

Political institutions and bank risk-taking behavior¹

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Abstract

This paper examines the impact of political institutions on bank risk-taking behavior. Using an international sample of banks from 98 countries over the period 1998-2007, I document that sound political institutions stimulate higher bank risk-taking. This is consistent with the hypotheses that better political institutions increase banks' risk by boosting the credit market competition from alternative sources of finance and generating the moral hazard problems due to the expectation of government bailouts in worst economic conditions. While it is contrary to the hypotheses that better political institutions decrease banks' risk by lowering the government expropriation risk and the information asymmetries between banks and borrowers. The results are robust to a number of sensitivity tests, including alternative proxies of bank risk-taking and political institutions, cross-sectional bank- and country-level regressions, endogeneity concerns of political institutions, country income levels, explicit deposit insurance schemes and sample extension from 1998 to 2014. I also examine the interdependence between political and legal institutions and find that political and legal institutions complement each other to influence bank risk-taking behavior.

Keywords: political institutions; political constraints; bank risk-taking; legal institutions; moral hazard problems

1. Introduction

The recent global financial crisis started in the United States following the Lehman Brothers bankruptcy filing on September 15, 2008 and spread across the globe. The negative effects of the crisis on banking sectors of different countries were heterogeneous raising the question of divergent bank risk-taking practices across countries. In response, the issue of cross-country variation in bank risk-taking behavior has led to active discussions among academicians and policy makers about its possible roots. Many believe that the formal and informal institutions, which differ across countries and influence internal and external operating environment of banks, lead to the cross-country variation in bank risk-taking practices. In this context, extant literature has identified banking industry regulations, legal institutions and national culture as significant determinants of bank risk-taking behavior. Significantly absent from this literature is how and whether political institutions impact the cross-country variation in bank risk-taking behavior. To fill this important research gap is the goal of the present study.

Law and finance literature (La Porta *et al.* 1997; La Porta *et al.* 1998) argues that legal institutions, such as legal origin and creditor rights, are important for the financial development of a country. Building on the law and finance literature, some studies have related legal institutions to bank risk-taking behavior. For instance, Houston *et al.* (2010) find that bank risk-taking is higher in countries where creditor rights are stronger.

Notwithstanding the law and finance literature, there is a growing consensus that the role of political institutions is more important than the role of legal institutions for financial sector development (Roe 2006; Keefer 2007; Roe & Siegel 2011). Legal institutions are the one channel, among several others, through which political institutions can exert their influence on financial development (Roe 2006). The legal origin of countries actually proxies political phenomena and is an insignificant determinant of financial development when political institutions are incorporated into the analysis (Keefer 2007). This literature suggests that the political stability should be included as an important determinant of financial development (Roe & Siegel 2011). In the same vein, recent macro-level studies report that stable political regimes and more restrictions on political power (Bordo & Rousseau 2006), a country's democratic characteristics (Girma & Shortland 2008), and political accountability (Quintyn & Verdier 2010) are robust predictors of financial development. Building on this literature, one can expect that the cross-country variation in bank risk-taking behavior might be due to the cross-country variation in political institutions.

Additional support for the relevance of political institutions to banking comes from the recent biannual Banking Banana Skins survey, carried out jointly by the Centre for the Study of Financial Innovation (CSFI) and the PricewaterhouseCoopers (PwC), which rated 'political interference' in banking as the most important risk in 2010 (Liu & Ngo 2014). Further, Beck (2011) suggests that the relationship between politics and banking is complex and a better understanding of this relationship is even more important now in the aftermath of the global financial crisis. Similarly, Calomiris and Haber (2014) argue that politics is baked into the banking and the occurrence of frequent systemic banking crisis in the United States (12 systemic banking crises) and none in Canada since 1840 is an outcome of different political institutions in both countries.

Building on recent political economy literature, I argue that political institutions may have first-order (or direct) and second-order (or indirect) effects on bank risk-taking. Political institution may have first-order effects on bank risk-taking through their impact on government expropriation risk, adverse selection problems, credit market competition and moral hazard

problems. Through all these channels, the net first-order effect of political institutions on bank risk-taking is uncertain. On the one hand, better political institutions may decrease banks' risk by lowering the government expropriation of banks and improving the information environment that lessens the information asymmetries between banks and borrowers. While on the other hand, political institutions may increase banks' risk by promoting the competition in bank credit market from alternative sources of finance and generating the moral hazard problems due to the expectation that a government will bailout the banks in worst economic conditions. Political institutions may have second-order effects on bank risk-taking by ensuring the consistency and implementation of legal institutions, and shaping a government's choice of entry and licensing requirements that impact banking industry structure and resulting competition. In empirical analysis, I examine the first-order effect of political institutions on bank risk-taking after controlling for their second-order effects through legal institutions and banking market structure.

An international sample of banks from 98 countries (or 107 countries in extended sample) is used for empirical analysis. Bank risk-taking is measured with Z-score which represents the probability of bank default. Political institutions are measured with political constraints index of Henisz (2000). This index measures the constraints that a policy change decision by any one branch of a government can face from other branches of the government. The empirical results consistently show that better political institutions in the form of higher ex-ante constraints on government behavior increase bank risk-taking. These findings suggest that higher credit market competition from alternative sources of financing and moral hazard problems linked with better political institutions lead banks to increase risk-taking.

The results are robust to a number of sensitivity tests, including alternative measure of bank risk-taking, alternative proxies of political institutions, bank- and country-level regressions, endogeneity concerns of political institutions, and alternative samples. I also observe that the effect of political institutions on bank risk-taking is robust irrespective of the income levels of countries and the existence of explicit deposit insurance schemes. As to the interdependence between political and legal institutions, I find that political and legal institutions complement each other to influence bank risk-taking behavior.

This study contributes to the literature in at least four ways: First, it adds to the currently expanding literature that aims to examine the determinants of the cross-country variation in bank risk-taking behavior. Extant literature has focused on banking industry regulations such as capital requirements, activity restrictions and explicit deposit insurance (Laeven & Levine 2009; Anginer *et al.* 2014; Haq *et al.* 2014), banking industry structure (Boyd & De Nicolo 2005; Martinez-Miera & Repullo 2010), macroeconomic indicators such as GDP growth, inflation, unemployment rates etc. (Ali & Daly 2010; Castro 2013; Chaibi & Ftiti 2015), legal institutions (Houston *et al.* 2010; Cole & Turk 2013; Fang *et al.* 2014) and national culture (Ashraf *et al.* 2016c). This study goes beyond these factors and finds that political institutions also have significant influence on bank risk-taking behavior.

Second, this study complements the recent literature which examines the role of political institutions in shaping firm behavior. Durnev and Fauver (2011) show that firms manage earnings more, practice worse governance and disclose less information when the risk of government expropriation is high. Caprio *et al.* (2013) and Chen *et al.* (2014) relate political institutions to firms' cash and liquid assets holdings. Qi *et al.* (2010) and Boubakri *et al.* (2014) show that political institutions explain the cross-country variation in the cost of debt and the implied cost of equity capital of firms, respectively. Boubakri *et al.* (2015) show that tighter political constraints stimulate firm growth. In this context, this study is most relevant to Boubakri

et al. (2013) who relate political institutions to industrial firms risk-taking behavior, excluding financial firms from their sample. In this study, I consider the risk-taking behavior of financial firms and identify that the channels through which political institutions influence bank risk-taking behavior are quite different from industrial firms.

Third, this work also complements to recent studies which argue that prevailing political factors influence the probability that government will bailout the banks if needed (Dam & Koetter 2012; Cukierman 2013; Antzoulatos & Tsoumas 2014). I extend this debate by finding that higher political constraints generate moral hazard problems and stimulate higher bank risk-taking due to the expectation that government will bailout the banks if a worst shock hits the banks.

Fourth, I complement the recent strand of the literature on the interdependence between legal and political institutions. In this regard, Roe (2006) suggests that the role of political economy and political history dominates the role of legal origin in explaining cross-country differences in financial development. Keefer (2007) finds that legal origin actually proxies the political phenomena and is an insignificant determinant of financial determinant when political institutions are incorporated into the analysis. Qi *et al.* (2010) and Boubakri *et al.* (2014) find that the effects of political and legal institutions substitute each other in influencing cost of debt and implied cost of equity, respectively. My findings suggest that political and legal institutions complement each other to influence bank risk-taking.

The rest of the paper proceeds as follows. Section 2 hypothesizes relationship between political institutions and bank risk-taking. Section 3 introduces data and variables. Section 4 presents empirical results. Final section concludes findings.

2. Relationship between political institutions and bank risk-taking

I conjecture that political institutions/constraints may play an important role in determining bank risk-taking behavior through different channels. I classify these potential channels of transmission according to their likely first-order or second-order effects on bank risk-taking behavior. First-order effects stem directly from political institutions to bank risk-taking, while second-order effects are channeled through legal institutions and banking industry structure and competition.

There are a number of ways in which political institutions can have first-order effects on bank risk-taking behavior. The first is through their impact on ‘government expropriation risk’. Banking industry is specifically vulnerable to government expropriation due to the inherent conflict of interest between government and banking industry; the government regulates banking industry and, at the same time, depends on the same industry for her survival (Haber *et al.* 2008). Government expropriation of banks may take many forms. For example, politicians may solicit bribes, can create bank monopoly that share rents with them, may grant licenses to favored parties, may force banks to extend loans to politically connected firms, may influence contract enforcement when some crucial group is involved, can use predatory taxation policies, may hold board positions or may favor banks in hope to get a position in these banks later, among others. Higher expropriation may result in higher bank risk due to higher defaults on loans to politically connected firms and the inefficiencies linked with monopoly or favored groups. Government expropriation risk cannot be ruled out even in countries with strong political institutions. For example, Liu and Ngo (2014) conclude that the banking industry in a developed democracy like the United States is not immune from politicians’ incentives and political interference. However,

in a cross-country setting, one can expect that the level of expropriation risk is lower in constrained regimes as compared to the risk level in authoritarian regimes. Hence, I expect a negative association between better political institutions and bank risk-taking.

