

The Political Economy of Banking Crises in Emerging Economies: The Veto Player Framework

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Abstract

The recent research on the consequences of financial crises has attempted to determine which crisis-management policies and which economic policies were responsible for the severe costs of these crises. Less attention has been paid to the role of domestic political institutions that directly influence a government's ability to implement these policies. This paper investigates the impact of domestic institutions, characterized by the veto player framework, on the severity of banking crises measured in terms of the magnitude of output losses. The analysis extends MacIntyre's (2001) study of the relationship between veto players and policy risks in the Asian financial crises. From the sample of emerging market economies, the empirical findings show that countries with an absence of veto powers in their political system or with excessive veto players would suffer from substantially larger output losses once banking crises occur because of their lack of credibility or the inflexibility of policy responses.

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1 Introduction

Recent financial crises of the late 1990's evoked arguments and discussions concerning the consequences of crisis-mismanagement policies. Policies implemented by the government such as the provision of unlimited liquidity support and a blanket deposit guarantee to ailing financial institutions (Bordo et al, 2001 and Honohan and Klingebiel, 2003), or even pre-crisis economic conditions such as private capital inflows (Gupta et al, 2003) or corporate leverage level (Stone, 2000), have been empirically demonstrated to be associated with the increased costs of banking crises as measured in terms of the magnitude of output losses. However, far less attention has been given to the roles of domestic political institutions which directly influence a government's ability to implement these policy responses. Theoretically, the cross-national differentiation in political structures, particularly the political decision making processes and the number of political decision makers who control policy outcomes, should be expected to influence the severity of crises, and this relationship needs to be further studied.

The possible impact of different characteristics of the political structure on the extent of severity of financial crises can be analyzed using MacIntyre's (2001) applied veto player framework. In times of financial crises, the political institutions characterized by the number of veto players, i.e. policy decision makers who must agree to make a change, can determine policy credibility and policy flexibility, which significantly determine investors' confidence and economic reform in the aftermath of crises. If the commitment of the government to its policy is credible, it should stop the spread of financial panic and reduce uncertainty about the future investment environment¹. However, the benefits from increasing the extent of credibility are traded off against the losses of policy flexibility in responding promptly to exogenous shocks and

¹ During the Asian financial crises, the unlimited liquidity support and deposit guarantee policies cannot stop bank runs in most Asian crisis-hit countries due to incredibility of government in following financial reform plans that had publicly announced (see Lindgren et al 1999, pp. 18-21).

allowing for the adjustment if any policy mistakes occur. In the political literature, the credibility and stability of a government's policy are underpinned by checks and balances or multiple veto players, since for political structure with many veto powers it may be difficult in reaching a collective decision to implement or change policies due to the disagreement among these veto authorities (North and Weingast 1989; Tsebelis 2002).

MacIntyre (2001) proposes that during financial crises, countries with an intermediate level of concentration of veto authorities are more likely to be associated with a satisfactory investment environment according to benefits from both policy stability and policy flexibility². For countries with a wide dispersal of veto authorities, the increasing extent of stability of implemented policies can also lead to the vulnerability of policy rigidity. On the other hand, the absence of veto players that create policy flexibility can also lead to the risk of policy volatility. Policy rigidity and policy volatility are two policies which cause investors to panic and hinder productive economic decisions. From this analysis, the degree of centralization of veto authority should have a U-shaped relationship with policy risks that affect investors' confidence.

MacIntyre applies his theory to qualitative case studies of several of the Asian crisis countries, and found it consistent with the behaviors of the governments in those countries. This study makes use of the recent development of quantitative proxies for the number of veto players, and uses MacIntyre's applied veto player framework to investigate the relationship between the number of veto players and the magnitude of output losses associated with banking crises.

² MacIntyre (2001) applies Tsebelis (2002)'s veto player theory. In Tsebelis's model, the dependent variable of policy stability has linearly positive relationship with the number of veto players and their ideology distances. In MacIntyre's applied model, which focuses on policy risk as dependent variables, the relationship is examined to be U-shaped. Later in this paper, the phrase of "the number of veto players and their ideology distances" sometimes is shortened to "the number of veto players".

The evidence presented in this study covers 45 banking crisis episodes in 27 emerging market economies over the period of 1980 to 1999. It provides support for the U-shaped connection between the number of policy decision makers and the extent of the severity of crises. On average, a country with a relatively large numbers of veto players suffers from large output losses associated with a banking crisis due to delays in a government's response to financial sector problems. The difficulty in reaching a consensus to implement or change policies, such as which financial institutions need to be restructured and which institutions need to be closed due to insolvency, will prolong unresolved financial problems and intensify financial panic. Consequently, the real economy will be affected by output losses, which occur through the disruption in the payment systems or credit constraints on the private sector. The size of output losses can be magnified by the credit chain where the cutback of bank credit supply deteriorates non-bank firms' financial positions, and consequently firms' inability to repay debts exacerbates banks' illiquidity problem³. For a country with relatively few veto players, the policy responses are vulnerable to volatility since any policy reversal cannot be vetoed by other parties and according to Keefer (2001), the likelihood of policy reversal occurs during financial crises due to the influence of special interests on policy decision-makers. This volatility of policy responses can destroy public confidence in the times of crises and subsequently can increase the magnitude of output losses.

In addition, the test of a linear relationship between the veto players and the magnitude of output losses associated with crises is also performed in this study. Recent studies on the relationship between the veto players and long-run economic performances find that the higher the number of veto players, the higher the level of private investment (Stasavage, 2002) and long-run economic growth (Henisz, 2000). This is because the government with checks and

³ For the studies of credit cycles, see Kiyotaki and Moore (1997).

balances will produce credible policies, which subsequently attract capital investment and economic growth. The linear relationship between the veto players and long-run economic performance can be established with the plausible assumption that in the long-run the benefits from policy credibility outweigh those of policy flexibility. However, for the magnitude of output costs of financial crises, which reflects the short-run adjustment of output, the empirical results in this paper do not find evidence of a linear relationship with the number of veto players. In times of financial crises, a government with high levels of checks and balances may face the difficulty to reach an agreement in implementing or changing policy responses. The increasing costs of delay will magnify the severity of crises. This tradeoff between the ability of political actors to implement policy change (policy decisiveness) and to commit on a given policy (policy resoluteness) needs be considered for the choice of institutional arrangements (Cox and McCubbins, 2001), particularly during the vulnerable periods of domestic and international financial system.

The organization of this paper is as follows: the next section discusses the theory of veto players and its linkage with the magnitude of output losses associated with banking crises. Section 3 identifies model specification, the methodologies to measure the magnitude of output losses, and the data sources. The empirical results and sensitivity analysis are reported in section 4 and the conclusion is in the last section.

2 Political Institutions of Veto Players and the Real Economy

George Tsebelis (2002) defines a veto player as an individual or collective actor whose agreement is required for a change of status quo policy. In the theoretical analysis of the connections between veto players and policy stability, he illustrates that policy stability, i.e. the absence of significant changes of policy outcomes from the status quo, can be expected in a

political system with multiple veto players and big ideological distances among them. The addition of a new veto player will increase the extent of policy stability by increasing the difficulty of an agreement among a certain number of policy decision-makers who have the power to veto a proposed change in policy. However, an additional veto player may not affect policy stability if the ideological and policy preferences of a new veto player are similar to the preferences of other existing veto players.

