The Political Economy of Banking Crises in Emerging Economies:
An Econometric Analysis of Political and Institutional Indicators

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ABSTRACT

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This dissertation evaluates how selected political and institutional variables affect banking sector fragility. A Binary Times—Series Cross – Sectional (BTSCS) model is used to test the relationship between banking crises and partisanship, rule of law and government strength across thirty-five emerging economies from 1980 through 2009. The model also tests for interactive effects of the selected qualitative indicators and domestic credit expansion on incidences of banking crises. The question investigated is: How do the selected political and institutional variables affect banking sector stability in the face of rapid domestic credit expansion? Direct-effect testing suggests general support for the hypothesis that banking crises are more prevalent under left-wing and centrist governments than under right-wing governments. However, interactive effects indicate that party orientation does not have a substantive effect on banking crises during periods of rapid domestic credit expansion. The effect of strength of rule of law on banking crises is inconclusive. However, econometric testing indicates some support for the hypothesis that banking crises are less likely under stronger systems of rule of law. Finally, the results show a strong and substantive relationship between government strength and incidences of banking crises. The interactive effects provide further support by suggesting that under conditions of rapid domestic credit expansion, higher levels of government strength reduce the likelihood of banking crises.

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CHAPTER ONE: INTRODUCTION

There is general consensus in political-economy literature that countries pursuing poor macroeconomic policies typically have weak institutions, including political institutions that do not constrain politicians and political elites, ineffective enforcement of property rights for investors, widespread corruption, and a high degree of political instability. [1] The purpose of this dissertation is to evaluate how selected political and institutional variables affect banking sector fragility. A Binary Times—Series Cross – Sectional (BTSCS) model is used to test the relationship between banking crises and partisanship, rule of law and government strength across thirty-five emerging economies from 1980 through 2009. The model also tests for interactive effects of the selected qualitative indicators and domestic credit expansion on incidences of banking crises. The question investigated is: How do the selected political and institutional variables affect banking sector stability in the face of rapid domestic credit expansion?

Banking crises are costly. The banking crises across Latin America in the 1980s, Europe and Asia in the 1990s and the 2008 Global Financial Crisis (GFC) highlight the costly nature of banking crises. The study outlined in this dissertation focuses on the political economy of banking crises in emerging economies. Emerging economies are gaining importance as international economic forces (i.e. India, Brazil, China, India etc…), as we saw with the expansion of the G8 to the G20. This underlines that financial sectors of emerging economies are on track to have a greater impact on economies beyond their borders. Therefore, studying various political and economic factors that may contribute to financial sector fragility in emerging economies has become more salient and relevant in the study of international economics.

[1] Acemoglu et al. (2002), Reinhart and Rogoff (2009), Willett and Chiu (2009), Broz (2013), Demirguc-Kunt and Detragiache (1998, 2002, 2005), for a more comprehensive list see References.

Political context matters. Contextual variations condition policy-makers' incentive and capacity structures "to manipulate economic policy for electoral and partisan gain, as well as the effectiveness of such manipulation, differently across democracies, elections, and policies."[2] Including indicators for political institutions in banking crisis models can help us understand the dynamics of politicians' willingness and ability to pass and implement prudent economic policies and make tough yet necessary decisions at critical times.[3]

The political and institutional variables chosen are party orientation, rule of law and government strength. These qualitative variables allow for testing across both democratic and non-democratic countries. In the case of party orientation, even in non-democratic countries the ruling power has a place on the left-right political spectrum. The ideological orientation of the political party in power can determine financial liberalization sequencing, types, levels and enforcement of regulatory measures and may inform expectations on government responses to financial distress. Effective legal systems decrease transaction costs by reducing opportunities for corruption in the banking sector thereby increasing the stability of the financial market. The strength of the legal system informs market expectations on property rights, contract enforceability and transaction costs. Government strength speaks to the quality of the regulatory environment and policy uncertainty. Government strength addresses political risk factors such as political gridlock, political paralysis and indecisiveness. Regime type, democratic v. non-democratic, is not given consideration because the literature on the relationship between economic growth, financial liberalization and democratization is by no means conclusive. Haggard (2000) finds that "contrary to defenders of 'Asian values' non-democratic governments

[2] Franzese, Jr., Robert (2002), p. 1. Gallo, Stegmann and Steagall (2006) state that "many financial crises during the last decade have derived more directly from political than purely economic problems," p.195.

[3] See: Leblang, David 2003, "To Devalue or to Defend: The Political Economy of Exchange Rate Policy in the Developing World," International Studies Quarterly 47, p.534

had no apparent advantages over democratic ones in adjusting to the crisis, and a number of disadvantages."[4]

The political-economy literature points to various mechanisms through which political and institutional structures may influence economic policies and incidences of banking crises. Broadly speaking, political and institutional factors can determine whether the leadership adopts and effectively enforces prudent financial sector regulations. Also, the political and institutional context faced by the financial sector may influence investor and consumer expectations on how the government will deal with problems in the banking sector. For example, the political orientation of the party in power may determine whether the financial sector will face stricter regulatory enforcement and control from the center. Party orientation of the ruling parties may determine the relationship between the government and private banks. Finally, the government-banking sector relationship can inform market expectations and set the tone for risk taking behavior in banking sector lending practices.

The dissertation is organized as follows: Chapter two discusses the nature of banking crises and the methodological approach used to develop the Baseline Economic Model (BEM) and the subsequent Political Economy Models (PEM). Chapter three examines the direct and indirect effects of partisanship on banking crises in emerging economies. The indirect effects of partisanship and government strength on banking crises are observed through the interactive effects of the selected independent variables and domestic credit growth levels. Chapter four examines the relationship between rule of law and banking crises. Finally, chapter five explores the direct and indirect relationship between government strength and incidences of banking crises. The following pages provide brief overviews of chapters two, three, four and five, and the main findings and their policy implications.

[4] Haggard (2000), p.2.

Chapter 2 provides an overview of the literature on banking crises and develops a Baseline Economic Model (BEM), which sets the foundation for the Political-Economy Models (PEM) introduced in chapters three, four and five. Analyses of financial crises in Latin America throughout the 1980s, Mexico in 1994-1995, the 1997 Asian Financial Crisis, Turkey and Argentina in 2001 and the 2008 Global Financial Crisis provide us with no shortage of empirical and econometric examinations of financial crises across different time periods. The binary nature of the dependent variable and the availability of data points required developing a Binary Time-Series Cross-Sectional model and using multivariate logistic regression to determine the direct and indirect effects of the selected political and institutional variables on banking crises.

The models introduced in this dissertation cover thirty-five emerging economies with data spanning from 1980 through 2009. Integrity testing indicated that of the forty countries in the original sample, five nations unduly influenced modelling results and were eliminated from the final Baseline Economic Model (BEM). The dependent variable is incidences of banking crises with data from Reinhart and Rogoff (2009)[5]. There are three independent political and institutional variables: party orientation of the executive, rule of law and government strength. The independent economic variable is domestic credit growth and is used to develop interaction terms to determine the indirect effects of partisanship and government strength on banking sector fragility in emerging economies. Chapter 2 presents a discussion of the literature on banking crises and outlines economic factors found to be significant in precipitating banking crises. In addition, the discussion presents literature on the role of domestic credit growth in banking crises. Precisely, the interactive effects determine how partisanship and government strength impact the banking sector when experiencing rapid domestic credit expansion. Based on the available data points for the sample of countries and years in this study, the main measure of

[5] RR (2009) use banking crisis start dates.

domestic credit is the domestic credit provided by the banking sector as a percent of GDP, and the domestic credit to the private sector to GDP ratio measure is used in sensitivity testing[6]. Other economic controls included are reserves as a percent of GDP, GDP growth rate, real interest rate, inflation rate, current account balance, incidences of currency crises, financial liberalization index, changes in terms of trade and real changes in exchange rates. The Appendix in Chapter 2 provides the comprehensive model integrity and specification testing results.

The relationship between partisanship and economic policy emanates from competitive parties cultivating strong ties to differing segments/classes of the voting population to establish reputations for policy making that favors those segments/classes and their ideological persuasions. Does partisanship have an effect on banking crises across the sample of emerging economies in this study? If so, how do the political parties behave in relation to the financial sector? Chapter 3 attempts to answer these questions by testing these relationships using logistic regression analysis in a Binary Time-Series Cross-Sectional model to determine the effects of partisanship on incidences of banking crises between 1980 and 2009 across thirty-five emerging economies. This study builds on the findings of Broz (2013) by examining the relationship between partisanship and banking crises in emerging economies.

Direct-effects testing indicate that leftist governments do not have a statistically significant impact on incidences of banking crises. However, in line with the hypothesis, we see that the odds of experiencing a banking crisis under leftist governments are higher than under rightist governments, by more than twice as much (odds ratio 2.250). This result is in line with Hibbs (1977). Under Hibbs (1977) Partisan Theory, leftist governments are much more willing to take on higher levels of inflation in pursuing job growth policies.

[6] Both measures are from the World Bank's World Development Indicators.

The logistic results of the BTSCS model surprise us by indicating a statistically significant positive correlation between centrist governments and incidences of banking crises for this study's sample of countries and years. The literature has made passing observations about centrist governments being prone to deficit spending and Broz (2013) found that in the run up to the recent sub-prime crisis, the deficit countries had more centrist governments than surplus countries or the rest of the OECD on average.[7] In the case of centrist governments, the odds of experiencing a banking crisis are three times higher under centrist governments than under right-wing governments (odds ratio 3.049). The magnitude of effects between centrist and leftist government is moderately high at a difference of 0.75 (or 75 percent).

Testing indicates substantively weak interactive effects for partisanship and domestic credit growth on incidences of banking crises. Marginal analysis shows that the probability of banking crises increase under right-wing governments with annual domestic credit expansion rates between 25 and 50 percent. This finding suggests support for the findings of Broz (2013). [8] However, substantively, given the various annual domestic credit expansion rates, there is very little difference in the probability of a banking crisis given the party orientation of the ruling executive. The greatest difference in the unconditional probability of a banking crisis by party is between right-wing rule and centrist rule with 45 percent annual domestic credit expansion at 0.7 percent, which is not a substantially high percentage. Partisanship exerts only weak effects on how the banking sector in the face of domestic credit expansion.

Effective legal systems decrease transaction costs by reducing uncertainty and opportunities for corruption in the banking sector thereby increasing the stability in the financial

[7] Broz (2013), p.81.

[8] Broz (2011) states "that right-wing parties, enabled by international capital mobility, run fiscal and current account deficits to reward their high-income constituents with asset booms", pp.5-6.

market. Haber (2008) examines the role of politics in financial development in the United States and Mexico from 1790 through 1914 and argues that the government is not a disinterested party in financial markets and has strong incentives to behave opportunistically and use financial repression for this own benefit. Identifying the relationship between law and order has significant policy implications. If the strength of rule of law significantly decreases banking sector fragility, then the inclusion of legal measures in reform packages gain importance and salience. In addition, the continual internationalization of nations will increase the need for an efficient legal system that has the capacity to handle the expansion and greater sophistication of the financial sector. The contract-intensive nature of the banking sector makes having an effective legal system critical for financial development and deepening.

This study hypothesizes that a weak law and order system increases the probability of a banking crisis. But what is the transmission mechanism between rule of law and banking crises? Shimpalee and Breuer (2006) discuss two causal mechanisms of how institutions affect currency crises, which is relevant and applicable to the cases of banking crises.[9] The causal mechanism is two-fold:

1- Institutions tend to have an impact and correlate with the health of the national economy. Therefore, institutions that lead to bad economic fundamentals may contribute to banking crises whereas institutions that help produce good economic fundamentals remove a reason for banking crises to occur.

2- Institutions are informative. Institutions that correlate with good economic conditions stabilize market expectations, reduce market uncertainty about the probability of a banking crisis, and make speculative capital outflows less likely.[10]

[9] In the authors' discussion of Li and Inclan (2001).
[10] Shimpalee and Breuer (2006), p. 128.

The PRS' International Country Risk Guide Law and Order index is the main proxy for the quality and effectiveness of the legal systems. The ICRG methodological note on this index is as follows:

Law and Order are assessed separately, with each sub-component comprising zero to three points. The Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law. Thus, a country can enjoy a high rating – 3 – in terms of its judicial system, but a low rating – 1 – if it suffers from a very high crime rate of if the law is routinely ignored without effective sanction (for example, widespread illegal strikes).[11]

The econometric testing finds weak support for the findings of Demirguc-Kunt and Detragiache (1996, 1998 & 2005). There is some evidence of a direct and inverse relationship between the level of law and order and incidences of banking crises across the sample of emerging economies and years. The ICRG's Law and Order Index does not have a statistically significant correlation with incidences of banking crises, however, the World Bank's World Governance Indicator "Rule of Law" exhibits a negative and statistically significant correlation with incidences of banking crises at the 10 percent level. The difference in results between the indices used may be due to inherently different methodologies behind each index. Also, each index may not fully capture the strength and efficiency of a country's legal institutions. An analysis of the marginal effects gives the magnitude of effects of changes in levels of rule of law on incidences of banking crises. A full point increase in WGI Rule of Law score decreases the probability of a banking crisis by 2.3 percent, holding all other variables at their means. Aggregately, a move from a -2.5 score to a 2.5 score gives a 11.5 percent [(-2.5-2.5)*2.3%] reduction in the probability of experiencing a banking crisis. For the STATA output of the marginal effects please refer to the Appendix at the end of Chapter Four. The magnitude of

[11] See: ICRG- Methodology http://www.prsgroup.com/ICRG_methodology.aspx#PolRiskRating

effects, using the WGI Index, suggests that increases in the strength of rule of law have a moderately significant impact on reducing banking sector fragility in the long-run.

In further research on the relationship between rule of law/institutions and banking crisis, it would be beneficial to create a composite indicator as is the case in Knack and Keefer (1995) and Law and Habibullah (2006). Both studies create a composite indicator comprised of five PRS indicators used to measure the overall institutional environment, including Corruption, Rule of Law, Bureaucratic Quality, Government Stability and Risk of Expropriation. The composite indicator is achieved by simply adding the scores for each of the five sub-categories. The use of a composite institutional variable in the case of banking crisis can meaningfully contribute to discussion of the political economy of the financial sector. Another area for further investigation is the examination of the origin of the legal code by country (Levine 1998, La Porta et al. 1997, 1998, Roe 2006). La Porta et al. (1997, 1998), argued that the origins of the legal code substantially influence the treatment of shareholders and creditors and the efficiency of contract enforcement.

In Chapter 5, the political economy model uses PRS' International Country Risk Guide (ICRG) Government Stability Index to measure government strength across 35 emerging economies from 1980 through 2009. This index comprises three sub-components, which add up to a maximum of 12 points for the highest level of strength:

- *Government Unity (0-4 points)*
- *Legislative Strength (0-4 points)*
- *Popular Support (0-4 points)*

The ICRG's explanation of the Government Strength indicator is as follows:[12]

> *[Government Strength] is an assessment both of the government's ability to carry out its declared program(s), and its ability to stay in office.*

The hypothesis in this study is that higher levels of government strength decrease the probability of a banking crisis in emerging economies. Logistic regression is employed in a Binary Time-Series Cross-Sectional model to look at the relationship between government strength levels and incidences of banking crisis across thirty-five emerging economies from 1980 through 2009. In addition to testing the direct effects of government strength on incidences of banking crisis, the interactive effects of government strength and domestic credit expansion on banking crises is examined. Domestic credit expansion is a significant indicator for incidences of banking crises (See Chapter 2) and the argument here is that government strength determines whether the government has the capacity and willingness to adopt and enforce prudential regulation in the financial sector. Government strength may determine how the banking sector deals with lending booms. In addition, government strength influences policy uncertainty. If there is high policy uncertainty then there will less consumer and investor confidence in whether the government will effectively manage problems in the financial sector. Without confidence in government actions, investors and borrowers will determine their banking sector transactions based on very short-term expectations related to credit, interest rate and exchange rate risks.

The hypothesis is that the effects of annual domestic credit growth on banking sector stability are lessened under stronger governments. The econometric testing indicates that there is indeed a substantive relationship between government strength and incidences of banking crises. The results show a negative and statistically significant interactive effect of government strength

[12] PRS' ICRG Government Stability Index methodology: http://www.prsgroup.com.ccl.idm.oclc.org/ICRG_Methodology.aspx#PolRiskRating

and domestic credit expansion on incidences of banking crisis, which is in line with the expected relationship and the literature.

In the case of government strength, we see mild substantive direct effects of government strength levels of banking sector fragility. Marginal analysis shows that a one score increase in the ICRG Government Strength index lowers the marginal probability of a banking crisis by just 1.12 percent. A 2 point increase means just a 2.24 percent drop in the probability of a banking crisis. The average government strength score for the sample of countries in this study is 7.66 out of 12, which means average of 8.58 percent reduction in the probability of a banking crisis. Movement from the average government strength level to its maximum score of 12 means a maximum further reduction of 4.86 percent in odds of a banking crisis occurring.

Table 5.8 presents the coefficient results for the interaction term with domestic credit growth rates and ICRG-GS scores. The results suggest support for the hypothesis that at times of rapid domestic credit expansion higher government strength decreases the odds of a banking crisis. Compared to domestic credit growth during times of low government strength, domestic credit growth at times of medium-strength decreases the odds of a banking crisis by 3.4 percent (1-0.956) and by 2.6 percent during times of high government strength. Consequently, we see that at times of higher government strength, domestic credit rates have a lesser impact on the banking sector. The results exemplify the importance of government strength in economic outcomes.

CHAPTER TWO: BASELINE ECONOMIC MODEL OF BANKING CRISES

Banking crises have had an uneven evolutionary history. After the financially turbulent years of the '20s and '30s, the post WWII period was marked by economic tranquility. The macroeconomic environment was calm, there was good economic growth, consistently low inflation and extensive controls on international capital flows. According to Demirguc-Kunt and Detragiache (2005), "in many countries, including the more free market-oriented ones, bankers' freedom of action remained severely restricted by watchful central bankers, wielding a wide array of regulatory powers to control the quantity and price of credit".[13] The tranquility of the times dissipated in the 1970s with the collapse of the Bretton Woods system and the first oil shock of 1973 creating both fiscal and monetary volatility. Banking sectors in industrialized countries however were able to weather these events via maintaining low (negative) real interest rates and benefiting from less systemic risk due to the pervasive regulatory measures. [14]

The 1980s marked the re-emergence of banking crises, primarily in Latin America, in the aftermath of implementing various trending deregulation and financial liberalization policies. Not since the Great Depression had banking crises reached such levels, in frequency and severity, as they did in the decades following financial liberalization in the '80s.[15] The 1980s ushered in an era of high real interest rates and the liberalization of credit markets around the world, most strikingly in Latin America and Asia. As emerging economies began implementing liberalization policies, developing their financial sectors and decreasing capital controls banking crises took on new significance as the number of countries impacted at a given crisis point

[13] Demirguc-Kunt and Detragiache (2005), p. 83.
[14] DD (2005), p.84.
[15] See Bordo et al (2001) and Laeven (2011).

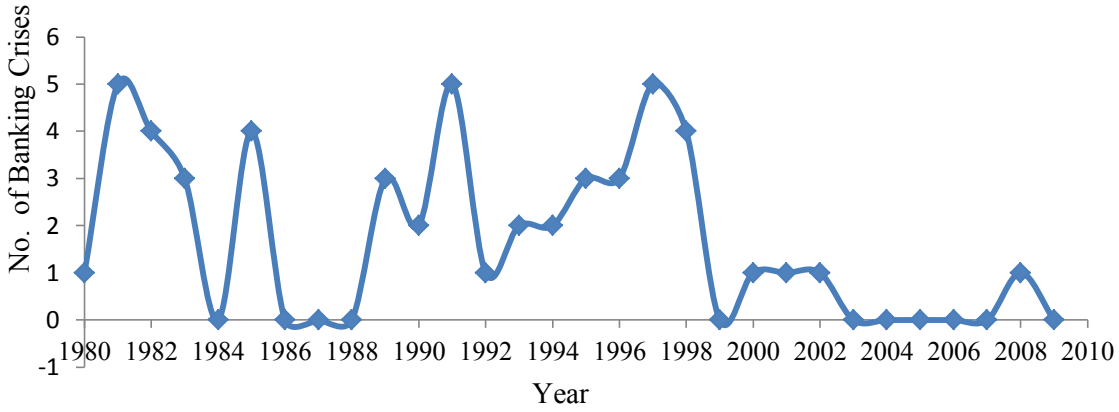
increased and the economic impact of these crises more deeply penetrated the domestic economies.

The grave economic and development consequences of banking crises have pushed research beyond the analysis of just economic and financial variables before and after banking crises, other variables such as political instability, policy uncertainty, the role of politics in the sequencing of liberalization policies and the role of government in financial sector development has been gaining greater scholarly attention due to their effects on investor and consumer confidence and expectations.

The first section of this chapter presents an introductory background on banking crises and an overview of the political-economy literature on this topic. The second section of this chapter presents the methodological approach, diagnostic testing and econometric model, which is to serve as the baseline economic model of the political economy approach implemented in chapters 3, 4 and 5.

Graph 2.1 charts incidences of banking crises by year from 1980. The study focuses on the post-1973 oil shock and break down of the Bretton Woods system to allow for more unbiased analysis of banking crises. We see that since 1980 each decade has witnessed many banking crises. There are no major trends, however the 1980s and 1990s were financially turbulent times compared with the relative economic stability from 2000 to 2008.

Graph 2.1 Incidences of Banking Crisis by Year



For this sample of countries the costs of a banking crisis can be as high as 143 percent of GDP (Kuwait 1982-1985), with an average of 41.5 percent of GDP[16]. The median is 33 percent, meaning that half of the countries in the sample face 29 percent or more in output losses due to a banking crisis. Emerging economies do not have the revenue streams of the more industrialized economies and face the additional costs of stalled or reversed development gains. The curtailing of credit to the real economy makes banking crises a nightmare scenario for emerging economies in terms of development and consumption costs. Graph 2.1 shows that there have been banking crises in the majority of the years between 1980 and 2009, which supports Reinhart and Rogoff's (2009) assertion that banking crises are not uncommon. The uncommon nature of banking crises makes the task of understanding the determinants of banking crises all the more important.

[16] Output cost data not available for all countries.

Table 2.1 Output Loss per Banking Crisis for Selected Countries [17]

Country	Year	Output Loss per Banking Crisis (% of GDP)
Argentina	**1980**	**58**
	1989	**13**
	1995	**0**
	2001	**71**
Brazil	**1990**	**62**
Chile	**1981**	**9**
China	**1998**	**19**
Colombia	**1998**	**43**
Ecuador	**1981**	**25**
Hungary	**2008**	**42**
Indonesia	**1997**	**69**
Kenya	**1997**	**58**
Kuwait	**1983**	**143**
Malaysia	**1997**	**31**
Mexico	**1981**	**27**
	1994	**14**
Morocco	**1983**	**22**
Sri Lanka	**1989**	**20**
Thailand	**1983**	**25**
	1996	**109**
Turkey	**1982**	**35**
	2000	**37**
Uruguay	**1981**	**38**
	2002	**27**
Mean		**41.5%**
Median		**33%**

Source: Laeven, Luc and Fabian Valenica (2008)

Emerging economies depend on the revenue streams from financial sector transactions to finance their development projects. There are two key differences between industrial and emerging economies regarding institutional banking structures, which make a huge difference in terms of the vulnerabilities the banking sector faces. First, private debt contracts have very short durations, and second, many debt contracts are denominated in foreign currencies.[18] Therefore, emerging economies where these two conditions hold, at the very least face exchange rate and credit risks that necessarily come from maturity and currency mismatches. Mishkin (1999)

[17] Laeven and Valencia (2008) figures on output loss by banking crisis is not available for all countries in the sample.

[18] Mishkin, Frederic S. (1999). Lessons from the Tequilla Crisis, Journal of Banking and Finance, 23: p.1522.

mentions that in emerging economies, like Mexico, private contracts are re-priced at least once a month, so the duration of debts is necessarily short. This is in contrast to industrialized countries, where the duration of debts can go into the years.[19] The reason for this difference in banking structures is that emerging countries face far greater inflationary pressures due to high and variables interest rates. Interest rate volatility increases uncertainty and lowers market confidence. Consequently, debt contracts must be short in duration bringing them in line with future expectations regarding the domestic currency. This was a prominent feature of the institutional structure in the Chilean financial markets before the financial crisis in 1982 and in Mexico 1994.[20]

Political and institutional considerations may further compound the vulnerabilities that banking sectors face in emerging economies. Factors such as partisanship, government strength, policy uncertainty and rule of law are important in reducing volatility of investor and consumer expectations. A stable political environment where property rights are protected supports an environment conducive to financial sector growth. In stable environments investors and consumers can engage in long-term financial contracts based on consistent expectations. If the regime is marked by political and institutional weakness, investor confidence and expectations can only be set on a very short-term basis.

In the past-twenty years, studies of banking crises have looked to interest rate, credit, liquidity and market risks to determine the causes of banking crises.[21] Studies have focused on how exogenous and endogenous shocks can generate systemic risk.[22] The Demirguc-Kunt and

[19] Mishkin (1999), p. 1522
[20] Mishikin (1999), 9.1523. The very nature of banks makes them vulnerable to large relative price changes and to losses of confidence (Goldstein 2005). Greater pressures due to high and variable interest rates accounts for the difference between emerging and industrialized economies.
[21] Ergungor and Thompson (2005)
[22] Davis and Karin (2008)

Detragiache's (1998) seminal article in modeling the macroeconomic, financial and institutional determinants of banking crises provides the methodological basis for the models in this dissertation. Other notable studies include, Demirguc-Kunt and Detragiache (2005), Eichengreen and Arteta (2002), Herrero and Del Rio (2003), Klomp (2010) and Kaminsky and Reinhart (1996, 1999). Table (2) below provides the findings of these studies.[23]

Table 2.2 Banking Crisis Studies

	Demirguc-Kunt and Detragiache (1998)	Demirguc-Kunt and Detragiache (2005)	Eichengreen and Arteta (2002)	Herrero and Del Rio (2003)	Klomp (2010)
Real GDP Level			ns, -		**, -
Real GDP growth rate	***,-	***, -		**, -	**, -
Changes in terms of trade	*,-	ns, +			ns, +
Real Interest Rate	***, +	***, +		ns, +	**, +
Inflation rate	***, +	***, +		ns, -	**, +
Reserves (% of GDP)	**, +	*, +	*, +		**, +
Private credit to the GDP	*, +	***, +			ns, +
Credit growth rate	***, +	**, +	*, +	ns, +	**, +
Real GDP per capita	*, -	**, _			na
Period	1980-1994	1980-2002	1975-1995	1970-1999	1970-2007
Countries	Mixed	91	75 emerging	79 mixed	61
Method	Logit	Logit	Logit	Logit	Logit

*, **, *** represent 10, 5 and 1 percent significance respectively. ns= not significant

Kaminsky and Reinhart (1996, 1999) pioneered the Signals Extraction Approach, which examines indicators individually by setting thresholds and sounding alarms when an indicator crosses a particular threshold. Kaminsky and Reinhart (1996) examine the behavior of a number of macroeconomic variables in the months before and after a crisis in a sample of 20 countries, they find that the best signals appear to be a loss of foreign exchange reserves, high real interest

[23] For comprehensive reviews of banking crises see: Davis and Karin (2008) and Laeven (2011).

rates, low output growth, and decline in stock prices.[24] For a more comprehensive list of studies on the determinants of banking crises, please refer to the References section.

The main economic explanatory variable is domestic credit growth. Domestic credit growth may be used as a proxy for economic openness. Domestic credit growth rates have been found consistently significant in a multitude of studies examining incidences of banking crises.[25] Finally, domestic credit has political economy dimensions, which make it appropriate for examining the indirect effects of partisanship and government strength on banking sector fragility.

A Political Economy Overview of Banking Crises

Literature focusing on the role of political institutions in precipitating banking crises is in its nascent phase, but has been gaining scholarly interest in recent years. This section provides an overview of the some of the most significant contributions to political-economy discussions of banking crises.

The political-economy literature emphasizes that stabilization policies are front loaded in terms of costs and the political players engage in a "war of attrition" trying to wait out the other to avoid the political costs of such stabilizations, which are unevenly distributed to the party initiating the stabilization policies.[26] Until the 1997 Asian Financial Crisis (AFC), the relationship between political institutions and financial/economic health was examined primarily in the context of Latin American countries.[27] The financial liberalization and privatization paths

[24] Kaminsky and Reinhart (1996)
[25] See Frankel and Saravelos (2010) , Laeven (2011) , Davis and Karin (2008) and Klomp (2010).
[26] Alesina, Alberto and Allan Drazen (1989). Why are Stabilizations Delayed? National Bureau of Economic Research Working Paper No. 3053, August.
[27] Due to the many financial crises Latin American countries faced during the 1980s.

in many Latin American countries created enough financial sector volatility to lead quite a few emerging economies to experience one or more banking crises throughout the 1980s and 1990s.[28]

The EMS crises in Europe in 1992-1993 gave rise to the second generation crisis models, expanding on first generation crisis models, which focus on macroeconomic fundamentals. The first generation crisis model focused mainly on fiscal discipline issues, where the "government uses its money printing machine to finance a budget deficit while also trying to maintain fixed exchange rates by using limited exchange reserves."[29] In the next evolution, second generation crisis models incorporated political and institutional considerations. In the second generation crisis model the government is caught between abandoning its fixed exchange rate and wanting to defend its exchange rate. In this model the costs of defending the exchange rate increase as the expectation that the government will abandon the fixed exchange rate increase. The costs of defending the exchange rate exponentially increase if an upcoming election is factored in the calculation. Speculators, foreign and domestic, will want to sell the currency, due to the expectation that the government will take on expansionary fiscal and monetary policies in the run up to an election, making the job of defending the exchange rate essentially impossible.[30] Mei (1999) points out that within the second generation crisis models the lack of fiscal discipline is "likely to happen during elections, since this is when democratically elected government would have the strongest incentive to engage in the inconsistent policies. As a result, he finds that 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

[28] Carstens et al. (2004). Banking Crises in Latin America and the Political Economy of Financial Sector Policy, Paper prepared for the seminar Governments and Banks: Responsibilities and Limits, IDB-IIC Annual Meetings, Lima, Peru, 28 March.. There remains a debate as to the role of open market economics in precipitating financial crises in Latin America, but the intricacies of this debate is beyond the scope of this paper.

[29] Mei (1999)

[30] Haggard (2000) and Mei (1999)

interventions."[31] And of course, the use of expansionary monetary and fiscal policies in the run up to elections, in order to keep down unemployment is well documented

The second generation crisis model introduces the concept of "multiple equilibria", a state in which national economies find themselves in zones of economic vulnerability where financial crises can either be hastened or avoided. It is within this zone of vulnerability that particular institutional arrangements and their policy formulations can have a decisive role in precipitating or warding off a financial crisis.