A second way in which political institutions can impact bank risk-taking is through decreased 'adverse selection'. Adverse selection occurs when bad credit risks (i.e., the firms which have high inherent risk and poor investment projects) become more probable to acquire loans than good credit risks (i.e., the firms with less inherent risk and better investment opportunities). Due to the asymmetric information between lenders and borrowers, the adverse selection is a severe problem in credit market (Stiglitz & Weiss 1981). Political institutions may decrease information asymmetry by improving the information environment. For example, Bushman *et al.* (2004) show that corporate firms disclose more information in countries with strong political institutions. In a more transparent environment, the managers of banks can easily verify creditworthiness of borrowers, which would decrease the chances of adverse selection. Better political institutions may also decrease adverse selection due to higher demand of bank credit. For example, recent studies find that firms take higher investment risks (Boubakri *et al.* 2013) and borrow more bank loans (Chen *et al.* 2014) when operating in regions with better political institutions. If all else equal, banks would be able to select less risky and higher number of borrowers due to higher loan demand. I expect a negative relation between political institutions and risk-taking due to decreased adverse selection problems.

A third way in which political institutions can affect risk-taking is through the 'credit market competition'. Political constraints may affect the availability of alternative sources of finance for borrowing firms. Constrained government is more likely to protect property rights and enforce contracts which will encourage more investors to participate in financial markets. Consistent with this argument, recent studies find that bond (Qi *et al.* 2010) and equity (Boubakri *et al.* 2014) financing costs of firms are significantly lower in countries with sound political institutions. The availability of cheap financing options increases the competition in bank credit market. Higher credit market competition would force banks to reduce interest rates on loans on the one hand, while take away some of their market share on the other hand. To compensate for reduced interest margins and to regain market share, the banks may extend loans to, on average, risky borrowers increasing overall bank risk-taking. Thus I expect a positive association between political institutions and bank risk-taking due to higher credit market competition.

Finally, bank risk-taking may also be influenced by the characteristics of governments' reaction functions. Governments use various tools to ensure systemic financial stability. For example, banks can be members of a deposit insurance scheme *ex ante* to avoid depositor runs if worse economic shock hits or they can get bailouts (e.g., capital injections) from the government *ex post* if deemed 'too big to fail' or 'too many to fail'². However, these government actions are likely to generate moral hazard problems and encourage banks to take on more risk in good times. Recent literature argues that these are the government bailouts which generate moral hazard and involve political factors. For instance, Dam and Koetter (2012) argue that it is the expectation of a bailout, rather than the actual rescues or the membership of a deposit insurer, that generates moral hazard. Cukierman (2013) argue that since the bailouts are financed with taxpayers' money, their decisions involve normative considerations such as the resource distribution within a country and are usually made by elected officials rather than by bureaucrats.

² Brown and Dinç (2011) find that government is less likely to close a bank if the banking sector is weak.

Therefore, the decision to provide a bailout or not, and hence the expectation of a bailout, are affected by the political ideology, political considerations and partisanship. In the same vein, Antzoulatos and Tsoumas (2014) argue that a substantial part of the expected bailouts can be attributed to a country's institutional environment and find that a good institutional environment is associated with higher expected bailouts. For a cross-country study, one can expect that the moral hazard problems are higher in constrained/democratic governments because they are more likely to respond by providing the bailouts to avoid worst economic conditions and to keep masses and depositors favor for the government. Hence, better political institutions may promote higher risk-taking by generating the moral hazard due to the expectation that a government will provide the bailouts.

Political institutions may have second-order effects on bank risk-taking through legal institutions and banking industry competition. Roe and Siegel (2011) identify that legal institutions are one channel through which political instability can impede financial development. Political stability ensures the consistency of primary legal institutions such as the legal rules, courts, and regulators. Highly unstable polities either will not protect investors or will be ineffective in protecting investors even though conventional institutions of investor protection are in place. A country's democratic political stability determines her willingness and capacity to build and maintain property and investor protection institutions. However, the impact of political institutions on bank risk-taking through legal institutions is uncertain. On the one hand, better legal protection granted to banks as creditors in democratic stable polities can ensure higher loan recoveries which will result in lower bank risk. While, on the other hand, better contracting institutions can result in higher defaults on loans because low grade borrowers get access to the credit market due to the reduced bank monitoring efforts and lower financial intermediation costs (Houston *et al.* 2010).

Political institutions can shape how governments control competition within banking industries through licensing and activity restrictions. For example, Demirguc-Kunt *et al.* (2004) argue, after a thorough analysis of banking industries of 72 countries, that the extent of competition in banking industry is more a national level preference. More specifically, Haber (2004) performs a historical analysis of the United States and Mexican banking industries and suggests strong role of political institutions. His analysis suggests that democratic political institutions let today's competitive banking industry in the United States, while political anarchy and instability constrained competitive banking industry in Mexico. Rosenbluth and Schaap (2003) examine the impact of political system on banking regulations and banking industry competition for a larger sample of countries. They show that politicians choose competitive and lower cost banking systems³ in the countries where they are more accountable to voters during elections. Unconstrained governments are more likely to discourage competitive financial systems. For example, Beck (2011) argues that unconstrained governments dislike competitive financial system because an uncompetitive financial system acts as a source of rents for the government⁴ on the one hand, while competitive financial system can finance opponents on the other hand. Barth *et al.* (2006) compare banking regulations in a cross-country setting and find that autocratic governments use restrictive regulations and higher entry barriers for banking

³ They show that bank interest margins are lower by approximately 1% in USA and UK as compared to Germany and Japan.

⁴ These rents may be direct as a share of profits due to ownership or as a support for election campaigns and also indirect as subsidized lending to preferred industries.

industry. Together, these arguments suggest that better political institutions result in a competitive banking industry. But the effect of increased competition on bank risk-taking is uncertain. Some studies argue that increased banking industry competition reduces individual banks' franchise values and encourage them to take on more risk (Keeley 1990; Hellmann *et al.* 2000; Repullo 2004), while the model of Boyd and De Nicolo (2005) predicts that increased banking industry competition, by charging lower interest rates on loans and resulting in less borrowers' defaults, can promote individual bank stability.

Overall, the above discussion suggests that first-order effects of political institutions on bank risk-taking are complex. Sound political institutions may decrease banks' risk by reducing the government expropriation risk and information asymmetries between banks and borrowers or may increase banks' risk by increasing the credit market competition and moral hazard problems. Similarly, political institutions may have complex second-order effects on bank risk-taking through the legal institutions and banking industry competition. In this study, I examine the first-order effects of political institutions on bank risk-taking behavior after controlling for the second-order effects through the legal institutions and banking industry competition.

3. Data and Variables

The data used in this study is compiled from various sources: Data for political institutions is collected from Henisz (2010), Freedom_House (2013), International Country Risk Guide (ICRG) database, Beck *et al.* (2001) dataset and Marshall and Jaggers (2013)'s Polity IV Project dataset. Bank-level accounting data is downloaded from *Bankscope* database. Data for banking industry regulations is taken from Barth *et al.* (2013). Macroeconomic indicators are from World Development Indicators (WDI) of World Bank. Governance variables are from World Governance Indicators database of Kaufmann *et al.* (2010).

Appendix A lists variables, variable definitions and data sources briefly.

(Insert Appendix A here)

3.1 Sample

Accounting balance sheet and income statement data for bank holding companies and commercial, cooperative, and saving banks over the period 1998-2007⁵ was downloaded from the *Bankscope* database. The sample includes both active and non-active banks to mitigate the concern of survivorship bias of less risk-taking banks.

Sample construction was started by deleting all bank observations with missing necessary accounting data. Banks of those countries were excluded for which the data of political institutions variables or other banking industry-level or country-level control variables was missing. Finally, all those banks were deleted which have less than three valid observations over the sample period. All bank-level variables were winsorized at one and ninety-nine percent levels to eliminate the outlier effects. Table 1 reports the countries included in main sample and the number of bank observations from each country.

(Insert Table 1 here)

⁵ I extend sample from 1998 to 2014 as a robustness test.

3.2 Measurement of bank risk-taking

Following recent literature (Laeven & Levine 2009; Houston *et al.* 2010; Ashraf *et al.* 2016a; Ashraf *et al.* 2016c), bank Z-score is used as the main proxy of bank risk-taking. $Z\text{-score} = (\text{ROA} + \text{CAR}) / \sigma(\text{ROA})$, where ROA is annual return on assets before loan loss provisions and taxes, CAR is annual equity to total assets ratio, and $\sigma(\text{ROA})$ is standard deviation of annual values of return on assets before loan loss provisions and taxes calculated over 3-year overlapping periods starting from 1998 and ending at 2007 (i.e., 1998–2000, 1999–2001 and so on). Z-score measures the number of standard deviations from mean value by which the bank return has to fall to deplete all shareholders' equity. Z-score is a highly skewed measure of bank risk-taking and higher values of Z-score indicate the lower probability of bank default. Following the literature I take the log of Z-score and multiply it with -1 so that the higher values of Z-score represent the higher probability of bank default. For brevity, I name it Z-score throughout the rest of the study. Logged Z-score defines the insolvency risk on the domain of all real numbers and is an attractive and unproblematic bank insolvency risk measure to use as a dependent variable in standard regression analysis (Lepetit & Strobel 2015).

$\sigma(\text{NIM})$ is used as a second measure of bank risk-taking for robustness tests. $\sigma(\text{NIM})$ equals standard deviation of annual net interest margin calculated over 3-year overlapping periods starting from 1998 and ending at 2007. Due to the 3-year overlapping window used for the calculation of bank risk-taking measures, the effective sample period for empirical analysis starts from the year 2000. Table 1 reports country-level mean values of Z-score.