The theory of veto players is useful in analyzing the impact of different political structures on the stability of government policies since it analyzes different political characteristics of regime type, legislatures and/or party system through the identification of one variable, i.e. the political actor or veto player. For instance, the executive and chambers of a legislature in a presidential system or members of the coalition in parliamentary system are counted as veto players who need to agree for any policy changes after taking into account the ideology of policy preferences among these players.

In recent literature, political institutions with checks and balances have been emphasized as playing necessary roles in improving economic performance. North and Weingast (1989) illustrate this connection from the evolution of checks and balances according to the constitutional arrangements of England in the 17th century. During that period, the creation of veto players was designed to exert control over the Crown's power to expropriate the property rights of private parties. By allowing the wealth holders' representatives in parliament with the rights to veto a major change in policies if there was a conflict of interests, the security of their property rights was then established. A politically independent judiciary together played a central role in assuring that governments commit to their agreements and thereby constrained their misuse of political power. These roles of veto players increased the credibility of government's

commitment, which provided an incentive for long term capital investments, productive activity, and long-run economic growth.

Henisz (2000), Stasavage (2002) and Gariva et al (2000) provide empirical support for a positive relationship between the number of veto players and the level of real economic activities. Henisz (2000) studies the determinants of long-run economic growth by focusing on the role of political institutions that provide credibility commitment and the protection of private property rights. He constructs the index of political constraints to proxy for the extent of government's credible commitment⁴. These political constraint indices are closely related to the veto players concept since they take into account the number of independent veto points over policy outcomes and the distribution of these actors' policy preferences. By including the political constraint index in Barro's (1996) cross-sectional regression of long-run economic growth, Henisz finds that higher political constraints are significantly associated with higher long-run economic growth.

Stasavage (2002) and Gariva et al (2000) employ Henisz's political constraint index to proxy for checks and balances. By focusing on private investment, Stasavage (2002) finds that checks and balances, which establish the credibility of government's commitment, has a positively linear relationship with the level of private investment but has a negative linear relationship with the conditional variance of private investment⁵. These results indicate that on average a country with higher checks and balances will have a higher level of private investment, but it is not a necessary condition. In a country with the absence of checks and balances, the

⁴ Henisz notes that the political constraint index should overcome the limitations of the variables of Law and Order, Corruption, and Bureaucracy compiled by International Country Risk Guide (ICRG), which are widely used in recent empirical research to proxy for institutional quality. ICRG's institutional variables may be subjected to endogeneity problem in regression analysis since these variables are subjectively measured and rated on the basis of private investment's decisions (see Henisz, 2000, pp. 2-5).

⁵ Stasavage (2002) also tests non-linear impact of checks and balances by entering $\log(\text{checks})$, which checks is the variable from the Database of Political Institution (DPI), into private investment regression. The positive significance of $\log(\text{checks})$ indicates that higher checks lead to higher private investment but at the diminishing rate.

large conditional variance of private investment suggests the possibility of high levels of private investment since policy credibility may be established through other mechanisms. Gariva et al (2000) employ Henisz's political constraint index to test Rodrik's (1999) model, which studies the effect of political institutions and conflict management, mainly proxied by ICRG's variables, on the collapse of economic growth after the economic shocks of the mid-1970s. Their results show that the averaged political constraint index in 1970-75 has a significant positive impact on the changes in growth rate, i.e. a country with higher political constraints will experience higher averaged growth rate in 1975-89 compared to the growth rate in 1960-75.

These findings of a positive linear relationship between political constraints and economic performances are established based on two assumptions. First, policy stability and credible commitment create certainty and the security of private property rights in investment environments, which attract higher capital investment and lead to long-run economic growth. Second, the gains from policy credibility outweigh the losses of policy flexibility. These two assumptions presume that the status quo policy is optimal so that policy change is not preferable. However, as mentioned in Henisz (2000), if policy stability locks-in a bad status quo policy, the increase in political constraint might not provide net gains to a country's economy and policy flexibility will become more desirable. Falaschetti (2003) shows that, if these assumptions are relaxed, a higher level of political constraints will not necessarily lead to higher levels of investment. In his study of 56 countries during the period of 1976-to-92, the estimates of a veto player variable, in the cubic functional form of total investment regression, are statistically significant, indicating that political constraints have a nonmonotonic relationship with investment. This result is robust regardless of whether a veto player variable is proxied by the political constraint index or checks variable from the database of political institutions (DPI). That

is, in marginal terms, additional veto points will have a positive marginal effect on investment only in a country with an intermediate level of veto powers. This relationship becomes negative at the high and low level of political constraints since a government's policy-making process can be disrupted by a marginal loss of responsiveness and a marginal loss of credibility, respectively⁶.

A Veto Player Framework of Banking Crises

In the study of the determinants of long-run economic activity, policy stability (presumably that the status quo policy is optimal) is widely recognized as an important requirement for capital investment environment and long-run economic growth, and the gains from policy flexibility may be negligible. Unlike the study of long-run economy, in the study of policy response to financial crises, policy adaptability may be as important as policy stability, given that the duration of crises in emerging economies is on average around two or three years (see IMF 1998, Bordo et al 2001, and Mulder and Rocha 2001). As MacIntyre (2001) argues, "if the policy status quo were perfectly optimal, rigidity would be desirable—but almost by definition this is not the case when crisis strikes" (p. 84). According to MacIntyre (2001), the lack of policy credibility, or policy volatility, will destroy investors' confidence while the lack of policy flexibility, or policy rigidity, can delay policy adjustments for economic reform or if any policy mistakes occur. Policy volatility and policy rigidity are two policy syndromes that are determined by political structures that have too much centralization or too much dispersal of veto authority⁷. The relationship between the extent of concentration of veto authority and policy risks

⁶ According to Falaschetti's results, intermediate values of veto players when proxied by a political constraint index is between 0.2 and 0.6 (out of a 0-0.8 scale), and those when proxied by checks variable from DPI is between 4 and 12 (out of a 1-14 scale). The undesirably high and low level of veto powers are values outside these ranges.

⁷ The motive of government's delayed or oscillated policy response is plausibly influenced by special interests as examined by Keefer (2001). During financial sector weaknesses, the regulatory failures and financial authorities'

for investors, therefore, is suggested to be U-shaped rather than linear. This reflects that while adding one more veto player can reduce the risk of policy volatility, there is an inflexion point (minimum point of U-shaped curve) that an additional veto player becomes undesirable by only increasing the likelihood of policy rigidity.

Thailand and Indonesia are MacIntyre's polar cases when considering the policy responses—policy rigidity and policy volatility—of four Southeast Asian crisis-hit countries (Indonesia, Malaysia, the Philippines, and Thailand) in 1997. Thailand had a parliamentary system with the coalition government that is formed by factionalized parties (Hicken, 2004). Since each party is typically involved in the legislative process; therefore, all parties in the coalition government are effective veto players, which their votes are needed to sustain a majority. In 1997, the Thai government had six coalition parties. The possibility that any factions of each party could vote against government's proposed proposal led to policy rigidity according to the lack of government's ability brings about timely policy adjustment. This was likely to occur during economic and financial distress due to rent-seeking or pork-barrel opportunities⁸. While the severity of financial crises in Thailand was due to the delay of policy responses, the Indonesian financial crisis was exacerbated by the lack of credibility in the government's commitment to implemented policies. The dictatorship of Indonesia indicated one veto authority

imperfect information in distinguishing between illiquid but solvent and insolvent financial institutions could raise special interests' benefits from large fiscal transfers and banks' bailouts. Keefer performs empirical test by using 40 banking crises from 35 countries and finds that additional veto players can reduce the magnitude of fiscal transfers since the influence of special interests can be reduced due to the difficulty for multiple veto players with divergent preferences to agree on policy change for special interests to receive benefits. However, this effect is conditioned on special interests' costs from failures in financial institutions (measured from M2/GDP). If these costs are high, an increase in checks and balance can instead increase fiscal transfers.