Khan et al. (2011) examine whether central bank autonomy reduces the probability of a banking crisis. [32] They use cross-country data from 1980-1989 and conduct both binary and ordered logit estimation models. They find that central bank autonomy is associated with lower probabilities of a banking crisis. The authors interact central bank independence with a country's law and order tradition and find that indeed countries which have independent central banks and a strong law and order tradition face fewer incidences of banking crisis. Crespo-Tenorio et al. (2011) examine the issue of political survival in the case of banking crises and find that incumbents are more likely to lose power sooner when they are forced to deal with the consequences of banking crises. They also find that in open economies, where the connection between government action and economic outcomes is so muddled that holding incumbents accountable for bad economic performance becomes difficult. Amri and Kocher (2011) examine the relationship between the political economy of financial sector supervision and banking crises and find that on average countries with more veto players (checks) are "less vulnerable to special interests influencing the adoption of imprudent regulations and are therefore less likely to

[31] Mei (1999)
[32] Khan, Anichul H., Haidaer A. Khan and Hasnat Dewan (2011). Central Bank Autonomy, Legal Institutions and Banking Crisis Incidence, International Journal of Finance and Economics,17 October.

experience banking crises."[33] Keefer (2007) argues that government policies can play a large role in influencing whether crises will occur and in allocating the costs of the crises.[34] Potential government measures can include: fiscal transfers, recapitalization and forbearance for insolvent banks. Rosas (2002) finds that bailouts and forbearance were largely a function of political influence, not technocratic determinations.[35] Keefer and Stasavage (2003) look at political institutions, political polarization and veto players in the context of the banking sector and find that "multiple veto players can increase credibility (reduce inflation), that legal central bank independence is more likely to reduce inflation in the presence of multiple political veto players, and that all of these effects strengthen when political veto players are more polarized."[36] Haber (2003) looks at the relationship between political institutions and regulation and performance of banking systems and finds that political competition (electoral suffrage, separation of powers and federalism) accomplishes two goals: it provides ex ante vetos on policy making and its provides sanctions on public officials who do not abide by their promises or who engage in rent seeking."[37]

Finally, Reinhart and Rogoff's (2009) study of banking crises emphasizes that "banking crises dramatically weaken fiscal positions in both developing and developed nations, with government revenues invariably contracting, and fiscal expenditures often expanding sharply.

[33] Amri, Puspa and Brett Matthew Kocher (2011). The Political Economy of Financial Sector Supervision and Banking Crises: A Cross-Country Analysis, European Law Journal, 18(1), p.24. The authors' conclusions line up with the findings of Bueno de Mesquita, Root and Keefer: that when there are multiple veto players the government faces fewer incentives to grant private benefits to the select few. However, in the authors' regressions the coefficients on checks were not found to be significant.

[34] Keefer (2007) and Hanson, Samuel G., Anil K. Kashyap and Jeremy C. Stein (2011). A Macroprudential Approach to Financial Regulation, *Journal of Economic Perspectives*, 25(1): 3-28

[35] Keefer, Phillip (2007). Elections, Special Interests and Financial Crisis, *International Organization*, 61(Summer), p.618.

[36] Keefer, Philip and David Stasavage. 2003. The Limits of Delegation: Veto Players, Central Bank Independence, and the Credibility of Monetary Policy. American Political Science Review Vol 97, No. 3 (August),p. 408.

[37] Haber, Stephen (2003). Political Institutions and Banking Systems: Lessons from the Economic Histories of Mexico and the United States, 1790-1914, Center for Research on Economic Development and Policy Reform, Working Paper No. 163, April, p. 4

Three years after a financial crisis central government debt increases, on average, by about 86 percent.[38] The sharp increase in debt is not only driven by the direct effects of banking crises, but also by the severe output losses associated with banking crises. Laevan and Valencia (2010)'s updated database provides data on output losses of countries that have experienced banking crises from the 1980s through 2008. The authors' database shows a wide variance in the rates of output losses, ranging from 0 percent to 143 percent of GDP. Taking the average, the output losses are 31 percent of GDP, however the median provides more meaning with 21 percent of GDP. The median tells us that half of all banking crises that have occurred since the 1980s have generated output losses greater than 21 percent of GDP. For emerging economies, the significant increases in output losses inevitably slows the pace of all around economic and financial development.

The goal of this chapter was to provide a brief history and overview of the determinants of banking crises outlined in the available literature. The literature imparts the particularly negative effects of banking crises on development in emerging economies and, thus far the purely economic models have left much to be desired in their predictive abilities witnessed by the "surprise" onset of the Asian Financial Crisis and the 2008 Global Financial Crisis. I take inspiration from and expand on the models set forth by Demirguc-Kunt and Detragiache (1998, 2005) to allow for a rigorous treatment of political and institutional variables (rule of law, government strength and party orientation) in the context of banking crises.

Data, Methods and Results

Economic modeling in this study is guided by the methodology and models presented Demirguc-Kunt and Detragiache (1998, 2000 and 2005). These works have a seminal role in the evolution

[38] Reinhart, Carmen M. and Kenneth S. Rogoff (2008). Banking Crises: An Equal Opportunity Menace, NBER Working Paper No. 14587, December.

of research on banking crises as they represent the some of the first works to examine financial crises in developing countries. The authors use a multivariate logit model in all three works, and argue against the signals approach since each possible covariate is considered in isolation and the economic model does not provide a way to aggregate the information provided by each indicator.[39] By focusing on whether or not the variable in question has crossed the crucial threshold, the Signals Approach ignores a lot of information in the data. Also, the Signals Approach does not present a way to examine the differences between indicators that just barely cross the critical thresholds and indicators that surpass the thresholds by large units. Detragiache and Demirguc-kunt (1998) argue that one way to remedy some of these problems is to use a multivariate logit model. In this approach, the probability that a crisis occurs is a function of a vector of explanatory variables. A logit econometric model is fitted to the data and an estimate of crisis probability is obtained by maximizing the likelihood function. Thus, the model produces a summary measure of fragility which makes the best possible use of the information in the explanatory variables, subject to the hypothesized functional form of course. In DD (1998), the authors find that a crisis probability estimated through a multivariate logit framework result in lower in-sample type I and type II errors than the signals of Kaminsky and Reinhart (1999).[40]

This study uses a Binary Time-Series Cross-Sectional (BTSCS) multivariate logit model to examine the determinants of banking crises using a sample of 40 emerging economies from 1980 through 2009. For a full list of economic variables and their sources see Table 2.4. The mathematical focus of my models is on the logistic regression as opposed to the logit regression. Both regressions present the same conclusions but the logistic regression presents

[39] DD (2005).
[40] DD (2005), p.10. To determine whether the logit model can be used to assess banking sector fragility, the authors construct out-of-sample forecasts of crisis probabilities using coefficients estimated from the multivariate logit model and forecasts of right-hand-side variables drawn from professional forecasters or international organizations (conclusions from DD (2000), p.10.

coefficient results in terms of odds of success. We can start with the basic logistic regression below,

$$Y \mid X = B_0 + B_1 X_1 + \varepsilon$$

Interpreted, this equation says the outcome (Y) depends on a vector of independent variables, Xi. However, in the case of discrete outcomes we cannot use this equation, because we can't meet the assumption of homoscedasticity. In the case of discrete outcomes, variance is not constant. By algebraic manipulation, the logistic regression can be written in terms of odds ratio for success, which is appropriate for models with binary outcomes.

$$\left[\frac{P(Y=1 \mid X_i)}{(1-P(Y=1 \mid X_i))}\right] = \left[\frac{\hat{\pi}}{(1-\hat{\pi})}\right] = \exp(b_0 + b_1 X_{1i})$$

Next we take the natural log of both sides to present the equation in term of logits (log-odds) for a single predictor.

$$\ln\left[\frac{P(Y=1 \mid X)}{(1-P(Y=1 \mid X))}\right] = \ln\left[\frac{\hat{\pi}}{(1-\hat{\pi})}\right] = b_0 + b_1 X_1$$

For multiple predictors the logistic regression is as follows:

$$\ln\left[\frac{\hat{\pi}}{(1-\hat{\pi})}\right] = b_0 + b_1 X_1 + b_2 X_2 \ldots + b_k X_k$$

The dependent variable is the incidence of banking crises from 1980 through 2009 provided by Reinhart and Rogoff (2009). The start date is set (1980) after the post- Bretton Woods and '73 oil shock time period. The inclusion of these two major episodes during the 1970s could exert undue influence in the model and bias the results. There is also the issue of data limitations. Since the focus is on emerging economies, the dataset for this model necessarily

has missing observations, which warrants using a Binary Time – Series Cross-Sectional (BTSCS) model.

Choosing incidences of banking crises as the dependent variable raises the issue of accurately defining and dating banking crises. There is no universal definition and method for dating banking crises. Table 3.1 provides a list of major scholarly attempts at defining banking crises.

Table 2.3 Defining a Banking Crisis

Authors	Definition of Banking Crisis	Source
Carmen M. Reinhart and Kenneth S. Rogoff (2008) and Graciela L. Kaminsky and Carmen M. Reinhart (1999)	They mark a banking crisis by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; and (2) if there are no runs, the closure, merging, takeover or large-scale government assistance of an important financial institution (or group of institutions), that marks the start of a string of similar outcomes for other financial institutions, p.81.	This Time is Different: A Panoramic View of Eight Centuries of Financial Crises (2008). National Bureau of Economic Research, Working Paper No. 13882. This Time It's Different: Eight Hundred Years of Financial Folly (2009). The Twin Crises: The Causes of Banking and Balance-of-Payments Problems. American Economic Review, 89(3): p.476.
Asli Demirguc-Kunt and Enrica Detragiache, IMF	In this study, the authors examine five different studies, Caprio and Klingebiel (1996), Drees and Pazarbasioglu (1995), Kaminsky and Reinhart (1996), Lindgren, Garcia and Saal (1996) and Sheng (1995) and define a banking crisis episode when at least one of the following four conditions hold: 1) The ratio of non-performing assets to total assets in the banking system exceeds 10 percent. 2) The cost of the rescue operation was at least 2 percent of GDP. 3) Banking sector problems resulted in a large scale nationalization of banks. 4) Extensive bank runs took place or emergency measures such as deposit freezes, prolonged bank holidays, or generalized deposit guarantees were enacted by the government in response to the crisis.	The Determinants of Banking Crises in Developing and Developed Countries (1998). IMF Staff Papers, 45(1).
Luc Laeven and Fabian Valencia, IMF	A banking crisis in defined as systemic if two conditions are met: 1) Significant signs of financial distress in the	Systemic Banking Crises Database: An Update (2012). IMF Working

	banking system (as indicated by significant bank runs, losses in the banking system and/or bank liquidations. 2) Significant banking policy intervention measures in response to significant losses in the banking system, p.4. They consider policy interventions in the banking sector to be significant if at least three out of the following six measures have been used; 1) Extensive liquidity support (5 percent of deposits and liabilities to nonresidents) 2) Banks restructuring gross costs (at least 3 percent of GDP) 3) Significant bank nationalizations 4) Significant guarantees put in place 5) Significant asset purchases (at least 5% of GDP).	Paper No. WP/12/163.

The study in this thesis uses the Reinhart and Rogoff (2009) definition for banking crises due to its comprehensiveness. The decision to use this dataset is driven by the availability and integrity of the data. RR's (2009) dataset covers fifty-one incidences of banking crises for the forty emerging economies included in this study. Also, Laeven and Valencia's (2010) dataset of incidences of banking crises is tested to assess the robustness of the results. Table 2.4 provides the list of banking crisis start dates for the forty emerging countries initially considered in this study.

Table 2.4 List of Sample Countries and Crisis Years

Country	Crisis Years	Country	Crisis Years	Country	Crisis Years
Argentina	1980,1985, 1989,1995, 2001	Israel	-	Slovenia	-
Bangladesh	-	Jordan	-	South Africa	1989
Botswana	-	Kenya	1996	Sri Lanka	1989
Brazil	1985, 1990, 1994	Korea	1983,1985, 1997	Thailand	1983,1996
Bulgaria	-	Kuwait	1983	Turkey	1982,1991, 2000
Chile	1981	Latvia	-	Ukraine	1997
China	1998	Lithuania	1995	Uruguay	1981,2002
Colombia	1998	Malaysia	1985,1997	Venezuela	1993
Czech	1991	Mexico	1981,1994		

Republic			
Ecuador	1981,1996, 1998	Morocco	1983
Egypt	1980,1981	Nigeria	-
Estonia	-	Philippines	1997
Hong Kong	1982	Poland	1991
Hungary	1991,2008	Russia	1995, 1998
India	1993	Singapore	1982
Indonesia	1992,1997	Slovakia	1991

Source: Reinhart and Rogoff (2009)

There is no universal list of countries classified as "emerging" vs. "developing". Therefore, in developing a list of emerging economies the following sources were consulted: The World Bank, IMF, S&P, Moody's, Institutional Investor and Emerging Markets Index. These sources all have their own criteria for which countries can qualify as "emerging". Countries overlapping across the various lists were chosen for this study.

The goal of this study is to examine the direct and indirect effects of partisanship, government strength and rule of law on incidences of banking crises across the selected emerging economies. Indirect effects are observed by testing interaction terms between domestic credit growth and the selected political and institutional variables on incidences of banking crises. The dynamics of credit growth have been the subject of study since banking crises became prevalent in Latin America and Asia in the '80s and 90's. Rapid credit growth due to financial and capital account liberalization increases the vulnerability of the banking sector to liquidity, credit, exchange rate and interest rate risks.[41] Most agree that when financial liberalization policies are not phased in gradually with the necessary macro-prudential regulatory measures in place, the credit growth that financial liberalization spurs creates systemic risk for the banking sector.[42] Consequently, when there is a shock, for example a sharp interest rate increase borrowers and the bankers are both adversely affected. When interest rates increase on

[41] Goldstein et al. (2005).
[42] DD (1998): pp.83-84, Drees and Pazarbasioglu (1998), KR 1999, Mishkin (1999).

the short-term debt contracts, borrowers will find it increasingly difficult to service their debts and the rates of non-performing loans start to rise. The bank also loses since it has to cover the losses from non-performing loans. In addition, in the case of an interest rate shock, bankers, have to pay more on bank deposits, which also increase their liabilities and deplete their reserves. These conclusions are supported by the observation that episodes of expansive credit growth are often followed by banking crises. Examples of banking crises following lending booms have spanned countries across Latin America and Asia in the past three decades.[43]

Financial liberalization can promote asset bubbles with a combination of sharp increases in the volume of credit and lack of quality control on investments banks fund.[44] Rapid credit growth not only increases the vulnerability of the banking sector to crises, but also impacts the severity of the banking crisis.[45] This is not to say that financial liberalization is not beneficial to an economy. As Mishkin (1999) points out "Liberalization and financial deepening are positive developments for the economy in the long run, in the short run the lending boom may outstrip the available information resources in the financial system, helping to promote a financial collapse in the future."[46] Since credit expansion is a prominent feature of deregulation and financial liberalization policies, it is important to understand the dynamics of domestic credit in relation to political and institutional variables (See chapters 3, 4 and 5).

Credit growth is the main economic explanatory variable in the baseline economic model developed in this chapter. Amri, Ankinand and Wihlborg (2011) was consulted in determining

[43] See: Mishkin (1999), DD (1998, 2005), Garcia Herrero and Del Rio (2003). There are too many studies to list here, see References. Lending booms emanate from financial deregulation and liberalization, both because of increased opportunities for lending.
[44] Allen and Gale (2000), Laeven (2011) and Mishkin (1999).
[45] Laeven (2011).
[46] Mishkin (1999), p.1530.

the appropriate measures of domestic credit growth.[47] The authors provide a table outlining measures of credit growth in the banking crisis literature.[48] The authors list four measures of credit: real credit per capita, real domestic credit to the private sector credit to GDP ratio, real domestic private credit growth/real GDP growth and net domestic credit. The two data sources for these measures are the World Bank's World Development Indicators and IMF's International Financial Statistics. After examining data availability for the set of sample countries in this study over the period from 1980 through 2009, the domestic credit provided by the banking sector as a percent of GDP (*DC1*) and the real domestic credit to the private sector credit to GDP ratio (*DC2*) present the most data points. The main indicator chosen as a proxy for domestic credit growth is *domestic credit provided by the banking sector as a percentage of GDP* (DC1). This indicator provides the most data points and reflects the direct role of the banking sector in domestic credit growth. Sensitivity analysis ensures the robustness of the results by testing a second measure of domestic credit, *DC2*. Studies such as Demirguc-Kunt and Detragiache (1998, 2005) and Mishkin (1999) look at the impact of one and two year lags. Demirguc-Kunt and Detragiache (1998, 2000, 2005), Mishkin (1999), Kaminsky and Reinhart (1999) among others, explore the impact of lagged domestic credit growth on incidences of banking crises. There is no standard in the literature regarding specific numbers of lags, but it is customary to examine one and two year lags. The reason for this is that changes in domestic credit, exchange rates and reserve rate policies take time show themselves in the financial market. In terms of banks in particular, it takes some time for loans to go bad, therefore we can expect lagged effects. The main economic indicator in this study, domestic credit growth, is set at a two year

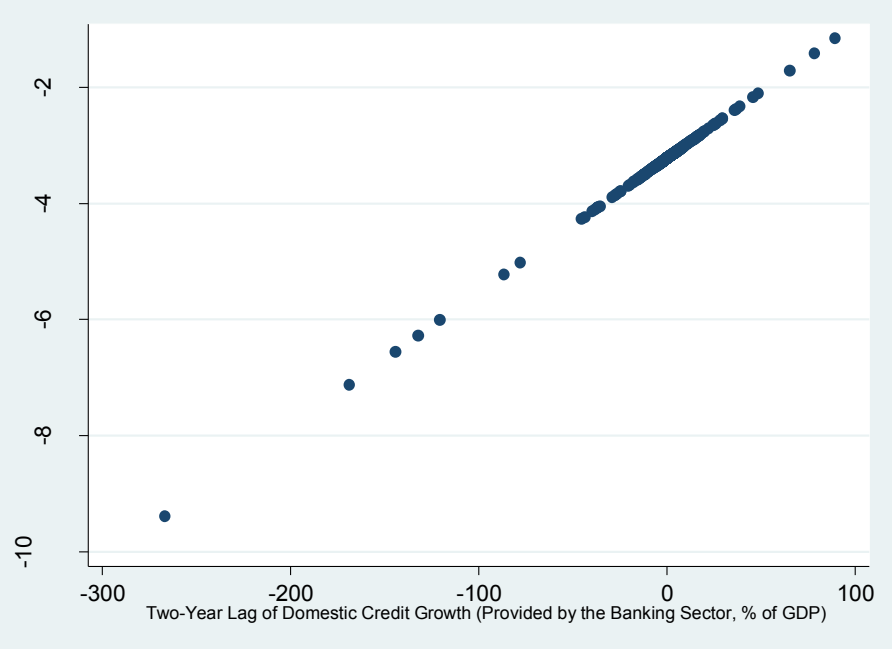
[47] Amri, Puspa, Angkinand, Apanard P., Clas Wihlborg (2011). International Comparisons of Banking Regulation, Liberalization and Banking Crises, Journal of Financial Economic Policy.

[48] Amri, Puspa, Angkinand, Apanard P., Clas Wihlborg (2011). International Comparisons of Banking Regulation, Liberalization and Banking Crises, Journal of Financial Economic Policy. See Table II, p.329.

lag. The reason or this is that rapid domestic credit expansion in emerging economies has been mostly the result of financial and capital account liberalization and a lag of two years allows for the effects of domestic credit growth to materialize in the financial sector. In their 1999 study of 76 currency crises and 26 banking crises for 20 countries during 1970 to mid-1995, Kaminsky and Reinhart find that two-year lagged domestic credit growth is an efficient proxy for financial liberalization.[49]

To further illustrate the positive relationship between two-year-lagged domestic credit growth and banking crises, I plotted a predicted probabilities graph using my dataset. Graph 2.2 indeed indicates a positive relationship between domestic credit growth at a two year lag and incidences of banking crises.

Graph 2.2 Predicted Probabilities



[49] Focusing on the link between currency and banking crises, Kaminsky and Reinhart (1999) analyze 76 currency crises and 26 banking crises for 20 countries during 1970 to mid-1995. One of their main findings is that financial liberalization often precedes banking crises. Their proxy for financial liberalization is two-year lagged domestic credit growth. http://www.imf.org/external/pubs/ft/wp/wp9883.pdf
http://www.gredeg.cnrs.fr/Colloques/NFI/Papers/PapierOnLine/Chaudry.pdf

In addition to domestic credit growth, other economic variables outlined by the literature to be significant are accounted for in the baseline economic model. In determining which economic variables to include, the following sources were consulted: Demirguc-kunt (1998, 2000, 2005), Eichengreen and Arteta (2002), Frankel and Saravelos (2010) Herrero and Del Rio (2003), Klomp (2010), Laevan and Valenica (2011) and Reinhart and Rogoff (2009) (see Table 2.2). Table 2.5 below lists all economic variables used in this study and their sources.

Table 2.5 All Economic Variables in Study

Variable	Code	Source
Banking Crisis	bc	Laeven and Valencia (2008) Reinhart and Rogoff (2008), binary
Reserves (% of GDP)	r1	Author's calculations using WDI data, continuous
Domestic Credit provided by the banking sector (% of GDP)	dc1	WDI, continuous
Domestic Credit to the Private Sector (% of GDP)	dc2	WDI, continuous
Real Changes in exchange rates (%)	exgr	USDA, continuous
Current Account Balance	ca	WDI, continuous
GDP growth rate	gdpgr	WDI, continuous
Real interest rate	rir	WDI, continuous
Inflation rates	infr	WDI, continuous
Currency crises	cc	LV (2008), binary
Changes in Terms of Trade	ch_tot	Author's calculations using WDI data, , continuous

Table 3.4 below lists the expected signs for each economic variable in the study.

Table 2.6 Expected Signs

Variable	Expected Sign
Domestic Credit (DC1)	+
Domestic Credit (DC2)	+
Current Account Balance	+
Reserves (% of GDP)	-
Real Interest Rate	+
Inflation Rate	+
GDP growth rate	-
Changes in Terms of Trade	-
Changes in Exchange Rates	+
Incidences of Currency Crises	+

In developing a baseline economic model, extensive diagnostic testing was performed. Testing indicated that including a financial liberalization index is not feasible due to large percentage of missing data. The model exhibits fixed country and time effects. Unit root is not a problem after differencing the reserves (% of GDP) variable. The model exhibits heteroskedasticity but not autocorrelation. Heteroskedasticity is addressed by running robust standard errors. Finally, there are no multicolinearity issues but there is an omitted variable bias, which is not uncommon in studies of banking crises.

In this portion of the study, the initial economic model is presented and examined for outliers. Sensitivity analysis using a different database for banking crises and an alternative proxy for domestic credit growth ensures the robustness of the results in the baseline economic model. In discussing the results of the various regressions, the focus is on the significance but not magnitude of effects of the economic variables. The reason for this is that the focus of this dissertation is not the magnitude of effects of the economic variables on incidences of banking crises.[50] One important note to mention in interpreting logistic regression outputs is that

[50] Chapters three, four and five present discussions on the magnitude of effects of political and institutional and interaction terms on incidences of banking crises.

coefficients greater than one exhibit a positive influence and coefficients less than one exhibit a negative influence. For the comprehensive list and results of the diagnostic testing, please refer to Chapter 2's Appendix.

The first of our regression results indicates that domestic credit growth at a two year lag is statistically significant at the 1 percent level and exhibits the correct sign. Other economic variables showing statistical significant are GDP growth rate at the 1 percent, reserves and real interest rates at the 10 percent and changes in terms of trade at the 1 percent level. The model Wald Chi-Squared is significant at the 1 percent level. The Linktest results allow for the examination of model specification. Model specification in this regression is appropriate since the _hat coefficient is insignificant and the _hatsq coefficient is significant. The AIC and Pseudo R-squared are used for comparing the various models. The presence of outliers can definitely influence regression results either through overestimating or underestimating regression coefficients and significance. In addition it is important to see how outliers impact the AIC and Pseudo R-squared levels.

The leverage plot below illustrates the countries that may unduly influence the data and regression results. According to the leverage plot seen below, Bulgaria, Ukraine, Nigeria, Israel and Kuwait are outlier countries. Therefore, these outliers are excluded from the model and subsequent analyses.

Graph 2.3 Determining Outliers

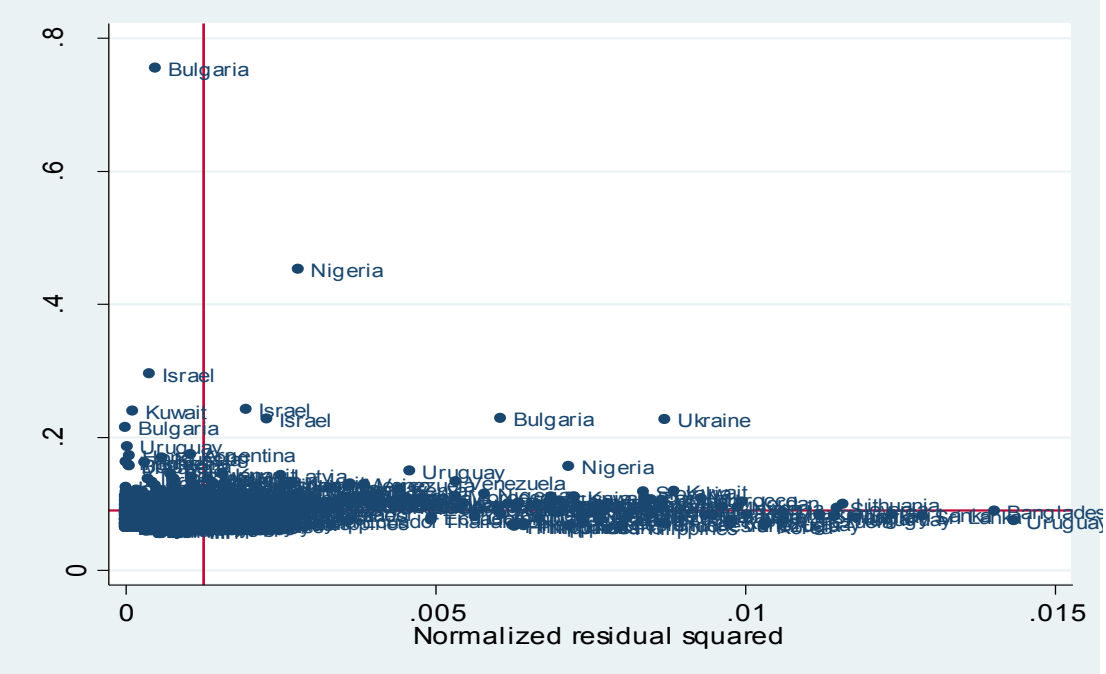


Table 2.7 presents the regression results with and without the country outliers. We see that the regression without the country outliers presents slightly different results from the initial regression including all countries. The main economic variable, domestic credit growth with a two-year lag remains significant at the 1 percent level and has a greater odds ratio than in the initial regression (4 percent vs. 3 percent). Reserve levels are significant at the higher level of confidence, 5 percent level. However, real interest rate is no longer statistically significant, indicating that the initial regression was overestimating this variable. Changes in terms of trade remain significant at the 1 percent level. Comparing the models, we see that the second regression produces a lower AIC level, which is preferable, and a higher pseudo R-squared, which is also preferable. The Linktest model specification test is also improved with the elimination of outliers; we see that the _hatsq coefficient is now significant at the 5 percent level.

Throughout the remaining study the model without the indicated outliers is used in developing the political economy models in chapters 3, 4 and 5.

Table 2.7 Model Comparison

Banking Crisis	Reg. (1) with Outliers (40 countries)	Reg. (2) No Outliers (35 countries)
Domestic Credit Provided by the Banking Sector (% of GDP)with two-year lag, DC1	1.03*** (.0117)	1.04*** (0.169)
Reserve Level (% of GDP)	.934* (.0424)	0.913** (0.0442)
Current Account Balance	0.973 (.0205)	0.959 (0.0278)
GDP growth rate	0.907 (.0651)	0.901 (0.0691)
Real interest rates	1.021* (.0143)	1.008 (0.0138)
Inflation rate	0.99 (.0074)	0.995 (0.0154)
Changes in Exchange Rates (%)	0.998 (.0036)	1.0137 (0.0186)
Changes in Terms of Trade	0.95*** (.0168)	0.939*** (0.0209)
Incidences of Currency Crises	2.268 (2.2042)	1.925 (2.5901)
Cons_	.041*** (.0153)	0.0408*** (0.0176)
AIC	228.23	204.98
Wald Chi2(9)	69.84***	89.29***
Pseudo R-Squared	0.149	0.1731
Linktest _hat	.769*	.995**
-hatsq	-.051	-.001
Observations	741	639

Sensitivity testing of the domestic credit growth variable confirms the robustness of the indicator presented in Table 2.7. The initial model is rerun using the alternative measure of domestic credit growth, Domestic Credit to the Private Sector (% of GDP) at a two year lag. Table 2.8 compares the odds ratios of both measures of domestic credit growth. Both tests

indicate that annual domestic credit growth levels are statistically correlated with incidences of banking crises at one and five percent levels.

Table 2.8 Domestic Credit Growth: Sensitivity Analysis w/o Outliers

Incidence of Banking Crisis (RR 2009) (1980-2009) 35 countries, 49 crisis observations for 29 countries across 30 years	Reg. (1)	Reg. (2)
Domestic Credit Provided by the Banking Sector (% of GDP)with two-year lag, DC1	1.04*** (0.169)	
Domestic credit to the private sector (% of GDP)with two-year lag, DC2		1.05** (0.026)
Reserve Level (% of GDP)	0.913** (0.0442)	0.918* (.0434)
Current Account Balance	0.959 (0.0278)	0.958 (0.0277)
GDP growth rate	0.901 (0.0691)	0.901 (0.0691)
Real interest rates	1.008 (0.0138)	1.01 (0.0142)
Inflation rate	0.995 (0.0154)	0.995 (0.0157)
Changes in Exchange Rates (%)	1.0137 (0.0186)	1.013 (0.0184)
Changes in Terms of Trade	0.939*** (0.0209)	0.941*** (0.0211)
Incidences of Currency Crises	1.925 (2.5901)	1.893 (2.51)
Cons_	0.0408*** (0.0176)	0.041*** (0.0177)
AIC	204.98	205.033
Wald Chi2(9)	89.29***	90.10***
Pseudo R-Squared	0.1731	0.1716
Linktest _hat	.995**	.956**
-hatsq	-.001	-.01
Observations	639	635

The second sensitivity analysis concerns the dependent variable, incidences of banking crises. To ensure the robustness of my results, the model is retested using Laevan and Valencia

(2008)'s dataset on incidences of banking crises for the sample of countries in this study. It is necessary to mention that the Laeven and Valencia (2008) dataset exhibits chronic autocorrelation, which cannot be corrected by differencing the data, lagging the dependent variable or allowing for cubic splines. Therefore, the presence of autocorrelation inflates the significance of the variables in this regression. In the case of BTSCS models, researchers have typically ignored autocorrelation issues since remedies are not readily available in addressing this issue.[51] The LV (2008) dataset is used for sensitivity analysis due to the very limited availability of alternative datasets, particularly in the case of emerging economies. Nonetheless we can glean some observations from comparing these two models. First, we see that domestic credit growth is significant with the correct sign, albeit with a higher odds percentage than the main model, 5.6 and 4 percent respectively. We would expect the pseudo R-squared to be higher in the second regression, however it isn't much higher than the main model. Also, the second regression exhibits a higher AIC than the main model, which is not preferable. Therefore for reasons mentioned above, we can conclude that the use of RR (2009) dataset provides for a sounder model in comparison to the LV (2008) dataset.