3.3 Measurement of political institutions

North (1981) defines institutions as “a set of rules, compliance procedures, and moral and ethical behavioral norms designed to constrain the behavior of individuals in the interests of maximizing the wealth or utility of principals (p. 201-202)”. Building on this definition, Glaeser *et al.* (2004) argue that a good measure of political institutions should capture ex-ante constraints on government behavior rather than the ex-post government policy choice or performance⁶. A measure of political institutions which captures the constraints on government behavior is better for this study due to at least three reasons: First, since government relies on banks for financial support, only self-enforcing political institutions, that would constrain government authority and discretion, can help in reducing government expropriation of banks through the change in government policy or politicians' influence. Second, higher constraints on government behavior ensure that the government will honor its commitments over property rights and encourage investors to participate in financial markets. Third, constraints determine whether a government has an authority to provide bailouts. Since political institutions are compliance procedures which determine government repetitive behavior, if the government has a tradition of bailing-out banks in past then she is likely to do so in future within its constraints.

⁶ Glaeser *et al.* (2004) compare three measures usually employed by literature as proxies of political institutions: government effectiveness, risk of expropriation by the government and constraints on the executive. They argue that first two measures, by construction, do not represent political institutions but they are actually government outcomes/performance. They suggest third one, constraints on the executive, as suitable measure of political institutions.

Consistent with these arguments, a good measure of political institutions comes from Henisz (2000) who measures political institutions by measuring the constraints that a policy change decision by any one branch of government can face from other branches of the government. Specifically, political constraints index, Political Constraints, of Henisz (2000) measures the degree of constraints on a policy change decision using data on the number of independent branches of government with veto power (executive, legislative, judicial, and sub-federal branches of government) and the distribution of political preferences both across and within these branches. Political Constraints index ranges from 0 to 1, where higher values represent the higher level of political constraints and thus stronger political institutions. Yearly data of Political Constraints index is available for almost all major countries of the world over the sample period. Table 1 reports mean value of Political Constraints index for each country over the sample period. This index has a zero value for countries such as China and Saudi Arabia where independent branches with veto power don't exist in government systems to constrain the decision making of ruling government. It has higher values for countries such as Belgium (0.89) and France (0.87) where independent branches with veto points (i.e., executive, parliament, judiciary etc.) exist in government system to constrain the decision making of each other.

Specific and predatory government policies towards banking industry are easy to find in countries with low political constraints. For example, the mean value of Political Constraints index is 0.03 for Pakistan and the government imposed a super tax for the tax years 2015 and 2016 for the rehabilitation of displaced persons in Pakistan which is to be paid by the banking companies at the rate of 4 percent of annual income and by all other taxpayers at 3 percent; the latter being required to pay only if their annual income is equal to or in excess of PKR500 million⁷. As another example, Jordan has 0.13 mean value of Political Constraints index and she imposed a corporate tax rate of 35 percent for banks and 14 percent for industrial firms in 2016. Similarly, Bangladesh has 0.32 mean value of Political Constraints index and she imposed a corporate tax rate of 42.5 percent for banks and 25 percent for all other public companies in 2016. Such kind of specific policies for banks are difficult to trace in the countries with high political constraints.

One criticism on political constraints index is if a government faces more constraints then it would be quite difficult to change bad policies which are already in place. To eliminate this concern that higher values of Political Constraints index are not capturing the effect of already existing predatory policies towards banking and to further check the robustness of results, a number of alternative proxies of political institutions are used: Political Rights, Democratic Accountability, GOVFRAC, POLARIZ and Polity.

Political Rights is political rights index from Freedom_House (2013). This index measures the fairness and competitiveness of elections as well as the strength of competing political and minority factions in constraining the government. This index offers the advantage of being an ex ante proxy of political risk representing future outcomes of the political bargaining process. Since lenders and borrowers consider future risks and returns in making investment decisions, this forward-looking measure is appropriate to further confirm main results. Democratic Accountability is democratic accountability variable from ICRG database. This variable measures the type (i.e., dominated democracy, alternating democracy, *de-facto* one-party state, *de jure* one-party state, and autarchy) and the responsiveness of a government to its

⁷ Currency of Pakistan is Pakistan Rupee (PKR).

people. Use of this variable helps to shed light on the variation in bank risk-taking behavior that is due to the different types of governments. GOVFRAC is government fractionalization variable from World Bank database of political institutions (Beck *et al.* 2001) and measures the chances of selection of legislators from different parties in two random draws. POLARIZ variable is also from World Bank database of political institutions and measures the maximum difference of orientation among government parties. Finally, Polity variable is from Polity IV Project dataset (Marshall & Jaggers 2013) and measures the concomitant qualities of autocratic and democratic authority in governing institutions. Appendix B reports country-level sample mean values of these five alternative proxies of political institutions.

3.4 Bank-level control variables

Four bank-level variables, Total Assets (log), Growth Total Assets, Loan Loss Provisions/Total Assets and Noninterest Income/Total Income, are used to control for bank-specific characteristics. Total Assets (log) is logarithm of annual total assets measured in thousand US dollars, Growth Total Assets is year-on-year growth rate of total assets of a bank, Loan Loss Provisions/Total Assets is annual loan loss provisions to total assets ratio of each bank, and Noninterest Income/Total Income is annual non-interest income to total gross revenues ratio for each bank. All these bank-specific variables are computed at fiscal year-end. The predicted signs between bank risk-taking variables and bank-level control variables are as follows: Total Assets (log) (+/-), Growth Total Assets (+), Loan Loss Provisions/Total Assets (+) and Noninterest Income/Total Income (+).

3.5 Banking industry-level control variables

Four banking industry-level variables, Bank Concentration, Capital Stringency and Activity Restrictions and Deposit Insurance, are used to control for banking industry structure, regulatory capital requirements, restrictions on activities of commercial banks and explicit deposit insurance scheme, respectively.

Bank Concentration is defined as ‘assets of three largest banks as a percentage of total assets of all banks operating in a country’ calculated annually for each country. Bank Concentration captures the effect of industry structure on bank risk-taking. Data for this variable is obtained from Financial Development database of World Bank.

Data for Capital Stringency, Activity Restrictions and Deposit Insurance variables is collected from Barth *et al.* (2013). Capital Stringency is the sum of two sub-indices: initial capital stringency index and overall capital stringency index. Capital Stringency variable reflects whether required capital for banks in a country is in-line with Basel requirements, and is sensitive to credit, market and operational risks. Besides, it reflects which type of funds can be used as capital, whether regulatory authorities verify sources of capital and which types of losses are deducted for the determination of capital adequacy ratios. This index ranges from 0 to 10, where higher values indicate stringent regulatory capital requirements and vice versa. Activity Restrictions reflects the extent to which commercial banks in a country are restricted to participate in non-lending activities such as securities, insurance, real estate activities and/or owning other firms. This variable ranges from 4 to 16 where higher values indicate higher activity restrictions and vice versa. Deposit Insurance is a dummy variable equals to 1 if a country implements explicit deposit insurance system to insure deposits of households and companies with banks, and 0 otherwise. Since Capital Stringency, Activity Restrictions and Deposit Insurance variables are based on data from World Bank surveys on bank regulations

conducted in 1999, 2003, 2007 and 2011, following recent studies (Agoraki *et al.* 2011; Ashraf *et al.* 2016b) I use information from the survey conducted in 1999 for bank observations over the year 2000, from 2003 survey for bank observations over the period 2001-2003, and from 2007 survey for bank observations over the period 2004-2007⁸.

As mentioned in Section 2 that political institutions may have second-order effects on bank risk-taking through the banking industry structure, the inclusion of Bank Concentration and Activity Restrictions variables in empirical models will control for these second-order effects. For example, Bank Concentration represents the share of largest banks operating in a country and thus captures the effect of historical licensing and entry restrictions. While, Activity Restrictions variable captures the extent to which the commercial banks are allowed to deal in non-lending activities. In sum, these both variables together represent current banking industry structure of a country. Inclusion of Deposit Insurance variable controls for bank risk-taking that is due to moral hazard problems of explicit deposit insurance.

3.6 Country-level control variables

GDP Per Capita (log), GDP Growth and Inflation from World Development Indicators database of World Bank are used to control for cross-country and over-time variation in macroeconomic conditions. GDP Per Capita (log) equals natural logarithm of annual gross domestic product per capita measured in current US dollars. GDP Growth equals annual percentage growth in gross domestic product of a country. Inflation equals percentage change in annual average consumer prices.

Creditor Rights and Law & Order variables are used to control for cross-country variation in legal institutions. Creditor Rights index is obtained from Djankov *et al.* (2007) and measures the legal protection granted to banks as creditors to recover their loans from borrowers in the case the borrowers default or declare bankruptcy. Law & Order is law and order index from ICRG database and measures the law enforcement tradition of a country. Creditor Rights and Law & Order together measure the existing legal institutions and the level of their enforcement in a country and, thus, control for the second-order effects of political institutions on bank risk-taking behavior through the legal institutions.

Finally, since changes can occur in bank risk-taking behavior during financial crisis situation, I create a dummy variable, equals to 1 if a country is categorized as under financial crisis in a year by the Laeven and Valencia (2013)'s financial crisis database and 0 otherwise, to include in all models.

4. Empirical Analysis

4.1 Summary statistics

Table 1 reports the countries included in main sample, the number of bank observations from each country, and country-level mean values of Z-score and Political Constraints for each country. Like many recent cross-country studies on banks (Houston *et al.* 2010; Zheng & Ashraf 2014; Ashraf & Zheng 2015), the number of bank observations is higher from some countries

⁸ I use information from survey conducted in 2011 for bank observations over the years 2008-2014 when sample is extended from 1998 to 2014 in robustness tests.