⁸ For instance, the rehabilitation criteria (by raising the capital) to resolve financial problem in ten of weakest financial companies at the beginning of 1997 was relaxed since "several senior members of government had interests in some of the 10 targeted institutions and used their leverage within the coalition to veto the actual implementation of the tough measures" (MacIntyre 2001, p. 98).

who had control over the policy process and any change in policy could not be vetoed⁹. While MacIntyre applies his theory only to case studies of a few Asian countries we can use the recently developed quantitative measures of veto players to test the theory on a much large sample.

3 Model Specification and Data

The Tobit estimation using maximum likelihood methodology is employed to test the hypothesis that the impact of the numbers of veto players on the magnitude of output losses associated with banking crises is U-shaped. Since the dependent variable, the magnitude of output losses, is assigned a value of zero for those countries that the occurrence of banking crises is not accompanied by output contraction, Tobit regression is an appropriate estimation technique for these censored samples.

The model can be defined as

$$\begin{aligned}
 y_{i,t}^* &= \mathbf{a} + \mathbf{b}_k x_{i,t-1} + \mathbf{s}_1 Checks_{i,t} + \mathbf{s}_2 (Checks_{i,t})^2 + \mathbf{e}_{i,t} \\
 y_{i,t} &= y_{i,t}^* & \text{if } y_{i,t}^* > 0 \\
 y_{i,t} &= 0 & \text{if } y_{i,t}^* \leq 0
 \end{aligned} \tag{1}$$

The dependent variable $y_{i,t}$ is the total observed magnitude of output losses associated with a crisis i in year t and $y_{i,t}^*$ is the latent dependent variable. The magnitude of output losses is calculated from both real GDP level (LEVELLOSS) and real GDP growth rate (GROWTHLOSS).

⁹ The prompt decisiveness of closing 16 banks and other Suharto's related-businesses in Indonesia once financial sector problems appeared demonstrated the capability of centralization of government in implementing flexible policy response in the early stage of crises. However, within a short period after these closures, the news and rumors of the revisions of government decisions to bail out some corporate and banks, which later appeared to be well-connected to Suharto's relatives started to destroy public confidence.

For each observation, $y_{i,t}$ takes a specific magnitude or a value of zero, where zero corresponds to no economic contraction associated with the occurrence of banking crises¹⁰.

To test for the U-shaped relationship hypothesis, the proxies for the number of veto players, or checks and balances in the crisis year (at period t), are entered output losses regressions in quadratic functional form. If there is evidence supporting the hypothesis of the U-shaped relationship, then the estimated coefficient of squared term (σ_2) should be positive and significant while the estimated coefficient of linear term (σ_1) should be negative and significant. According to the Tobit estimation, σ_1 and σ_2 are consistent and efficient estimates of the effects of checks on the latent dependent variable $y_{i,t}^*$.

For control variables, X is a k -element vector of economic and financial variables that have been frequently used in the literature, which includes real GDP per capita, real GDP growth rate, current account to GDP, the ratio of money supply to reserves, the ratio of private credit growth to GDP and twin crisis dummy. These control variables are entered into the output losses regressions with lags in order to avoid the endogeneity problem, or the feedback effects from the magnitude of output losses during crisis years to other economic and financial variables¹¹. GDP per capita is included to control for the level of development. GDP growth rate and current account to GDP control for pre-crisis economic condition and government macroeconomic policy. The ratio of M2 to reserves and the rate of private credit growth control for the size of

¹⁰ When the dependent variable is censored, performing the OLS methodology yields biased and inconsistent parameter estimates while Tobit estimation produces consistent and asymptotically efficient parameter estimates. However, with the small proportion of zero values of the dependent variable such as when the magnitude of output losses is measured by GROWTHLOSS (see 'Output Costs of Banking Crises' under data section), both estimation techniques, OLS and Tobit regressions, yield similar values of estimated coefficients. The empirical tests in table (2) and (3) also report the estimated coefficients of OLS model. See Greene (1997) and Long (1997) for more discussions on Tobit estimation.

¹¹ The ratio of current account to GDP and the ratio of private credit growth to GDP are entered the regressions with averaged two-year pre-crisis periods while real GDP per capita, real GDP growth rate, and money supply to reserve are entered the regressions with one lag of the crisis year.

financial sector, and twin dummy is included with the value of one if there is currency crisis within two year before or after each banking crisis episode and zero otherwise.

Data

Dates of Banking Crises

Data on the episodes of banking crises are from Caprio and Klingebiel (2003). The information on bank insolvency is compiled from published financial sources and interviews with experts. Banking crises include both systemic and nonsystemic (i.e. smaller or borderline) events. The systemic banking crisis is defined when much or all of bank capital is exhausted, and the nonsystemic banking crisis is defined if there is evidence of significant banking problems. Based on the data of banking crisis episodes in emerging market economies and all available data for independent variables, the sample comprises 45 banking crisis episodes in 27 emerging market countries¹² during the period of 1980-to-1999.

Output Costs of Banking Crises

The magnitude of output loss associated with a banking crisis is estimated by annually summing up the difference between the actual output and the estimated potential output from a crisis year until a year that actual real GDP returns to its potential output trend. A banking crisis is identified as being accompanied by output loss if the actual output downwardly deviates from its potential trend within a crisis year or one year after crisis year¹³. Since there is no consensus on techniques in calculating output losses (see Hoggarth et al, 2002; Mulder and Rocha, 2001;

¹² Argentina, Bangladesh, Brazil, Chile, Colombia, Costa Rica, Ecuador, Egypt, Ghana, Hungary, Indonesia, Jordan, Kenya, S. Korea, Malaysia, Mexico, Nigeria, Paraguay, the Philippines, Russia, Singapore, Sri Lanka, South Africa, Thailand, Turkey, Venezuela, and Zimbabwe.

¹³ If the real GDP starts to slow down and lower than it trend in the year following crisis year, the starting point of output contraction is adjusted to begin at period $t+1$, where t is a crisis year. The year following the crisis year is included since occasionally the effect of crises to the real economy takes time for financial shocks to transfer to the real sector.

Angkinand and Hiro, 2004), both real GDP growth rate (GROWTHLOSS) and real GDP level (LEVELLOSS) are employed to estimate the output losses¹⁴. The output losses measured from the magnitude of growth contraction relative to its growth trend, which is calculated from averaged three-year pre-crisis growth rate¹⁵, or GROWTHLOSS is used by many studies such as IMF (1998), Bordo et al (2001), Honohan and Klingebiel (2003), and Classens et al (2003). However, Hoggarth et al (2002) and Mulder and Rocha (2001) point out many biases from using the growth rate to approximate the severity of crises, particularly the underestimation of the magnitude of GROWTHLOSS, i.e. although the real GDP growth rate already returns to its growth trend, the real GDP level may not recover to its pre-crisis capacity. In order to estimate the magnitude of absolute output loss (LEVELLOSS), the Mulder and Rocha's methodology is adopted. The total absolute output losses in real GDP level is calculated from the sum of the deviation of real GDP level from its potential output level. For the estimates of potential output trend, HP filter is applied to the real GDP level from 1960 up to a crisis year, and the potential output level from the crisis year is projected from its past trend by assuming that the output would grow constantly at the averaged three-year pre-crisis growth rate (of the HP filter estimate). This estimated potential trend will reflect the level of GDP that would be if the crisis would not have occurred.