Table 2.9 Sensitivity Analysis: Incidences of Banking Crises w/o Outliers

Incidence of Banking Crisis, 35 Countries (bcrr)	(1) RR (2008) Banking Crisis Dep. Var.	(2) LV (2008)* Banking Crisis Dep. Var.
Domestic Credit Provided by the Banking Sector (dc1) (% of GDP)with two-year lag	1.04*** (0.169)	1.056** (0.027)
Reserve Level (% of GDP)	0.913** (0.0442)	0.968 (0.0383)

[51] Beck, Thorsten, Demirguc-Kunt, Asli &, Levine Ross. (1999). A New Database on Financial Development and Structure. *Policy Research Working Paper Series*, no. 2146, The World Bank.

Current Account Balance	0.959 (0.0278)	0.951* (0.028)
GDP growth rate	0.901 (0.0691)	0.781*** (0.031)
Real interest rates	1.008 (0.0138)	0.978** (0.0106)
Inflation rate	0.995 (0.0154)	1.024** (0.0108)
Changes in Exchange Rates (%)	1.0137 (0.0186)	1.044*** (0.0131)
Changes in Terms of Trade	0.939*** (0.0209)	0.9997 (0.009)
Incidences of Currency Crises	1.925 (2.5901)	1.133 (0.5974)
Cons_	0.0408*** (0.0176)	0.268*** (0.1007)
AIC	204.98	399.35
Wald Chi2(9)	89.29***	135.27***
Pseudo R-Squared	0.1731	0.2372
Linktest _hat	.995**	.988***
-hatsq	-.001	-.005
Observations	639	639

*LV(2008) exhibits autocorrelation, which inflates significance levels for variables.

Summary

The purpose of this chapter was to provide a back ground on banking crises, an overview of the political economy literature on banking crises and develop and present a baseline economic model to serve as the foundation for the political economy models developed in chapters 3, 4 and 5. The baseline economic model was developed through extensive diagnostic and sensitivity testing. The final model presented in this chapter provides a sound model for hypothesis testing in the next three chapters.

Appendix

Table A1: Full Summary Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
bc	overall	.1233333	.3289565	0	1	N = 1200
	between		.090645	0	.3333333	n = 40
	within		.3165353	-.21	1.09	T = 30
ca	overall	-.3532397	10.95722	-240.5	54.67	N = 1068
	between		4.939671	-7.282778	17.196	n = 40
	within		9.863406	-258.0492	37.12076	T-bar = 26.7
r1	overall	18.39486	19.41778	0	122.25	N = 1073
	between		16.95603	4.405667	78.916	n = 40
	within		9.030242	-38.28348	81.48485	T-bar = 26.825
r2	overall	5.199016	6.102623	0	80.25	N = 1047
	between		3.318077	.0248148	14.21333	n = 39
	within		5.120211	-6.704317	71.23568	T-bar = 26.8462
r3	overall	87.98	120.5927	0	1474.37	N = 794
	between		55.12199	.5773333	212.6347	n = 29
	within		107.9195	-123.7147	1386.382	T-bar = 27.3793
dc1	overall	59.92812	39.56949	-72.99	232.08	N = 1066
	between		33.60166	-28.85633	140.5945	n = 40
	within		20.78844	3.895019	188.2028	T-bar = 26.65
dc2	overall	47.04233	34.23448	1.39	170.28	N = 1062
	between		30.18789	13.72767	149.2035	n = 40
	within		17.07796	-8.12801	130.0841	T-bar = 26.55
rir	overall	7.093763	18.59965	-91.72	374.31	N = 930
	between		9.481365	-6.363889	48.93462	n = 39
	within		16.68664	-80.43741	356.5953	T-bar = 23.8462
infr	overall	43.38947	242.9813	-4.02	4734.91	N = 1042
	between		92.49431	2.070333	403.1859	n = 39
	within		226.3748	-356.5964	4409.822	T-bar = 26.7179
gdpgr	overall	3.774893	5.391137	-32.12	33.99	N = 1126
	between		2.128972	-1.603636	10.01	n = 40
	within		4.979834	-30.08211	33.7513	T-bar = 28.15
po	overall	2.004658	.9307149	1	3	N = 644
	between		.6683063	1	3	n = 31
	within		.6720449	.2713251	3.654658	T-bar = 20.7742
exgr	overall	4.14622	48.46169	-99	1003.21	N = 1148
	between		8.562881	-11.86765	32.56533	n = 40
	within		47.7547	-127.4191	974.8439	T-bar = 28.7

fi	overall	13.4494	6.561579	0	25	N =	835
	between		4.251709	5.27	21.75	n =	36
	within		5.095926	.1994012	23.14171	T =	23.1944
gs	overall	7.596181	2.108933	.67	12	N =	927
	between		.7865186	6.374	9.5328	n =	40
	within		1.956639	-.3388188	12.12538	T-bar =	23.175
lo	overall	3.614175	1.296862	0	6	N =	927
	between		.9421704	1.35	5.3568	n =	40
	within		.8804558	-.6041586	5.574175	T-bar =	23.175
la1	overall	.2	.4001668	0	1	N =	1200
	between		.4050957	0	1	n =	40
	within		0	.2	.2	T =	30
cete2	overall	.275	.4467004	0	1	N =	1200
	between		.4522026	0	1	n =	40
	within		0	.275	.275	T =	30
esa3	overall	.275	.4467004	0	1	N =	1200
	between		.4522026	0	1	n =	40
	within		0	.275	.275	T =	30
mena4	overall	.15	.3572203	0	1	N =	1200
	between		.3616203	0	1	n =	40
	within		0	.15	.15	T =	30
afr5	overall	.1	.3001251	0	1	N =	1200
	between		.3038218	0	1	n =	40
	within		0	.1	.1	T =	30
gs_rec	overall	7.647249	2.120468	1	12	N =	927
	between		.7721186	6.44	9.52	n =	40
	within		1.974236	-.1860841	12.12725	T-bar =	23.175
lo_rec	overall	4.67206	1.299737	1	7	N =	927
	between		.9370167	2.36	6.36	n =	40
	within		.8910597	.0887271	6.79206	T-bar =	23.175
fi_sq	overall	223.8891	165.4541	0	625	N =	835
	between		112.5509	46.2925	492.7321	n =	36
	within		126.0146	-196.593	518.1031	T =	23.1944
tr	overall	84.33714	69.15538	11.55	460.47	N =	1110
	between		64.7085	20.25733	360.3897	n =	40
	within		21.65224	-19.23119	223.9188	T-bar =	27.75
cc	overall	.0391667	.1940722	0	1	N =	1200
	between		.0391414	0	.1333333	n =	40
	within		.1901816	-.0941667	1.005833	T =	30

Multicolinearity

Multicolinearity is not an issue in this model. Multicolinearity is tested for graphically and Formal tests. . The mean VIF score is a low 2.5 with the highest VIF being 8.62 in the case of reserves (For the full VIF table, see Table A3)

Table A2 Multicolinearity

	bc	dc1gr2L2	ca	r1	gdpgr	rir	cc	infr
bc	1.0000							
dc1gr2L2	0.0588	1.0000						
ca	-0.0326	-0.0213	1.0000					
r1	-0.1262	-0.0221	0.4205	1.0000				
gdpgr	-0.3417	-0.0125	0.0525	0.1226	1.0000			
rir	0.0268	-0.0052	-0.1063	-0.1196	-0.1584	1.0000		
cc	0.2248	0.0211	0.0404	-0.0609	-0.2992	0.1440	1.0000	
infr	0.1470	-0.0749	-0.0200	-0.0756	-0.1708	-0.0874	0.1189	1.0000
exgr	0.1549	0.0188	0.0624	-0.0097	-0.1977	0.0599	0.3692	-0.0137

	exgr
exgr	1.0000

The multicolinearity table confirms the results from the VIF test and shows that multicolinearity is not present in the dataset.

Graph A1: Multicolinearity

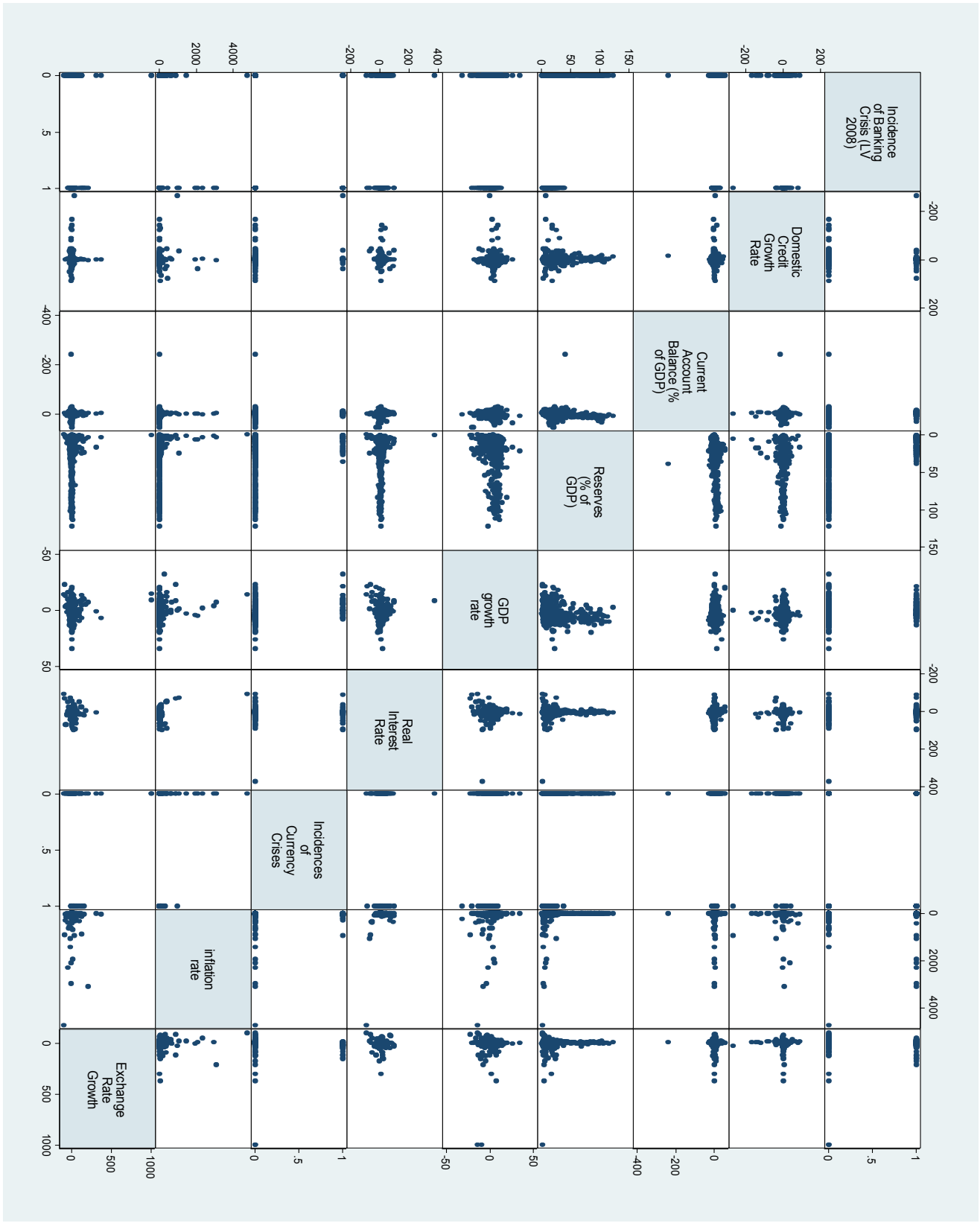


Table A3: VIF Test for Multicolinearity

Variable	VIF	1/VIF
dc1gr2L2	1.08	0.925044
ca	3.01	0.332735
r1	9.60	0.104195
gdpgr	1.70	0.589322
rir	1.88	0.532245
logcc1	1.43	0.698925
infr	1.30	0.767242
exgr	1.35	0.740946
year		
1984	2.03	0.492935
1985	2.06	0.485857
1986	2.22	0.450849
1987	2.42	0.413970
1988	2.33	0.430059
1989	2.38	0.420344
1990	2.46	0.406816
1991	2.42	0.414033
1992	2.43	0.412312
1993	2.49	0.401401
1994	2.89	0.346320
1995	2.99	0.334650
1996	3.33	0.300417
1997	3.38	0.295721
1998	3.43	0.291459
1999	3.50	0.285680
2000	3.54	0.282585
2001	3.48	0.287662
2002	3.53	0.282994
2003	3.63	0.275324
2004	3.66	0.273442
2005	3.65	0.274240
2006	3.62	0.276316
2007	3.50	0.285778
2008	3.36	0.297376
2009	3.59	0.278517
ctry_dum_1	1.70	0.587009
ctry_dum_2	2.05	0.488003
ctry_dum_3	4.92	0.203160
ctry_dum_4	2.04	0.490557
ctry_dum_5	1.88	0.532422
ctry_dum_7	1.96	0.509292
ctry_dum_8	1.89	0.529543
ctry_dum_9	1.63	0.612834
ctry_dum_10	2.27	0.440517
ctry_dum_11	2.01	0.498410
ctry_dum_12	1.78	0.562626
ctry_dum_13	2.26	0.442698
ctry_dum_14	1.95	0.513989
ctry_dum_15	2.14	0.467148
ctry_dum_16	1.98	0.504741
ctry_dum_17	2.14	0.466260
ctry_dum_18	2.06	0.484946
ctry_dum_19	2.22	0.449852
ctry_dum_20	2.06	0.484721
ctry_dum_21	2.36	0.423096
ctry_dum_22	1.72	0.580276
ctry_dum_23	1.70	0.589147

```
 ctry_dum_24 |      2.03    0.492828
 ctry_dum_25 |      1.77    0.564933
 ctry_dum_26 |      1.86    0.537992
 ctry_dum_27 |      2.02    0.495222
 ctry_dum_30 |      2.06    0.484297
 ctry_dum_31 |      1.71    0.586272
 ctry_dum_32 |      1.56    0.639044
 ctry_dum_33 |      4.64    0.215452
 ctry_dum_34 |      1.56    0.639630
 ctry_dum_35 |      1.68    0.595177
 ctry_dum_36 |      2.09    0.479061
 ctry_dum_37 |      2.15    0.464058
 ctry_dum_38 |      2.10    0.476886
 ctry_dum_40 |      1.65    0.607404
 ctry_dum_41 |      2.32    0.430807
-------------+----------------------
    Mean VIF |      2.50
```

Data Recoding

The variables that required recoding are Government Strength (GS), Rule of Law (LO). The ICRG provides for a continuous scoring index for both these variables. GS scores range from 0 through 12 and LO scores range from 0-6. These continuous variables are recoded into discrete scores. Recoding these variables into discrete intervals allows for creating interaction terms, which will be covered in Chapter 5. Government strength is recoded discretely from 1 through 12 and Rule of Law recoded discretely from 1 through 7. In addition, high, medium and low dummy variables are created for both LO and GS variables. The high dummy variables indicate high levels of rule of law and government strength, medium dummy variables indicates medium levels of rule of law and government strength and low dummy variables indicate low levels of rule of law and government strengths. In the case of rule of law a score between 0 and 2 is coded as low, score of 3 and 4 are coded as medium and a score of 5 or 6 is coded has high. In the case of government strength, scores between 1 and 4 are coded as low, scores between 5 and 8 are coded as medium and scores between 9 and 12 are coded as high.

Fixed or Random Effects Model

The Hausmen Test is used to determine whether to use a fixed effects or random effects BTSCS logistic model. The Hausmen test indicates that we can reject the null hypothesis of non-systematic differences in coefficients at the 1 percent level. Consequently, the model exhibits fixed effects. Here on out a panel fixed effects logit model is used to examine the impact of political and institutional factors on incidences of banking crises. Country clusters are incorporated to account for the country fixed effects.

Table A4: The Hausmen test for random or fixed effects

```
  ---- Coefficients ----
             |      (b)           (B)             (b-B)     sqrt(diag(V_b-V_B))
             |       .       random_eff~3    Difference          S.E.
-------------+------------------------------------------------------------------
          ca |    .0380123      .024037        .0139754         .010821
          r1 |   -.1316495    -.0695147       -.0621348        .0236888
         dc1 |    .0257745      .002523        .0232515        .0082701
         rir |   -.0046981    -.0084634        .0037653        .0069026
          tr |     .037511     .0106585        .0268526        .0095504
          cc |    1.012364     1.159606       -.1472415         .167832
        infr |    .0000638    -.0016108        .0016746        .0016593
       gdpgr |   -.0955125    -.1332288        .0377163        .0131804
          fi |   -.0410364    -.0170444         -.023992        .0186229
        exgr |    .0062618     .0065454       -.0002836        .0012031
------------------------------------------------------------------------------
                        b = consistent under Ho and Ha; obtained from xtlogit
         B = inconsistent under Ha, efficient under Ho; obtained from xtlogit

    Test:  Ho:  difference in coefficients not systematic

                chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                         =       30.45
              Prob>chi2 =      0.0007
              (V_b-V_B is not positive definite)
```

An Examination of Missing Data

Table A5 provides a STATA output presenting the number of present and missing observations by variable. The first column (Obs=.) indicates the number of observations missing for the respective variable listed in the left- hand column. We see that the two variables with the most

missing variables are party orientation (po) and the financial liberalization index (fi) variables, with 556, 365 missing observations respectively. The other economic, political and institutional variables have healthy numbers of present variables to allow for rigorous econometric testing.

Table A5: Summary of Missing and Present Observations by Variable

Variable	Missing Observations	Present Observations
Party Orientation (po)	556	644
Government Strength (gs)	273	927
Rule of Law (lo)	273	927
Domestic credit provided by the banking sector annual growth (% of GDP)(dc1gr2)	178	1022
Current Account Balance (% annual)	132	1068
Reserves (% of GDP)(r)	127	1073
GDP Growth (% annual)(gdpgr)	74	1126
Real interest rate (rir)	270	930
Inflation rate (inf)	158	1042
Exchange rate growth (% annual) (exgr)	52	1148
Financial Liberalization Index (fi)	365	835

Next we need to know what percent of the sample is influenced by missing observations. Table A5 presents a STATA output listing the patterns for missing observations. There are no missing observations for the incidences of currency crises so this variable is not included in the table. We see that twenty-five percent of the sample has values on all the variables. However we see that 21 percent of the missing data are in the party orientation variable. The next highest percentage of missing data, 8 percent is related to the financial liberalization index. We also that 8 percent of sample are missing observations for both party orientation and the financial liberalization index. Table A5 confirms that the two problematic variables are party orientation and the financial liberalization variables.

The missing variables for the rest of the economic, political and institutional variables impact less than 5 percent of the sample, which bodes well for meaningful econometric testing.

Table A6: Missing-value patterns

* (1 means complete)

Percent	Pattern 1	2	3	4	5	6	7	8	9	10	11
25%	1	1	1	1	1	1	1	1	1	1	1
21	1	1	1	1	1	1	1	1	1	1	0
8	1	1	1	1	1	1	1	1	1	0	0
8	1	1	1	1	1	1	1	1	1	0	1
4	1	1	1	1	1	1	1	0	0	1	1
4	1	1	1	1	1	1	0	1	1	1	1
4	1	1	1	1	1	1	1	0	0	1	0
2	1	1	1	1	1	0	1	1	1	1	1
2	1	1	1	1	1	1	0	0	0	1	0
2	0	0	0	0	0	0	0	0	0	0	0
2	0	1	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	0	0	0	1	1
1	1	1	1	1	1	1	0	1	1	1	0
1	1	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	0	0	0	1
<1	1	0	0	0	0	0	0	0	0	0	1
<1	1	0	0	0	0	0	0	1	1	0	1
<1	1	1	1	1	1	0	1	0	0	1	1
<1	1	1	1	1	1	1	0	1	1	0	1
<1	1	1	1	0	1	1	1	1	1	1	0
<1	1	1	1	1	1	1	0	1	1	0	0
<1	1	1	0	0	0	0	0	0	0	0	0
<1	1	1	1	1	1	1	1	0	0	0	0
<1	1	0	0	0	0	1	0	0	0	0	1
<1	1	0	1	1	1	1	0	1	1	0	1
<1	1	1	0	0	0	0	0	1	1	0	0
<1	1	1	0	0	0	1	0	1	1	1	0
<1	1	1	0	1	0	1	0	1	1	0	1
<1	1	1	1	1	1	0	1	1	1	0	1
<1	0	1	0	0	0	0	0	1	1	0	0
<1	1	0	1	1	1	1	0	1	1	0	0
<1	1	1	0	1	0	0	0	0	0	0	1
<1	1	1	0	0	0	0	0	0	0	1	0
<1	1	1	0	0	0	1	0	0	0	1	0
<1	1	1	1	1	0	1	1	1	1	1	1
<1	1	1	1	1	1	0	1	0	0	1	0
<1	1	1	1	1	1	1	0	0	0	0	1
<1	1	1	0	0	0	0	0	1	1	0	1
<1	1	1	0	0	0	0	0	1	1	1	0
<1	1	1	0	0	0	1	0	0	0	0	1
<1	1	1	1	1	0	1	0	1	1	1	1
<1	0	1	0	0	1	0	0	0	0	1	0
<1	0	1	0	1	0	1	0	0	0	1	0
<1	0	1	1	0	0	0	0	0	0	1	1
<1	0	1	1	0	1	0	1	0	0	0	0
<1	0	1	1	1	1	0	1	0	0	1	0
<1	0	1	1	1	1	1	1	0	0	1	1
<1	1	0	0	0	0	0	0	1	1	1	1

<1	1	0	0	1	0	0	0	0	0	0	1
<1	1	0	1	1	0	1	0	1	1	0	0
<1	1	0	1	1	1	1	0	1	1	1	1
<1	1	1	0	1	0	0	0	1	1	0	1
<1	1	1	1	0	1	0	0	0	0	1	1
<1	1	1	1	0	1	0	1	0	0	0	1
<1	1	1	1	0	1	0	1	0	0	1	1
<1	1	1	1	0	1	1	0	0	0	1	0
<1	1	1	1	0	1	1	0	1	1	1	0
<1	1	1	1	0	1	1	1	0	0	1	1
<1	1	1	1	0	1	1	1	1	1	0	0
<1	1	1	1	1	0	1	0	1	1	0	1
<1	1	1	1	1	1	0	0	0	0	1	1
<1	1	1	1	1	1	0	1	0	0	0	1
100%											

** Variables are (1): EX Growth (2): GDP Growth Rate (3): Reserves (% of GDP) (4): Current Account Balance (5): Domestic Credit Growth Provided by the Banking Sector (% of GDP) (6): Inflation Rate (7): Real Interest Rate (8): Government Strength (9): Rule of Law (10): Financial Liberalization Index (11): Party Orientation.

The next step is to graphically examine both variables of party orientation and financial liberalization to get a more precise picture of problem within these variables. Graphs 1 and 2 provide line graphs by variable by country.

An examination of the party orientation variable shows that there are no observations for Egypt, Hong Kong, Indonesia, Jordan, Kenya, Kuwait, Malaysia, Morocco and Singapore, in addition to many years throughout the sample. Dropping these countries from the entire sample is not an option as countries such as Malaysia and Indonesia are particularly important to include in any study examining financial crises. Also, we see that for the variables in the study the missing data is not so much of an issue, with the exception of financial liberalization. My goal is to try to include as many countries from as many regions for as many years as possible to allow for better generalizations. To remedy the issue of missing observations for the party orientation variable, we use a separate dataset when evaluating the role of party orientation in banking crises in emerging economies. For this analysis, we will use truncate the dataset and drop all

countries with observations missing for party orientation. However, for the other explanatory variables, rule of law, government strength and domestic credit I use the full dataset.

Upon examining Graph 2 we see that there are no financial liberalization index scores for Botswana, Slovakia, Slovenia and Kuwait and many years throughout the sample. In this the financial liberalization index is dropped and may be proxied by other economic control variables in this study, namely real interest rates, GDP growth and domestic credit growth. The independent economic variable, annual domestic credit growth is set at a two year lag.

Unit-Root (Stationarity)

The Fisher/Fuller test is used in determining whether there is a unit root problem. This test accounts for time trends and subtracts the mean across panels and allowing for two years lags. The proxy for reserves (% of GDP) exhibits a unit root, which is corrected for by differencing the observations for this indicator.

Table A7: Domestic Credit Provided by the Banking Sector Growth

```
Fisher-type unit-root test for dc1gr2L2
Based on augmented Dickey-Fuller tests
```

Ho: All panels contain unit roots	Number of panels = 40
Ha: At least one panel is stationary	Avg. number of periods = 23.55
AR parameter: Panel-specific	Asymptotics: T -> Infinity
Panel means: Included	
Time trend: Included	Cross-sectional means removed
Drift term: Not included	ADF regressions: 2 lags

		Statistic	p-value
Inverse chi-squared(80)	P	171.4504	0.0000
Inverse normal	Z	-6.0408	0.0000
Inverse logit t(204)	L*	-6.3521	0.0000
Modified inv. chi-squared	Pm	7.2298	0.0000

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

All four of the tests strongly reject the null hypothesis that all the panels contain unit roots.

Table A8: Current Account Balance (% Annual)

```
Fisher-type unit-root test for ca
Based on augmented Dickey-Fuller tests
```

Ho: All panels contain unit roots		Number of panels	= 40
Ha: At least one panel is stationary		Avg. number of periods	= 26.70
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Included		Cross-sectional means removed	
Drift term: Not included		ADF regressions: 2 lags	

		Statistic	p-value
Inverse chi-squared(80)	P	109.5300	0.0159
Inverse normal	Z	-2.2118	0.0135
Inverse logit t(204)	L*	-2.1396	0.0168
Modified inv. chi-squared	Pm	2.3346	0.0098

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

All four of the tests strongly reject the null hypothesis that all the panels contain unit roots.

Table A9: Total Reserves (% of GDP)

```
Fisher-type unit-root test for r1
Based on augmented Dickey-Fuller tests
```

Ho: All panels contain unit roots		Number of panels	= 40
Ha: At least one panel is stationary		Avg. number of periods	= 26.82
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Included		Cross-sectional means removed	
Drift term: Not included		ADF regressions: 2 lags	

		Statistic	p-value
Inverse chi-squared(80)	P	88.7263	0.2362
Inverse normal	Z	0.4321	0.6672
Inverse logit t(204)	L*	0.4328	0.6672
Modified inv. chi-squared	Pm	0.6899	0.2451

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

All four tests strongly confirm the null hypothesis that the panels contain unit roots. To address the issue of unit root/ non-Stationarity I difference the data for this variable. I rerun the DF test and show that the reserves variable no longer exhibits a unit root.

```
Fisher-type unit-root test for dr1
Based on augmented Dickey-Fuller tests
```

Ho: All panels contain unit roots		Number of panels	= 40
Ha: At least one panel is stationary		Avg. number of periods	= 25.82
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Included		Cross-sectional means removed	
Drift term: Not included		ADF regressions: 2 lags	

		Statistic	p-value
Inverse chi-squared(80)	P	198.1799	0.0000
Inverse normal	Z	-6.4962	0.0000
Inverse logit t(204)	L*	-6.9260	0.0000
Modified inv. chi-squared	Pm	9.3429	0.0000

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

Table A10: GDP Growth Rate (% Annual)

```
Fisher-type unit-root test for gdpgr
Based on augmented Dickey-Fuller tests
```

Ho: All panels contain unit roots		Number of panels	= 40
Ha: At least one panel is stationary		Avg. number of periods	= 28.15
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Included		Cross-sectional means removed	
Drift term: Not included		ADF regressions: 2 lags	

		Statistic	p-value
Inverse chi-squared(80)	P	158.0319	0.0000
Inverse normal	Z	-4.5038	0.0000
Inverse logit t(204)	L*	-4.8407	0.0000
Modified inv. chi-squared	Pm	6.1690	0.0000

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

All four of the tests strongly reject the null hypothesis that all the panels contain unit roots.

Table A11: Real Interest Rate (% Annual)

```
Fisher-type unit-root test for rir
Based on augmented Dickey-Fuller tests
```

Ho: All panels contain unit roots		Number of panels	= 39
Ha: At least one panel is stationary		Avg. number of periods	= 23.85
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Included		Cross-sectional means removed	
Drift term: Not included		ADF regressions: 2 lags	

		Statistic	p-value
Inverse chi-squared(78)	P	227.4097	0.0000
Inverse normal	Z	-6.6287	0.0000
Inverse logit t(199)	L*	-8.6221	0.0000
Modified inv. chi-squared	Pm	11.9623	0.0000

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

All four of the tests strongly reject the null hypothesis that all the panels contain unit roots.

Table A12: Incidences of Currency Crises

```
Fisher-type unit-root test for cc
Based on augmented Dickey-Fuller tests
```

Ho: All panels contain unit roots		Number of panels	= 40
Ha: At least one panel is stationary		Number of periods	= 30
AR parameter: Panel-specific		Asymptotics: T -> Infinity	
Panel means: Included			
Time trend: Included		Cross-sectional means removed	
Drift term: Not included		ADF regressions: 2 lags	

		Statistic	p-value
Inverse chi-squared(80)	P	329.3429	0.0000
Inverse normal	Z	-11.5393	0.0000
Inverse logit t(204)	L*	-14.0836	0.0000
Modified inv. chi-squared	Pm	19.7123	0.0000

P statistic requires number of panels to be finite.
Other statistics are suitable for finite or infinite number of panels.

All four of the tests strongly reject the null hypothesis that all the panels contain unit roots.