(i.e., 11643 observations from Germany, 4759 from Japan, 1973 from Switzerland, and so on) and lower from others (i.e., 1 from Papua New Guinea, 3 from both Sri Lanka and Zimbabwe, 8 from Guatemala, and so on). Z-score is lowest in Singapore (-4.42) and highest in Zambia (-2.06). Similarly, Political Constraints index has the lowest 0 value for countries such as Azerbaijan, China, Saudi Arabia etc. and higher values for mostly western countries (i.e., 0.89 for Belgium, 0.87 for Australia, France and Switzerland, and so on).

Table 2 reports summary statistics for main variables. Z-score has mean and standard deviation of -3.64, and 1.09, respectively. These statistics are comparable in magnitude to that reported by Houston *et al.* (2010) and Ashraf *et al.* (2016c). Political Constraints has mean and standard deviation values 0.73 and 0.20, respectively. These statistics show considerable cross-country variation in political constraints on government behavior for sample countries. As shown from the mean and standard deviation values that all bank-level and country-level variables have a considerable variation across means.

Table 3 reports correlations between variables. As shown from correlations of Panel 2, different proxies of political institutions, to some extent, measure different aspects of political institutions.

(Insert Table 2 here)

(Insert Table 3 here)

4.2 Empirical model

Since the dataset used is panel form over the period 2000-2007, the pooled panel ordinary least squares estimator is used to examine the impact of political institutions on bank risk-taking after including related control variables. Use of pooled panel estimator offers two advantages here: First, this estimator estimates the impact of existing political institutions on bank risk-taking proxies and thus takes into account cross-country variation in political institutions. Second, this estimator also helps to shed light on how the probability of bank default changes over time if changes, although slow, occur in political institutions. Specifically, I estimate following model.

$$Z - score_{i,j,t} = \alpha_i + \beta_1 Political Institutions_{j,t} + \sum_{k=1}^k \beta_k X_{i,j,t}^k + \sum_{l=1}^l \beta_l X_{j,t}^l + \sum_{m=1}^m \beta_m X_{j,t}^m + \sum_{t=1}^{T-1} \epsilon_t D_t + \epsilon_{i,j,t} \quad Eq. (1)$$

Here, i, j and t subscripts represent bank, country and year, respectively. α_i is a constant term. Dependent variable, *Z-score*, measures bank risk-taking where higher values of *Z-score* represent the higher probability of bank default and vice versa. Political Constraints index is used as main proxy of *Political Institutions*, while alternative proxies are also employed for robustness tests. $X_{i,j,t}^k$ is a set of bank-level control variables including Total Assets (log), Growth Total Assets, Loan Loss Provisions/Total Assets and Noninterest Income/Total Income. $X_{j,t}^l$ is a set of banking industry-level controls including Bank Concentration, Capital Stringency, Activity Restrictions and Deposit Insurance. And $X_{j,t}^m$ is a set of country-level macroeconomic and institutional controls including GDP Per Capita (log), GDP Growth, Inflation, Creditor Rights and Law & Order variables. Detailed definitions of all these variables are given in [Section 4](#). D_t are year fixed-effects dummy variables to control for global business cycles. $\epsilon_{i,j,t}$ is an error term. Heteroskedastic-robust standard errors are used to estimate p -values in regressions.

4.3 Political institutions and bank risk-taking: Main specification

To analyze the impact of political institutions on bank risk-taking, Eq. (1) is estimated using all six proxies of political institutions one-by-one and results are reported in Table 4. Model 1 reports the primary specification that estimates the effect of Political Constraints index on bank risk-taking. Models 2 to 6 estimate the impact of alternative proxies of political institutions on bank risk-taking.

Political Constraints index enters positive (0.244) and with highly significant (at 1% level) coefficient in Model 1 showing that the probability of bank default is significantly higher in countries with higher political constraints. This result suggests that political institutions have significant positive first-order effects on bank risk-taking behavior. This finding is consistent with the credit market competition and moral hazard effects, whereby better political institutions increase banks' risk by promoting the competition from bond and equity markets and generating the moral hazard that a government will bailout the banks in worst economic conditions. While it is opposite to the government expropriation risk and adverse selection hypotheses, whereby better political institutions decrease banks' risk by decreasing the government expropriation of banks and lessening the information asymmetries between banks and borrowers. Economic significance of the result is also notable. A one standard deviation change in Political Constraints index (0.20) is associated with a change in Z-score of 0.049 ($0.244 * 0.20$) where the mean Z-score is -3.64 in model 1.

Control variables also show significant results in expected directions. For bank-level controls, negative and significant coefficient on Total Assets (log) shows that large banks in general have less risk. Positive and significant coefficients on Growth Total Assets, Loan Loss Provisions/Total Assets and Noninterest Income/Total Income variables show that banks having higher growth opportunities, more loan loss provisions and higher share of non-interest income in total revenues, respectively, are more risky.

(Insert Table 4 here)

For industry-level controls, negative and significant coefficients of Capital Stringency and Activity Restrictions show that the probability of bank default is lower in countries which impose stringent capital requirements for banking industry and restrict banks from dealing in non lending activities. These findings suggest that banking regulations, such as minimum capital requirements and the restrictions on bank activities, are effective in restricting excessive bank risk-taking and are consistent with recent studies (Rahman *et al.* 2015; Ashraf *et al.* 2016a). Positive and significant coefficient of Deposit Insurance shows that the probability of bank default is higher in countries where explicit deposit insurance schemes exist. This result is consistent with the line of research which suggests that deposit insurance reduces depositors' discipline on banks and generates moral hazard problems encouraging banks to take higher risks (Demirgüç-Kunt & Detragiache 2002; Demirgüç-Kunt & Huizinga 2004).

For country-level macroeconomic controls, negative and significant coefficient of GDP Per Capita (log) indicates that the probability of bank default is lower in high income countries. Possible reasons for this result are the availability of diversification opportunities, better access and capacity to afford advance risk management techniques and the availability of necessary skills to measure and manage risks in developed countries. Positive and significant coefficients of GDP Growth and Inflation show that banks' default risk is higher in growing and inflationary economies. The possible reason is that higher GDP growth normally drives higher levels of speculative bank-funded lending which is more likely to increase bank risk-taking. This effect

would be even more serious if banks fund this lending with large amounts of short-term debt (Reinhart & Rogoff 2009).

For country-level institutional controls, Law & Order variable shows a significantly negative impact on the probability of bank default. This seems to be an outcome of better law enforcement due to which the contractual parties to loan agreements are more likely to honor their commitments. Positive association of Creditor Rights index with the probability of bank default is consistent with the findings of Houston *et al.* (2010) and shows that banks take on higher risks in countries where they enjoy strong legal protection as creditors.

These results of control variables, not only, confirm the influence of control variables on bank risk-taking, but also validate the model to analyze the relationship between political institutions and bank risk-taking behavior.

Results for alternative proxies of political institutions in Models 2 to 6 are also consistent with the result of main proxy, Political Constraints, of political institutions. Model 2 replaces Political Constraints with Political Rights index from Freedom_House (2013), a measure that captures fairness and competitiveness of elections and constraints on government from minority groups. Consistent with the results of Model 1, Political Rights index shows positive (0.034) and significant (at 1% level) coefficient suggesting that bank risk-taking is significantly higher in countries having higher political rights. Model 3 uses democratic accountability index, Democratic Accountability, from ICRG database as a proxy of political institutions. Democratic Accountability captures the responsiveness of the government toward its people. Consistent with main results, coefficient (0.031) is positively significant at 1% level suggesting that banks take higher risk when government accountability towards its people is higher.

Models 4 and 5 use two alternative proxies, GOVFRAC and POLARIZ, from the political institutions database of World Bank (Beck *et al.* 2001). By measuring the probability of selection of legislatures from different parties, GOVFRAC captures checks and balances on the government. And, by measuring the strength of different parties in a government, POLARIZ captures constraints on the government. Again, positive and significant coefficients of GOVFRAC (0.291) and POLARIZ (0.064) in Models 4 and 5, respectively, show that strong political institutions in the form of higher checks and balances and higher level of constraints on government encourage banks to take on higher risk. Model 6 uses Polity index from Polity IV Project dataset as a proxy of political institutions. Polity index captures the autocratic or democratic nature of the government. Consistent with main results, coefficient (0.007) is positive and significant at 1% level. These results of alternative proxies further confirm that the positive first-order effect of political institutions on bank risk-taking behavior is robust and is not sensitive to any one definition of political institutions.

Overall, above results suggest that political institutions have strong first-order effect on bank risk-taking even after controlling for the second-order effects and the probability of bank default is significantly higher in countries with strong political institutions.

4.4 Alternative specifications and endogeneity

Several robustness tests are performed to further confirm the main results. Country-level and bank-level regressions are estimated to confirm that main results are not biased due to the large number of banks from few countries or the higher number of annual observations for some banks and less for others. For country-level regression, Z-score is averaged at country-level and renamed as Z-score (country). Political Constraints and all control variables are also averaged at country-level. This reduces sample to 98 country-level observations. Z-score (country) is

regressed on country-level averaged Political Constraints and control variables using cross-sectional ordinary least squares estimator. As shown in Model 1 in Table 5, the coefficient of Political Constraints (0.405) remain positive and significant (significance weakens to 5% level) confirming main results. The main reason for weakness in significance is very small sample size (98 observations) for this test.

For bank-level regression, a new Z-score (bank) is calculated for each bank having at least three or more valid observations over the sample period. Here, $Z\text{-score (bank)} = (\text{ROA} + \text{CAR}) / \sigma(\text{ROA})$, where ROA is annual return on assets before loan loss provisions and taxes averaged over sample period (i.e., 1998-2007), CAR is annual equity to total assets ratio averaged over sample period, and $\sigma(\text{ROA})$ is standard deviation of annual values of return on assets before loan loss provisions and taxes calculated over sample period. Political Constraints and other control variables are also averaged over the same period over which Z-score (bank) is calculated. This results in one observation per bank. Z-score (bank) is regressed on averaged Political Constraints and control variables using cross-sectional ordinary least squares estimator. As shown in Model 2 in Table 5, Political Constraints (0.365) enters positive and significant (at 1% level). It again confirms main results.