In the sample of 45 banking crises episodes, 64 percent of crisis episodes are accompanied by a decline in the real GDP level (LEVELLOSS>0) and 89 percent of crisis episodes are accompanied by a decline in GDP growth rate (GROWTHLOSS>0). Figure (1)

¹⁴ See Angkinand (2005) for details of the estimation of output losses associated with crises.

¹⁵ IMF (1998) uses averaged three-year pre-crisis growth rates while Bordo et al (2001) use five year average to calculate trend growth rate. According to Mulder and Rocha (2001), however, the use of different pre-crisis periods to calculate trend growth rate does not result in the significant difference in the calculated magnitude of output losses.

presents the relationship between these two measurements of the magnitude of output losses¹⁶.

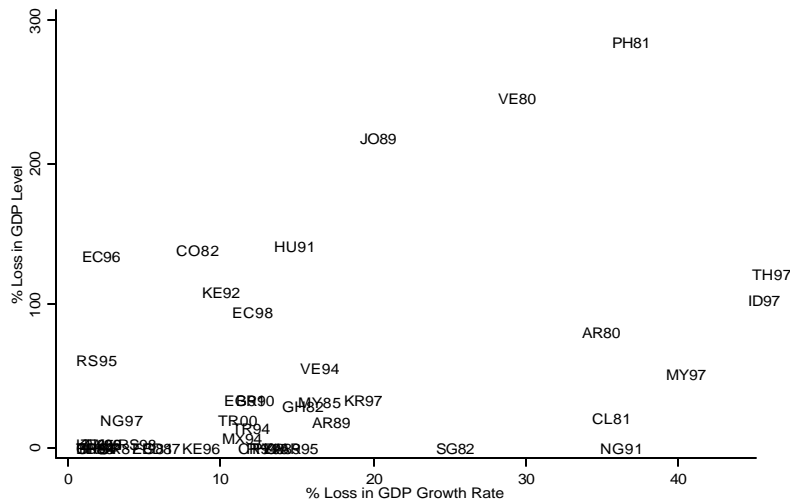
The positive relationship indicates that the occurrence of banking crises in most countries induces both growth contraction (the decline in growth rate) and economic recession (the decline in real GDP level). However, there are some cases, which crises only affect the real economy by interrupting the process of high economic growth without causing the decline in level of GDP (i.e. the GDP growth rate declined but did not turn into a negative growth rate).¹⁷¹⁸ The descriptive statistics in table (1) report that on average, the total magnitude of absolute output losses is about 47 percent per crisis, but around 13 percent when output losses are measured from GDP growth rates. These magnitudes are higher when excluding crisis episodes that are not accompanied by output losses (i.e. when the magnitude of output losses is assigned the value of zero). Both LEVELLOSS and GROWTHLOSS are employed as the dependent variables in the model. The use of different methods of measuring output losses to test the effect of the veto players on the severity of crises will not only capture the different impact of political institutions on the magnitude of losses in real GDP level and in real GDP growth rate, but also strengthen the robustness of empirical results.

¹⁶ The correlation between LEVELLOSS and GROWTHLOSS is 0.43.

¹⁷ From figure (1), banking crisis episodes, which interrupt only the process of economic growth, are present along the x-axis (% loss in GDP growth rate). These episodes include, for example, Singapore (1982), Nigeria (1991), Argentina (1994), the Philippines (1998) (total numbers of crises in this category are 13 out of 45 crisis episodes).

¹⁸ By construction of the estimates of output losses, it is possible for a crisis episode to be accompanied only by the decline in real GDP level without the decline in real GDP growth rate particularly if the occurrence of a crisis is preceded by negative growth rates. However, there are only few cases of episodes in this case. From the estimation of LEVELLOSS, the potential output trend is measured based on pre-crisis growth rates of the HP filter estimates. If averaged pre-crisis growth rate is negative, an economy is assumed to be growing at constant rate of zero, otherwise the potential output level trend will have downward slope and identifying economic recovery will mislead. With this assumption, a crisis with negative growth rate prior to crisis can be identified as having economic recession if the actual real GDP level is below the potential output trend (which is assumed to be at 0%). For GROWTHLOSS, the potential output trend is measured from averaged pre-crisis growth rates. If in crisis years a country has higher but negative growth rates than pre-crisis growth rates, that banking crisis will be identified as not being associated with losses in GDP growth rate measured relative to its pre-crisis growth trend.

Figure (1) The Relationship Between Two Measurements of Output Losses



Data on Veto Players

The proxies of the number of veto players are from two datasets: the Database of Political Institutions (DPI) version 3.0 collected by Beck et al (2002), and Political Constraints constructed by Henisz (2000)¹⁹. The variable from DPI, which is called “checks”, is the number of checks and balances, adjusting for whether these veto players are independent of each other. The number of checks is counted based on the Legislative Index of Electoral Competitiveness (LIEC) or Executive Index of Electoral Competitiveness (EIEC), which ranged from 1-to-7 in the same dataset. The minimum score of checks is assigned to be equal to 1 when LIEC or EIEC is less than 5, which indicates the absence of competitive elections of legislatures, and the executive counts as one check. In presidential systems, the additional veto points stand for a chief executive, each chamber of the legislature, and each party coded as allied with the president’s party. In parliamentary systems, the augmented points of veto players include a chief

¹⁹ The details in measuring *checks* and data from the Database of Political Institutions versions 3.0 (May, 2001) can be downloaded from <http://www.worldbank.org/research/bios/pkeefer.htm> For political constraints, the data and its descriptions are also downloadable from author’s website <http://www-management.wharton.upenn.edu/henisz/>.

executive and every party in the government coalition (if that party is needed to maintain a majority or that party has a position on economic issues closer to the largest opposition party than to the party of the executive). Thus, these additional veto points are linearly increased by the numbers of veto players in the political system and by taking into account the policy preferences among these veto players.

For an alternative proxy of the veto players, the index of political constraints (the variable called “polconv”) constructed by Henisz (2000) is used. This index derives from a simple spatial model of political interaction by taking into account both the number of veto players with veto powers over policy change and the distribution of their policy preferences. This index is constructed using a political science database for the number of independent branches of government, which is denoted by executive, lower and upper legislative chambers, judiciary, and sub-federal institutions. The initial measure is then modified to capture the distribution of policy preference among each independent branch of legislatures and executives. The political constraint index is distributed from 0-to-1 where higher score indicates the greater policy makers’ constraints to change the economic policy. The spearman rank correlation coefficient between the political constraint index and checks for the sample in this paper is 0.66.

The data for economic and financial variables are from World Development Indicators (WDI) and International Financial Statistics (IFS). Table (1) reports descriptive statistics for dependent and independent variables in the model.