Table A13: Inflation Rate (% Annual)

```
Fisher-type unit-root test for infr
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots           Number of panels       =     39
Ha: At least one panel is stationary        Avg. number of periods =  26.72

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included                      Cross-sectional means removed
Drift term:   Not included                  ADF regressions: 2 lags

                                     Statistic      p-value

 Inverse chi-squared(78)    P        304.1785       0.0000
 Inverse normal             Z         -5.1487       0.0000
 Inverse logit t(199)       L*       -10.8857       0.0000
 Modified inv. chi-squared  Pm        18.1088       0.0000

 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
```

All four of the tests strongly reject the null hypothesis that all the panels contain unit roots.

Table A14: Exchange Rate Growth (% Annual)

```
Fisher-type unit-root test for exgr
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots           Number of panels       =     40
Ha: At least one panel is stationary        Avg. number of periods =  28.70

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included                      Cross-sectional means removed
Drift term:   Not included                  ADF regressions: 2 lags

                                     Statistic      p-value

 Inverse chi-squared(80)    P        221.0564       0.0000
 Inverse normal             Z         -8.7275       0.0000
 Inverse logit t(204)       L*        -9.0623       0.0000
 Modified inv. chi-squared  Pm        11.1515       0.0000
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
```

All four of the tests strongly reject the null hypothesis that all the panels contain unit roots.

Time Trend Analysis

In this section I test for a time trend to determine to include a time variable in my final model to control for this trend. The following STATA output indicates that my sample does not exhibit a time trend (`Prob > chi2 = 0.0000`). Consequently for hypothesis testing I do not need to include time-fixed effects.

Table A15: Time Trend Assessment

```
Logistic regression                                     Number of obs   =        577
                                                        Wald chi2(30)   =     595.89
                                                        Prob > chi2     =     0.0000
Log pseudolikelihood = -194.45131                       Pseudo R2       =     0.2216

                              (Std. Err. adjusted for 34 clusters in country)
------------------------------------------------------------------------------
             |               Robust
          bc | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    dc1gr2L2 |    1.02174   .0171378     1.28   0.200     .9886968    1.055888
          ca |   .9973997   .0280859    -0.09   0.926     .9438438    1.053995
         dr1 |    .927447   .0317414    -2.20   0.028     .8672756     .991793
       gdpgr |   .8198724   .0329128    -4.95   0.000     .7578369    .8869859
         rir |   .9821362   .0087191    -2.03   0.042      .965195    .9993748
        infr |   1.001648   .0021685     0.76   0.447     .9974072    1.005908
          cc |   2.576099   1.043271     2.34   0.019     1.164775    5.697481
        infr |          1  (omitted)
        exgr |   1.004127   .0056754     0.73   0.466     .9930648    1.015312
          fi |   .9150845   .0472162    -1.72   0.085     .8270679    1.012468
 _Iyear_1981 |          1  (omitted)
 _Iyear_1982 |          1  (omitted)
 _Iyear_1983 |   1.874357   2.843284     0.41   0.679     .0958589    36.64987
 _Iyear_1984 |    1.47153   1.859252     0.31   0.760     .1236777    17.50842
 _Iyear_1985 |   2.355655   2.709679     0.74   0.456     .2471643     22.4511
 _Iyear_1986 |   1.036825    1.71406     0.02   0.983     .0405989    26.47869
 _Iyear_1987 |   .3193687   .6200524    -0.59   0.557     .0071071    14.35142
 _Iyear_1988 |          1  (omitted)
 _Iyear_1989 |    .253798   .4935186    -0.71   0.481     .0056143    11.47303
 _Iyear_1990 |   .9027296   1.516658    -0.06   0.951     .0335329    24.30212
 _Iyear_1991 |   2.202719   3.197525     0.54   0.586     .1280362    37.89531
 _Iyear_1992 |   1.873558   2.470402     0.48   0.634     .1413531    24.83299
 _Iyear_1993 |   3.526442   4.784051     0.93   0.353     .2469322    50.36117
 _Iyear_1994 |   4.042927   5.042597     1.12   0.263     .3507704    46.59817
 _Iyear_1995 |   1.578539   2.086611     0.35   0.730     .1183272    21.05844
 _Iyear_1996 |   4.068274   5.064278     1.13   0.260      .354663    46.66644
 _Iyear_1997 |   5.782207   7.040195     1.44   0.150     .5317445     62.8759
 _Iyear_1998 |    6.47539   8.042167     1.50   0.133     .5676866    73.86236
 _Iyear_1999 |   4.414717   5.666263     1.16   0.247     .3567718    54.62797
```

```
 _Iyear_2000 |    7.01449   8.647665     1.58   0.114     .6260519    78.59263
 _Iyear_2001 |   2.670881   3.446615     0.76   0.446     .2129261    33.50273
 _Iyear_2002 |   1.101363   1.131835     0.09   0.925      .146953    8.254344
 _Iyear_2003 |   .8346536   .1727104    -0.87   0.382     .5563802    1.252105
 _Iyear_2004 |   1.228568   .1519679     1.66   0.096     .9640722    1.565628
 _Iyear_2005 |          1  (omitted)
 _Iyear_2006 |          1  (omitted)
 _Iyear_2007 |          1  (omitted)
 _Iyear_2008 |          1  (omitted)
 _Iyear_2009 |          1  (omitted)
       _cons |   .5300332   .8078419    -0.42   0.677     .0267274    10.51111
------------------------------------------------------------------------------

. testparm _Iyear_* /*there are NO time fixed effects*/

 ( 1)  [bc]_Iyear_1983 = 0
 ( 2)  [bc]_Iyear_1984 = 0
 ( 3)  [bc]_Iyear_1985 = 0
 ( 4)  [bc]_Iyear_1986 = 0
 ( 5)  [bc]_Iyear_1987 = 0
 ( 6)  [bc]_Iyear_1989 = 0
 ( 7)  [bc]_Iyear_1990 = 0
 ( 8)  [bc]_Iyear_1991 = 0
 ( 9)  [bc]_Iyear_1992 = 0
 (10)  [bc]_Iyear_1993 = 0
 (11)  [bc]_Iyear_1994 = 0
 (12)  [bc]_Iyear_1995 = 0
 (13)  [bc]_Iyear_1996 = 0
 (14)  [bc]_Iyear_1997 = 0
 (15)  [bc]_Iyear_1998 = 0
 (16)  [bc]_Iyear_1999 = 0
 (17)  [bc]_Iyear_2000 = 0
 (18)  [bc]_Iyear_2001 = 0
 (19)  [bc]_Iyear_2002 = 0
 (20)  [bc]_Iyear_2003 = 0
 (21)  [bc]_Iyear_2004 = 0

           chi2( 21) =   82.13
         Prob > chi2 =    0.0000
```

The test indicates that we can reject the null hypothesis that there are time fixed effects.

Autocorrelation

The Wooldridge test for autocorrelation (Prob > F = 0.5374) indicates that the BCSTS data does not exhibit serial correlation.

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      36) =      0.388
           Prob > F =      0.5374
```

Heteroskedasticity

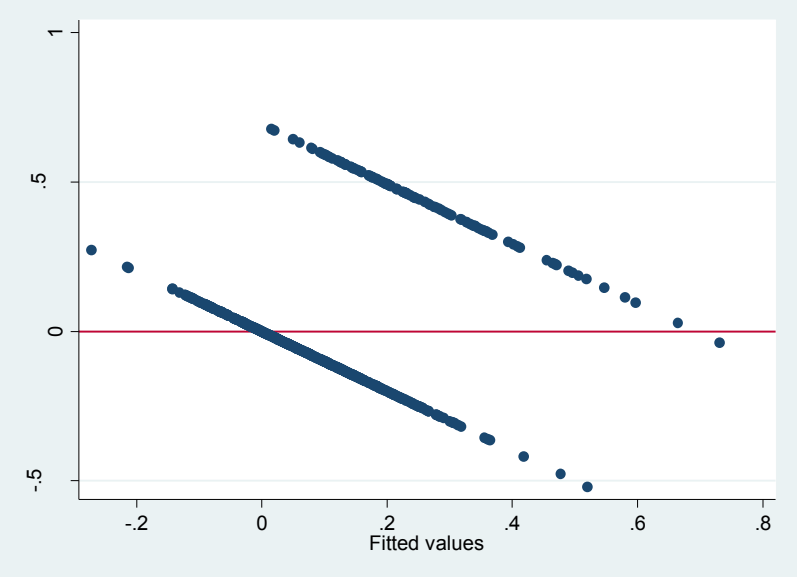
The data exhibits heteroskedasticity. I conducted the "hettest" and looked at "rvfplots". Both sets of tests indicate that the data indeed exhibits heteroskedasticity. I use a logistic regression with robust standard errors to account for heteroskedasticity present in my model.

```
Modified Wald test for groupwise heteroskedasticity in cross-sectional time-series
FGLS regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (32)  =    1250.13
Prob>chi2 =     0.0000
```

Graph A2: RVF Plot for Heteroskedasticity



Omitted Variable Bias

The Ramsey test for omitted variable bias (Prob > F= 0.000) indicates that the BTSCS model in this study exhibits an omitted variable bias.