Further, the number of bank observations is relatively higher from Germany (11643 observations) as shown in Table 1. To confirm that main results in Table 4 are not biased due to the higher number of observations from one country, all observations of Germany are deleted and all specifications of Table 4 are re-estimated. As shown in Model 3 of Table 5, Political Constraints index (main proxy of political institutions) enters positive and significant at 1% level. In unreported results, positive and significant results are observed for alternative proxies of political institutions also.

(Insert Table 5 here)

Since all banks operating in a country are subject to the same country-level macroeconomic and institutional variables (e.g., deposit insurance, banking regulations, law and order and political factors), I use more conservative standard errors by clustering at country level and re-estimate main specification (i.e., Model 1 in Table 4). As shown from results of Model 4 in Table 5, Political Constraints index enters positive and significant. In unreported results, I observe that results of alternative proxies of political institutions are largely remain same when standard errors are clustered at country-level.

Another possible concern with the results might be endogeneity between bank risk-taking and political institutions. To test this possibility, instrumental variable approach is used for the main specification (Model 1 of Table 4) and results are reported in Models 5 and 6 of Table 5. Keeping in mind the arguments of Baum *et al.* (2003) that an instrument must satisfy the relevance and exogeneity conditions, I follow Boubakri *et al.* (2013) and use individualism index of Hofstede *et al.* (2010) as an instrument for political institutions. This index is available for 75 sample countries.

This index is suitable as Hofstede links political institutions with individualism dimension of national culture on the one hand, while cross-cultural researchers consider this dimension to be the most significant and fundamental driver of cultural differences across countries/societies (Triandis 2001) on the other hand. In high individualism societies, voters are more empowered to use political power and the political power is more balanced. Consistent with this argument, Individualism variable enters positive and significant with Political Constraints index in first stage regression in Model 5. In Model 6, the fitted values of Political

Constraints index enter positive and significant with Z-score in second-stage regression. These results confirm that the endogeneity is less a concern in main results. To assess the appropriateness of the instrument, I rely on the Kleibergen-Paap under-identification test and the Stock-Yogo weak identification test.

Kleibergen-Paap under-identification test is an LM test of whether the model is identified (i.e., the excluded instrument, Individualism, is relevant or correlated with endogenous regressor, Political Constraints). Kleibergen-Paap rk LM statistic produces a zero p -value suggesting that the model is identified and the Individualism dimension of national culture is an appropriate external instrument for Political Constraints index. Stock-Yogo weak identification test is performed to test that individualism is not a weak instrument for Political Constraints. F-test of the excluded exogenous variable is conducted in the first-stage regression for analyzing the null hypothesis that the Individualism does not explain differences in Political Constraints. The null hypothesis is rejected at the 1% level suggesting that Individualism is not weakly correlated with the endogenous variable, Political Constraints. The results of these both tests indicate that the instrument is relevant. With one endogenous and one instrumental variable, the regression is exactly-identified and a formal over-identification test to check the exogeneity of the instrument cannot be performed.

4.5 Components of the Z-score and alternative bank risk-taking measure

Disaggregating the Z-scores, where $Z\text{-score} = (\text{CAR} + \text{ROA}) / \sigma(\text{ROA})$, higher bank equity ratios and higher levels of ROA translate into higher Z-scores, and higher standard deviations of ROA translate into lower Z-scores. So, the finding that stronger political institutions result in lower Z-scores (or higher when Z-score is multiplied with -1 in above tests) may be attributed to lower equity ratios, lower ROA, and/or higher standard deviations of ROA. Therefore, it is possible that existence of stronger political institutions may not necessarily increase the risk of banks assets, but rather the drop in Z-scores may instead be due to a decline in the average bank equity ratios. To explore that how various components of Z-score relate to stronger political institutions, Eq. (1) is estimated by using each of the Z-score components as a separate dependent variable and results are reported in Table 6. Political Constraints index shows negative and significant coefficients with equity ratios and ROA in Models 1 and 2, respectively, while the coefficient is not significant with standard deviation of ROA in Model 3. These results suggest that the higher probability of bank default in countries with higher political constraints is primarily driven by the lower capital levels and lower ROA, but not by the higher volatility of ROA. These results support main finding that banks are more risky in better political institutions countries.

For example, for capital levels, it is well established argument in post-crisis banking literature that lower levels of capital cause higher bank risk-taking (Admati & Hellwig 2013). Further, higher bank risk-taking in the form of lower equity ratios further supports the argument that better political institutions increase moral hazard by increasing the expectation of government bailouts. Because by reducing the equity ratios, banks increase the value of put-option on bank assets for equity holders. This finding is also consistent with the arguments of Calomiris and Haber (2014) that government pressurized banks to extend excessive subprime loans during the run-up period to the 2007-09 crisis in the United States and used lenient capital requirements to make up for erosion in bank profits.

(Insert Table 6 here)

Similarly, banks having lower ROA ratios are risky because these banks cannot accumulate enough equity to use as buffer capital in bad times on the one hand and are expected to increase risk-taking to compensate for lower profitability on the other hand. Lower profitability is also a validation of the argument that in better political institutions countries, banks face more competition from alternative sources of lower cost financing, such as bond market or equity issuing, and cannot charge higher rates on loans. Banks can compensate lower profitability with more asset risk; however, bankers' attempts to increase profitability will result in more volatility of earnings. But insignificant coefficient of standard deviation of ROA suggests that banks do not try to increase ROA with increased asset risk, and is somewhat surprising given the robust main results in Table 4. To further confirm this issue, I use an alternative measure of bank assets quality, $\sigma(\text{NIM})$ (i.e., standard deviation of annual net interest margin calculated over 3-year overlapping periods starting in 1998 and ending in 2007). $\sigma(\text{NIM})$ measures the lending risk of a bank and is a better measure than standard deviation of ROA⁹ for measuring bank risk-taking in lower quality loans.

Eq. (1) is estimated using $\sigma(\text{NIM})$ as dependent variable with all six proxies of political institutions. As shown in Table 6, most of the political institutions proxies show positive and significant coefficients; Political Constraints (0.073), Political Rights (0.014), GOVFRAC (0.185), POLARIZ (0.049) and Polity (0.004) enter positive and significant except Democratic Accountability. In contrast to the insignificant result of Political Constraints with $\sigma(\text{ROA})$ in Model 3, these results suggest that banks increase their lending risk to compensate for the lower profitability in better political institutions countries. One possible reason for insignificant result of Political Constraints with $\sigma(\text{ROA})$ in Model 3, but positively significant result with $\sigma(\text{NIM})$ in Model 4 may be that some of the volatility in total earnings is smoothed by varying the level of non-interest income in better political institutions countries.

4.6 Other control variables

To confirm that main results are not biased due to some important omitted variables, a number of additional control variables are added in main specification and results are reported in Table 7. Corruption and socio-economic conditions indices from ICRG database, and freedom of press index, Press Freedom, from Freedom_House (2013) database are included one-by-one and simultaneously to examine some possible channels through which political institutions may impact bank risk-taking behavior. These variables are rescaled so that higher values of these variables represent low corruption, better socio-economic conditions and higher freedom of press, respectively. Positive and significant coefficients of Political Constraints in Models 1 to 4 suggest that political constraints hold direct influence beyond their influence through the channels of corruption, socioeconomic conditions and freedom of press. Indeed, the inclusion of corruption, socio-economic conditions and freedom of press indices although weaken the coefficient of Political Constraints index, but it does not eliminate the effect of political institutions on bank risk-taking behavior.

Glaeser *et al.* (2004) argue a best proxy of political institutions is that which measures ex-ante constraints on government behavior rather than the ex-post performance/outcomes of the government. To confirm that my proxy of political institutions actually captures ex-ante constraints on government behavior while not the ex-post government performance, I include

⁹ ROA includes both lending and non lending incomes, and banks can use non lending income to smooth variation in lending income.

yearly assessments of effectiveness of the government, Govt. Effectiveness, and political stability, Political Stability, in a country from World Governance Indicators of the World Bank. As shown from the results of Models 5 to 7, the Political Constraints index keeps its significance. Both Govt. Effectiveness and Political Stability enter positive and significant showing that ex-post higher government effectiveness and higher political stability in a country encourage banks to take higher risks.

(Insert Table 7 here)

Finally, Ashraf *et al.* (2016c) examine the impact of national culture on bank risk-taking and suggest to include cumulative national culture variable (IND + Inv UAI + Inv PDI) to proxy for national cultural effects. I also include this variable to examine that the proxy of political institutions is not capturing the cultural effects. As shown in Model 9, Political Constraints enters positive and significant even after controlling for cumulative national culture variable. This result confirms that national culture and political institutions have independent effects on bank risk-taking behavior.

4.7 Sample extension and crisis-period analysis

As another robustness test, the sample period is extended from 1998 to 2014 by including the data of years 2008 to 2014 into the main sample. Z-score is recalculated for extended sample using 3 year overlapping window. This increases effective sample to 72,940 bank observations from 107 countries¹⁰. Again due to three year overlapping window used to calculate Z-score, the effective sample period starts from 2000 and ends at 2014. All specifications of Table 4 are re-estimated and results are reported in Table 8. Consistent with the results of Table 4, all proxies of political institutions enter positive and significant except Democratic Accountability in Model 3. A worthwhile point to mention here is that the coefficients of all proxies of political institutions in Table 8 are lower than the coefficients observed in Table 4 for pre-crisis sample period. For example, the coefficient of Political Constraints is 0.244 in Table 4, but weakens to 0.077 in Table 8. Similarly, the coefficients of alternative proxies of political institutions are also lower. These lower coefficients in Table 8 suggest that existing political institutions have lower effect on bank risk-taking during crisis times as the inclusion of crisis period into main sample has weakened the effect of political institutions on bank risk-taking for the whole sample.