Table (1) Descriptive Statistics

Variable	N	Mean	Std Dev	Minimum	Maximum
Magnitudes of output losses ²⁰					
LEVELLOSS	45	46.81	70.30	0.00	285.84
GROWTHLOSS	44	13.11	12.73	0.00	44.27
Magnitudes of output losses, only when output losses occur					
LEVELLOSS	29	72.64	76.30	1.70	285.84
GROWTHLOSS	39	14.79	12.57	0.28	44.27
The Veto Players					
Checks	45	2.64	1.43	1.00	6.00
Polconv	45	39.35	34.38	0.00	84.04
Control Variables					
GDP per capita _{t-1} [†]	45	3.51	4.04	0.26	17.57
GDP growth rate _{t-1}	45	3.00	4.59	-12.57	10.22
CA to GDP _{t-2}	45	-2.87	3.73	-11.96	11.04
Private credit growth _{t-1}	45	9.66	23.33	-39.14	77.64
M2 to Reserve _{t-1}	45	8.90	12.25	1.27	62.56
Twin dummy	45	0.64	0.48	0.00	1.00

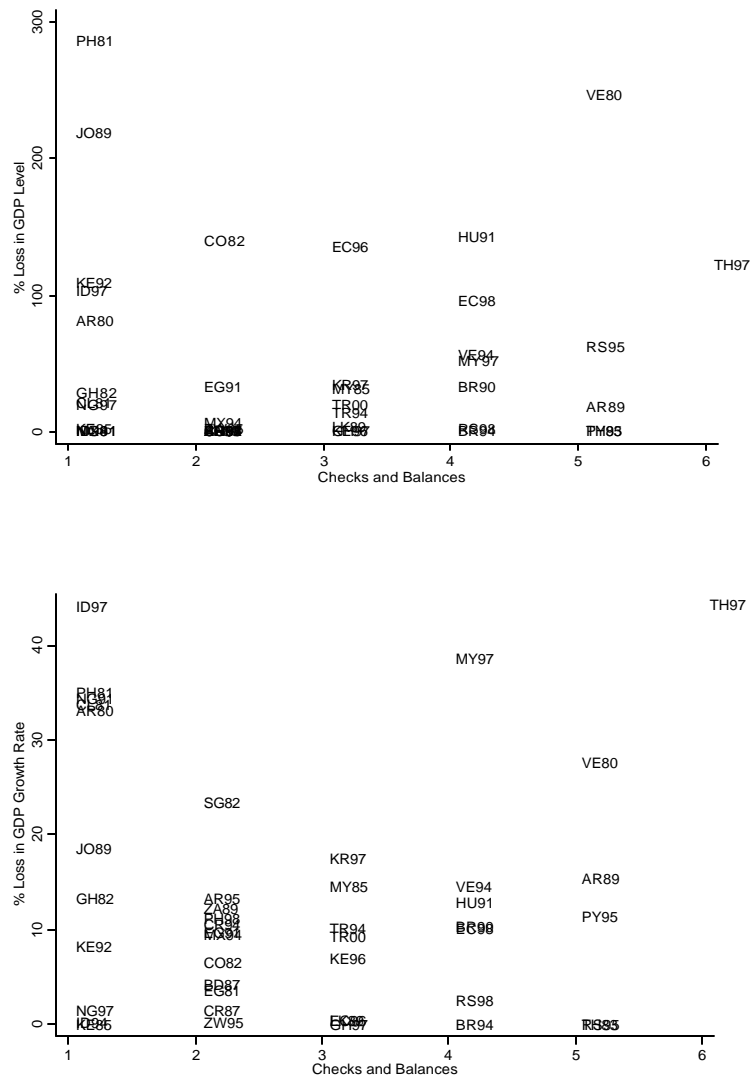
[†] GDP per capita is in 1,000 dollars

Figure (2) plots the relationship between the magnitude of output losses associated with crises (measured by both LEVELLOSS and GROWTHLOSS), and the veto player variables proxied by checks variable from DPI. The number of checks in Indonesia, the Philippines, and Thailand is consistent with MacIntyre's assigned number of veto players for Southeast Asian countries during the 1997-98 Asian financial crises. Indonesia and Thailand had one and six veto players, respectively. The Philippines had an intermediate number of veto players (three veto players in MacIntyre's and two veto players in 1997-98 and three veto players in 1999 according to DPI). The effective number of veto players in Malaysia, however, is counted in a different way. The Malaysian government was formed by many ethnic parties. The DPI reports the number of government seats of Malaysia's three largest government parties equal to 144 out of 172 seats in legislature so the number of checks is assigned the value of four in 1997 and three in 1998. However, since Malaysia's cabinet is dominated by the largest party—the United Malays

²⁰ For GROWTHLOSS, the Mexican crisis in 1981 is outlier observation and excluded in all regressions.

National Organization or UMNO²¹; therefore, MacIntyre argues that Malaysia has only one veto player, which is the collective veto player. The preliminary examination of figure (2) suggests that the relationship should be U-shaped. The relationship between the magnitude of output losses and the polconv variable also provides a similar pattern.

Figure (2) the Scatter Plots Between the Magnitude of Output Losses and the Veto Players



²¹ According to the Database of Political Institution, UMNO had 88 seats in the government in 1997-98.

4 Empirical Results

Tables (2) and (3) report results of the impact of the number of veto players on the magnitude of output losses associated with banking crises. The variables *checks* and *polconv* are used as alternatives to proxy for the number veto players and their ideological preferences. In each table, column (1)-(4) present results when the dependent variable is the magnitude of absolute output losses (*LEVELLOSS*) and column (5)-(8) present results for the losses in GDP growth rate (*GROWTHLOSS*). For each of these two dependent variables, the proxies of the veto players enter the Tobit regressions by three specifications: a linear form, a quadratic functional form, and a bivariate model of quadratic functional form. The model specification of quadratic functional form estimated by OLS methodology is also reported in both tables. When the proportion of zero values of dependent variable is small as in the case of *GROWTHLOSS*, the estimated coefficients obtained from OLS estimations are close to those from the Tobit models (e.g. column 7–8). However, for the sample with substantial censored values of the dependent variable, the estimated coefficients from OLS estimations will be biased downward, which is the case when the magnitude of output losses is measured in GDP level (e.g. column 3–4).

From tables(2) and (3), when the veto players variables enter the regressions in quadratic functional forms, the estimated coefficients both in linear and squared terms are significant at any normal level of statistical significance²². The significantly negative sign of *checks* and significantly positive sign of (*checks*)² in table (2) and similarly for *polconv* and (*polconv*)² in table (3) provide evidence supporting the U-shaped relationship between the magnitude of

²² In column 3 table 3 when the veto player variable is proxied by *polconv*, only linear term of *polconv* is significant at 10% level with p-value of 0.093 while the squared term of *polconv* has p-value of 0.126.