```
Ramsey RESET test using powers of the fitted values of logbc1
       Ho:  model has no omitted variables
                 F(3, 724) =     20.58
                  Prob > F =      0.0000
```

CHAPTER THREE: PARTISANSHIP AND BANKING CRISES

Does partisanship have an effect on banking crises in the sample of emerging economies in this study? If so, how do the political parties behave in relation to banking crises? Chapter 3 attempts to answer these questions by testing these relationships using logistic regression analysis in a Binary Time-Series Cross-Sectional model to determine the effects of partisanship on incidences of banking crises between 1980 and 2009 across thirty-five emerging economies.

The relationship between partisanship and economic policy starts with competitive parties cultivating strong ties to differing segments/classes of the voting population and establishing reputations for policy making that favors those segments/classes and their ideological persuasions. Politicians facing short-time horizons have strong partisan and electoral incentives in regards to the amount, nature and timing of economic-policy activity. However, earlier literature examining the relationship between partisanship and economic policy formulations rarely considered political and institutional contexts.

Political context matters. Contextual variations condition policy-makers' incentive and capability structures "to manipulate economic policy for electoral and partisan gain, as well as the effectiveness of such manipulation, differently across democracies, elections, and policies."[52] This argument may explain why democracies when faced with similar international economic pressures pursue different policy formulations. In the case of Latin America, Remmer (2002) found that "domestic political institutions, particularly political parties and trade unions, give rise to important policy variations among nations similarly situated with respect to the international economy."[53] Although the democratic countries in Latin America were similarly situated with respect to the international economy, domestic labor-oriented and business-oriented parties

[52] Franzese, Jr., Robert (2002), p. 1.
[53] Remmer (2002), p29.

pursed different policies when faced with a down domestic economy and adopted policies in line with their ideological positions at other times.

The study in this chapter builds upon—the latest scholarship on the role of partisanship on economic outcomes—Broz's (2013) Partisan-Policy Financial Cycle theory and findings. The political economy model of banking crisis developed in this chapter builds upon Broz's (2013) model in three ways, first, by considering emerging economies, second, by determining the magnitude of effects of partisanship on incidences of banking crises and, finally by examining the interactive effects of partisanship on banking crises given rapid domestic credit expansion. Political systems in emerging economies have been increasing in sophistication and international significance. As the G8 found it necessary to expand to the G20, we need to consider how select political indicators affect financial crises in emerging economies.

The following subsections examine the literature surrounding the relationship between partisanship and economic outcomes and test for direct and interactive effects of partisanship on incidences of banking crises across the selected emerging economies and years.

Overview of the Literature

The political-economy literature on the role of political parties in economic policy making has been developed by the works of Nordhaus (1975), Hibbs (1977, 1987a, 1987b), Frey and Schneider (1978, 1988), Tufte (1978), Alesina (1987, 1988), Willett et al. (1988), Alesina and Rosenthal (1995), Franzese (2002), Remmer (2002), and more recently Broz (2013), among others. The perspectives on the role of partisanship on choices of economic policies have not been static in the least.

Nordhaus (1975) – Political Business Cycle

Nordhaus (1975)'s seminal discussion on the Political Business Cycle (PBC) was followed by a large literature that rigorously examined the various nuances of the PBC (for a comprehensive treatment of the PBC see Willett et al., 1988). Willet et. al (1998) explain that "the basic idea of the political business cycle literature is that because the typical lags in adjustment of inflation to changes in macroeconomic policy are longer than for unemployment, a carefully engineered economic expansion can give incumbent politicians the advantage of a booming economy just before an election, while most of the associated inflationary costs do not follow until the election is safely over. With less than full information and a short horizon on the part of the public, political incentives exist to destabilize the economy and in the process generate an inflationary bias."[54] Therefore, irrespective of the party-orientation of the incumbent, electoral timings and closeness of the elections may determine monetary and fiscal policy contractions and expansions. We should expect to see a newly elected executive to start his term adopting more constrained economic policies and, near the end of the term, the executive will begin to adopt more expansionary policies as elections approach.

Frey and Schneider (1978) found support for the PBC by finding that in the case of close/tight elections, incumbents have an incentive to move to the center, causing an erosion of the partisan oriented aspects of electoral campaigns. According to Frey and Schneider (1988), "the government has considerable discretionary power which it can use to carry out its ideological programs. When political survival is seriously threatened, government is forced to undertake a vote-maximizing policy at election time. At other times, however, the government is free to pursue its ideological goals."[55] The authors argue that "maximizing vote share at election

[54] Willett et al. (1988), p.14.
[55] Schneider and Frey (1988) in Willett et al. (1988), p. 256.

time, subject to the constraint of economics system, determines the government's optimal policy: the unemployment rate is increased immediately after the elction in order to push down both inflation and inflation expectations, thus shifting the Phillips curve towards the origin. Before the election, unemployment is reduced, and the cost of terms of an outward shifting Phillips curve arises only after the election. The government is thus able to increase its vote share by deliberately destabilizing the economy, a phenomenon known as the Political Business Cycle."[56]

Hibbs (1977, 1987) – Partisan Theory

Building on the Political Business Cycle theory, Hibbs (1977, 1987ab) argued in favor of the Partisan Theory (PT) of economic policy, and more specifically monetary policy. He found that the economic policies that political parties favor depend on where the political party falls on the Phillips Curve. PT stresses the position of political parties in terms of inflation and unemployment. In theorizing the origins of partisan theory, Hibbs (1987a) states that "avoidance of inflation and maintenance of full employment can be most usefully regarded as conflicting class interests of the bourgeoisie and proletariat, respectively, the conflict being resolvable only by the test of relative political power in society and its resolution involving no reference to an overriding concept of the social welfare (Hibbs 1987a, p.1, quoting Harry G. Johnson).[57] Using Gallup's data, Hibbs (1987a) shows how relative inflation/unemployment concerns varies across electoral groups, with Democratic, blue-collar, lower-income voters more unemployment-averse and less inflation-averse than Republicans, white collar, higher income voters.[58] Democrats penalize incumbents 1.1 times as much for unemployment as for inflation, whereas Republicans and Independents punish them only .65 and .49 times as much for unemployment as for inflation (Hibbs 1987a, p.177). In sum, different groups of voters suffer disproportionately from

[56] Schneider and Frey (1988) in Willett et al. (1988), p. 256.
[57] Franseze (2002), p.26.
[58] Hibbs (1987a), pp:127-38. Figures 4.1-4.3.

unemployment or inflation and public perceptions reflect the differences. These perspectives drive the popular and electoral approval of incumbents, producing differing partisan incentives to combat unemployment or inflation. Please see Appendix A for a detailed ranking of policy preferences by political party orientation.

In line with Hibbs (1977), Tufte (1978) found that parties of the right favor low taxes, low inflation, and modest, balanced budgets; they oppose equalization and accept higher unemployment more willingly than inflation. Parties of the right seek to control inflation because state revenue is raised by direct taxation based on progressive nominal schedules, and higher inflation increases the effective rate of income taxation.[59] Parties of the left favor equalization, low unemployment, and larger budgets with less emphasis on balance and accept inflation more willingly than unemployment. In the PT, expectations are adaptive and the Phillips curve is exploitable, policy makers use their policy control to shift economic outcomes in the desired direction during their term.

Alesina (1987, 1988), Alesina and Rosenthal (1995) – Partisan Theory with Rational Expectations

From the Rational-Expectation perspective, Phillips Curves and voters are less exploitable. Instead, policy makers achieve similar electoral effects by exploiting (a) differences in the timing with which various policies become clear to rational voters and (b) private information on their own competence (e.g., their ability to provide more public goods at less tax cost).

Alesina's (1987, 1988) "rational partisan theory" provided a framework, central tenet of which is that fully expected macroeconomic policies, such as those assumed by traditional electoral or partisan policy-cycle models, are ineffective. In rational partisan theory, only unexpected monetary and fiscal policy can create real-economic effects, so when left (right)

[59] Hibbs (1985), p.187.

governments are elected, to the degree this was not completely foreseen, growth, employment, and inflation rise (fall). [60]

Alesina and Rosenthal (1995) found evidence consistently favoring the rational expectations models. They concluded that there are strong partisan effects but few discernible election-year effects on macroeconomic outcomes, suggesting both election and partisan effects on macroeconomic policies. They also found that partisan policy and outcome effects are clearer in two-party/bloc systems, because they adjust fiscally to deficit – inducing shocks more quickly than irregularly alternating coalition governments do.

Broz (2013) – Partisan-Policy Financial Cycle

Broz (2013) extends the research on partisanship by examining the partisan nature of the government as a *cause* and *consequence* of financial crises in the U.S. and across the OECD. Broz (2013) presents the *Partisan-Policy Financial Cycle* (PPFC) model, in which right-wing, pro-market governments preside over financial booms while left-wing governments are elected to office after crashes. Examining the United States and advanced industrial countries in the OECD, he finds that "right-wing governments are more likely than average to be associated with policies that precipitate crises: large fiscal and current account deficits, heavy borrowing from abroad, lax bank regulation. However, once a major financial crises occurs, the causal arrow flips and government partisanship becomes a consequence of crises."[61] Broz (2011) finds that the "electorate moves to the left after a major financial crisis, and this leftward shift is associated with changes in government partisanship in that direction."[62] Consequently, Broz (2013) looks at government party-orientation as both the cause and consequence of financial crises.

[60] Franzese (2002), p. 36.
[61] Broz (2011), p. 1.
[62] Broz (2011), p. 1.

Broz (2013) examines the relationship between partisanship and banking crises and concludes that "The evidence presented here is not sufficient to rule out the existence of a Partisan-Policy Financial Cycle that takes the form: governments in power prior to a systemic financial crisis are more likely than average to be right-of-center in political orientation. Inasmuch as right-leaning governments are more likely to be in office prior to a major crisis, they are therefore more likely than average to be associated with policies that predict crises: twin deficits, capital inflow bonanzas, and deregulation of the financial sector." [63]

Partisanship and Banking Crises

The policy link between the current account and macroeconomic conditions is the fiscal deficit.[64] When a government increases its fiscal deficit, domestic residents may use the additional income to boost consumption, causing total national saving to decline. Unless domestic investment decreases to offset the saving shortfall, the country must borrow from abroad (i.e., it must run a current account deficit. Broz (2013) observes that countries that experienced a financial crisis after a foreign borrowing binge, 58 percent (seven of twelve cases) underwent a partisan shift from right to left as of three years after the onset of a crisis. By contrast, just 8 percent (1 case) moved from left to right after a crisis, and 33 percent (4 cases) experienced no change in partisan orientation.[65]

In examining the transmission mechanism between partisanship and banking crises, let's begin with the "Starve the Beast" theory. The theory comes from Charles Edward Barnes (1907)'s Washington Post article, and it refers to intentionally starving an animal. In Barnes's

[63] Broz (2011), p.23-5.
[64] Broz (2013), p.81: The current account balance records the difference between a country's savings and its investment. If the current account balance is positive, it measures the portion of a country's savings invested abroad; if negative, it is the portion of domestic investment financed by foreign savings. Because any excess of national spending over income must be financed by foreigners, the current account deficit is equivalent to the net inflow of capital from abroad.
[65] Broz (2013), p.76.

account, an Indian had captured a tiger in a pit and needed to get it into a cage so that it could be transported and sold. The tiger had no desire to enter the cage, so the Indian simply starved it until it entered the cage to get some food that had been placed there. Bartlett (2007) points out, "starve the beast" is a variation of the old carrot-and-stick idea.[66] The economic application of Starve the Beast was operationalized by Buchanan (1976, Brennan and Buchanan 1977,1979), an avid supporter of a balanced-budget approach, endorsed California's Proposition 13, which laid out a plan for tax cuts unaccompanied by spending cuts as an appropriate way to restrain the growth of government. In the 1980s, public-choice theory developed the idea that a conservative government might intentionally increase the national debt through tax cuts in order to bind the hands of a subsequent liberal government (Persson and Svensoon 1989; Alesina and Tabellini 1990; Petterson-Lidbom 2001). With this approach, more of the budget would have to be used for interest payments, thereby precluding a liberal government from spending as much as it would like on consumption.[67] By lowering taxes and issuing debt, right-wing governments constrain future spending. In addition to strategically limiting the fiscal choices of successors, deficits have another attraction for the right: they favor high-income constituents by cutting taxes more than spending.[68]

Although it runs counter to conventional wisdom, there is empirical evidence that the right, which conventionally is supposed to support a balanced budget and a low level of consumption, has partisan incentives to run fiscal deficits, i.e. "Starve the Beast" theory or as a result of greater internationalization. When capital is internationally mobile, right parties can generate wealth gains for their constituents via a twin deficits policy without crowding out private investment. Broz (2013) finds in cases fitting the capital inflow bonanza profile (CA

[66] Bartlett, p. 4-5.
[67] Bartlett 2007, p. 10-11.
[68] Broz (2013), p.91.

deficit/systemic and CA Deficit/Borderline), the budget balance turned sharply negative in the pre-crisis period. These governments were running a twin deficits policy of deficit spending financed by capital inflows.[69] His data suggests that "right-wing governments are more likely to pursue this strategy in the context of large current account deficits. In surplus nations, by contrast, the right takes a more conservative fiscal stance, discouraging excessive consumption and pre-crises asset booms."[70] In explaining the transmission mechanism between financial crises and partisanship Broz (2013) suggest that there is an electoral mechanism for the partisan financial cycle, in which right-wing governments preside over fiscal deficits:[71]

> Begin with the assumption that right parties disproportionately represent homeowners and other asset owners, as in Ansell (2007, 2009). Because external deficits fuel asset booms in housing and equities markets, right-wing parties may derive short term electoral benefits from this policy, even if the weak affect that asset holder experience turns out to be transitory. Moreover, when capital inflows are available to finance budget deficits, right parties can generate asset-price appreciations via large fiscal deficits without crowding out private investment and thereby antagonizing their high-income business constituents. This result is because capital inflows prevent domestic interest rates from rising above the world interest rate, so that the crowding of investment that usually takes place in a closed economy does not occur (Friedman 1992).

In investigating the subprime cases, Broz (2013) finds that "in the run up to the crisis, the deficit countries had more centrist governments than surplus countries or the rest of the OECD on average. But after the crisis, the deficit countries moved sharply to the left while CA surplus countries remained steadfastly right-wing. Deficit nations experienced far greater political change, with elections bringing the left to power in all but one case—Ireland—by 2010."[72] Cusack (1999) examines the conventional wisdom that left parties are prone to reckless deficit spending as a result of their expansionary policies and that right governments are generally fiscally prudent. This conventional wisdom is supported by the Partisan Theory, which posits

[69] Broz (2013), p.89-90.
[70] Broz (2013), p.91
[71] Broz (2013), p.91.
[72] Broz (2013), p.81.

that rightist governments are less likely to adopt expansionary policies since they are not willing to accept higher levels of inflation. Left parties are seen as unwilling to take on higher levels of unemployment and, therefore will accept higher levels of inflationary policies as a means to lower unemployment. In investigating partisanship and policy formulation in the OECD, Cusack (1999) finds evidence to the contrary, left governments "have conducted more conservative fiscal policies under conditions of full or near-full employment than those on the right."[73] In the case of right parties, he posits that the right has incentives to pursue deficit policies. First, they can through their fiscal policies tie the hands of leftist successors, second, by creating deficits through tax cuts without proportional spending cuts, they can both please their natural constituency with the former while appealing to the interests of those who are advantaged by the latter.[74] Garret and Lange (1991) find that OECD countries with left government and strong labor parties tend to run smaller budget deficits that do right parties. These findings suggest a partisan fiscal pattern in which the left is more likely to adopt a conservative stance than the right. Alesina and Tabellini (1990) make similar arguments in the context of Reagan administration deficits. Cameron (1985) finds that left governments are usually less likely to incur large budget deficits than governments controlled by centrist, Christian democratic, or conservative parties. Cameron (1985) looks at 21 countries among the advanced industrial nations from 1965 through 1981, and fined that "those countries whose governments were dominated by leftist parties had lower, rather than higher rates of change in prices and smaller acceleration in the rate of change than those dominated by centrists or rightists."[75] Finally, Remmer (2002) tests for the relationship between partisanship and domestic credit growth (used

[73] Cusack (1999), p. 484.
[74] Cusack (1999), p. 484.
[75] Cameron (1985), p.245-246.

as a proxy of expansionist policies) and finds that there to be statistically significant and positive relationship between labor governments and domestic credit.[76]

The Argument

The Partisan Theory and the Partisan-Policy Financial Cycle models present the evolution of discussions on the political economy of partisanship. The Partisan theory focuses on where political parties fall on the Phillips curve, with the right-wing parties being more inflation-averse and the left-wing parties being more unemployment-averse, these tendencies become important particularly, in cases when elections are not close.[77] In terms of how inflation impacts the growth and stability of the financial sector, one may argue that since left-wing parties are willing to take on more inflation by adopting expansionary policies, banking sector fragility may be higher under left-wing governments than under right wing governments.

The Partisan-Policy Financial Cycle theory developed by Broz (2013) posits that partisanship is both the cause and consequence of financial crises. His work focuses on observations and testing in the post-Bretton Woods era. Under this model, right-wing parties preside over economic booms and once a crisis occurs, left-wing governments are elected to address and tackle the problems. The evidence presented by Broz (2011 & 2013) is only concrete enough in that it "is not sufficient to rule out the existence of a Partisan-Policy Financial Cycle." This only means that the theory propounded by Broz (2013) invites greater investigation. The root-element of the predictions of the PPFC is the increase in international capital mobility after the 1970s and the breakdown of the Bretton-Woods system. Broz (2011) argues:

> The source of these patterns may be partisan electoral competition, which has taken new forms with the onset of international capital mobility. Prior to the early 1970s, right parties championed fiscal discipline and balanced budgets. This made electoral sense since, in the absence of large-scale capital flows, budget deficits crowded-out domestic

[76] Remmer (2002), pp.42-47.
[77] Frey and Schneider (1988), in Willett et al. (1988).

> investment to the determent of right-parties' business constituents. But with the free flow of international capital, right parties obtained greater scope to run fiscal deficits without generating increases in domestic interest rates. Yet deficits have another appeal for right parties when capital is internationally mobile. Deficits (financed by capital inflows) tend to raise asset prices, and the gains of asset price appreciation go disproportionately to right-party constituents, namely homeowners and older asset-holders. In short, by undermining the appeal of balanced budgets and providing an easy way to generate short-run wealth effects for asset-owning constituents, international capital mobility may have caused a fundamental shift in the right's electoral strategy. Unfortunately, this shift has exposed OECD economies to a higher risk of financial crisis.[78]

The hypothesis that emerges from Broz's (2011, 2013) study is that in the presence of greater international capital mobility, right-wing government have more incentives to implement policies that precipitate financial crises in the pursuit of short-term financial gains. Consequently, under the PPFC banking crises are more likely under right-wing governments than under left-wing governments.

Both the PT and the PPFC examine advanced industrial democracies, which makes sense considering that they have more entrenched democratic institutions, political-party systems are highly developed and there is much less data limitations than emerging economies. However, examining advanced industrial democracies has not led to definite results on the role of partisanship in setting economic and financial policies. This study extends the examination of partisanship to emerging economies. The focal time period is the post-1973 oil-shock and post-Bretton Woods era of 1980 through 2009. The questions attempted here are: Does partisanship play a significant role in banking crises in emerging economics? If so, what are the implications for the theoretical models of partisanship in the political economy literature?

Hypothesis 1: In line with the Partisan Theory, banking crises are more likely under left-wing, more labor-oriented governments than under right-wing more business-oriented governments.

[78] Broz (2011), p. 24.

Hypothesis 2: In line with the Partisan-Policy Financial Cycle theory, banking crises are more likely under right-wing parties than under left-wing parties.

Methodology and Results

This study contributes to the political economy literature on banking crises by examining the interactive effects of partisanship and domestic credit expansion on incidences of banking crises. The dataset used in this study is from the World Bank's 2010 Database of Political Institutions.[79] The database spans from 1975 through 2009 and records the left-right orientation of the party heading the executive branch. Party orientation has an annual frequency and is coded as EXECRLC and coded as follows: No Information (0), Right of center (1), Left of center (3) and Center (2).[80] For testing purpose, the no information data are dropped from the dataset, which decreases the number of observations for this variable to 577 total observations. My study covers the time period between 1980 and 2009. The focus on a post-Bretton Woods time period is in line with the literature (Broz 2013; Bordo and Landon 2010). Banking crises occur in environments of financial globalization, where free capital mobility fuels asset booms, therefore the post-Bretton Wood time period is the appropriate time period in which to examine banking crises.

[79] Broz (2011, 2013) employs the same dataset.

[80] See: DPI2010 Codebook, p. 7. Party orientation with respect to economic policy, coded based on the description of the party in the sources, using the following criteria: Right: for parties that are defined as conservative, Christian democratic, or right-wing. Left: for parties that are defined as communist, socialist, social democratic, or left-wing. Center: for parties that are defined as centrist or when party position can best be described as centrist (e.g. party advocates strengthening private enterprise in a social-liberal context). Not described as centrist if competing factions "average out" to a centrist position (e.g. a party of "right-wing Muslims and Beijing-oriented Marxists").

0: for all those cases which do not fit into the above-mentioned category (i.e. party's platform does not focus on economic issues, or there are competing wings), or no information.

Table 3.1 Independent Political Institutional Variables

Independent Variable	Coding	Description	Source
Party Orientation (po)	0-3 (discrete) Recoded 1-3	1: Right 2: Center 3: Left	Database of Political Institutions, annual 1975-2009, The World Bank

It is intuitive to assume that there is a time-lag between the time the policy-makers adopt policies and when the market reacts to such policies. The literature on partisanship has commonly used a one-year lag (See: Broz 2011, 2013; Cusack 1999; Hibbs 1977; Remmer 2002). I test up to a two-year lag and as Table 3.4 shows statistical significance at a one-year lag for the party variable. The one-year lagged model performs more efficiently than the other models, with the lowest AIC level (66.99) of the political-economy models.

Table 3.2 presents observations relating banking crises and the categories of party orientation. We see that right- parties were in power 239 years of a total of 588 years of available observations for party orientation.[81] Left-wing parties were in power a total of 270 years and centrist governments dominated power for a total of 79 years. Of the 588 observations available for party-orientation of the executive, banking crises occurred 4.9 percent (or 29 years) of the time. Table 3.2 shows that although right-wing governments were in power 31 years less than left-wing parties (270-239), banking crises occurred 2.1 percentage points more often under right-wing parties than under left-wing parties (5.4% - 3.3 %). On an interesting note, of the 79 years in power centrist governments experienced a total of 7 years of banking crises. These results indicate that centrist governments had the highest rate for banking crises at 8.8 percent. The percentage of banking crises under centrist governments out strips the rates of banking crises under right-wing and left-wing governments at 5.4 percent and 3.3 percent, respectively. Broz

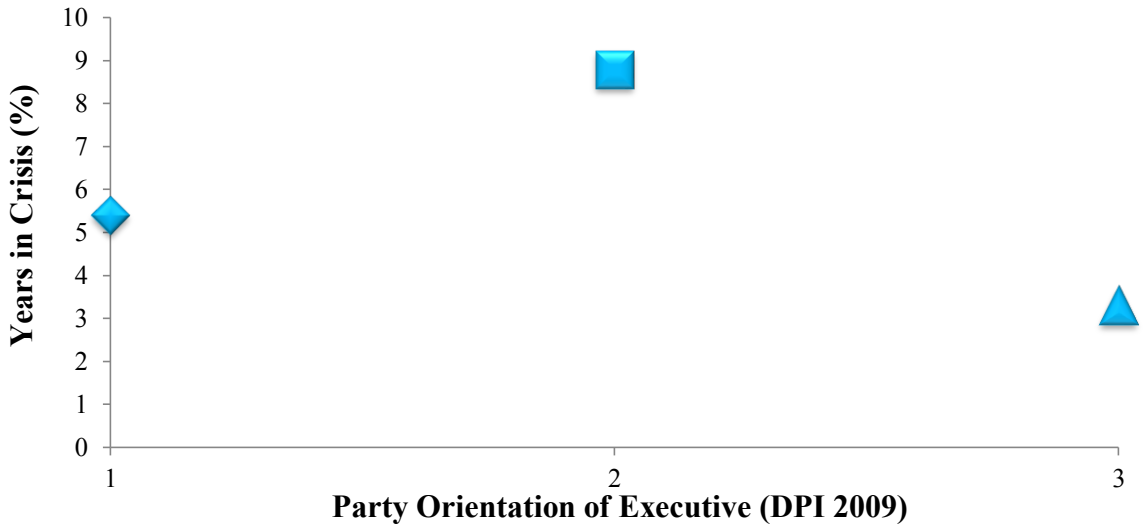
[81] See Database of Political Institutions (DPI) 2009.

(2013) finds that in the run up to the recent sub-prime crisis, the fiscal deficit countries had more centrist governments than fiscal surplus countries or the rest of the OECD on average.[82]

Table 3.2 Banking Crises by Party Orientation of Ruling Party

Party Orientation	No. of Years in Power	No. of Crises	Percentage Years in Crisis
Right	239	13	5.4%
Center	79	7	8.8%
Left	270	9	3.3%
Total	588	29	4.9%

Graph 3.1 Party Orientation at Times of Banking Crises



Next, we determine the predicted probabilities of a banking crisis by party orientation of the executive. Graph 3.2 presents the results, and we can see support for the literature that emphasizes the greater likelihood of experiencing financial crises under right-wing governments. The predicted probability of experiencing a banking crisis is highest under rightist governments, followed by centrist governments and finally leftist governments. We can notice that although leftist party rule has the greatest percentage of observations, this subset produces lower predicted probabilities of banking crises in comparison to centrist and rightist party rule. The results also

[82] Broz (2013), p.81.

provide support for the observations in the literature that centrist governments are likely to pursue policies that provoke financial crises.

Graph 3.2 Predicted Probabilities of Banking Crises by Party Orientation

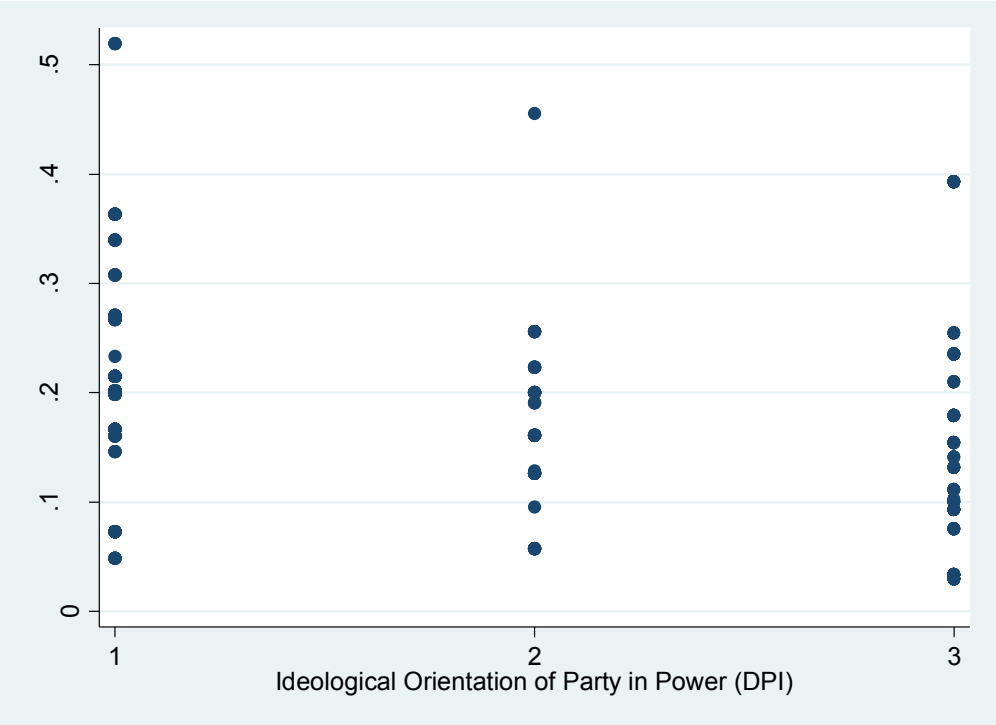


Table 3.3 presents the results of the logistic regression for the piece-wise political-economy model with the categorical variable of party orientation. Rightist government is the reference point for interpretation purposes. We see the odds of a banking crisis at time t is 1.99 times higher under a centrist government than under a right-wing government, statistically significant at the 16 percent level. At time t-1 the odds of experiencing a banking crisis under centrist government is 2.44 times higher than under rightist governments in this sample. We also notice that at a one-year lag the odds of experiencing a banking crisis is approximately 20 percent less under leftist party rule than under rightist party rule. These results suggest support for Broz (2011, 2013)'s Partisan-Policy Financial cycle theory, in which financial/banking crises are more likely under rightist than leftist governments.

Table 3.3 Political Economy Model (PEM)—Party Orientation

Incidence of Banking Crisis (RR 2009) (1980-2009) 35 countries, 49 crisis observations for 29 countries across 30 years	Reg. (1) BEM	Reg. (2) w/ PO Levels	Reg. (3) One- Year Lag	Reg. (4) Two-Year Lag
Centrist		1.99* (16%)	2.442**	1.670
		(.9777)	(1.3967)	(1.3602)
Leftist		1.171	2.000	1.851
		(.6724)	(1.4047)	(1.203)
Domestic Credit Growth, two-year lag	1.04***	1.049**	1.041*	1.046*
	(0.169)	(.0234)	(.0246)	(.0234)
Reserve Level (% of GDP)	0.913**	.926	.897	.908
	(0.0442)	(.1057)	(.0821)	(.0883)
Current Account Balance	0.959	.987	1.017	1.004
	(0.0278)	(.0463)	(.0551)	(.0534)
GDP growth rate	0.901	.856	.806	.820
	(0.0691)	(.1143)	(.0666)	(.0686
Real interest rates	1.008	1.022	1.013	1.016
	(0.0138)	(.0215)	(.0145)	(.0162)
Inflation rate	0.995	.954***	.966**	.975**
	(0.0154)	(.0183)	(.0224)	(.0184)
Changes in Exchange Rates (%)	1.0137	1.018	1.000	1.006
	(0.0186)	(.0268)	(.0189)	(.0177)
Changes in Terms of Trade	0.939***	.941***	.946***	.939***
	(0.0209)	(.0207)	(.0224)	(.0197)
Incidences of Currency Crises	1.925	.279	.501	.385
	(2.5901)	(.3717)	(.5330)	(.4369)
	0.919***	.889***	.880***	.884***
Year	(0.026)	(.042)	(.0413)	(.0375)
Cons_	0.204***	6.1e+100***	8.6e+109	2.7e+105
	(0.1209)	(5.7e+102)	(8.1e+111)	2.3e+107
AIC	200.17	134.16	136.31	139.46
Wald Chi2	81.14***	97.72***	66.99***	73.12***
Pseudo R-Squared	0.2035	0.2404	0.2315	0.2377
Linktest _hat	.995**	.790*	.931*	.773
-hatsq	-.001	-.050	-.015	-.053
Observations	639	358	375	377

The statistically significant correlation between centrist parties and banking crises calls for greater investigation. Table 3.4 isolates centrist-party rule years by country, number of years and number of crises. We see that Argentina has had a total of 18 years between 1980 and 2009 with centrist party rule and the highest number of banking crises, a total of 3 banking crises spanning 18 years from 1980 through 2009. Argentina has had the greatest number years under centrist rule followed by the Philippines, Sri Lanka, Colombia and Korea which have had double-digit years under centrist rule. To determine whether the political-economy model in

Table 3.3 is unduly influenced by the observations for Argentina, I re-run the regressions without Argentina, Table 3.5 presents the results.

Table 3.4 Countries Governed by Centrist Parties

Country	Years with Centrist Party Rule	# of Years	# of Crises
Argentina	'84-'01	18	3
Colombia	'80-'82; '87-'98	13	1
Ecuador	'80	1	
Korea	'96-'07	12	1
Latvia	'96-'97; '03-'07	7	
Philippines	'93-'98; '01-'09	15	1
Russia	'09	1	
Slovenia	'05-'08	4	
Sri Lanka	'80-'94	15	1
Turkey	'80	1	
Ukraine	'00-'02	3	1

Table 3.5 presents the regression results for the piecewise political-economy model with party orientation, without the inclusion of observations for Argentina. We see that at time t, the odds of having a banking crisis under centrist rule is approximately two times higher than under rightist rule, at the 1 percent statistical significance level (Odds ratio of 2.04). At a one-year lag, centrist party rule is statistically significant at a 1 percent level, as well. The odds of a banking crisis, at a one-year lag, are 3.049 times higher or three under centrist rule as under rightist government rule.

The exclusion of Argentina negatively impacts model performance. We see that the Linktest, _hat coefficients lose their significance, which indicates poor model performance. Consequently, the elimination of Argentina from the sample takes away meaningful observations.

Table 3.5 Political Economy Model (PEM)—Party Orientation without Argentina

Incidence of Banking Crisis (RR 2009) (1980-2009) w/o Argentina	Reg. (1) BEM	Reg. (2) w/ PO Levels	Reg. (3) One- Year Lag	Reg. (4) Two-Year Lag
Centrist		2.04***	3.049***	2.6622
		(1.034)	(2.601)	(1.4197)
Leftist		1.5703	(2.250)*	2.101
		(1.0744)	(1.387)	(1.419)
Domestic Credit Growth, two-year lag	1.04***	1.055*	1.046**	1.051**
	(0.169)	(.0267)	(.0264)	(.0256)
Reserve Level (% of GDP)	0.913**	.934	.905	.917
	(0.0442)	(.1109)	(.0885)	(.0932)
Current Account Balance	0.959	.988	1.018	1.005
	(0.0278)	(.0457)	(.0553)	(.0544)
GDP growth rate	0.901	.887	.833**	.849**
	(0.0691)	(.150)	(.0740)	(.0737)
Real interest rates	1.008	1.02	1.011	1.014
	(0.0138)	(.0239)	(.0148)	.0163
Inflation rate	0.995	.959**	.974	.983
	(0.0154)	(.0184)	(.0228)	(.0198)
Changes in Exchange Rates (%)	1.0137	1.026	1.006	1.013
	(0.0186)	(.0345)	(.0235)	(.0202)
Changes in Terms of Trade	0.939***	.936***	.943**	.938***
	(0.0209)	(.0224)	(.0247)	(.0226)
Incidences of Currency Crises	1.925	.311	.593	.466
	(2.5901)	(.4134)	(.606)	(.5068)
Year	0.919***	.898***	.887**	.8899598***
	(0.026)	(.0404)	(.0409)	.0372786
Cons_	0.204***	1.05e+92***	6.6e+102***	4.78e+99***
	(0.1209)	(9.42e+93)	(6.0e+104)	(4.0e+101)
AIC	200.17	88.07	88.67	87.20
Wald Chi2	81.14***	125.47***	149.99***	108.14***
Pseudo R-Squared	0.2035	0.3683	0.3663	0.3553
Linktest _hat	.995**	0.821	0.724	0.512
-hatsq	-.001	-.039	-.056	-.1066
Observations	639	347	351	353

The literature on partisanship has thus far only mentioned centrist parties in passing or as a side observation (Cameron 1985; Cusack 1999; Broz 2011, 2013). Since there aren't many historical and contemporary data sources that measure partisanship across countries, one reason for the lack of attention, for lack of a better word, on centrist parties may that among advanced industrial economies of Europe and the United States centrist parties have not been evidenced to be an influential factor in setting economic policy. When mentioned, centrist parties are associated with current account deficits and pursuing crisis prone economic policies (Cameron

1985; Cusack 1999; Broz 2011, 2013). The results in Table 3.5 suggest support for the argument that leftist parties are more positively correlated with incidences of banking crises, however the coefficients for Left-Party rule are not statistically significant. The results also suggest that centrist governments play a more significant role in financial crises in emerging economies than evidenced in the advanced industrial economies.

Another way to look at the impact of party orientation on incidences of banking crisis is to examine how party orientation of the executive has behaved vis a vis banking crises across the three decades covered in this study. The differences in institutional and financial environments for each decade may have impacted economic policies pursued and adopted by the different political parties. Table 3.6 presents the regression results for the model with an interaction term between party orientation and decade. Interestingly, we see that during the 1980s, the odds of a banking crisis were approximately 82 percent (1-0.182) lower under centrist party rule than under rightist party rule. However, the opposite occurs for the 1990s. During the '90s the odds of a banking crisis increase by approximately 88 percent (1.88-1) under centrist party rule than under rightist party rule. During the 2000s the odds of having a banking crisis is not statistically significantly different under centrist party rule than under rightist party rule, but we can see that the odds of having a banking crisis under centrist governments is approximately 52 percent higher under than under rightist governments. The results in Table 3.6 do not show a statistically significant relationship between leftist parties and incidences of banking crises. During each of the decades considered, the odds of experiencing a banking crisis are higher under leftist governments than under right-wing governments. In the 1980s, the odds of experiencing a banking crisis under a left wing government were thirty-five percent higher than under right-wing governments (1.346-1= 35 percent). The same pattern holds for the following two decades.

Table 3.6 Political Economy Model (PEM)—Party Orientation by Decade

Incidence of Banking Crisis (RR 2009) (1980-2009) 35 countries, 49 crisis observations for 29 countries across 30 years	Reg. (1) BEM	Reg. (2) PO# '80s	Reg. (3) PO# '90s	Reg. (4) PO# '00s
Centrist		.183*	1.880**	1.518
		(.2045)	(.8053)	(1.184)
Leftist		1.346	1.85*	1.668
		(.6187)	(1.2153)	(2.5621)
Domestic Credit Growth, two-year lag	1.04***	1.054**	1.059***	1.012
	(0.169)	(.0279)	(.0262)	(.0204)
Reserve Level (% of GDP)	0.913**	.910	.916	.901
	(0.0442)	(.1185)	(.1134)	(.1093)
Current Account Balance	0.959	.989	.988	1.003
	(0.0278)	(.0589)	(.0516)	(.0514)
GDP growth rate	0.901	.833*	.837	.845
	(0.0691)	(.1025)	(.1044)	(.1138)
Real interest rates	1.008	1.022	1.019	1.021
	(0.0138)	(.0218)	(.0213)	(.0221)
Inflation rate	0.995	.950**	.947**	.95**
	(0.0154)	(.0224)	(.0238)	(.0207)
Changes in Exchange Rates	1.0137	1.015	1.013	1.017
	(0.0186)	(.0229)	(.0245)	(.028)
Changes in Terms of Trade	0.939***	.941***	.940***	.94***
	(0.0209)	(.0191)	(.0184)	(.0197)
Incidences of Currency Crises	1.925	.262	.262	.348
	(2.5901)	(.3240)	(.3513)	(.4121)
Year	0.919***	.847**	.878**	.945
	(0.026)	(.0648)	(.0527)	(.0629)
1980s		1.458		
		(1.2504)		
1990s			.719	
			(.4114)	
2000s				.165***
				(.1235)
Cons_	0.204***	5.8e+142**	1.6e+112**	5.27e+47
	(0.1209)	(8.8e+144)	(2.0e+114)	(7.01e+49)
AIC	200.17	133.17	135.11	131.23
Wald Chi2	81.14***	85.46***	143.71***	229.32***
Pseudo R-Squared	0.2035	0.2741	0.2796	0.3067
Linktest _hat	.995**	.741*	1.03**	.67*
_hatsq	-.001	-.064	.007	-.086
Observations	639	358	372	362

The regression results in this sub-section suggest that, in the case of the emerging economies included in this study, centrist governments are more highly correlated with banking crises then evidenced in the prior research on advanced economies of the US and OECD. There is some support for Hibbs (1997)'s Partisan Theory projections.

Partisanship and Domestic Credit Growth

As discussed in Chapter 2, domestic credit can be viewed as proxy for financial liberalization/economic openness, which may explain why it has a consistently significant correlation with incidences of banking crises. Banking crises occur in environments of domestic and international capital mobility. This section investigates how partisanship impacts banking sector fragility given rapid domestic credit expansion.[83]

But how do partisanship and domestic credit growth relate? One way may be through varying degrees of partisanship commitment to enforcing financial sector regulations. The 2008 Global Financial Crisis set off major debates on party ideology and regulation enforcement. It has been argued that right-wing ideology encourages adopting a lax regulatory enforcement framework. This argument emanates from trying to explain the lax regulatory framework under the George W. Bush administration. Right-wing ideology is believed to be more in-line with the free market school of thought that argues the self-corrective nature of economic activity. In short, in terms of regulatory enforcement, right-wing governments are associated with a hands-off approach and left-wing governments are more associated with a hands-on approach to the financial sector. From the perspective of the Partisan Theory, the effects of rapid domestic credit expansion should be higher on incidences of banking crises when there are leftist and centrist parties in power. Remmer (2002) tests for the relationship between partisanship and domestic credit growth (used as a proxy for expansionist policies) and finds that there to be statistically significant and positive relationship between labor governments and domestic credit.[84] Therefore, we should expect the interaction between annual domestic credit growth and leftist-

[83] Studies on financial crises consistently find domestic credit growth to be significant indicator of crises. The Baseline Economic Model in this thesis also finds levels of domestic credit growth statistically correlated with incidences of banking crises.

[84] Remmer (2002), pp.42-47.

party governments to have a significant and positive relationship with incidences of banking crises. On the other hand, following Broz (2011, 2013) we should expect that the interaction between domestic credit growth and leftist parties to not be significant. On the other hand domestic credit should have a greater effect on incidences of banking crisis under right-wing governments.

In the following sub-sections I explore how interactions between partisanship and domestic credit expansion affect incidences of banking crises through logistic regression and marginal analysis.

Hypothesis (3): As domestic credit grows rapidly, the odds of experiencing a banking crisis under rightist governments are higher than under leftist governments.

A more comprehensive overview of the relationship between banking crises and domestic credit expansion is provided in Chapter 2 than is provided here. In this section, we examine the interactive effects of domestic credit and party orientation of the executive on banking sector fragility. Interactive effects are examined through marginal analysis and the impact of marginal values on the unconditional probability of a banking crisis. First, we must determine the unconditional probability of banking crises for this study. To do this, we divide the number of banking crises (49 crisis points) by the total number of panel years (30*35= 1050) to get 4.7 percent unconditional probability of a banking crisis for this sample of 35 countries across 30 years.[85] Studies have found that domestic credit expansion rates exceeding twenty percent annually put strain on the financial sector. The marginal rates presented in Table 3.9 provides us

[85] The probability that an event will occur, not contingent on any prior or related results. An unconditional probability is the independent chance that a single outcome results from a sample of possible outcomes. To find the unconditional probability of an event, sum the outcomes of the event and divide by the total number of possible outcomes. Also referred to as marginal probability.

$$P(A) = \frac{\text{Number of Times 'A' Occurs}}{\text{Total Number of Possible Outcomes}}$$

with observed increases in the marginal probability of a banking crisis based on the political party in power, which then allow us to see how the marginal rates impact the unconditional probability of a banking crisis in this BTSCS model. [86]

Table 3.7 presents the logistic regression results for effect of partisanship on banking crises given the annual domestic growth rates by year for each of the 35 countries in the sample. The coefficients for the interaction effects are not significant. However, the direction of the relationship between the interaction terms and incidences of banking crises suggest support for Broz's (2013) findings. When the relationship between incidences of banking crises are tested directly, we see that the odds of experiencing a banking crisis under centrist government (three times as likely) and leftist governments (twice as likely) are higher than under right-wing governments. The results of direct testing between party orientation and incidences of banking crisis do not support the Broz (2013)'s findings. Broz (2013) found that incidences of banking crises are higher under right-wing governments, when the relationship was directly tested. In terms of this study, once I introduce the interaction term comprised of party-orientation and annual domestic credit growth, we see that at higher levels of domestic credit expansion the odds of experiencing a banking crisis is higher under right-wing governments than under centrist or leftist governments, by 6 and 3 percent respectively.[87] Therefore, the findings in this study suggest support for examining further interactions between economic policies and partisanship. Examining the indirect relationship between partisanship and financial crises may provide important information on the

Table 3.8 presents the correlation and significance of domestic credit annual growth levels on incidences of banking crises. We see that domestic credit growth has a statistically

[86] Lane and McQuade (2013), Coudert and Pouvelle (2010) and Hilbers et. al. (2005). See Chapter 2 discussion on domestic credit growth.