To further examine the crisis period effects on the relationship between political institutions and bank risk-taking, I drop crisis country-years, crisis years and crisis countries from the extended sample and report results in Table 9. Model 2 reports main specification where I drop 2008 to 2014 country-years data of global financial crisis hit countries from the extended sample. Model 3 reports results after dropping 2008 to 2014 country-years data for all countries. Model 4 reports results after dropping 2008 to 2014 country-years data for all countries as well as all banks for countries which remained under crisis for two or more years over the period 1998-2007. As shown coefficient of Political Constraints is lowest (0.077) in full extended sample in Model 1, while it increases as crisis country-years, crisis-years or crisis countries data is dropped, with highest coefficient (0.398) for 1998-2007 non crisis countries sample in Model 4. These results again confirm that existing political institutions have strongest influence on bank risk-taking in non-crisis periods and non-crisis countries.

¹⁰ As more countries qualify to be included into sample due to having at least one bank with three or more valid observations in extended sample period, therefore number of countries increases to 107 for extended sample as compared to 98 countries in the main sample.

Possible reason for weak results during the crisis period is higher endogeneity between political institutions and banking during crisis periods. For example, veto players of the political system face more public pressure and have fewer options to restrict government to not act in the crisis period. Therefore, due to direct interventions of state into banking sector during financial crisis in the form of bank nationalizations, deposit guarantees, changing regulations and/or monetary policies, the existing political institutions have lower influence over bank risk-taking behavior during crises periods.

(Insert Table 8 here)

(Insert Table 9 here)

4.8 Legal institutions, deposit insurance, income-level and political institutions' effects on bank risk-taking

Legal institutions:

Extant literature has examined the interdependence between political and legal institutions. For example, Qi *et al.* (2010) and Boubakri *et al.* (2014) find that political and legal institutions substitute each other to determine the yield on corporate bonds and the implied cost of equity capital, respectively. Therefore, I also analyze whether the cross-country differences in legal institutions influence the relationship between political institutions and bank risk-taking behavior.

For analysis, the main sample is distributed into weak and strong legal institutions countries subsamples. For doing so, two alternative proxies of legal institutions, legal origin and legal rights of creditors, are used. The main specification (i.e., Model 1 of Table 4) is re-estimated for each subsample to analyze that in which group political institutions are more important.

Data for legal origin of a country is obtained from Professor Andrei Shleifer's Harvard web pages¹¹. Sample countries are divided into common and non-common legal origin subsamples. Legal rights of creditors are measured with the strength of legal rights index from Doing Business database of World Bank. This index ranges from 1 to 10 where lower values represent lower legal rights and vice versa. Annual data for this index is available for most of the sample countries from 2005 onward. Since legal institutions change very slowly over time, the 2005 values of the strength of legal rights index of each country are used for the years 2000 to 2004. The index is averaged for each country and the countries having average values from 1 to 5 are classified as low legal rights countries and having values from 6 to 10 as high legal rights countries.

Table 10 reports results for common and non-common legal origin, and low and high legal rights subsamples, separately. As shown, Political Constraints enters positive and with higher coefficients in common (Model 2) and high legal rights (Model 4) countries subsamples. The coefficient of Political Constraints is almost two times higher in common legal origin subsample (0.244) as compared to its value for other legal origins subsample (0.159). Similarly, the coefficient is almost five times higher in high legal rights subsample (0.878) as compared to its value in low legal rights subsample (0.180). These results show that political institutions have comparatively strong positive effects on bank risk-taking in common legal origin and high legal protection countries. Given the findings of Cole and Turk (2013) that banks have higher loan

¹¹ Dataset was downloaded from the link <http://scholar.harvard.edu/shleifer/publications?page=2> in June 2014.

ratios in common law countries and Houston *et al.* (2010) that banks have higher insolvency risk in strong legal rights countries, the findings here that political institutions have stronger effect on bank risk-taking in common law and higher legal rights countries suggest that the political institutions have significant marginal effect over and above the legal institutions and the managers of banks view political and legal institutions as complements in making bank risk-taking decisions. These results also confirm the arguments of Roe and Siegel (2011) that better political institutions ensure consistency and enforcement of better legal institutions. However, these results are not consistent with Qi *et al.* (2010) and Boubakri *et al.* (2014) who find that political and legal institutions substitute each other to determine the yield on corporate bonds and the implied cost of equity capital, respectively.

(Insert Table 10 here)

Deposit insurance:

I further examine the moral hazard problems channel of political institutions. Although Deposit Insurance variable is included in all models to control for the effects of explicit deposit insurance, however I further confirm that positive association between political institutions and bank risk-taking is not due to the moral hazard problems of already existing explicit deposit insurance but is due to the expectation of government bailouts linked with political factors. For doing so, I distribute main sample into two subgroups based on existence of explicit deposit insurance schemes: ‘Explicit deposit insurance’ subgroup consists of bank observations of countries where deposit insurance is already in place or country-years after the implementation of explicit deposit insurance if it was implemented during the sample period. ‘No explicit deposit insurance’ subgroup consists of bank observations of countries which don’t have explicit deposit insurance or country-years before the implementation of explicit deposit insurance if it was implemented during the sample period¹². Data for that a country has explicit deposit insurance or has implemented explicit deposit insurance during the sample period is collected from Demirgüç-Kunt *et al.* (2005), Demirgüç-Kunt *et al.* (2014) and other internet country sources such as websites of central banks or regulatory authorities.

As shown in Table 10, Political Constraints enters positive and significant in ‘explicit deposit insurance’ sub-group (Model 6) showing that political institutions keep their positive influence over and above the moral hazard effect of already existing deposit insurance. Given the findings of previous studies that banks take higher risk due to the moral hazard problems of explicit deposit insurance (Demirgüç-Kunt & Detragiache 2002; Anginer *et al.* 2014; Hoque *et al.* 2015), this positive association of Political Constraints in ‘explicit deposit insurance’ subsample indicates that the moral hazard problems linked with better political institutions complement the moral hazard problems of explicit deposit insurance for bank risk-taking. On the other hand, Political Constraints index enters insignificant in ‘No explicit deposit insurance’ subsample (Model 5). This latter result, to some extent, suggests that there will be less moral hazard due to the expectation of government bailouts, if the government has a tradition to not provide explicit guarantees.

¹² Some sample countries implemented explicit deposit insurance systems during the sample period (number of countries with explicit deposit insurance has increase from 84 countries in 2003 to 112 countries in 2013 in the World as mentioned in Demirgüç-Kunt *et al.* (2014)), so we classify years before the start of explicit deposit insurance in ‘no explicit deposit insurance’ group and years after the start of deposit insurance in ‘explicit deposit insurance’ group.

Income level of countries:

Income levels of countries may impact the association between political institutions and bank risk-taking. To examine this possibility, the sample countries are distributed, first, into two income categories (i.e., developed and developing countries) and then in more precise four income categories (i.e., low income, lower middle income, higher middle income and higher income OECD countries) based on World Bank classification of countries. World Bank classifies countries based on their GDP per capita. As shown in Models 1 and 2 in Table 11, Political Constraints index enters positive and significant in both developing and developed countries subsamples. Models 3 to 6 report result for four income categories. Again Political Constraints index enters positive and significant in low income, lower middle income and higher income OECD countries subsamples. The coefficient of Political Constraints in higher middle income countries subsample although insignificant, but is positive and suggests positive influence of political institutions on bank risk-taking. Positive association between political institutions and bank risk-taking in low and lower middle income countries suggests that better political institutions pave the way for higher bank risk-taking in these countries by increasing the competition from alternative sources of financing and increasing the investment opportunities for banks. This positive influence is further augmented by higher moral hazard problems linked with the expectation of government bailouts as the income levels of countries increase. Consequently, political institutions have strongest positive influence on bank risk-taking in developed (Model 2) or high income OECD countries' subsamples (Model 6). These results largely suggest that better political institutions increase bank risk-taking in all countries irrespective of the income levels of different countries.

(Insert Table 11 here)

5. Conclusion

The global financial crisis of 2007-09 has urged new research on bank risk-taking behavior. In this regard, the literature which considers country-level factors as significant determinants of bank risk-taking behavior has expanded. In this study, I contribute to this strand of the literature by examining the impact of political institutions on bank risk-taking behavior.

Building on recent political economy literature, I hypothesize that political institutions may have first-order effects on bank risk-taking behavior through government expropriation risk, adverse selection problems, credit market competition and moral hazard problems of expectation of government bailouts. Through all these channels, the net first-order effect of political institutions on bank risk-taking is uncertain and is an important empirical question. Further, political institutions might have second-order effects on bank risk-taking by ensuring the consistency and enforcement of legal institutions, and by shaping the banking industry structure and resulting competition. In empirical analysis, the first-order effects of political institutions on bank risk-taking are examined after controlling for their second-order effects through the legal institutions and banking industry structure.

Analyzing an international sample of banks from 98 countries over the period 1998-2007 and using the Z-score as main measure of bank risk-taking and the political constraints index of Henisz (2000) as main proxy of political institutions, I find robust evidence that political institutions have strong positive first-order effects on bank risk-taking behavior even after controlling for the second-order effects. The results are robust to the use of alternative proxies of political institutions, bank- and country-level regressions and different samples. The results also

hold when endogeneity is accounted for using instrumental variable approach. Further, the results for the subcomponents of Z-score (main measure of bank risk-taking) show that higher bank insolvency risk in countries with better political institutions is mainly driven by the lower equity ratios. Lower equity ratios indicate moral hazard problems; when the owners' equity acts as a put option on bank assets in the presence of the expectation of government bailouts, the banks try to maximize the value of this put option by reducing the equity. By using the volatility in net interest margins as alternative measure of banks' risk, it is observed that banks take higher risk in lending activities in better political institutions countries. Lower equity ratios and higher volatility in lending income suggest that the moral hazard problems generated by the expectation of government bailouts and the higher credit market competition from alternative sources of financing, respectively, urge higher bank risk-taking in countries with better political institutions. Contrary, I do not find support for the government expropriation risk and adverse selection hypotheses, whereby better political institutions decrease banks' risk by decreasing the government expropriation of banks and lessening the information asymmetries between banks and borrowers.