Table (2) The Impact of the Veto Players (Proxied by *checks*) on the Magnitude of Output Losses Associated with Banking Crises
 Dependent Variable: The magnitude of output losses, Estimation Method: Tobit Regression

Dependent Variable	LEVEL	LEVEL	LEVEL	LEVEL	GROWTH	GROWTH	GROWTH	GROWTH
	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS
	TOBIT	TOBIT	TOBIT	OLS	TOBIT	TOBIT	TOBIT	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	108.8763* (57.9307)	-8.0561 (50.3958)	99.0086 (68.9109)	119.9183** (52.9599)	35.5424*** (7.8688)	-1.2934 (6.8751)	23.5915*** (8.6051)	25.6371*** (8.6075)
GDP per capita _{t-1}		8.1972** (3.6854)	9.4736** (3.5426)	5.8261** (2.7411)		0.7031 (0.5099)	0.9910** (0.4394)	0.8293* (0.4453)
GDP Growth Rate _{t-1}		-11.2121 *** (3.7457)	-10.4282*** (3.5193)	-5.4053** (2.5835)		0.9348* (0.5226)	0.9780** (0.4347)	0.8339* (0.4228)
CA to GDP _{t-2}		-8.0178* (4.5716)	-6.8829 (4.1062)	-4.0123 (2.7540)		-0.4894 (0.5163)	-0.4142 (0.4369)	-0.3350 (0.4465)
M2 to Reserve _{t-1}		-0.4907 (1.4629)	-0.7176 (1.4151)	0.1444 (0.8976)		0.0719 (0.1701)	0.0459 (0.1438)	0.0224 (0.1469)
Private Credit Growth _{t-2}		0.01223 (0.6278)	-0.1219 (0.5892)	-0.1330 (0.4481)		-0.0458 (0.0868)	-0.0472 (0.0731)	-0.0239 (0.0726)
Checks	-82.0771* (44.8092)	9.7110 (11.2035)	-94.9844** (42.8969)	-77.5021** (33.6414)	-18.9556*** 5.9900	-0.0626 (1.5390)	-20.2509*** (5.4370)	-20.0813*** (5.5219)
(Checks) ²	14.5746* (7.2948)		14.0175** (6.7970)	11.9163** (5.3710)	3.0137*** 0.9682		3.3217*** (0.8655)	3.3438*** (0.8797)
Twin Dummy		75.8957** (33.1071)	64.8066** (31.5177)	22.1315 (22.0858)		9.2944** (4.1459)	6.5471* (3.5659)	5.6045 (3.5830)
N	45	45	45	45	44	44	44	44
LR Chi-squared	4.09	15.64	19.65		8.84	11.37	23.75	
F-statistics				1.83				3.37
Pseudo R-squared	0.0110	0.0420	0.0528		0.0271	0.0349	0.0728	
R-squared				0.2894				0.4348
Log Likelihood	-184.1385	-178.3660	-176.35842		-158.57065	-157.30765	-151.11947	

*, **, *** indicate significance level of 10%, 5%, and 1% respectively. The numbers in parentheses are standard errors of estimated coefficients.

Table (3) The Impact of the Veto Players (Proxied by polconv) on the Magnitude of Output Losses Associated with Banking Crises
 Dependent Variable: The magnitude of output losses, Estimation Method: Tobit Regression

Dependent Variable	LEVEL	LEVEL	LEVEL	LEVEL	GROWTH	GROWTH	GROWTH	GROWTH
	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS
	TOBIT	TOBIT	TOBIT	OLS	TOBIT	TOBIT	TOBIT	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	29.0301 (25.1692)	-22.2656 (39.6708)	-7.4779 (39.1196)	31.6320 (28.2306)	15.1673*** (3.2806)	-0.0484 (5.5692)	1.9209 (5.3979)	5.7475 (5.0292)
GDP per capita _{t-1}		8.5025** (3.7181)	9.2279** (3.6393)	5.5209* (2.8517)		0.7710 (0.5077)	0.9054* (0.4893)	0.7814 (0.5023)
GDP Growth Rate _{t-1}		-10.1731*** (3.3514)	-11.3748*** (3.4916)	-5.9150** (2.4582)		0.8922* (0.4851)	0.4753 (0.4753)	0.4325 (0.4446)
CA to GDP _{t-2}		-7.6330* (4.4579)	-8.4603* (4.4355)	-4.4609 (2.8374)		-0.4948 (0.5092)	-0.5597 (0.4871)	-0.4824 (0.4999)
M2 to Reserve _{t-1}		-0.4618 (1.4114)	-0.7343 (1.5471)	0.3731 (0.9148)		0.0466 (0.1678)	0.0610 (0.1603)	0.0073** (0.1628)
Private Credit Growth _{t-2}		0.0621 (0.6213)	-0.0756 (0.6084)	-0.1111 (0.4682)		-0.0379 (0.0868)	-0.0570 (0.0837)	-0.0213 (0.0825)
Polconv	-1.2301 (2.4719)	-0.4548 (0.4480)	-4.0002* (2.3166)	-2.6924 (1.7306)	-0.6663* (0.3396)	-0.0344 (6.1148)	-0.6565** (0.3104)	-0.6181* (0.3159)
(Polconv) ²	0.0154 (0.0322)		0.0464 (0.0296)	0.0321 (0.0225)	85.6652* (44.4141)		0.0082** (0.0040)	0.0075* (0.0041)
Twin Dummy		78.6116** 33.2715	82.7107** 33.0488	36.4510 22.5312		9.3869** (4.1125)	9.8974** (3.9327)	9.0525** (3.9775)
N	45	45	45	45	44	44	44	44
LR Chi-squared	0.25	15.91	18.44		3.70	11.68	15.67	
F-statistics				1.43				1.75
Pseudo R-squared	0.0007	0.0427	0.0495		0.0114	0.0358	0.0481	
R-squared				0.2411				0.2862
Log Likelihood	-186.05939	-178.22885	-176.96273		-161.14104	-157.15159	-155.15714	

*, **, *** indicate significance level of 10%, 5%, and 1% respectively. The numbers in parentheses are standard errors of estimated coefficients.

output losses and the number of veto players. On average, countries with an absence or excessive veto powers in their political system would suffer from substantially larger output losses once crises occur according to the vulnerability of volatility or rigidity of implemented policies in responding unforeseen financial shocks. These magnitudes of losses will be lower for countries with intermediate levels in the concentration of veto players. On the other hand, the estimations in column 2 and column 6 show that the estimated coefficients of checks and polconv are all insignificant when they are entered in the regressions in linear form.

For control variables, the significance of the estimated coefficients varies across model specifications. The twin crisis dummy, pre-crisis GDP per capita, and pre-crisis growth rate have significant effects on the magnitude of output losses in most regressions. The substantive effects of these control variables on the magnitude of output losses can be compared from standardized coefficients. One-standard deviation change in each of these three control variables also has a relatively larger impact on the magnitude of output losses than that of any other control variables. However, other economic and financial variables such as pre-crisis credit growth rate and the ratio of money supply to reserve are included in a set of control variables although their individual coefficients are not significant. The F-test for whether these control variables have marginal contribution to the model is highly significant (p -value < 0.05), indicating that this set of control variables is jointly significant and enhance the model. Additionally, the significance of the likelihood ratio chi-squares (LR chi2) in the Tobit models in table (2)-(3) also shows that when a set of control variables is included, the model as a whole is statistically significant²³.

²³ By comparing among Tobit models with specification of quadratic functional form in table (2)-(3), the likelihood ratio chi-squares are significant at 5% level in the models that include a set of control variables (column 3 & 7) but insignificant in bivariate models (column 1 & 5). The likelihood-ratio chi-square is defined as $2(L_1 - L_0)$, where L_1 is the log likelihood for the full model with constant and predictors and L_0 represents the log likelihood for the model with constant only. In addition, the pseudo-R2 is defined as $(1 - L_1) / L_0$.

The estimated coefficients from Tobit regressions in table (2)–(3) are marginal effects of independent variables on the latent dependent variable ($y_{i,t}^*$), which is unobserved. Table (4) summarized the marginal effects of the veto players on the latent dependent variables (y^*) and the observed dependent variables (y)²⁴. To compare the impact of checks and polconv on the observed total magnitude of output losses per crisis, table (4) presents the effect of a one-standard deviation change in checks and in polconv on the observed dependent variables in percentage point terms, which is shown under the column of y (\mathbf{x} -std coeff). A one-standard deviation change in checks and in polconv has a more or less equivalent impact on the magnitude of output losses with stronger impact on losses in GDP level than on losses in the GDP growth rate.