[87] I do the following calculation to get these figures: Centrist: 1-0.941= 5.9 percent, Leftist: 1-0.968= 3.2 percent.

significant correlation to incidences of banking crises under right-wing governments. In the Baseline Economic Model (BEM) increases in the domestic growth level increases the odds of experiencing a banking crisis by 4 percent, under right-wing governments this odds percentage increases to 9.9 percent (significant at the one percent level, see Table 3.8), suggesting that increases in annual domestic credit growth rates have twice the impact under right-wing governments. However, it should be noted that the magnitude of effects between left and center interaction terms is small at 2.7 percent (.968-.941).

Table 3.7 PEM: Interaction Effects – Party Orientation & Domestic Credit Growth

Incidence of Banking Crisis (RR 2009) (1980-2009) 35 countries, 49 crisis observations for 29 countries across 30 years	Reg. (1) BEM	Reg. (2) PO (L1)*DC1(L2)
Party Or. Center		2.99** (0.539)
Party Or. Left		2.118 (1.1912)
Party Or.-Center##Domestic Credit Growth, t-2		.941 (.1095)
Party Or. -Left##Domestic Credit Growth, t-2		.968 (.0366)
Domestic Credit Growth, two-year lag	1.04*** (0.169)	1.061** (.0309)
Reserve Level (% of GDP)	0.913** (0.0442)	.896 (.0829)
Current Account Balance	0.959 (0.0278)	1.014 (.0578)
GDP growth rate	0.901 (0.0691)	.806*** (.0690)
Real interest rates	1.008 (0.0138)	1.012 (.0154)
Inflation rate	0.995 (0.0154)	.967 (.0230)
Changes in Exchange Rates (%)	1.0137 (0.0186)	.999 (.0189)
Changes in Terms of Trade	0.939*** (0.0209)	.944*** (.0224)
Incidences of Currency Crises	1.925 (2.5901)	.531 (.5905)
Year	0.919*** (0.026)	.884*** (.0436)

Cons_	0.204*** (0.1209)	7.5e+105*** (7.4e+107)
AIC	200.17	140.07
Wald Chi2	81.14***	66.05***
Pseudo R-Squared	0.2035	0.2332
Linktest _hat	.995**	.979*
-hatsq	-.001	-.005
Observations	639	366

Table 3.8 Effect of Domestic Credit Growth on Banking Crises Given Political Orientation of the Executive

Variable	Domestic Credit Growth
Party Orientation of Ruling Party	
1	1.099*** (.0391)
2	.983 (.2808)
3	.969 (.0425)

Marginal Analysis

Marginal analysis of how partisanship impacts the unconditional probability of experiencing a banking crisis at different rates of domestic credit expansion can provide us with in-depth understanding of the relationship between partisanship and banking crises.

Predictive/marginal probabilities presented in Table 3.9 suggest support for Broz's (2013) Partisan-Policy Financial Cycle theory and the argument that as the economy opens, right-wing governments have incentives to pursue crisis-prone policies such as expanding domestic credit and adopting on the deficit spending policies. It must be mentioned that although banking crises are typically preceded lending booms, rapid domestic credit expansion does not necessarily mean an inevitable path to financial crisis. To determine the interactive effects, we calculated the marginal probabilities of banking crises by party given various

domestic credit expansion rates (5 to 50 percent). We see that for annual domestic credit expansion rates of 10 to 20 percent, leftist governments exhibit higher marginal probabilities of banking crises. To determine substantive interactive effects, we calculated the changes in the unconditional probability of banking crises (4.7 percent) given the marginal probabilities of banking crises for each of the three political parties at different credit expansion rates.[88] For example, we see that the unconditional probability of a banking crisis increases from 4.7 percent to 5.4 percent under right-wing governments with an annual domestic credit expansion rate of 35 percent. Beyond the 20 percent annual domestic credit expansion threshold, the marginal probability of a banking crisis increases under right-wing government for annual expansion rates of 25 to 50 percent. Although we see increases in the probability of a banking crisis under right-wing governments given higher expansion rates, substantively the differences in the unconditional probabilities of a banking crisis do not differ greatly from one party to another. The greatest difference in the unconditional probability of a banking crisis by party is between right-wing rule and centrist rule with 45 percent annual domestic credit expansion at 0.7 percent, which is not a substantially high percentage.

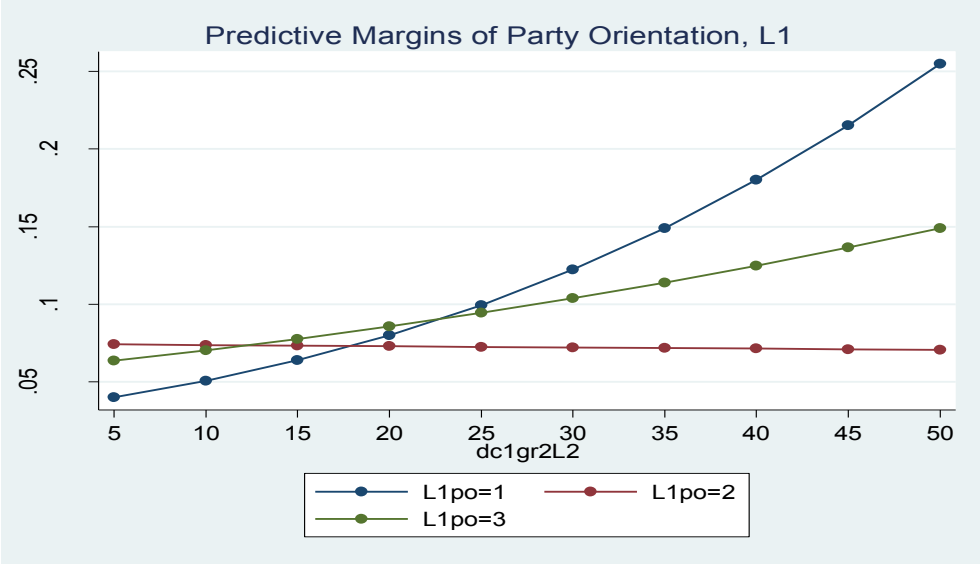
[88] To calculate the changes in the unconditional probability of banking crises, we increased the unconditional probability by the respective marginal probability. For example: the unconditional probability of a banking crisis under left governments given a 20 percent annual domestic credit expansion = 4.7* (1+0.086)= 5.1 percent.

Table 3.9 Interaction Effects: Party Orientation, (L1) & Domestic Credit Growth, (L2)

	Marginal Probabilities			Unconditional Probability of a Banking Crisis (Baseline 4.7%) Given Annual Domestic Credit Expansion Rate		
Domestic Credit Growth Level	**Right**	**Center**	**Left**	**Right**	**Center**	**Left**
5%	4.0%	7.4%	6.4%	4.9%	5.0%	5.0%
10%	5.1%	7.4%	7.0%	4.9%	5.0%	5.0%
15%	6.4%	7.3%	7.8%	5.0%	5.0%	5.1%
20%	8.0%	8.3%	8.6%	5.1%	5.1%	5.1%
25%	**9.9%**	7.3%	9.5%	5.2%	5.0%	5.1%
30%	**12.2%**	7.2%	10.4%	5.3%	5.0%	5.2%
35%	**14.9%**	7.2%	11.4%	5.4%	5.0%	5.2%
40%	**18.0%**	7.1%	12.5%	5.5%	5.0%	5.3%
45%	**21.5%**	7.1%	13.7%	5.7%	5.0%	5.3%
50%	**25.5%**	7.1%	14.9%	5.9%	5.0%	5.4%

Graph 3.5 is a visual representation of the predictive probabilities listed in Table 3.9. We see that the marginal probabilities under right-wing government do increase at higher rates beyond an annual domestic credit growth of 25 percent.

Graph 3.5 Party Orientation, L1 & Domestic Credit Growth, L2



In sum, the marginal analysis shows that the probability of banking crises increase under right-wing governments with annual domestic credit expansion rates between 25 and 50 percent Substantively, given the various annual domestic credit expansion rates, the magnitude of the interactive effects on incidences of banking crises are quite low (less than one percent). Partisanship and domestic credit expansion do not exert substantive interactive effects on incidences of banking crises.

Conclusions, Policy Implications & Further Research

The direct-effects testing indicate that leftist governments do not have a statistically significant impact on incidences of banking crises. However, we notice that the odds of experiencing a banking crisis under leftist governments is higher than under rightist governments, by more than twice as much (odds ratio 2.250). In the case of centrist governments, the odds of experiencing a banking crisis are three times higher centrist governments than under right-wing governments (odds ratio 3.049). The magnitude of effects between centrist and leftist government is moderately high at a difference of 0.75 (or 75 percent). This result is in line with Hibbs' (1977) Partisan Theory, in which leftist governments are much more willing to take on higher levels of inflation in pursuing job growth policies. High inflation can create price instability, which in turn increase the fragility of the banking sector.

The interactive effects of partisanship and domestic credit expansion challenge the existing literature by indicating only a very small magnitude of effects of partisanship on banking crisis given domestic credit expansion.[89] The magnitude of effects is quite small at 0.7 percent at the greatest point of difference in the unconditional probability of a banking crisis (4.7 percent to 5.4 percent).

[89] Domestic credit growth is established as a significant indicator of banking crises.

Broz (2011) states "that right-wing parties, enabled by international capital mobility, run fiscal and current account deficits to reward their high-income constituents with asset booms."[90] Further research would be to look at the interaction effects of party-orientation of the executive and current account balances. Current account deficits have not only preceded most financial crises, but the current account balances are driven by policy-oriented economic policies. In the Partisan-Policy Financial Cycle theory, right-wing parties are more prone to deficit spending policies and international capital mobility has created incentives for the right-wing parties to adopt crisis-prone economic policies.[91]

Finally, this study presents interesting findings by finding a statistically significant positive correlation between centrist governments and incidences of banking crises for this study's sample of countries. The literature has made passing observations about centrist governments being prone to deficit spending Broz (2013) found that in the run up to the recent sub-prime crisis, the deficit countries had more centrist governments than surplus countries or the rest of the OECD on average.[92] A suggestion for further research would be to examine centrist parties in the emerging economies, and perhaps revisiting OECD countries, in a more systematic way. The results indicate a need for greater investigation and case studies of the history of policies adopted by centrist governments in the set of emerging economies in this study.

In terms of policy implications, this study provides support for the idea that policy-makers face partisan incentive structures. I find support for both the Partisan-Policy Financial Cycle and the Partisan theory. Since I find support for both these theories, does that mean partisanship behaves differently based on the problem and policies in questions? In this study the

[90] Broz (2011), p.5-6.
[91] Broz (2011), p.5-6.
[92] Broz (2013), p.81.

question was, how does partisanship effect banking crises? And how does partisanship behave when a particular policy-set is considered, in this case policies impacting domestic credit growth? This study confirms that partisanship behaves differently when faced with various problems and policies. This study validates that need to consider political party reputations and class/segment ties in society when analyzing which policies are presented and adopted. Finally, this study accords with the finding of Remmer (2002) that internationalization has not made partisanship obsolete, in the case of the sample of countries considered in this study and in light of the literature, internationalization may have created incentives for parties to deviate from the ideological foundations of the party.

The results in this chapter provide three avenues for further research. First, the relationship between centrist governments and banking crisis needs to be investigated in greater detail with a larger sample of countries. Also, there needs to be a detailed analysis and case study on the history of centrist party platforms in relation to their leftist and right-wing counter parts. The questions we may want to answer are: Why are centrist governments more crisis prone? Is the rank-order of policy preferences of the political parties relevant in the study of banking crises?[93] One possible rationale may be that, without the ideological and set policy reputations, centrist parties may be more driven by voter policy preferences of the time. Lack of an ideological anchor may create incentives to adopt economic policies that may be more front loaded, but not prudent for the financial sector in the long run.

Second, the results present a case of examining the effect of partisanship on incidences of banking crisis given different policy directions. For example, there is literature relating partisan preferences to current account deficits. The earlier work points to higher current account deficits under left-wing governments, because of partisan preferences for expansionary policies to lower

[93] See Appendix for a detailed table o the rank-order of policy preferences by party orientation.

unemployment. Another set of the literature points to right-wing partisan incentives for greater spending, using concepts such as "Starve the "Beast" and internationalization. The question we may want to answer is: what are the interactive effects of partisanship on banking crises given high current account deficits?

Finally, it may be beneficial to examine the interactive effects of partisanship and a composite indicator on incidences of banking crisis. The composite indicator can be comprised of indicators such as domestic credit growth, current account balances and exchange rate changes. A composite indicator such as this can capture more broadly the indirect effects of partisanship on banking crisis given an various economic environments.

Appendix

Ranked Preferences of Political Parties in Advanced Industrial Societies Regarding Various Economic Goals.

Rank	Socialist-Labor	Center	Conservatives
1	Full-Employment	Price Stability	Price Stability
2	Equalization of Income Distribution	Economic Expansion	Balance of Payments Equilibrium
3	Economic Expansion	Full Employment	Economic Expansion
4	Price Stability	Equalization of Income Distribution	Full Employment
5	Balance of Payments Equilibrium	Balance of Payments Equilibrium	Equalization of Income Distribution

Table provided in Hibbs (1977), p.1471. Information based on Kirschen et al., 1964.

CHAPTER FOUR: RULE OF LAW AND BANKING CRISES

The Public Choice literature has found that institutions are critical for economic development and long-term economic growth (Kaufmann 1979, North 1990, Knack and Keefer 1995, Weingast 1995, Eichengreen and Arteta 2000, Haggard 2000, Haggard and McIntyre 2001 Claessens and Laeven 2002). According to North (1990), institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction. Good quality institutions provide the necessary checks and balances on economic policy making, which is necessary for a sound macroeconomic environment. But, does institutional quality have direct impact on whether a financial/banking crisis occurs? Demirguc-Kunt and Detragiache (1998) attempted to answer this question. They find a statistically significant negative correlation between the quality of the legal institutions and incidences of banking crises in developed, developing and emerging economies. My research into the relationship between rule of law and banking crises builds on Demirguc-Kunt and Detragiache (1998)'s study. My study considers more recent banking crisis points, including the 2008 Global Financial Crisis and I also consider countries in transition, which at the time of DD (1998)'s study had only recently emerged from socialist rule. More than twenty years have now elapsed since the fall of communism and there is no economic reason to not include these emerging economies.

The contract-intensive nature of the banking sector makes having an effective legal system critical for financial development and deepening. The IMF in their 1997 assessment of financial stability in emerging economies state that the rule of law supports the financial sector in the following ways:[94]

- *To establish clearly the rights, responsibilities and liabilities of the parties to financial transactions;*

[94] IMF (1997), p. 4.

- *To establish codes to support market forces in maintaining appropriate incentives and adequate information;*
- *To provide means to enforce legal obligations and claims efficiently.*

Effective legal systems decrease transaction costs by reducing opportunities for corruption in the banking sector thereby increasing the stability of the financial market. Haber (2008) examines the role of politics in financial development in the United States and Mexico from 1790 through 1914 and argues that the government is not a disinterested party in financial markets and has strong incentives to behave opportunistically and use financial repression for this own benefit. Consequently, institutions that encourage political competition reduce the chance for opportunistic behavior and generate larger, more competitive and more efficient banking systems.[95] An effective rule of law system supports political competition by establishing impartiality and requiring the enforcement of the rules of the game. Shimpalee and Breuer (2006) study the impact of institutions on currency crises and their argument on the importance of the legal system can just as easily be applied to the case banking crises. The authors make the argument that a higher degree of law and order means that not only is there greater 'observance' of the law by the populace, but also that the judicial system is fair and impartial. Contractual obligations are more likely to be fulfilled according to the terms of the agreement and the judicial system is more likely to settle cases fairly. Thus, a higher degree of law and order implies less uncertainty in all types of transactions. By reducing uncertainty in transactions, there is less likely to be a misallocation of resources and fewer inefficient outcomes. Therefore, although law and order strengthens an economy in ways that may not be

[95] Haber (2008)

directly observable in macroeconomic performance, it strengthens the banking sector decreasing the probability of a banking a banking crisis.[96]

The effectiveness of the legal system is a determinant of the level of corruption in the banking sector. Examples may include countries in which the banking sector is liberalized but bank supervision is weak and legal remedies against fraud are easy to circumvent, banking crises may also be caused by widespread "looting", bank managers not only may invest in projects that are too risky, but they may also invest in projects that are sure failures but from which they can divert money for personal use.[97] Mehrez and Kaufmann (1999) consider the effects of transparency on banking crises in financially liberalized markets. They find that countries with low transparency (or high corruption) are more likely to experience banking crises as a result of financial liberalization.[98] Akerlof and Romer (1993) claim that looting behavior was at the core of the savings and loan crisis in the United States and of the Chilean banking crisis in the late 1970s. Thus, a weak legal system that allows fraud to go unpunished increase weakens the banking sector thereby increasing the probability of a banking crisis.[99]

The hypothesis is that a weak law and order system increases the probability of a banking crisis by encouraging information asymmetries and bad market behavior. But what is the transmission mechanism between rule of law and banking crises? Shimpalee and Breuer (2006) discuss two causal mechanisms of how institutions affect currency crises, which is relevant and applicable to the cases of banking crises.[100] The causal mechanism is two-fold:

[96] The indirect relationsip between rule of law and financial crises: Shimpalee and Breuer (2006), p. 130. Mehrez and Kaufmann (1999).
[97] Demirguc-Kunt (1998).
[98] Demirguc-Kunt and Detragiache (1996), p. 15.
[99] Demirguc-Kunt and Detragiache (DD) (1998), p. 87.
[100] In the authors' discussion of Li and Inclan (2001).

3- Institutions tend to have an impact and correlate with the health of the national economy. Therefore, institutions that lead to bad economic fundamentals may contribute to banking crises whereas institutions that help produce good economic fundamentals remove a reason for banking crises to occur.

4- Institutions are informative. Institutions signal market expectations. Institutions that correlate with good economic conditions stabilize market expectations, reduce market uncertainty about the probability of a banking crisis, and make speculative capital outflows less likely.[101]

Demirguc-Kunt and Detragiache (1996, 1998, and 2005) investigate extensively the role of institutions in affecting banking sector fragility. They use a qualitative and a quantitative proxy for institutional development, PRS's International Country Risk Guide Law and Order Index and GDP per capita, respectively. The authors find that weaker institutional environments are related to higher probabilities of banking crises. Using the same proxy as DD (1998), I use ICRG's Law and Order indicator to examine the role of rule of law in precipitating banking crises in a sample of thirty-five emerging economies from 1980 through 2009. The ICRG's Law and Order indicator is one of the main indicators used to assess the effectiveness of the legal system in developed, developing and emerging economies (Shimpalee and Breuer 2006, Knack and Keefer 1995, Levine 1998, Law and Habibullah 2006, Law and Azman-Saini 2012, Demirguc-Kunt and Detragiache 1998, 2005). The logistic results of the BTSC model provide support for the findings of Demirguc-Kunt and Detragiache (1996, 1998). The ICRG- Law and Order indicator does not have a statistically significant impact on incidences of banking crises, however the direction of the relationship is in line with the existing literature showing a negative relationship

[101] Shimpalee and Breuer (2006), p. 128.

between the effectiveness of the legal system (higher scores indicate better rule of law systems) and incidences of banking crises.

The following subsections provide an overview of the literature on the relationship between rule of law and economic development and banking sector stability. The hypothesis is tested using logistic regression in a Binary Time-Series Cross-Sectional model for a sample of thirty-five emerging economies from 1980 through 2009. The chapter concludes with a discussion of the findings, policy implications and further research on this topic.

Literature Overview

A negative relationship between a strong rule of law tradition and financial sector stability is intuitive. All transactions in the financial sector explicitly or implicitly rely on contractual agreements and nations that espouse stronger rule of law systems can expect to have more stable market operations, investor protections and contract enforceability, which allow for the entrenchment and expansion of the financial sector. Demirguc-kunt and Detragiache (1996, 1998, 2005)'s study includes measures for the quality of the legal system, contract enforcement and bureaucracy and finds that these measures are statistically significant indicators for banking crises.[102] Acemoglu, Johnson and Robinson (2004) look at the history of institutions and market volatility and crises and determine that "differences in institutions, in particular enforcement of property rights, rule of law and constraints placed on politicians and elites, have a first-order effect on long-run economic development."[103] Some studies showing a strong correlation between legal institutions and financial development include: Knack and Keefer 1995, Mauro 1995, La Porta et al. 1998 and Hall and Jones 1999. Khan et al. (2011) interact central bank

[102] Demirguc-kunt and Detragiache (1998), p. 93. Also see Demirguc-kunt and Detragiache (2005).
[103] Acemoglu, Johnson and Robinson (2004). Institutions, Volatility and Crises, chapter 3 in *Growth and Productivity in East Asia,* NBER—East Asia Seminar on Economics, Volume 13, Takatoshi Ito and Andrew K. Rose, eds. Published by National Bureau of Economic Research. Also see: North and Thomas 1973; Jones 1981; Olsen 1982

independence with a measure of law and order and find that a country's autonomous central bank can perform its duties more effectively to reduce the banking sector's instability when the country's law-and-order tradition is stronger.[104] In another study, Gallo, Stegmann and Stegall (2006) conclude that Argentina's weak democratic institutions, lack of government transparency, regulatory oversight and rule of law allows politicians to implement unsustainable economic policies. The authors offer that "social confidence in the government is low, the independence of the Supreme Court has been shattered and the rule of law continues to be eroded, as the government tramples on the property rights of private firms and public debt-holders."[105] Claessens et al. (2004) examine the role of institutions in resolving banking crises and find that "better institutions—less corruption, improved law and order, legal system, and bureaucracy—do."[106]

Some authors have argued that general development of legal systems and institutions is crucial in mediating the effect of financial openness on financial development. For instance, Chinn and Ito (2006) argued that financial systems with a higher degree of institutional development, on average, benefit more from financial liberalization than those with a lower degree of development. Shimpalee and Breuer (2006)'s strongest results regarding institutions show that corruption, a de facto fixed exchange rate regime, weak government stability, and weak law and order increase the probability of a currency crisis.[107]

LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1998, 1997; henceforth LLSV) have substantially advanced research into the legal determinants of financial development. LLSV

[104] The authors use the Law and Order Index from the International Country Risk Guide monthly data, PRS.

[105] Gallo, Andres, Juan Pablo Stegmann and Jeffrey W. Steagall (2006). The Role of Political Institutions in the Resolution of Economic Crises: The Case of Argentina 2001-2005, Oxford Development Studies, 34(2), p.195.

[106] Claessens, Stijn, Daniela Klingebiel and Luc Laevan (2004). Resolving Systemic Financial Crises: Policies and Institutions, World Bank Policy Research Working Paper No. 3377, August.

[107] Shimpalee and Breuer (2006), p. 125.

(1998) collect and summarize information on the legal systems of 49 countries. LLSV(1997) then use these data to show that legal systems that rigorously protect creditors and enforce contracts encourage better functioning debt and equity markets than legal systems that are more lax in safeguarding creditors and enforcing contracts.[108] Levine (1998) finds that cross-country differences in the legal rights of creditors and the efficiency with which legal systems enforce those rights explain over half of the cross-country variation in banking-sector development. The data show that countries with legal systems that give high priority to banks receiving the full present value of their claims against firms have better-developed banks than countries where the legal codes do not emphasize the rights of creditors. The data indicate that countries that effectively enforce compliance with laws tend to have better-developed banks than countries where enforcement is lax.[109] Law and Habibullah (2006): Pistor et al. (1998) point that law and legal systems were important in promoting Asian economic growth, but they have been largely ignored by the literature. Rodrik et al. (2002) find that quality of institutions overrides geography and integration (international trade) in explaining cross-country income levels. Rodrik (1997) examines the role of institutional quality on economic performance in Eight east Asian countries. The results demonstrate that institutional quality is statistically significant determinant of growth per worker in these economies. The objective of Law and Habibullah (2006)'s study is to examine the effects of institutional quality and financial development on economic performance in East Asian economies over 1980-2001. Given the significant role that institutions play in financial development, the study investigates whether the interaction between both variables has a separate positive influence on economic performance.[110] De Soto (2000) examined related issues, focusing on the role of property rights as a sort of institution, and claimed that lack of

[108] Levine (1998), p.597.
[109] Levine (1998), p.598.
[110] Law and Habibullah (2006), p. 203.

property right is a serious impediment to financial development. Other empirical studies have also found that better property rights and legal systems tend to improve financial development (Claessens and Laeven 2003, and Mishkin 2009). Levine (1998) also pointed out that countries with legal and regulatory systems that prioritize creditors receiving full present value of their claims on corporations have better functioning financial intermediaries than countries in which the legal system provides much weaker support to creditors. In addition, he finds that contract enforcement and information disclosure are significant determinants of financial development.[111] Therefore, we see that the literature on the political economy of rule of law emphasizes the importance of effective legal institutions in economic/financial growth and development.

Hypothesis (1): Stronger rule of law systems decrease the odds of banking crises in emerging economies.

Methodology and Results

The study uses logistic regression in a Binary Time-Series Cross-Sectional model to examine the relationship between law and order and incidences of banking crises for a sample of thirty-five emerging economies from 1980 through 2009. The model in this chapter builds on Demirguc-Kunt and Detragiache (1998)'s study on the relationship between institutions and banking crises. My study considers more recent banking crisis points, including the 2008 Global Financial Crisis. DD (1998)'s study covers 1980 through 1994, my study spans 1980 through 2009. Former transition countries are included in the sample countries, which at the time of DD (1998)'s study had only recently emerged from socialist rule. More than twenty years have now elapsed since the fall of communism and many transition economies can now be included in financial crisis studies.

[111] Law and Azman-Saini (2012), p. 219.

DD (1998) find the Law and Order indicator from the ICRG, as a proxy for the effectiveness of the legal system, to be significantly and negatively correlated with the emergence of banking sector problems. The results show a significant coefficient of -0.516 in a logistic regression excluding years after the banking crisis. The coefficient suggests that higher levels of rule of law may decrease the odds of a banking crisis by approximately 50 percent.[112] Weak law and order systems also increase the costs of banking crises. As predicted by theory, the authors find that low values of the "law and order" index, which should proxy more opportunities to loot and/or a lower ability to carry out effective prudential supervision, are associated with a higher likelihood of a crisis. Indexes of corruption, quality of contract enforcement, quality of the bureaucracy, and delays in the justice system are less significant than of than the "law and order" index.[113] For this study, monthly data is annualized for the Law and Order index from PRS' International Country Risk Guide (ICRG). A nation can score anywhere from 0 to 6, with 6 indicating a very strong law and order system. The indicator is continuously scored within this range. For empirical analysis when appropriate, the variable is recoded into a discrete indicator with a range from 1 through 7 to allow for easier testing. The ICRG provides the following note on its methodology and subcomponents of law and order:

> Law and Order are assessed separately, with each sub-component comprising zero to three points. The Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law. Thus, a country can enjoy a high rating – 3 – in terms of its judicial system, but a low rating – 1 – if it suffers from a very high crime rate of if the law is routinely ignored without effective sanction (for example, widespread illegal strikes).[114]

[112] DD (1998), p. 84.
[113] DD (1998), p. 99.
[114] ICRG Methodological Note: http://www.prsgroup.com.ccl.idm.oclc.org/ICRG_Methodology.aspx

Sensitivity testing is conducted by using an alternative proxy for the quality of the legal system. The World Bank's World Governance Indicators provide us with a *Rule of Law* measure for our sensitivity analysis. The WGI Rule of Law indicator is an annual and continuous variable with scores from -2.5 to 2.5 spanning from 1996 through 2011.

Table 4.1 provides the cross-tabulation of banking crises by ICRG's Law and Order scores. For each score, its frequency at times of banking crises is divided by its frequency at all times, crisis and non-crisis years. This ensures that each score is weighted by its frequencies allowing us to compare and contrast across scores. For more aggregate analysis, The law and order index was divided into three levels: low (scores 1-3), medium (4-5) and high (6-7). For lower levels of law and order, I added up frequencies for scores from 1 through 3 and divided by the total number of frequencies for scores 1 through 3 (22/158= 13.9%). We see that low law and order level has a frequency of 13.9 percent at times of banking crises, 11.2 percent for medium strength law and order levels and 10.5 percent for high strength law and order at times of banking crises. Thus, the trend suggests an inverse relationship between rule of law scores and incidences of banking crises, which supports further testing.

Table 4.1 Banking Crises by Frequency of Law and Order Scores

Law and Order Levels	Score	Frequency of Score at Time of Banking Crisis	Total Frequency of Score	Percentage of Banking Crisis by Score	Percentage of Banking Crisis by Level
LOW	1	1	7	15	13.9
	2	9	44	20.5	
	3	12	107	11.2	
MEDIIUM	4	22	180	12.2	11.2
	5	25	239	10.5	
HIGH	6	20	202	10	10.5
	7	5	36	14	
	Total	94	815	11.5	

Graph 4.2 gives a visual representation of frequencies of law and order scores during times of crisis. There is no observable pattern between the frequencies of law and order scores at

times of banking crises. However, we see that a score of 2 was present at more than twenty percent of incidences of banking crises.

Graph 4.1 Frequencies of Law and Order Scores at Times of Banking Crises

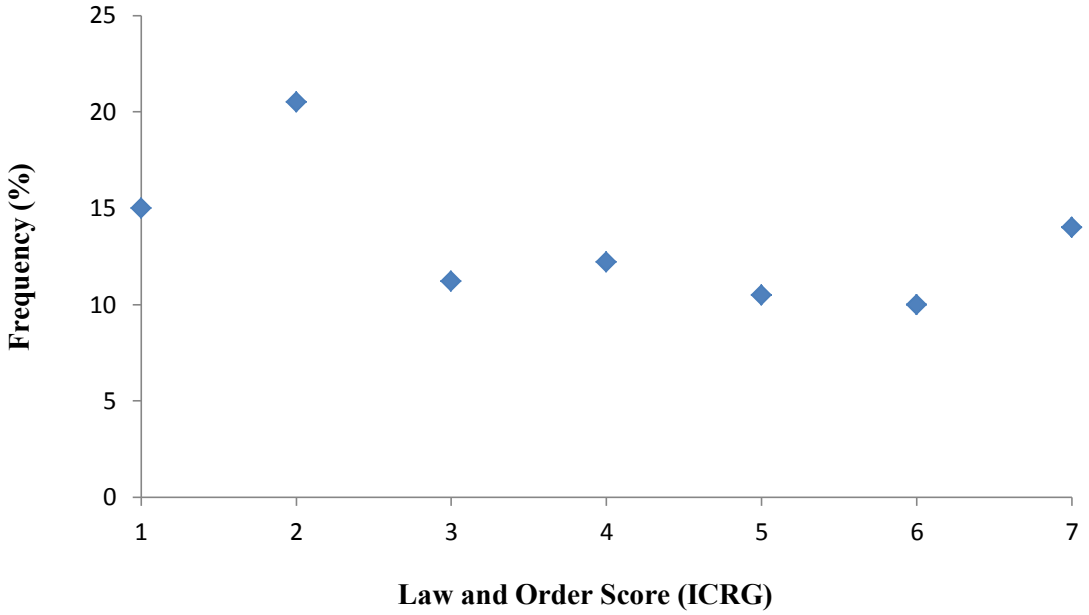


Table 4.2 Descriptive Statistics

Variable	Mean	Median	Std. Dev.	Min	Max	N	n
ICRG- Law and Order	3.6	4.72	1.28	0	6	815	35

The BTSCS Political-Economy Model in this section examines the direct relationship between the strength of the legal system, in thirty-five emerging economies from 1980 through 2009, and incidences of banking crises. Table 4.3 presents the political-economy model logistic regression results, including law order at times, t, t-1 and t-2. The literature does not point to using a specific lag length when it comes to the ICRG's Law and Order Index. However, here one-year and two-year lags are tested, because it can argued that there is a time lag from when there are gains in the legal system and when the effects are felt in the financial sector. Also,

there might be time-lags between when contracts and agreements go bad and when the banking sector absorbs the loss. In more general terms, it is reasonable to assume a time lag between when contracts rights are violated and when losses are absorbed by the banking sector. Therefore, one-year and a two-year lags are included for exploratory purposes.

Table 4.3 presents the logistic regression results, which suggest the ICRG- Law and Order indicator does not have a statistically significant relationship with banking crises. The political economy model tested here includes a set of economic control variables, as set out in Chapter 2. Chapter 2 developed the baseline economic model with the set of economic control variables used in the political economy models introduced in Chapters 3, 4 and 5. Also, with the exception of the one-year lagged ICRG-Law and Order indicator, the rule of law proxy exhibits the wrong sign at times t and t-2. The results show the ICRG-Law and Order indicator to be statistically insignificant and not exhibiting the correct sign, with the exception at the one-year lag. These results suggest exploring time lags in further research projects on this topic. As to why we see a positive relationship between law and order and incidences of banking crises at other times, one possible explanation may be that there is an indirect endogenous relationship between the strength of the legal system and incidences of banking crises. One could argue that since banking crisis only occur in open and liberalized economies and economic openness and liberalization can only occur under at least a somewhat effective legal system then, in the case of emerging economies we may see a positive relationship between the legal system and banking crises. Further research on this topic can examine how other rule of law indices perform in models of banking crises for emerging economies.

Overall, the political economy model improves on the performance of the Baseline Economic Model (BEM). The inclusion of the rule of law variable also decreases the AIC to an

approximate range of 169 to 177 from 200 in the BEM and increases the pseudo R-squared to a range of approximately 24 percent to 25 percent from 21 percent under the BEM. The test results and model performance suggests support for the theory that more efficient legal systems are less conducive to banking crises and the inclusion of institutional variables may improve upon existing economic models.

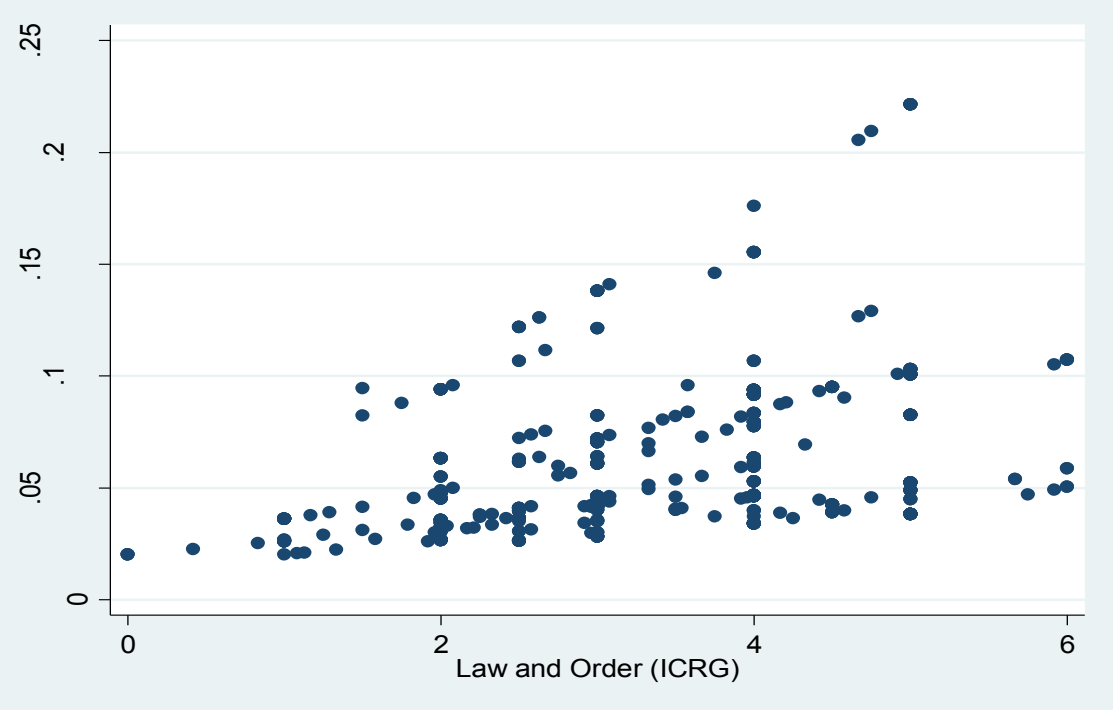
Table 4.3 Political Economy Model (PEM)—Rule of Law

Incidence of Banking Crisis (RR 2009) (1980-2009) 35 countries, 49 crisis observations for 29 countries across 30 years	**Reg. (1) BEM**	**Reg. (2)**	**Reg. (3)**	**Reg. (4)**
ICRG- Law and Order (lo),		1.116 (0.1476)		
ICRG- Law and Order (lo), One-Year Lag			0.974 (0.1438)	
ICRG- Law and Order (lo), Two-Year Lag				1.186 (0.2192)
Domestic Credit Growth, two-year lag	1.04*** (0.169)	1.051*** (0.0146)	1.055*** (0.0143)	1.056*** (0.0145)
Reserve Level (% of GDP)	0.913** (0.0442)	0.894** (0.052)	0.896* (0.0553)	0.894* (0.0557)
Current Account Balance	0.959 (0.0278)	0.944* (0.0324)	0.938* (0.0338)	0.938* (0.0337)
GDP growth rate	0.901 (0.0691)	0.885** (0.052)	0.873** (0.0528)	0.865** (0.054)
Real interest rates	1.008 (0.0138)	1.009 (0.0145)	1.011 (0.0136)	1.009 (0.0142)
Inflation rate	0.995 (0.0154)	0.989 (0.0152)	0.988 (0.0141)	0.986 (0.0151)
Changes in Exchange Rates (%)	1.0137 (0.0186)	1.007 (0.0164)	1.006 (0.0155)	1.006 (0.0159)
Changes in Terms of Trade	0.939*** (0.0209)	0.937*** (0.0207)	0.94*** (0.0197)	0.941*** (0.0198)
Incidences of Currency Crises	1.925 (2.5901)	7.989 (10.577)	7.336 (10.1393)	6.247 (8.3948)
Year	0.919*** (0.026)	0.898*** (0.0301)	0.888*** (0.0325)	0.883*** (0.0331)
Cons_	0.204*** (0.1209)	1.08e+92*** (7.2e+93)	1.9e+101 (1.4e+103)	4.1e+106 (3.1e+108)
AIC	200.17	177.74	169.948	168.881
Wald Chi2	81.14***	126.96***	136.03***	106.9***
Pseudo R-Squared	0.2035	0.2374	0.2472	0.2466
Linktest _hat	.995**	0.908**	0.904**	0.920**
-hatsq	-.001	-0.02	0.021	-0.0174
Observations	639	601	584	565

Using logistic regressions presented in the previous table, the predicted probabilities of banking crises by ICRG-Law and Order index scores at present time (t) and at a one-year lag (t-1) are calculated and plotted in Graph 4.2. I chose to plot the predicted probabilities of banking crisis by law and order at a one year lag, because at this lag length the indicator exhibits the expected direction of relationship with incidences of banking crisis.

Graph 4.2 presents a positive relationship between the law and order scores and probabilities of banking crises at time t. This observed trend does not support the hypothesis that higher levels of rule of law may decrease the odds of banking crises.

Graph 4.2 Predicted Probability of a Banking Crisis by ICRG- Law and Order Scores



Sensitivity analysis and robustness testing is done by using an alternative proxy for rule of law. The World Bank's *Rule of Law* measures provides us the alternative dataset. The WGI Rule of indicator has an annual frequency and data years range from 1996 through 2012. The WGI methodology has a continuous score range from -2.5 to 2.5 with lower scores indicating

lower levels of Rule of Law. The results in Table 4.4 support the conventional wisdom that higher levels of rule of law are inversely correlated with financial/banking crises. We can see that at time t, higher rule of law scores decreases the odds of a banking crisis by approximately 70 percent. The inverse correlation between rule of law and incidences of banking crisis is significant at the 10 percent level. We also notice that the negative relationship between rule of law strength and incidences of banking crisis is consistent through the time lags.

Table 4.4 PEM—Sensitivity Analysis

Incidence of Banking Crisis (RR 2009) (1980-2009) 35 countries, 49 crisis observations for 29 countries (1996-2009)	Reg. (1) BEM	Reg. (2)	Reg. (3)	Reg. (4)
Rule of Law WGI, -2.5 to 2.5 Score		.301* (.2561)		
Rule of Law WGI, One-Year Lag			.895 (.8498)	
Rule of Law WGI, Two-Year Lag				.392 (.4512)
Domestic Credit Growth, two-year lag	1.04*** (0.169)	1.106** (.0574)	1.007 (.0469)	1.075 (.1546)
Reserve Level (% of GDP)	0.913** (0.0442)	.926 (.115)	1.027 (.2408)	.928 (.3092)
Current Account Balance	0.959 (0.0278)	.873** (.0547)	.889** (.0474)	.949 (.0846)
GDP growth rate	0.901 (0.0691)	1.058 (0.2305)	1.074 (.1854)	.964 (.1753)
Real interest rates	1.008 (0.0138)	1.033 (.0251)	.925 (.0579)	1.026 (.0304)
Inflation rate	0.995 (0.0154)	1.013 (.0261)	.878** (.0560)	1.044 (.0416)
Changes in Exchange Rates (%)	1.0137 (0.0186)	1.000 (.0198)	1.057 (.0417)	.944 (.0276)
Changes in Terms of Trade	0.939*** (0.0209)	.959 (.034)	.837*** (.0588)	.934* (.0400)
Incidences of Currency Crises	1.925 (2.5901)	88.251* (227.98)	1 (empty)	173.3002*** 365.3069
Year	0.919*** (0.026)	.735 (0.1692)	.788 (.1356)	.820 (.2832)
Cons_	0.204*** (0.1209)	3.8e+264 (1.7e+267)	3.3e+205 (1.1e+208)	3.3e+170 (2.3e+173)
AIC	200.17	70.86	50.1	53.96
Wald Chi2	81.14***	57.10***	67.38***	42.69***
Pseudo R-Squared	0.2035	0.425	0.5144	0.4703
Linktest _hat	.995**	1.567***	1.194***	1.735***
-hatsq	-.001	.094***	.041**	0.124*
Observations	639	311	277	249

The econometric testing indicates some support for the conventional wisdom that the effectiveness of legal systems has a negative relationship with financial crises. However, in the case of banking crises, as seen in the results in this study, the results are not conclusive and further testing is required using other measures of law and order and, plausibly time lags.

Magnitude of Effects

An analysis of the marginal effects gives the magnitude of effects of changes in levels of rule of law on incidences of banking crises. The magnitude of effects of the continuous WGI Rule of Law indicator is relatively small. A full point increase in WGI Rule of Law score decreases the probability of a banking crisis by 2.3 percent, holding all other variables at their means. Aggregately, a move from a -2.5 score to a 2.5 score means a 11.5 percent [(-2.5-2.5)*2.3%] reduction in the probability of experiencing a banking crisis. For the STATA output for the marginal effects please refer to the Appendix. An aggregate decrease of approximately 12 percent in the probability of having a banking crisis, is not insignificant. On the ICRG Law and Order scale, if a country can maintain score of 4 out of 7 there is a 8 percent reduction in probability of experiencing a banking crisis [4*2%]. The average ICRG Law and Order score for the sample of countries and years in this study is 3.6 (See Table 4.2). A score of 3.6 means a reduction of approximately 7 percent in the probability of a banking crisis reducing the unconditional probability of a banking crisis from 4.7 to 4.63 percent. The small magnitude of effects challenges the hypothesis by showing that for the sample countries and years in this study rule of law does not play a significant factor in incidences of banking crisis.

Rule of Law and Domestic Credit Growth

The relationship between the strength of rule of law and domestic credit expansion is tenuous at best. Levine (1998) and DD (1996, 1998) demonstrate a positive relationship between rule of

law and the domestic credit that goes to the private sector.[115] Higher levels of rule of law allow for greater financial sector development and the expansion of the share of domestic credit to the private sector. As Levine (1998) points out, legal rights of creditors and the ability to enforce those rights are strongly tied to the ratio of bank credit to the private sector as a share of GDP.[116] The initial test to determine whether the interaction term is significantly meaningful is done by the Wald Test. Table 4.5 presents the results of the Wald Tests for the Law and Order and Domestic Credit Growth interaction terms. The results indicate that the regression coefficients between domestic credit growth and incidences of banking crisis do not significantly differ depending on the level of law and order score.

Table 4.5 Wald Test: Law and Order & Domestic Credit Growth (L2) Interaction Terms

#	Interaction Term		Results		
	Independent Variable (Continuous)	**Moderation Variable (s) (Categorical)**	**Chi2**	**Prob > Chi2**	**Statistical Significance**
1	Domestic Credit Growth (L2)	Law and Order	2.17	0.3380	No
2	Domestic Credit Growth (L2)	Law and Order (L1)	2.22	0.3300	No
3	Domestic Credit Growth (L2)	Law and Order (L2)	1.47	0.4185	No

Summary, Policy Implications and Further Research

The econometric testing in this chapter suggests support for the findings of Demirguc-Kunt and Detragiache (1996, 1998). There is minor evidence of a direct and inverse relationship between the level of law and order and incidences of banking crises. The ICRG's Law and Order Index does not have a statistically significant correlation with incidences of banking crises, however the World Bank's World Governance Rule of Law indicator exhibits a negative and statistically significant correlation with incidences of banking crises at the 10 percent level.

[115] DD (1998), p.83. The authors find some evidence that problems are more likely where a larger share of credit goes to the private sector, possibly indicating a connection between the emergence from a state of financial repression and banking sector fragility.[115]

[116] Levine (1998), p.604.

Identifying the relationship between law and order has policy implications. If the strength of rule of law significantly decreases banking sector fragility, then the inclusion of legal measures in reform packages gain importance and salience. Continual internationalization of nations will only increase the dependence on an efficient legal system that has the capacity to handle all claims from the financial sector.

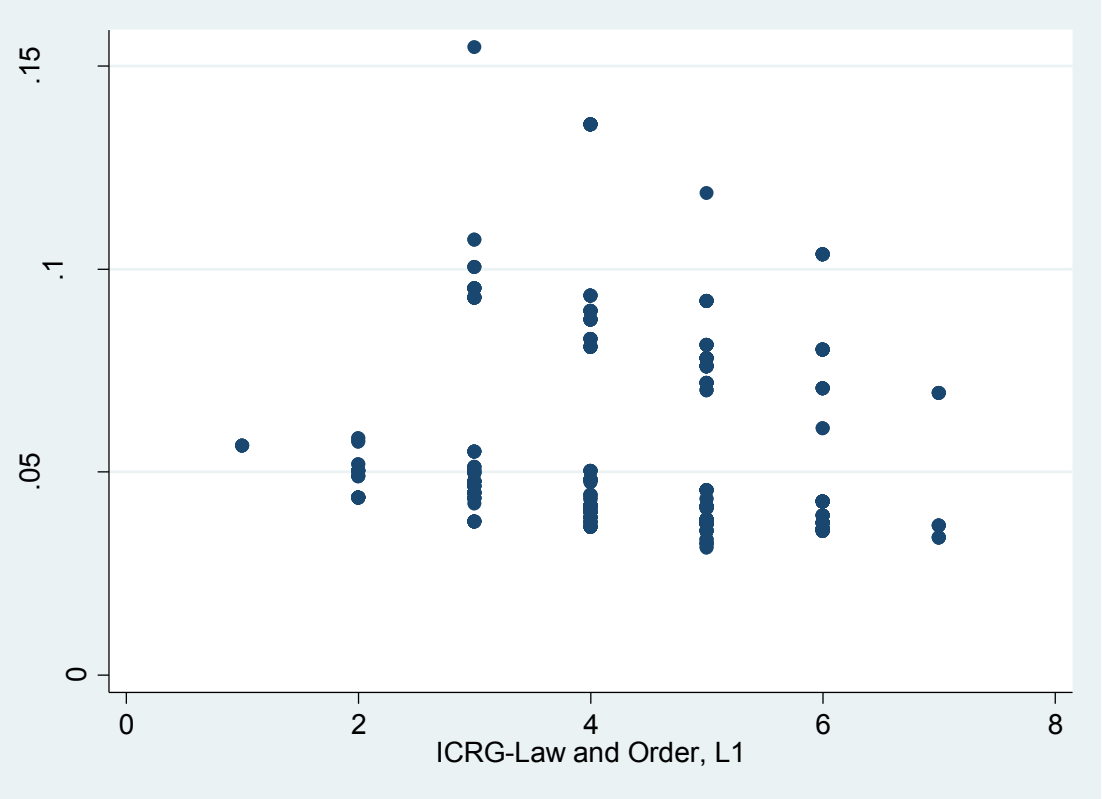
In further research of the relationship between rule of law/institutions and banking crisis, it would be beneficial to create a composite indicator as is the case in Knack and Keefer (1995) and Law and Habibullah (2006). Both studies create a composite indicator comprised of five PRS indicators used to measure the overall institutional environment, including Corruption, Rule of Law, Bureaucratic Quality, Government Stability and Risk of Expropriation. The composite indicator is achieved by simply adding the scores for each of the five sub-categories. The use of a composite institutional variable in the case of banking crisis can provide meaningful foundation to discussions of the political economy of the banking sector.

Another area for further investigation is the examination of the origin of the legal code by country (Levine 1998, La Porta et al. 1997, 1998, Roe 2006). La Porta et al. (1997, 1998), argued that the origins of the legal code substantially influence the treatment of shareholders and creditors and the efficiency of contract enforcement.

Appendix

Graph 4.3 plots the predicted probabilities of a banking crisis by the ICRG law and order scores lagged by one year. Here we see a negative relationship between the probability of a banking crisis and the strength of the legal system. One observation that stands out is the systematic scattering of the probabilities. However, we have to be able to make a strong case in favor of using the lagged results, which may be a topic for further research.

Graph 4.3 Predicted Probability of a Banking Crisis by ICRG-Law and Order, L1



Marginal Effects

Discrete/ Categorical Variable

Marginal Effect $X_k = Pr(Y = 1|X, X_k = 1) – Pr(y=1|X, X_k = 0)$