Further analysis shows that the effect of political institutions on bank risk-taking is not sensitive to the income levels of countries. Political institutions enter positive and significant in both developed and developing countries subsamples when main sample is divided into two income categories (developed vs. developing), or in low income, lower middle income and high income OECD countries subsamples when main sample is divided into four income categories (low income, lower middle income, higher middle income and high income OECD). I also confirm that the proxy of political institutions is not capturing the moral hazard of explicit deposit insurance by dividing main sample into two subsamples based on that a country implements explicit deposit insurance scheme or not. Results show that the positive influence of political institutions on bank risk-taking is robust in countries having explicit deposit insurance. Positive association of political institutions in 'explicit deposit insurance' subsample suggests that moral hazard problems linked with sound political institutions complement the moral hazard problems of explicit deposit insurance. I also examine the interdependence between political and legal institutions and find that political and legal institutions complement each other to influence bank risk-taking behavior.

These findings have important implications for governments and regulators. Constrained governments/sound political institutions generate moral hazard problems by increasing the likelihood that a government will bail-out the banks in worst economic conditions to safeguard the depositors and economy. Nonetheless, regulators in these countries have not used proper regulations, such as the higher capital requirements, to control moral hazard problems. One reason of lack of proper regulations might be that regulators consider moral hazard problems of explicit deposit insurance only. However, the findings of this study suggest that the regulators must devise regulations to control the moral hazard problems of better political institutions in addition to the moral hazard problems of explicit deposit insurance. One may argue that government can decrease future moral hazard problems by deciding not to bailout current troubled banks, but it might not always be an optimal solution when this decision causes systemic negative externalities. An optimal solution, then, may include higher capital requirements or any other regulation which can control higher bank risk-taking.

Appendix A: Political institutions and bank risk-taking: Variable definitions

Variable	Definition	Data Source
Dependent variables		
Z-score	Equals $-1 * [\log \{ (ROA + CAR) / \sigma(ROA) \}]$, where ROA and CAR are annual return on assets before loan loss provisions and annual taxes and equity to total assets ratios, respectively. $\sigma(ROA)$ is the standard deviation of annual values of return on assets before loan loss provisions and taxes calculated over three years rolling window. Higher values of Z-score represent higher bank risk-taking and vice versa.	Bankscope database
$\sigma(NIM)$	Equals standard deviation of annual net interest income to total earning assets ratio calculated over three years rolling window. Higher values of $\sigma(NIM)$ represent higher bank risk-taking and vice versa.	
Independent political institutions variables		
Political Constraints	'Political Constraints' is POLCONV index from Henisz dataset and measures the degree of constraints on a government policy change decision from the other independent veto points in the political system and the distribution of political preferences both across and within veto points. This index varies from 0 to 1 where 0 represents lower political constraints, while 1 shows higher constraints.	Henisz (2010)
Political Rights	'Political Rights' is political rights index from Freedom House surveys and measures the fairness and competitiveness of elections as well as the strength of competing political and minority factions in constraining the government. In original form, this index varies from 1 to 7 where lower values represent higher political rights and vice versa. For this study, it is multiplied by -1 so that higher values represent higher political rights and vice versa.	Freedom_House (2013)
Democratic Accountability	'Democratic Accountability' is democratic accountability index from International Country Right Guide dataset and measures the type of the government in a country (i.e., alternative democracy, dominated democracy, de facto one-party state, de jure one-party state and autarchies) and responsiveness of the government to its people. The index varies from 1 to 6 where lower values are assigned to autarchies and higher values to alternative democracies.	International Country Risk Guide (ICRG) database
GOVFRAC	GOVFRAC variable from the Database of Political Institutions of the Development Research Group of the World Bank. This variable measures the probability of selection of legislators from different parties in two random draws, where the probability may vary from 0 towards 1.	Database of Political Institutions (Beck <i>et al.</i> 2001)
POLARIZ	POLARIZ variable from the Database of Political Institutions of the Development Research Group of the World Bank. This index measures the maximum polarization between the executive party and the four principle parties of the legislature. POLARIZ varies from 0 to 2 where 0 represents that the chief executive's party has an absolute majority in the legislature and 2 shows higher polarization in government.	
Polity	Polity is polity index from the Polity IV Project of the Centre for	Marshall and

	Systemic Peace and measures the concomitant qualities of autocratic and democratic authority in governing institutions. Polity index spans from fully institutionalized autocracies (-10), through mixed authority regimes, to fully institutionalized democracies (+10).	Jagers (2013)
Independent Control variables		
Bank-level		
Total Assets (log)	Equals natural logarithm of annual total assets of each bank.	Bankscope database
Growth Total Assets	Equals year-on-year growth rate of annual total assets of each bank.	
Loan Loss Provisions/Total Assets	Equals annual loan loss provisions to total assets ratio of each bank.	
Noninterest Income/Total Income	Equals annual non-interest income to total revenue ratio of each bank.	
Industry-level		
Bank Concentration	Equals annual sum of assets of three largest banks as a percentage of sum of assets of all commercial banks operating in a country in that year.	Global financial development database, World Bank
Capital Stringency	Capital stringency variable measures whether regulatory capital requirements for banks in a country are in line with Basel accords. Index ranges from 0 to 10 where higher values indicate more stringent capital requirements for banks in a country.	Barth <i>et al.</i> (2013)
Activity Restrictions	This variable reflects the extent to which banks in a country are restricted to participate in securities, insurance, real estate activities or owning other firms. Variable ranges from 4 to 16 where higher values indicate higher restrictiveness.	
Deposit Insurance	Dummy variable equals 1 if a country has explicit deposit insurance and 0 otherwise.	
Country-level		
GDP Per Capita (log)	Equals logarithm of annual GDP per capita (current US\$) of each country.	World Development Indicators, World Bank
GDP Growth	Equals year-on-year annual GDP growth rate of each country.	
Inflation	Equals annual percentage change in consumer prices in a country.	
Creditor Rights	A measure of legal rights of creditors against debtor in case of reorganization or liquidation. The index ranges from 0 (weak creditor rights) to 4 (strong creditor rights).	Djankov <i>et al.</i> (2007)
Law & Order	Law and order index measures the overall law enforcement tradition of a country.	ICRG database
Socio-economic	Assessment of the socio-economic pressures at work in society that could constrain government action or fuel social dissatisfaction. The risk rating assigned is the sum of three subcomponents, each with a maximum score of 4 points and a minimum score of 0 points. A score of 4 points equates to 'very low risk', and a score of 0 points to 'very high risk'. The subcomponents are unemployment, consumer confidence, and poverty.	

Corruption	Assessment of the corruption in government. This variable ranges from 0 to 6, with high scores indicating that high government officials are likely to demand special payments, and illegal payments are generally expected throughout lower levels of government in the form of bribes connected with import and export licenses, exchange controls, tax assessment, policy protection, or loans.	
Press Freedom	Press freedom index assessing that how much free is the press in a particular country.	Freedom_House (2013)
Political Stability	Political stability and absence of violence measure the likelihood of destabilizing or overthrowing the government by unconstitutional or violent means and the extent of political violence and terrorism.	Kaufmann <i>et al.</i> (2010)
Govt. Effectiveness	Measures the quality of civil and public services and extent of independence of these services from political pressures, and quality of policy formulation and government's commitment to implementation of these policies.	

Appendix B: Country-level sample mean values of 5 alternative proxies of political institutions

Sr. #	Country Name	Political Rights	Democratic Accountability	GOVFRAC	POLARIZ	Polity
1	ALBANIA	-3	4.34	0.29	0.55	7.64
2	ALGERIA	-6	3.61	0.54	0.26	0.19
3	ARGENTINA	-2.12	4.61	0	0.45	8
4	ARMENIA	-4.63	3.23	0.48	-	5
5	AUSTRALIA	-1	6	0.28	2	10
6	AUSTRIA	-1	5.12	0.39	2	10
7	AZERBAIJAN	-6	1.68	0.03	0	-7
8	BANGLADESH	-3.93	3.30	0.22	0	4.35
9	BELARUS	-6.69	1.21	0.53	0	-7
10	BELGIUM	-1	5.72	0.81	2	9.74
11	BOLIVIA	-2.33	4.42	0.27	1.18	8.4
12	BOTSWANA	-2	3.59	0	0	8
13	BRAZIL	-2.24	4.64	0.75	1.88	8
14	BULGARIA	-1.10	5.18	0.31	0	8.9
15	BURKINA FASO	-4.56	3.62	0.27	0	-0.28
16	CAMEROON	-6.12	2.84	0.05	0	-4
17	CANADA	-1	6	0	0.86	10
18	CHINA	-7	1.06	0	0	-7
19	COLOMBIA	-3.74	3.57	0.37	2	7
20	COSTA RICA	-1	5.48	0.07	2	10
21	COTE D'IVOIRE	-6.14	1.78	0.55	0	1.12
22	CROATIA	-2	5.20	0.40	1.05	8.37
23	CZECH REPUBLIC	-1	5.21	0.25	2	9.51
24	DENMARK	-1	6	0.39	2	10
25	ECUADOR	-3	4.08	0.36	2	6.01
26	EGYPT	-6	2.03	0	0	-5.17
27	EL SALVADOR	-2	4.53	0.19	2	7
28	ETHIOPIA	-5	4.10	0.41	0	10
29	FINLAND	-1	6	0.63	1.36	10
30	FRANCE	-1	5.42	0.26	0.84	9
31	GERMANY	-1	5.38	0.33	2	10
32	GHANA	-1.44	4.16	0.05	0.62	6.88
33	GREECE	-1	6	0	0	10
34	GUATEMALA	-3.5	4.56	0.51	1.67	8
35	HONDURAS	-3	4	0	0	7
36	HUNGARY	-1	6	0.24	1.16	10
37	INDIA	-2	6	0.59	1.24	9
38	INDONESIA	-2.60	4.51	0.55	-	7.02
39	IRELAND	-1	6	0.14	0.65	10
40	ISRAEL	-1	6	0.69	1.59	10
41	ITALY	-1	5.07	0	0.20	10
42	JAMAICA	-2	4	0	0	9
43	JAPAN	-1	5	0.19	0	10
44	JORDAN	-4.97	4.23	0.12	0	-2.16
45	KAZAKHSTAN	-6	1.39	0.18	0	-5.58
46	KENYA	-3.99	4.26	0	0	5.39
47	KUWAIT	-4	3	0.50	0	-7
48	LATVIA	-1.20	5	0.65	1	8
49	LITHUANIA	-1.13	5.35	0.57	0	10
50	MADAGASCAR	-3	5	0.38	0	7
51	MALAWI	-3.76	4	0	0	5.31
52	MALAYSIA	-4.49	3.21	0.45	0	3
53	MALI	-2	3.26	0.14	0	6
54	MEXICO	-2	5.94	0.12	1.04	8
55	MOROCCO	-5	4.25	0.77	0	-6