Table (4) Marginal Effects of checks and polconv on the Magnitude of Output Losses

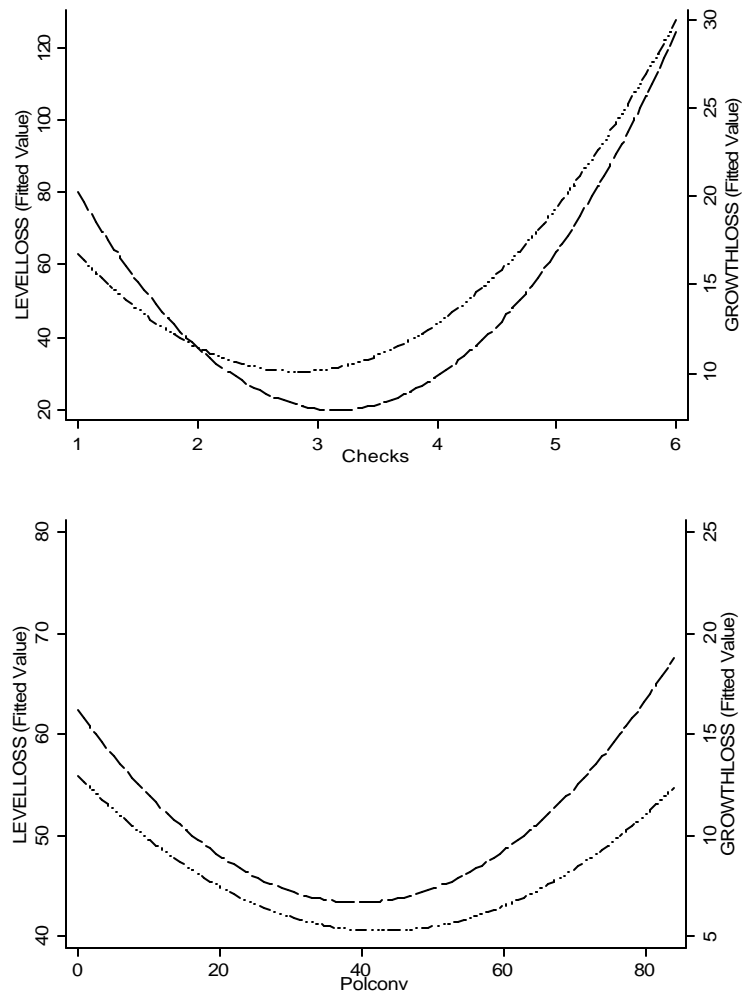
	LEVELLOSS			GROWTHLOSS		
	y^*	y	y (\mathbf{x} -std coeff)	y^*	y	y (\mathbf{x} -std coeff)
Checks	-94.984	-61.212	-87.697	-20.251	-18.001	-25.789
(Checks) ²	14.015	9.032	12.939	3.322	2.957	4.230
Polconv	-4.000	-2.578	-88.623	-0.657	-0.584	-20.062
(Polconv) ²	0.046	0.030	1.028	0.008	0.007	0.251
Proportion of no output contraction	0.64			0.89		

Note: y^* and y are unobserved (latent dependent variable) and observed magnitude of output losses. $y(\mathbf{x}$ -std coeff) is the observed magnitude of output losses with standardized independent variables. According to equation (1) in section 3, the marginal effects of check and balance variables (and other control variables) on the observed total magnitude of output losses $y_{i,t}$ are calculated from $\frac{\partial E[y|?, Checks]}{\partial (Checks)} = s \times \text{Prob}[y_{i,t}^* > 0]$

²⁴ The marginal effects of checks and polconv are obtained from the full models, which also include a set of control variables (column 3 and 7 from table 2–3).

Figure (3) shows the fitted values of the expected magnitude of output losses (y) with the different values of checks and polconv, which are estimated from the quadratic specifications of the Tobit models (column 3 and column 7 in table 2-3). The left-axis shows the scale of the magnitude of output losses in GDP level and the right-axis for the losses in GDP growth rate.

Figure (3) The Fitted Values of the Expected Magnitude of Output Losses with Different Values of Checks and Polconv from Tobit Estimations.



Note: - - - - - LEVELLOSS — — — GROWTHLOSS. The expected dependent variables of LEVELLOSS and GROWTHLOSS are observed magnitudes of output losses ($y_{i,t}$) for the values of checks and polconv that are not standardized.

The fitted values of predicted magnitude of output losses with the different values of *checks* show the U-shaped relationship with the inflection point of three checks. That is, when the number of veto players is proxied by checks, additional veto points, up to approximately three veto players, bring declines in the magnitude of output losses; beyond three veto players, the higher veto points the larger output losses associated with banking crises. Similar analysis can be performed for *polconv* variable. The inflection point of the U-shaped curve can be calculated by taking the first derivative of regression (3) and (7) in table (3) with respect to *polconv* and setting the slopes equal to zero. From this calculation, the inflection point of the U-shaped curve is where *polconv* equals to 43.10 for the dependent variable of the losses in GDP level and equals to 39.87 for the losses in GDP growth rate.

The significance of estimated coefficients in quadratic terms indicates that the marginal effect of the veto players on the magnitude of output losses is not constant, and depends on the values of the independent variables. The marginal effects for the different values of checks on the magnitude of output losses can be simply calculated by taking the first derivative of the magnitude of output losses with respect to checks.²⁵ The predicted marginal effects for different values of checks, reported in table (5), suggest that when the value of checks is greater than three, the magnitude of output losses will increase at increasing rates for additional checks. Similarly, when the value of checks is less than three, the reduction in the value of checks will increase the magnitude of output losses at an increasing rate²⁶.

²⁵ For example, the predicted change in the magnitude of output losses in GDP level for a change in the number of checks from 1 to 2 is $-61.212 + (2 \cdot 9.032) \cdot 1.5 = -34.12$.

²⁶ From tables (2)-(3) and the robustness of these empirical results in the next section, the veto players variables has more significant impact on GROWTHLOSS than LEVELLOSS. Similarly, the prediction of the effect of changes in number of veto players on output losses is also more accurate for GROWTHLOSS than LEVELLOSS. These can be partly due to the methodology in measuring LEVELLOSS. As noted by Mulder and Rocha (2001), from the methodology in measuring output trend, the actual output is less likely to return to its trend and the magnitude of output losses will be truncated when the next crisis occurs.

Table (5) Marginal Effects of Different Values of *checks* on the Magnitude of Output Losses

Change in the values of <i>checks</i>	LEVELLOSS	GROWTHLOSS
from 1 to 2	-34.12	-10.29
from 2 to 3	-16.05	-3.64
from 3 to 4	2.01	3.00
from 4 to 5	20.07	9.64
from 5 to 6	38.14	16.29

This empirical evidence suggests that after controlling for economic and financial factors, countries with intermediate numbers of veto players in times of financial crises will benefit from the tradeoff between a government's ability to maintain policy credibility and a government's ability to adjust policies flexibly, to respond to crises appropriately, and subsequently to minimize the severity of crises. From the sample of the political structures in 27 emerging market economies in this study, South Korea is the example of countries that have intermediate numbers of veto players, which is equal to three checks or at the inflexion point of the U-shaped curve, in the year of financial crises. In the 1997-98 Asian financial crises, the Korean coalition government, formed by two parties with diversified preferences, had brought the country to a stronger and faster recovery than the recoveries of the rest of the Asian crisis-hit countries. The government's commitment to the IMF program required extensive reforms in the financial and business sectors as well as in the labor market (Heo, 2001) and the prompt reforms, which led to business recovery and a heavily growing export sector, had quickly restored the investors' confidence in the post-crisis periods.