```
Marginal effects after logistic
      y  = Pr(bc) (predict, p)
```

```
        =  .07853981
------------------------------------------------------------------------------
                      variable |          dy/dx                X
-------------------------------+----------------------------------------------
                        lo_rec |       -.0202477            4.63652
                      dc1gr2L2 |        .0032277            -.02563
                        ch_tot |       -.0004232            4.41374
                            ca |       -.0016846           -.525614
                           dr1 |       -.0023205             .66785
                         gdpgr |       -.0178014            4.81239
                           rir |       -.0013659            7.95944
                            cc*|        .0364973            .025597
                          infr |        .0014873            12.6514
                          exgr |        .0027904           -.362423
                          year |        .0002996             1998.2
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

Continuous Variable

Marginal Effect of Xk = limit [Pr(Y = 1|X, Xk+Δ) – Pr(y=1|X, Xk)] / Δ]
as Δ gets closer and closer to 0

```
margins, at(RL = (-2.5 -1.5)) atmeans

Adjusted predictions                              Number of obs   =        247
Model VCE    : Robust

Expression   : Pr(bcrr), predict()

1._at        : RL              =        -2.5
               dc1gr2L2        =    .0694635 (mean)
               ch_tot          =    .7260902 (mean)
               ca              =   -1.238381 (mean)
               dr1             =    .4027935 (mean)
               gdpgr           =    4.818259 (mean)
               rir             =    7.534818 (mean)
               cc              =    .0283401 (mean)
               infr            =    7.352915 (mean)
               exgr            =   -1.115061 (mean)
               year            =    2003.109 (mean)

2._at        : RL              =        -1.5
               dc1gr2L2        =    .0694635 (mean)
               ch_tot          =    .7260902 (mean)
               ca              =   -1.238381 (mean)
               dr1             =    .4027935 (mean)
               gdpgr           =    4.818259 (mean)
               rir             =    7.534818 (mean)
               cc              =    .0283401 (mean)
               infr            =    7.352915 (mean)
               exgr            =   -1.115061 (mean)
               year            =    2003.109 (mean)
```

```
------------------------------------------------------------------------------
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         _at |
          1  |    .036486   .0517449     0.71   0.481    -.0649322    .1379042
          2  |   .0132521    .013975     0.95   0.343    -.0141383    .0406425
------------------------------------------------------------------------------

.
end of do-file

. display .0132521 - .036486
-.0232339
```

MEMs (marginal effects at means) for continuous variables measure the *instantaneous rate of change*, which may or may not be close to the effect on P(Y=1) of a one unit increase in Xk. Appendix 1 explains the concept in detail. What the MEM more or less tells you is that, if, say, Xk increased by some very small amount (e.g. .001), then P(Y=1) would increase by about .001*.534 = .000534, e.g.

CHAPTER FIVE: GOVERNMENT STRENGTH AND BANKING CRISES

This study represents an initial attempt to evaluate the relationship between government strength and banking crises. There is only one other study that examines the interactive effects of government strength and financial crises, see Willett and Chiu (2009). Willett and Chiu's study interact government strength with exchange rate regimes and determine the interactive effects on currency crises. Consequently, the study presented here represents one of the first attempts at examining the relationship between government strength and banking crises.

Governmental strength profiles inform investor and consumer expectations on banking sector stability by signaling commitment to effective and prudential regulations. Expectations are formed on the basis of government capacity and reputation on factors such as policy uncertainty and gridlock. Haggard (2000), Haggard and MacIntyre (2001) and Hickens (1998, 2000) make the case that one of the contributing factors to the breakout of the financial crises in Thailand and Korea was governmental instability and weakness. In both cases the post-crisis era ushered in institutional and political changes. Economic variables explain about one-third of the variation in government popularity.[117] Paldam (1981) mentions the responsibility hypothesis, i.e., the idea that the government is held responsible for the economic situation.[118] Therefore, government popularity is in part dependent on past handling of the economy, which in turn increases the political capacity of the government to adopt the necessary adjustments in the future without risking their political survival in the next elections. Government strength, as measured in capacity and willingness, influences whether a set of announced policy programs are implemented and enforced.

[117] Paldam (1981), p.289.
[118] Paldam (1981), p.288.

Perceptions of the government strength inform investor, consumer and speculator expectations on how the government will handle banking sector problems, i.e. how the government will choose to deal with insolvent banks and liquidity and regulatory issues. Related to political survival, it is has been shown that failing banks are less likely to be taken over by the government or lose their license before elections than after elections. This effect becomes even stronger when the ruling party is politically weak. Politicians are engaged in a process which has a short time horizon facing elections, and popular perceptions of government reputation and capacity inform voter preferences. If the government is popular and has a high approval rating, concerns about political survival in the next elections are alleviated thereby increasing the political capacity of the administration to adopt policy revisions. The following subsections discuss the literature on the relationship between government strength and financial crises, present and discuss the results of the econometric testing and conclude with discussing the policy implications and recommendations for further research.

The banking/financial sector is the life blood of the economy and has strong ties with the government. Particularly in emerging economies where banking/financial sector expansion and deepening depends on government direction and assistance. Some of the ways in which governments influences the banking sector in emerging economies are by setting financial/banking regulations, ownership of banks, through programs of directed lending and investment, through fiscal dominance and by initiating, supervising and sequencing of financial liberalization. The greater role of the government in financial sector development in emerging economies necessitates a strong, stable yet flexible government for long term and banking sector development and growth.

In the case of banking crises, government strength reduces uncertainty as to government capacity towards managing the banking sector. Shimpalee and Breuer (2006) discuss the transmission mechanism between government stability and currency crises, which can be applied to banking crises as well. They argue that "government stability consequently leads to less uncertainty as to what government policy toward businesses (banking and non-banking) will be in the future. With less uncertainty, there is less likely to be a misallocation of resources and associated inefficiencies. Thus, a higher degree of government stability is less likely to lead to capital flight and thus it is less likely currency crises will arise.[119] The authors find a negative and statistically significant correlation between government stability and incidences of banking crises, and also find that government strength is associated with depth of crises.[120] Government stability directly influences policy uncertainty. If there is high policy uncertainty then there will less consumer and investor confidence in whether the government will effectively manage problems in the financial sector. Without confidence in government actions, investors and borrowers will determine their banking sector transactions based on very short-term expectations related to credit, interest rate and exchange rate risks. High policy uncertainty does not allow for long term stable expectations, which are required for long term financial sector stability and pushes banks into short-term and risky transactions.

The hypothesis in this study is that higher levels of government strength decrease the probability of a banking crisis in emerging economies. The study employs logistic regression in a Binary Time-Series Cross-Sectional model to look at the relationship between government strength levels and incidences of banking crisis across thirty-five emerging economies from 1980 through 2009. In addition to testing the direct effects of government strength on incidences of

[119] Shimpalee and Breuer (2006), pp. 128-9.
[120] Shimpalee and Breuer (2006), p.139.

banking crisis, we test for the interactive effects of government strength and domestic credit expansion on banking crises. Domestic credit expansion is a significant indicator for incidences of banking crises (See Chapter 2) and the argument here is that government strength ameliorates the effects of domestic credit expansion on banking sector fragility. The hypothesis is that the effects of annual domestic credit growth on banking sector stability are reduced under stronger governments. The econometric testing indicates that there is indeed a statistically significant correlation between government strength and incidences of banking crises. The results show a negative and statistically significant interactive effect of government strength and domestic credit expansion on incidences of banking crisis, which is in line with the expected relationship and the literature.

My hypothesis on the influence of government strength in precipitating banking crises is driven both by theory and empirical observation. Stronger governments are governments less plagued by issues of political survival, political paralysis and indecisiveness. Under stronger governments, when economic fundamentals are weak and the economy enters the "zone of vulnerability" these governments have a much easier time taking corrective measures. This study was motivated by Chiu and Willet (2009)'s study on the interactive effects of government strength and exchange rate regimes on incidences of currency crises. Similar to Chiu and Willett (2009) this study has implications for rational expectation models of the political economy of macroeconomic policy, such as the Political Business Cycle (PBC).[121] Chiu and Willett (2009) argue that factors such as costs of information, coordination problems, and free riding incentives in disaggregated decision-making processes, and the rationality of being uninformed about many issues can "explain deviations from the predictions of such macro rational expectations models

[121] Chiu and Willett (2009), p.1002.

without needing to invoke irrationality."[122] This study suggests support for including political variables in models of financial crises, in order to capture the political environment when assessing the impact of economic outcomes on the banking/financial sector.

Literature Review and Discussion

The government can shape market expectations through its reputation for policy stability and credibility. Setting expectations can be done by demonstrating the political and institutional capacity, ensuring policy stability and enhancing the credibility of announced programs. Rodrik (1989) argues that in order to address the credibility issue with announced programs, the government must "signal its true type" so that the private sector can have confidence in the announced programs. Factors such as government unity, legislative strength and reputation for credible commitment can provide the signals necessary for consumers and investors to form low-variance expectations on government actions in the face of economic shocks. As Rodrik discusses, lack of credibility can be costly.[123] A lack of credibility and policy uncertainty increases the variance of expectations of the financial/banking sector, which can derail government announced stabilization and reform packages.[124] Rodrik (1991) finds that success of policies may depend in no small part on the psychology of private-sector expectations. A reform can end up being reversed for no other reason than a shared expectation that it will not last. Even if the initial expectation is not based on underlying fundamentals, it can prove self-

[122] Chiu and Willett (2009), p. 1002.

[123] Rodrik (1989), p. 756. "For an important example, consider orthodox policies of disinflation that rely on sharp reductions in monetary growth. Unless the private sector becomes convinced that the monetary contraction will continue, the result may well be wages and prices set at too high a level relative to the future stock of monetary aggregates. The consequent reduction in real liquidity may then exert strong recessionary forces. A conceptually similar outcome obtains in the case of trade-liberalizing reforms lacking credibility. When a future reversal of the liberalization is anticipated, the private sector will tend to over-borrow from abroad, running 'too large' a deficit on the current account."

[124] Rodrik (1991), p. 229: in countries such as Argentina, Brazil, Turkey and Mexico failed stabilization programs were driven by private sector uncertainty about future policies.

fulfilling.[125] As opposed to the political-economy literature on banking crises, the relationship between government strength and currency crises has been examined in various studies, and there is a general consensus that stronger governments, as defined by governments with low policy uncertainty, credibility and legislative majorities (or facing a fragmented opposition) are less vulnerable to currency crises.[126] Willett and Chiu (2009) look at the interactive effects of government strength and exchange rate regimes on incidences of currency crises. They find that weak governments, measured by the ICRG's Government Stability Index, increase the likelihood of currency crises under any type of exchange rate regime. The authors argue that "political and institutional fragility can weaken the government's ability and willingness to adopt and pass needed adjustments, particularly when the economy is in a zone of vulnerability."[127] The authors discuss the dynamics of government strength and discuss the importance of government popularity and unity:

> *One set of influences operates through their effects on the effective time horizon of governments. The less politically secure the government, the less its ability or willingness to undertake acts that are unpopular in the short run, if they will bring substantial long run benefits or avoid high long-run costs. Thus, such governments will have high discount rates. And all but the most popular governments are likely to feel insecure as elections approach.*[128]
>
> *Even if the executive is convinced that the risks of future crises are so high that should be willing to bear the short-run political costs of initiating adjustment policies, the odds of*

[125] Rodrik (1991), p.230. "For policy reform to be successful, entrepreneurs, workers and farmers have to respond to the signals generated by the reform. For example, outward oriented exchange rate and trade policies can serve their purpose only if the desire export response materializes. On the other hand, because physical investment is partly irreversible, rational behavior by the private sector call for withholding investment until much of the residual uncertainty regarding the success of the reform is eliminated. Without investment, reforms are less likely to prove sustainable; but investment will not be forthcoming in the presence of uncertainty as to future policies."

[126] See: Edwards 1996; Bernhard and Leblang 1999; Bussiere and Mulder 2000; Friden, Ghezzi and Stein 2001; Poirson 2001; Block 2002; Meon and Rizzo 2002; Alesina and Wagner 2003; Calvo and Mishkin 2003; and Shimpalee and Breuer 2006.

[127] Willett and Chiu (2009), p. 1005.

[128] Willett and Chiu (2009), p. 1005.

successful adoption of such policies can be substantially reduced when the government is divided or cases a large number of veto players..[129]

Feng (2001) argues that "The government must keep its political capacity consistent with the desired policy, thus maintaining its policy stability.[130] Strong governments can implement bad and good policies more effectively. However, here the focus is on how strong and weak governments set expectations in the financial sector. Financial sector expectations on the direction of policies in the banking/financial market are partly driven by whether there is the perception that the government has the capacity and willingness to enforce adopted policy adjustments. Feng (2001) argues that uncertainty about government effectiveness can be more adverse than the policy itself by deterring investors from committing their assets. Given a bad policy with certainty about its execution, the investor can still find ways to make money and the financial sector can work around it. However, if the government lacks consistency in its policy execution, investors will delay their investment until becomes clear that the government is consistent in executing its policy.[131]

Leblang and Satyanath (2006) look at the relationship between government stability and currency crises and find that divided government and governments with high turnover rates increase the variance of expectations held by speculators thereby increasing the likelihood of currency crises. Their results are in line with Persson, Roland and Tabellini's (1997) findings that the separation of powers between the executive and legislative branches increases the ability of voters to extract information from the government. Consequently, the executive's party

[129] Willett and Chiu (2009), p. 1006.
[130] Feng (2001), p.275.
[131] Feng (2001), p.276.

majority in the legislative is a source of strength for the government, allowing greater power over setting market sector expectations on its future policy paths.[132]

In emerging economies, governments are more likely to be closely involved with the banking sector. This is due to the fact that governments must spearhead privatization and financial liberalization policies. The government is the biggest investor and guarantor and by means of guarantees and regulations lends legitimacy to liberalization and privatization policies. A high degree of involvement in the market by the government exposes the financial sector to political risk factors. In the face of political risk factors investors and speculators may become uncertain about government responses to economic changes. Political uncertainty will have an impact on reasonably cautious investors by dissuading them from engaging in the banking sector. If there is an event that focuses the market on government weaknesses, then the crisis can be rather sudden. The crisis can only end when the uncertainty over economic policy is resolved.[133]

For the most part, lending booms have preceded banking crises. However domestic credit expansions do not always lead to banking crises. This study argues that a determinant of whether domestic credit expansions increase banking sector fragility is governmental strength in managing the financial sector. Governments adopt, set and enforce financial sector regulations. As such, it may be argued that stronger governments have the ability and willingness to ensure substantive enforcement and limit misallocation of credit through effective regulations.[134]

Hypothesis (1): Higher levels of governmental strength lower the probability of a banking crisis in an emerging economy

[132] Authoritarian executive may have complete control over the expectations, however the lack of influence of the legislative creates market uncertainties when it comes to forecasting policy paths and whether the government will implement its announced programs.

[133] Krause (1998)

[134] In this study, I use the ICRG definition of strength, which comes from executive and legislative control and mass popularity. A strong government under this definition is not only capable, but also willing to make the tough decisions. The government is more willing to do what is necessary because political survival is not critically threatened.

Hypothesis (2): The effects of domestic credit expansion on banking sector fragility lessen as government strength increases.

Methodology and Results

This section builds upon the baseline economic model developed in Chapter 2 and used in Chapters 3 and 4. The annualized monthly *Government Stability* indicator from PRS' *International Country Risk Guide (ICRG)* dataset is the main proxy for government strength in the political economy model presented in this section. To reiterate, the study employs logistic regression in a Binary Time-Series Cross-Sectional Model for a sample of thirty-five emerging economies from 1980 through 2009. Each country examined in this index can score anywhere between a 0 and 12 in government stability levels. The indicator is continuously scored within this range. For testing purposes, when appropriate the ICRG Government Stability variable is recoded into a discrete variable ranging from 1 to 12, with 12 being the highest level of stability. The Government Stability index is "an assessment both of the government's ability to carry out its declared program(s) and its ability to stay in office."[135] The three sub-components of the ICRG government strength indicator are: government unity, legislative strength and popular support. The degree of government stability/ strength is measured as the sum of these three subcomponents, each scoring between 0-4 points for a maximum total of 12. A score of 0 points indicates "very high risk" and a score of 4 points to "very low risk."[136] The ICRG's explanation of the Government Strength indicator is as follows:[137]

[Government Strength] is an assessment both of the government's ability to carry out its declared program(s), and its ability to stay in office.

[135] PRS' ICRG Government Stability Index methodology: http://www.prsgroup.com.ccl.idm.oclc.org/ICRG_Methodology.aspx#PolRiskRating
[136] ICRG Methodology: http://www.prsgroup.com.ccl.idm.oclc.org/ICRG_Methodology.aspx
[137] PRS' ICRG Government Stability Index methodology: http://www.prsgroup.com.ccl.idm.oclc.org/ICRG_Methodology.aspx#PolRiskRating

As mentioned in Chapter 3, Political Risk Services' International Country Risk Guide (ICRG) data is one of the prevailing qualitative indexes used by academics for testing qualitative variables such as Rule of Law, Government Stability, Quality of Bureaucracy and Executive Accountability among others. Some studies that have used ICRG's Government Stability Index in their econometric testing include MacIntyre (2001), Heinsz (2000), Borner and Kobler (2002) and Willett and Chiu (2009). What makes this index of particular interest is it's measurement of government strength across regime types. In this study, regime types are not considered across the sample of countries and years. This is mainly because the literature on the relationship between democracies and economic development and growth is inconclusive (i.e. Singapore). MacIntyre (2001), using Tsebelis' (1995) veto player framework, argues that there is a positive relationship between the number of veto players and policy stability, suggesting that there is greater policy stability in democracies.[138] However, more veto players may also create policy rigidity. One of the advantages of authoritarian regimes over democracies is the ability to adopt and implement policies expediently. Greater political flexibility addresses issues such as policy rigidity and paralysis that can come from political gridlock. Haggard (2000) finds that "contrary to defenders of 'Asian values' non-democratic governments had no apparent advantages over democratic ones in adjusting to the crisis, and a number of disadvantages. These included arbitrary actions on the part of chief executives, political instability, and profound uncertainties about the succession process."[139] The focus is on political and institutional indicators that could be found in both democratic and non-democratic countries. In the case of party orientation, even in non-democratic countries the ruling power has a place on the left-right political spectrum. By considering factors such as governance, dominance in the legislature and popular approval, the

[138] More veto players implies a lower probability of reneging on policy announcements.
[139] Haggard (2000), p.2.

ICRG Government Stability index can measure a government's capacity and willingness to adopt and follow through on program announcements, irrespective of the degree of democracy present in the emerging economies.

Sensitivity analysis is conducted to determine the robustness of the regression results of the political economy model. The political economy model is re-run with another proxy for government strength. The ALLHOUSE indicator from the World Bank's *Database of Political Institutions (DPI)*, which is a binary variable that assigns a "1" to a country where the party of the executive has an absolute majority in the legislature, provide us with the measure of government strength. The rationale here is that when one party controls both the executive and legislative branches they have greater capacity to adopt and implement announced programs.

Table 5.1 provides the cross-tabulation of banking crises by recoded ICRG-Government Stability scores. The following frequency table allows us to observe how government strength scores correspond with incidences of banking crisis. Is the frequency of banking crises lower under higher government strength scores? Is there any observable trend?

For each score, its frequency at times of banking crises is divided by its frequency across all years. Next, I divided the recoded government strength index into low (scores 1-4), medium (5-8) and high (9-12) strengths. For low levels of government strength, frequencies for scores 1 through 4 are added up and divided by the total number of frequencies for scores 1 through 4 (8/55=14.5%). We see that low government strength was present at 14.5 percent of incidences of banking crisis, 14 percent of banking crises occurred during medium-strength governments' tenure and seven percent of crisis occurred under high-strength governments. The drop in percentage between low and medium strengths is pretty minor at 0.5 percent, however the drop between the medium and high levels of government strength is pretty significant with a drop of

50 percent in percentage of frequency. Empirically, the observations suggest a negative relationship between government strength and incidences of banking crises and support further econometric testing.