The economic consequence of increasing or decreasing the number of veto players in most countries is consistent with the model prediction reported in table (5). For instance, the differences in policy responses, and the degree of severity of the banking crises in 1981 and 1998 in the Philippines were due to the change in the political structure. In the first half of the 1980s, policy reactions to the major financial crisis under the authoritarian leadership of Ferdinand

Marcos were aimed to provide massive financial assistances to financial institutions and public corporations (Nascimento, 1991). Similar to the case of Indonesia under Suharto, the implemented policies that could not be vetoed were aimed to support well-connected businesses resulted in the deepened severity of the crises. The magnitude of the losses in growth rates of 35 percent associated with banking crisis in 1981 and 11 percent in 1998 indicates that the increasing number of veto players of the Philippines from one checks in 1981 to two checks in 1998 and three checks in 1999²⁷ contributes to the decrease in the magnitude of losses in growth rate by about 24 percent. Another example is Ghana, which the increase in checks values from one to three is associated with the decrease in the magnitude of growth losses by about 29 percent.

On the other hand, when checks are larger than three, increasing the number of veto players can cause the increase in the magnitude of output losses. The example of crisis episodes that support this finding is the occurrence of banking crises in Thailand in 1983 and 1997. The increase in the number of veto players to six checks in 1997 from five checks in 1983 is associated with the larger magnitude of losses in the growth rate in 1997 than that in 1983 by about 44 percent. This magnified severity of crisis in 1997-98 was notably the result of the delay of policy changes in dealing with financial sector problems, which was apparent in the delayed process of passing the new bankruptcy laws since the a number of governments could lose their stake in failing financial institutions (Vatikiotis, 1998). Venezuela is another example where the magnitude of losses in the growth rate is lower by about 13 percent when the checks value changes from five checks in the 1980 banking crisis to four checks in the 1994 banking crisis.

Robustness of the Results

²⁷ Polconv of the Philippines reduces from 0 in 1981 to 0.7 in 1998, where 0 out of 0-1 scale indicates no political constraints.

The tests for the robustness of empirical results are performed by the analysis of outliers and the sensitivity tests of control variables. The purpose of the outlier analysis is to test for the robustness of the U-shaped relationship against the linear relationship between the number of veto players and the magnitude of output losses, since the significance of estimates in quadratic terms can be influenced by outlying and influential observations. If an observation is detected as an outlier or influential observation²⁸, it will be excluded before the Tobit regressions are re-estimated. The re-estimations of the model specifications in table (2)–(3) illustrate that, after excluding some outlying and/or influential observations, the estimated coefficients in quadratic specifications (column 3 and 7) remain significant, while the insignificance of estimated coefficients from the linear specification (column 2 and 6) are not improved, indicating the robustness of the U-shaped relationship. This finding of a U-shaped relationship between the magnitude of output losses and the concentration of veto authorities is stronger when output losses are measured from the losses in GDP growth rate (GROWTHLESS). The exclusion of any outlying and/or influential observations does not impact the significant and substantive effect of estimated coefficients. One exception is the re-estimation of LEVELLOSS regression in column 3 table 2. The exclusion of these three observations (the Philippines 81, Venezuela 80, and Jordan 89) that was detected by Cook’s Distance statistics as having a large influence, and this discrepancy reduces the significances of the coefficients of checks and (checks)² from 5 percent to a 10-15 percent level of significance.

The results in tables (2)-(3) are further examined by using different lag(s) of control variables, including a one year lag, averaged two-year lags, and averaged three-year lags of the

²⁸ The statistics for identifying outliers or observations with large discrepancy are Studentized Residuals and for identifying influential observations are DFBeta, which measures the change in individual coefficient caused by dropping a single observation. Cook’s Distance (Cook’s D) is statistics for detecting outlying observation that has influence on the coefficients since it is composed of a discrepancy and a leverage term.

crisis year. With the changes of the lags of control variables, the estimated coefficients of the veto player variables in quadratic terms (both linear and squared terms) remain significant. However, the F-statistics of the set of control variables that are used in table (2)–(3) yield the highest significant level. Furthermore, the sensitivity of control variables is also tested by including the lag(s) of other economic and financial variables such as the world economic growth rate, the total (private plus public) credit growth rate, and the inflation rate. These variables are not only insignificant for individual effects, but the F-statistics for the test of overall significance of the model is also lower compared to that of the set of control variables used in table (2)–(3). In addition, since the impact of the veto players on the magnitude of output losses might vary across the regions and the types of banking crises, the sensitivity analysis is also performed by controlling for these specific factors. The regional dummies (separated into four regions: Africa, Central and Latin America, East and Southeast Asia, and other region) and the dummies of banking crisis types (separated into systemic and nonsystemic banking crises) do not have a significant effect as well as do not improve the F-statistics of the overall fit of the model.

5 Conclusion

The empirical findings in this paper suggest the importance of domestic political institutions in alleviating the severity of financial crises. In times of unforeseen financial shocks, the implementation of policy responses must be credible in order to stop financial panic as well as be flexible for any adjustment if any policy mistakes occur. One fruitful method of characterizing the political institutions underlying the governments' ability to produce policies with credibility and flexibility is the concept of veto players. Political institutions with checks and balances will allow the government to produce credible and stable policies, since a change in any policies according to political benefits can be vetoed by other parties. However, the political

institutions with excessive veto players can be vulnerable to the delay and inflexibility of policy responses. On the other hand, in the absence of any veto players, political institutions become vulnerable to policy volatility since any changes in policies can be processed without the veto by other parties. In the consideration of the choice of institutional arrangements, particularly when there are changes in global financial environments, political authorities need to rely on this tradeoff between policy credibility and policy flexibility.

The number of veto players and their ideological distance significantly influences the magnitude of output losses associated with banking crises. From the sample of 45 banking crisis episodes in 27 emerging market economies, the numbers of veto players has a U-shaped relationship with the magnitude of output losses, and this finding is robust regardless of the measures of output losses and the measures of the veto players. The inflexion points of the U-shaped curve is equal to three for the checks variable from DPI (from 1-to-6 of min-to-max scales in the sample) and equal to approximately 40 for the polconv variable constructed by Henisz (from 0-84 of min-to-max scales in the sample). The decrease in the values of veto players from the inflexion points will increase the magnitude of output losses at an increasing rate according to the increasing vulnerability of policy volatility. Similarly, the increase in the values of veto players from the inflexion points will increase the magnitude of output losses at an increasing rate due to the increasing risk of policy rigidity.

Nonetheless, it is not a necessary condition that political institutions with an absence or excessive number of veto players will produce policy volatility or policy rigidity or, on the other hand, political institutions with intermediate numbers of veto players can always escape from the severity of financial crises. Policy makers in a country with small numbers of veto players, coupled with the awareness that the credible commitment can be threatened, can employ other

mechanisms to signal their commitment; similarly for policy makers in a country with many vetoes. Further research should examine what policies governments in these countries should pursue in order to safeguard their economies in these periods of financial vulnerability.

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