Table 5.1 Banking Crises by Government Strength Scores

Level of Government Strength (ICRG)	Score	Total Frequency of Score	Frequency of Score at Times of Banking Crisis	Percentage of Score at Times of Banking Crisis	Percentage of Banking Crisis by Level of Government Strength
LOW	**1**	5	1	20	14.5
	2	14	3	21.43	
	3	11	0	0	
	4	25	4	16	
MEDIUM	**5**	60	5	8.33	14
	6	110	14	12.73	
	7	134	25	18.66	
	8	153	20	13.07	
HIGH	**9**	114	9	7.89	7
	10	110	7	6.36	
	11	76	4	5.26	
	12	2	1	50	
	Total		93	11.4	

Table 5.2 presents the descriptive statistics and we notice that there is only a minor difference in mean and median scores of Government Stability, with 7.66 and 7.75 respectively. These numbers show that a half of the country observations in this sample had scores of 7.75 or higher indicating a slight bias towards stronger governments. Overall, the distribution of scores is balanced across the countries and years in this study and do not call for econometric scaling.

Table 5.2 Descriptive Statistics

Variable	Mean	Median	Std. Dev.	Min	Max	N	n
Government Strength	7.66	7.75	2.14	0.67	12	815	35

Political economy studies on government strength have not typically lagged the proxies for government strength. In line with the political economy model in Chapter 4, time lags may be significant in examining the relationship between qualitative indicators such as government strength, rule of law, policy uncertainty etc. and banking crises. Intuitively speaking, there must

be a time lag between when the political executive makes its announcements and sets policies and when the economic effects are realized in the financial sector. In this study I only consider up to a two-year lag, testing other lag lengths may be a subject for further research. I chose a two-year lag because I wanted to examine the effects of government strength on banking crises somewhere between the short and long-term.

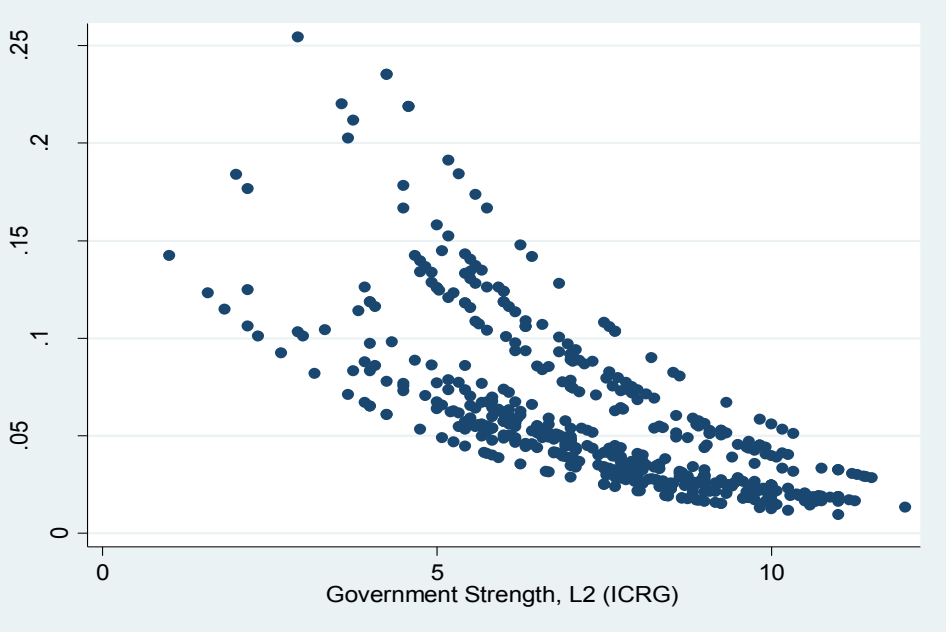
Multicolinearity tests indicate very low colinearity between government strength (-0.0470) and, the dependent variable, incidences of banking crisis. The relationship also exhibits the expected sign. For more information on multicolinearity between the selected independent political and institutional variables, please see Table 5.3 and Graph 5.2 in the Appendix. Table 5.4 presents the regression results and we can see that government strength at a two-year lag has a negative statistically significant effect (10 percent level) on the odds of a banking crisis occurring. Higher government scores at two-year lags may decrease the odds of a banking crisis by approximately 17.6 percent (1-0.824). The results of these initial regressions support the hypothesis that higher levels of government strength may lower the odds of a banking crisis. We can also see that the political economy model with government strength improves upon the Baseline Economic Model (BEM). The political economy model with government strength has a lower AIC levels and a higher pseudo R-squared across times t, t-1 and t-2. The statistically significant political-economy model, reg. (4), has the lowest AIC (166.9) and the highest Pseudo R-sq (0.257) across models presented so far.

Table 5.4 Political Economy Model – Government Strength

Incidence of Banking Crisis (RR 2008) (1980-2009) 35 countries, 49 crisis observations for 29 countries across 30 years	Reg. (1) BEM	Reg. (2) GS	Reg. (3) GS_L1	Reg. (4) GS_L2
Government Strength (gs), 1-12 score		1.18		
		(0.2017)		
Government Strength (gs), One-Year Lag			1.0173	
			(0.125)	
Government Strength (gs), Two-Year Lag				0.824*
				(0.089)
Domestic Credit Growth, two-year lag	1.04***	1.053***	1.059***	1.064***
	(0.169)	(0.0152)	(0.0167)	(0.0159)
Reserve Level (% of GDP)	0.913**	0.887**	0.889**	0.881*
	(0.0442)	(0.0548)	(0.0567)	(0.0653)
Current Account Balance	0.959	0.932**	0.94*	0.952
	(0.0278)	(0.0324)	(0.0358)	(0.0363)
GDP growth rate	0.901	0.875***	0.864**	0.856**
	(0.0691)	(0.05)	(0.0552)	(0.0573)
Real interest rates	1.008	1.003	1.007	1.009
	(0.0138)	(0.0141)	(0.147)	(0.0151)
Inflation rate	0.995	0.994	0.99	0.986
	(0.0154)	(0.0162)	(0.0148)	(0.0153)
Changes in Exchange Rates (%)	1.0137	1.004	1.007	1.009
	(0.0186)	(0.016)	(0.0161)	(0.0157)
Changes in Terms of Trade	0.939***	0.939***	0.94***	0.94***
	(0.0209)	(0.0201)	(0.02)	(0.0186)
Incidences of Currency Crises	1.925	8.398*	6.117	5.781
	(2.5901)	(11.2101)	(8.3479)	(7.3717)
Year	0.919***	0.88***	0.9***	0.925**
	(0.026)	(0.0444)	(0.041)	(0.0361)
Cons_	0.204***	2.1e+109***	1.73e+90***	1.59e+67***
	(0.1209)	(2.1e+111)	(1.55e+92)	(1.23e+69)
AIC	200.17	177.268	171.464	166.885
Wald Chi2	81.14***	105.25***	94.34***	80.89***
Pseudo R-Squared	0.2035	0.24	0.2393	0.257
Linktest _hat	.995**	1.198***	0.978***	0.934**
-hatsq	-.001	0.04	-0.005	-0.014
Observations	639	601	584	565

Graph 5.3 plots the predicted probabilities of a banking crisis by ICRG-GS scores for the 35 countries in sample, across 30 years. We see a steep negative relationship between government strength scores, at a two-year lag, and predicted probabilities of banking crises.

Graph 5.2 Predicted Probability of BC by GS Scores



Sensitivity testing assesses the robustness of the results presented in Table 5.4. In the first test, the ICRG-GC index is recoded into a discrete variable (1 through12) and drop the lower and upper most scores (1and 2, 11 and 12) and re-run the political economy model, this is done to minimize any undue influence by the lower and upper most scores on the model. The second test uses another proxy for government strength, the ALLHOUSE indicator available through the World Bank's Database of Political Institutions (DPI), 1975-2012. The ALLHOUSE variable is a binary variable where a score of 1 indicates that the ruling party in the executive has a majority in the legislature, and 0 if not.[140] Tables 5.5 and 5.6 present the results of the two sensitivity tests, respectively.

Table 5.5 presents the logistic regression results of the political economy model with the highest and lowest ICRG-GS scores (1and 2, 11 and 12) dropped from the sample. Compared to

[140] On a methodological note, there are no econometric issues with regressing two binary variables.

the results in Table 5.4, the statistical significance of GS-L2 goes from the 10 percent level to the one percent level. The effect of the GSL2 coefficient increases from a 17.6 percent to approximately 32 percent (1-0.683) negative odds effects. Dropping the upper and lower most ICRG-GS scores strengthened the robustness of the results in Table 5.4 and supports the hypothesis that higher governmental strength is inversely related to banking crises.

Table 5.5 Political Economy Model (PEM)- Government Strength with Dropped Extremes

Incidence of Banking Crisis (RR 2008) (1980-2009) 35 countries, 49 crisis observations for 29 countries across 30 years	Reg. (1) BEM	Reg. (2)	Reg. (3)	Reg. (4)
Government Strength (gs)		1.159 (.2490)		
Government Strength (gs), L1			.858 (.1446)	
Government Strength (gs), L2				.683*** (.0983)
Domestic Credit Growth, two-year lag	1.04*** (0.169)	1.055*** (.0171)	1.059*** (.0189)	1.071*** (.0199)
Reserve Level (% of GDP)	0.913** (0.0442)	.875 ** (.0597)	.869** (.0657)	.856* (.0855)
Current Account Balance	0.959 (0.0278)	.938 * (.0366)	.949 (.0403)	.961 (.0432)
GDP growth rate	0.901 (0.0691)	.863 *** (.0529)	.848*** (.0552)	.827*** (.0596)
Real interest rates	1.008 (0.0138)	1.003 (.0143)	1.009 (.01550	1.009 (.0157)
Inflation rate	0.995 (0.0154)	.993 (.0171)	.983 (.0162)	.979 (.0160)
Changes in Exchange Rates (%)	1.0137 (0.0186)	1.002 (.0157)	1.008 (.0164)	1.006 (.0149)
Changes in Terms of Trade	0.939*** (0.0209)	.939 *** (.0197)	.940*** (.0192)	.939*** (.0168)
Incidences of Currency Crises	1.925 (2.5901)	9.058 (13.2415)	6.335 (9.9458)	6.621 (9.04803)
Year	0.919*** (0.026)	.878** (.0503)	.913* (.0475)	.925* (.045)
Cons_	0.204*** (0.1209)	1.9e+111** (2.1e+113)	1.10e+78* (1.13e+80)	2.50e+67* (2.42e+69)
AIC	200.17	156.749	148.69	134.73
Wald Chi2	81.14***	103.19***	110.04***	88.49***
Pseudo R-Squared	0.2035	0.2610	0.2653	0.3116
Linktest _hat	.995**	1.078***	0.703**	0.608*
-hatsq	-.001	0.0167	-0.071	-0.1
Observations	639	491	450	415

Table 5.6 presents the logistic regression results the political economy model including the DPI's ALLHOUSE proxy indicator of government strength. This variable is binary, with a

score 1 if the party in the executive also controls the legislative branch, 0 if not. The logic here is that if the government has control of both branches then it has the capacity to adopt revisions efficiently and expediently

The results show that the ALLHOUSE variable does not have a statistically significant effect on the odds of a banking crisis and exhibits the wrong sign. Intuition and the literature on government strength do not support a positive relationship between government strength and financial crises. Therefore, one reason for the difference between the present and previous model may lie behind the methodological considerations behind each index, PRS -ICRG and WB - DPI. The government Strength indicator of the ICRG includes considerations for popular support and government unity, which the DPI's ALLHOUSE variable does not. The results in Table 5.6 do not support the hypothesis in this section and call for further research and testing of indices that measure government strength.

Table 5.6 Political Economy Model (PEM)—Government Strength: Sensitivity Analysis

Incidence of Banking Crisis (RR 2008) (1980-2009) 35 countries, 49 crisis observations for 29 countries across 30 years	**Reg. (1) BEM**	**Reg. (2)**	**Reg. (3)**	**Reg. (4)**
ALLHOUSE		1.487 (.7627)		
ALLHOUSE, L1			1.309 (.6941)	
ALLHOUSE, L2				1.849 (1.0021)
Domestic Credit Growth, two-year lag	1.04*** (.169)	1.05*** (.0152)	1.051*** (.0147)	1.052*** (.0173)
Reserve Level (% of GDP)	.913** (.0442)	.915* (.0533)	.913* (.0541)	.919* (.0551)
Current Account Balance	.959 (.0278)	.961 (.0284)	.962 (.029)	.957 (.0287)
GDP growth rate	.901 (.0691)	.891* (.0661)	.893* (.0661)	.881** (.0592)
Real interest rates	1.008 (.0138)	1.02 (.0182)	1.019 (.0184)	1.02 (.0179)
Inflation rate	.995 (.0154)	.983 (.0203)	.982 (.0208)	.988 (.0187)
Changes in Exchange Rates (%)	1.0137 (.0186)	1.02 (.0196)	1.02 (.0198)	1.02 (.0181)

Changes in Terms of Trade	.939*** (.0209)	.927*** (.0184)	.927*** (.0186)	.926*** (.0197)
Incidences of Currency Crises	1.925 (2.5901)	.427 (.5445)	.439 (.5600)	.455 (.5732)
Year	.919*** (.026)	.933** (.0279)	.927*** (.0275)	.946** (.0265)
Cons_	.204*** (.1209)	4.85e+58** (2.91 e+60)	8.34e+63*** (4.95e+65)	2.50e+46** (1.4e+48)
AIC	200.17	189.47	189.89	183.53
Wald Chi2	81.14***	85.07***	87.69***	86.96***
Pseudo R-Squared	0.2035	0.2234	0.2217	0.2334
Linktest _hat	.995**	1.0006**	.969**	1.053**
-hatsq	-.001	.0001	-.007	.011
Observations	639	606	608	607

The analysis of the direct effects of government strength on banking crises shows the main proxy, GS-ICRG, to have a negative and statistically significant correlation with incidences of banking crises. The DPI's ALLHOUSE variable, which has been used as a proxy for government strength in other studies (see Willett and Chiu 2009), does not have a statistically significant correlation with incidences of banking crises and exhibits the wrong sign.

Marginal Analysis

Marginal analysis provides the magnitude of effects of government strength levels on incidences of banking crisis. Table 5.7 presents the Marginal Effect at Means (MEM) results for government strength (continuous variable). MEMs for continuous variables measure the *instantaneous rate of change,* which may or may not be close the effect on P(Y=1) of a one unit increase in X_1. What the MEM more or less tells you is that, if, say, X_1 increased by some very small amount (e.g. .001), then P(Y=1) would increase by about .001*.534 = .000534, e.g. According to the results below, gains in government strength exhibit weak effects on incidences of banking crisis. Increases in government strength levels are multiplied by -0.0112, which means that for a one score increase in the ICRG Government Strength index, the marginal probability of a banking crisis drops by just 1.12 percent. A 2 point increase means just a 2.24 percent drop in the probability of a banking crisis. The average government strength score for

the sample of countries in this study is 7.66 out of 12, which means average of 8.58 percent reduction in the probability of a banking crisis. Movement from the average government strength level to its maximum score of 12 means a maximum further reduction of 4.86 percent in odds of a banking crisis occurring.

Table 5.7 Margins at Means *(Stata Output)*

```
Adjusted predictions                            Number of obs   =  558
Model VCE    : Robust

Expression   : Pr(bcrr), predict()

1._at        : gsl2             =           1
               dc1gr2L2         =   -.0864885 (mean)
               ch_tot           =    4.527849 (mean)
               ca               =    -.509319 (mean)
               dr1              =    .5515591 (mean)
               gdpgr            =    4.837975 (mean)
               rir              =    7.975986 (mean)
               cc               =    .0268817 (mean)
               infr             =    12.57711 (mean)
               exgr             =   -.5643728 (mean)
               year             =    1998.844 (mean)

2._at        : gsl2             =           2
               dc1gr2L2         =   -.0864885 (mean)
               ch_tot           =    4.527849 (mean)
               ca               =    -.509319 (mean)
               dr1              =    .5515591 (mean)
               gdpgr            =    4.837975 (mean)
               rir              =    7.975986 (mean)
               cc               =    .0268817 (mean)
               infr             =    12.57711 (mean)
               exgr             =   -.5643728 (mean)
               year             =    1998.844 (mean)

------------------------------------------------------------------------------
-
             |            Delta-method
             |     Margin   Std. Err.      z    P>|z|     [95% Conf.
Interval]
-------------+----------------------------------------------------------------
-
         _at |
          1  |    .053711   .0358449     1.50   0.134    -.0165438
.1239658
          2  |   .0424769   .0251207     1.69   0.091    -.0067587
.0917124
------------------------------------------------------------------------------
-
display .0424769-.053711 = -0.01123

Marginal Effect at Means = -1.12%
```

Direct effects analysis of the political economy model in this Chapter, thus far suggests that including the political/qualitative variable, ICRG-Government Stability, improves upon the baseline economic model, which only considers economic and financial indicators. The main proxy for government strength proves to have a negative statistically significant correlation with banking crisis as forecasted by the hypothesis. However, the ICRG-GS has a weak magnitude of effect on whether a crisis will occur. The robustness of the results is supported when the highest and lowest ICRG-GS scores are dropped from the sample. However when another proxy for government strength is tested, we do not statistically significant relationship between the political variable and incidences of banking crisis. Additionally, the proxy exhibits the wrong sign, pointing to a positive relationship between government strength and banking crisis. This result is not supported by the literature and differences in results may come from differences in measurements of the ICRG and DPI indices. Finally, the results in this section suggest further research on developing a composite indicator of government strength to be used in political economy models of banking crises. Variables such as the DPI's ALLHOUSE may capture an aspect of government strength, whereas a composite indicator may be able to capture the dynamics of government strength to a greater extent.

Interactive Effects of Government Strength and Domestic Credit on Banking Crises

The literature on banking crises points to domestic credit booms as being a precipitating factor for financial crises, which is a part of why financial liberalization is studied in the context of banking crisis. Domestic credit expansion is a natural product of implemented financial liberalization packages, and the capacity of the banking sector to absorb this expansion depends not only on sound economic fundamentals but on factors such as government strength. If expectations of government capacity and willingness to step in when necessary are kept

consistent and steady, I hypothesize that banking sector will be able to handle greater levels of domestic credit expansion. In other words, government strength determines the threshold for when domestic credit expansion begins to tip the banking sector into a crisis. Looked at it this way, we can see how the degree of government strength may be crucial for a financial sector in the "zone of vulnerability." Empirically as well, the regression results in the previous section support interacting government strength and domestic credit expansion in the context of banking crises.

Comparing the political economy model with interactive effects with the BEM, we see that the domestic credit growth variable remains statistically significant at the one percent level. We can also note that the odds percentage of domestic credit growth's effects on banking crises increases with the inclusion of both proxies for government strength. We can see that under the BEM Domestic Credit growth at time t-2 increases the odds of a crisis occurring by 4 percent. This percentage increases to 6.4 percent with the inclusion of GS at time t-2. Similarly, the inclusion of the ALLHOUSE variable increases the percentage level impact of domestic credit growth to 5.2 percent at time t-2. Therefore, we see that the inclusion of proxies for government strength increases the magnitude of effects of domestic credit growth indicating an underlying correlation between the two variables.

The Wald test for the interaction term, domestic credit expansion and government strength at two-year lags, indicates significance at the 10 percent level. This means that the impact of domestic credit expansion on incidences of banking crises significantly differs across different levels of government strength.

The regression analyses in this section focus on the relationship between domestic credit growth and incidences of banking crises given different levels of government strength, both variables set at two-year lags.

Table 5.8 presents the coefficient results for the interaction term with domestic credit growth rates and ICRG-GS scores. Compared to domestic credit growth during times of low government strength, domestic credit growth at times of medium-strength decreases the odds of a banking crisis by 3.4 percent (1-0.956) and by 2.6 percent during times of high government strength. Consequently, we see that at times of higher government strength, domestic credit rates have a weaker impact on incidences of banking crises.

Table 5.8 Political Economy Model (PEM) – Interaction Effects: Domestic Credit Growth & Government Strength

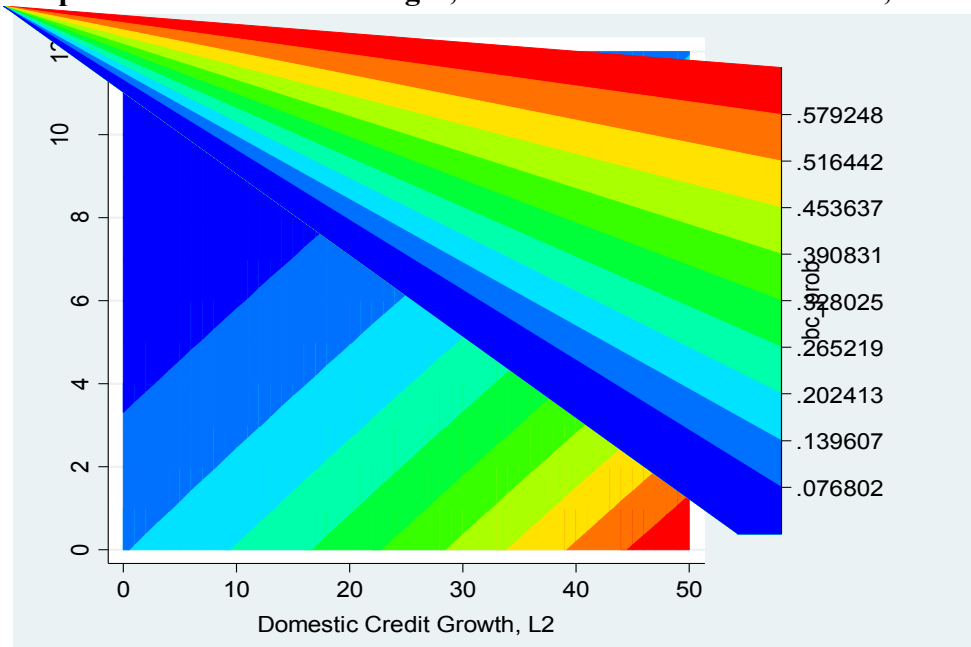
Incidence of Banking Crisis (RR 2008) (1980-2009) 35 countries, 49 crisis observations for 29 countries across 30 years	Reg. (1) BEM	Reg. (2) GS	Reg. (3) GS, L1	Reg. (4) GS, L2
Government Strength (L2)				
Medium		1.482 (1.700)	1.309 (1.4359)	0.656 (0.534)
High		2.037 (2.7048)	0.906 (1.0587)	0.291 (.2800)
Domestic Credit Growth, two-year lag	1.04*** (0.169)	.997 (.0442)	1.047* (.2963)	1.047** (0.0235)
Domestic Credit Growth # Government Strength-Medium		1.059 (.0433)	0.749* (.1491)	**0.956 ** (0.0226))**
Domestic Credit Growth # Government Strength-High		1.053 (.0560)	0.754* (.1537)	**0.974 (0.0247)**
Reserve Level (% of GDP)	0.913** (0.0442)	0.937** (.0205)	0.900* (.0595)	0.885* (0.0603)
Current Account Balance	0.959 (0.0278)	0.943* (.0323)	0.946* (.0351)	0.950 (.0359)
GDP growth rate	0.901 (0.0691)	0.879** (.0537)	.865** (.0564)	0.860** (.0556)

Real interest rates	1.008 (0.0138)	1.005 (.0144)	1.009 (.0141)	1.007 (.0144)
Inflation rate	0.995 (0.0154)	0.989 (.0163)	0.986 (.0164)	0.984 (.0167)
Changes in Exchange Rates (%)	1.0137 (0.0186)	1.006 (.0160)	1.009 (.0168)	1.010 (.0170)
Changes in Terms of Trade	0.939*** (0.0209)	0.943*** (.0323)	.939*** (.0203)	0.940*** (.0196)
Incidences of Currency Crises	1.925 (2.5901)	7.628 (10.1163)	5.644 (7.8320)	5.0772 (6.7276)
Year	0.919*** (0.026)	0.894*** (.0334)	0.908*** (.0335)	0.908*** (.0368)
Cons_	0.204*** (0.1209)	2.34e+95*** (1.73e+97)	2.47e+82*** (1.83e+84)	4.52e+82*** (3.65e+84)
AIC	200.17	182.69	175.41	172.00
	81.14***	105.43***	146.29***	95.38***
Wald Chi2	0.2035	0.2405	0.2477	0.2593
Pseudo R-Squared	.995**	1.065***	.966**	.937**
Linktest _hat	-.001	.014	-.007	-.014
-hatsq	639	594	577	558
Observations				

In order to determine the magnitude of the interactive effects of the continuous variables, government strength and rates of domestic expansion, on incidences of banking crisis, we looked at the marginal effects by creating interaction plots using STATA statistical software. Graph 5.3 shows the results. The y-axis plots ICRG-GS scores and the x-axis plots annual domestic credit growth rates. On the right hand side of the graph we see bc_prob, which lists the predicted probability of a banking crisis by government strength scores and domestic credit growth rates. Graph 5.3 shows that at any domestic credit growth rate, nations scoring higher on government stability face lower predicted probabilities of a banking crisis. For example, at a 30 percent annual domestic credit growth rate, a nation scoring 8 on government stability faces a 13 percent probability of experiencing a banking crisis, however if that same government is weakened and slips to a score of 4, the predicted probability of having a banking crisis increase to approximately 33 percent. A 4 point drop means an increase of 20 percent in the odds of having a banking crisis. We also see that higher domestic credit growth rates the higher government

strength must be to keep low the predicted probability of a banking crisis. For example, for a country with a10 percent domestic credit growth rate the government strength score should be a 1 to 3 for a 14 percent predicted probability of a banking crisis. However, if the domestic credit growth rate increases to say 25 percent the government strength score should be between 6 and 9 to keep the probability of a banking crisis at 14 percent. Now, say that the domestic credit growth rates increases from 10 percent to 25 percent under a weaker government with a score of 4, the predicted probability of a banking crisis increases from 14 percent to 26.5 percent.[141] The marginal analysis of the interactive effects of government strength and domestic credit growth on incidences of banking crises follows the direction of the existing studies, which suggest that government strength is an important qualitative indicator in precipitating financial crises. In this case, government strength levels may determine capacity to absorb domestic credit expansion without tipping the financial sector into a crisis.

Graph 5.3 Government Strength, L2 & Domestic Credit Growth, L2



[141] All testing and analyses assume holding all other variables at their means.

Conclusions, Policy Implications and Further Research

The policy implication of the findings is that banking sector stability is not influenced solely by economic factors and political and institutional frameworks have an impact on banking sector fragility. In this case of government strength, we see weak substantive direct effects of government strength levels of banking sector fragility. Marginal analysis shows that a one score increase in the ICRG Government Strength index, the marginal probability of a banking crisis drops by just 1.12 percent. A 2 point increase means just a 2.24 percent drop in the probability of a banking crisis.

The interactive effects of government strength and domestic credit growth rates show more significant effects on the occurrence of banking crises. Graph 5.3 presents the marginal effects and we can see that higher levels government strength is necessary at higher rates of domestic credit expansion. The implication is that expectations of government actions are formed through the lens of particular policy trajectories. The results suggest that the importance of government strength in economic outcomes depends on the policies considered.

Directions for future research are both qualitative and quantitative. Since the inclusion of political indicators such as government strength in economic models is in its infancy, the literature would benefit from a rich case study. One such case study can provide comprehensive examination of the available proxies for government strength. Studies on government strength can benefit from knowing the strengths, weaknesses, foci and theoretical background of the available indices. On the quantitative path, recommendations for further research include using other indicators of government strength to test the robustness of the results in this study. One such indicator is the Relative Political Capacity indicator developed by Arbetman, Kugler and Organski (1997). Using a composite indicator may capture more aspects of government strength and provide for a more informative proxy in economic models. Finally, the significance of time

lags as seen in this study suggests examining greater time lags. The development a theoretical bases for different time lags could inform further threshold analysis on the effects of government strength on economic outcomes. Finally, this study suggests examining the effects of political indicators such as government strength on financial crises through interactive effects.

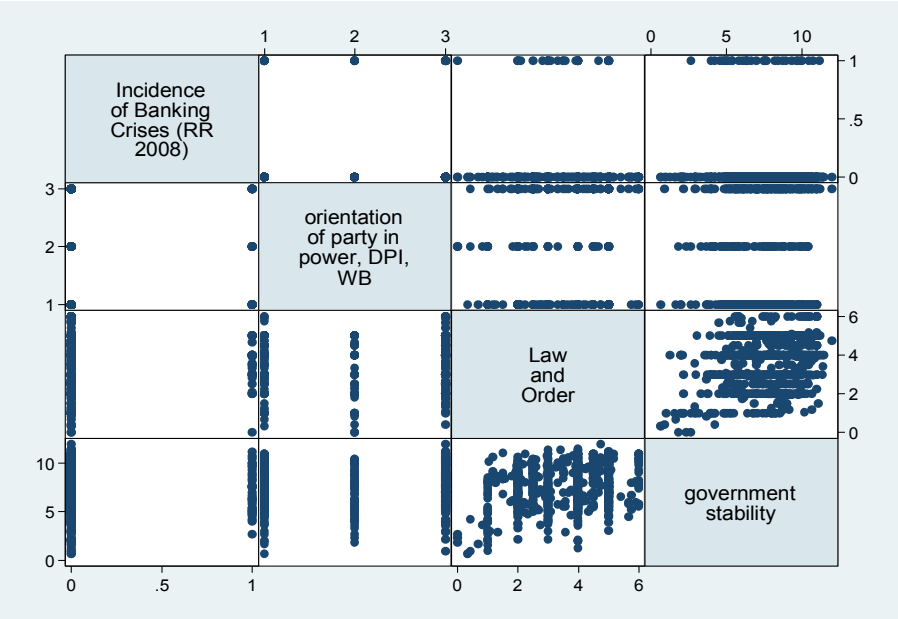
Appendix

*No serious issues of colinearity are present.

Table 5.3 Multicolinearity

	Banking Crisis	PO- Left	PO-Center	PO-Right	Rule of Law	Gov't Strength
Banking Crisis	1.0000					
PO- Left	0.0404	1.0000				
PO-Center	0.0869	-0.1687	1.0000			
PO-Right	-0.0422	-0.3359	-0.1755	1.0000		
Rule of Law	-0.0046	0.0720	-0.1473	0.0116	1.0000	
Gov't Strength	-0.0470	-0.0908	-0.1206	0.0183	0.3044	1.0000

Graph 5.2 Multicolinearity- Political and Institutional Variables



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