56	MOZAMBIQUE	-3	4.27	0	0	5
57	NAMIBIA	-2	4	0	0	6
58	NETHERLANDS	-1	6	0.58	2	10
59	NEW ZEALAND	-1	6	0.23	2	10
60	NICARAGUA	-3	6	0	0.36	8.09
61	NIGER	-3.36	4.68	0.53	-	5.64
62	NIGERIA	-4	3.09	0	0	4
63	NORWAY	-1	6	0.49	2	10
64	OMAN	-6	1	0	0	-8.17
65	PAKISTAN	-6	0.81	0.03	0	-3.75
66	PANAMA	-1	6	0.26	0	9
67	PAPUA NEW GUINEA	-3	4.5	-	-	4
68	PARAGUAY	-3.47	2	0	0.85	7.53
69	PERU	-2.01	4.33	0.03	0.75	8.39
70	PHILIPPINES	-3.47	5	0.59	0.98	8
71	POLAND	-1	6	0.38	0	9.76
72	PORTUGAL	-1	6	0.03	0.78	10
73	REP. KOREA	-1.54	5.99	0.16	0.62	8
74	REP. MOLDOVA	-2.97	4.83	0.02	0.03	8
75	ROMANIA	-2.14	6	0.23	0.25	8.60
76	RUSSIA	-5.90	3.17	0.05	0	6.09
77	SAUDI ARABIA	-7	0.20	0	0	-10
78	SENEGAL	-2.17	3.83	0.04	0.20	7.85
79	SINGAPORE	-5	2	0	0	-2
80	SLOVAKIA	-1	6	0.70	1	9.28
81	SLOVENIA	-1	5.08	0.59	1.61	10
82	SOUTH AFRICA	-1.58	4.57	0.05	0	9
83	SPAIN	-1	5.98	0.01	1.63	10
84	SRI LANKA	-3	4.59	0.14	1	5
85	SWEDEN	-1	6	0.45	2	10
86	SWITZERLAND	-1	6	0.69	-	10
87	THAILAND	-3.25	4.18	0.40	0	6.02
88	TOGO	-5.75	2.22	0	0	-3.5
89	TUNISIA	-6.21	2	0	0	-3.88
90	TURKEY	-3.06	4.82	0.09	0.27	7
91	UGANDA	-5	2.5	0	0	-1.79
92	UKRAINE	-3.53	3.66	0.25	1	6.30
93	UNITED KINGDOM	-1	6	0	0	10
94	UNITED REPUBLIC OF TANZANIA	-4	4	0.01	0	-1
95	URUGUAY	-1	5	0.33	1.34	10
96	VIET NAM	-7	1	0	0	-7
97	ZAMBIA	-3.93	4.18	0	0	4.57
98	ZIMBABWE	-6	1	0	0	-4
Total sample mean		-1.69	5.04	0.29	1.15	8.77

Note: This appendix reports country-level mean values of 5 alternative proxies of political institutions. Political Rights is political rights index from Freedom_House (2013), Democratic Accountability is democratic accountability index from ICRG database, GOVFRAC is government fractionalization variable and POLARIZ is POLARIZ index both from Beck *et al.* (2001), and Polity is polity index from Polity IV Project dataset.

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Table 1 Country-wise sample distribution and descriptive statistics

Sr. #	Country Name	Annual Observations	Z-score	Political Constraints
1	ALBANIA	26	-3.34	0.42
2	ALGERIA	56	-2.92	0.46
3	ARGENTINA	306	-2.13	0.42
4	ARMENIA	41	-3.06	0.24
5	AUSTRALIA	40	-3.60	0.87
6	AUSTRIA	1423	-4.09	0.75
7	AZERBAIJAN	70	-3.03	0.00
8	BANGLADESH	83	-3.12	0.32
9	BELARUS	43	-2.95	0.00
10	BELGIUM	258	-3.69	0.89
11	BOLIVIA	60	-3.12	0.57
12	BOTSWANA	27	-2.76	0.44
13	BRAZIL	574	-2.59	0.72
14	BULGARIA	106	-3.16	0.69
15	BURKINA FASO	45	-2.99	0.34
16	CAMEROON	46	-2.59	0.00
17	CANADA	129	-3.35	0.85
18	CHINA	214	-3.64	0.00
19	COLOMBIA	97	-2.74	0.21
20	COSTA RICA	200	-3.84	0.72
21	COTE D'IVOIRE	50	-3.63	0.11
22	CROATIA	203	-3.19	0.73
23	CZECH REPUBLIC	83	-3.23	0.74
24	DENMARK	458	-3.64	0.69
25	ECUADOR	92	-2.94	0.29
26	EGYPT	153	-3.15	0.17
27	EL SALVADOR	64	-3.66	0.19
28	ETHIOPIA	42	-2.97	0.15
29	FINLAND	22	-3.59	0.77
30	FRANCE	1215	-3.82	0.87
31	GERMANY	11643	-3.69	0.84
32	GHANA	19	-2.61	0.35
33	GREECE	49	-3.46	0.70
34	GUATEMALA	8	-4.93	0.49
35	HONDURAS	77	-2.85	0.30
36	HUNGARY	106	-3.36	0.75
37	INDIA	382	-3.08	0.72
38	INDONESIA	306	-2.76	0.26
39	IRELAND	31	-4.27	0.76
40	ISRAEL	94	-3.81	0.78
41	ITALY	1446	-3.97	0.73
42	JAMAICA	23	-3.50	0.40
43	JAPAN	4759	-3.98	0.76
44	JORDAN	79	-3.70	0.13
45	KAZAKHSTAN	113	-2.82	0.00
46	KENYA	146	-3.34	0.40
47	KUWAIT	54	-3.91	0.21
48	LATVIA	102	-3.36	0.78
49	LITHUANIA	61	-3.41	0.77
50	MADAGASCAR	32	-2.88	0.44
51	MALAWI	31	-2.70	0.41
52	MALAYSIA	54	-3.48	0.63
53	MALI	34	-3.20	0.35
54	MEXICO	220	-2.97	0.30
55	MOROCCO	44	-3.98	0.60
56	MOZAMBIQUE	16	-2.37	0.32

57	NAMIBIA	16	-3.91	0.70
58	NETHERLANDS	112	-3.86	0.77
59	NEW ZEALAND	11	-4.15	0.71
60	NICARAGUA	13	-3.27	0.74
61	NIGER	28	-2.90	0.48
62	NIGERIA	150	-2.73	0.46
63	NORWAY	318	-4.24	0.77
64	OMAN	36	-4.24	0.00
65	PAKISTAN	110	-2.92	0.03
66	PANAMA	240	-3.67	0.29
67	PAPUA NEW GUINEA	1	-2.93	0.63
68	PARAGUAY	92	-2.36	0.36
69	PERU	89	-3.06	0.20
70	PHILIPPINES	70	-3.70	0.37
71	POLAND	120	-3.35	0.74
72	PORTUGAL	71	-3.51	0.75
73	REP. KOREA	16	-2.53	0.75
74	REP. MOLDOVA	41	-3.10	0.74
75	ROMANIA	133	-2.85	0.73
76	RUSSIA	1896	-3.20	0.72
77	SAUDI ARABIA	75	-3.85	0.00
78	SENEGAL	43	-3.40	0.31
79	SINGAPORE	32	-4.42	0.03
80	SLOVAKIA	95	-3.13	0.78
81	SLOVENIA	99	-3.57	0.77
82	SOUTH AFRICA	78	-3.46	0.43
83	SPAIN	370	-4.23	0.85
84	SRI LANKA	3	-2.39	0.24
85	SWEDEN	467	-4.16	0.77
86	SWITZERLAND	1973	-3.91	0.87
87	THAILAND	130	-2.87	0.52
88	TOGO	13	-3.16	0.00
89	TUNISIA	66	-3.70	0.00
90	TURKEY	68	-2.77	0.74
91	UGANDA	42	-3.39	0.11
92	UKRAINE	86	-2.65	0.73
93	UNITED KINGDOM	360	-3.92	0.74
94	UNITED REPUBLIC OF TANZANIA	33	-2.92	0.15
95	URUGUAY	141	-2.24	0.53
96	VIET NAM	70	-3.79	0.14
97	ZAMBIA	56	-2.06	0.71
98	ZIMBABWE	3	-1.56	0.11
Total obs./Total mean		34021	-3.64	0.73

Note: This Table reports sample countries, annual bank observations from each country and country-level mean values of main dependent variable, Z-score, and main independent variable, Political Constraints. Z-score represents bank risk-taking. Political Constraints represents political institutions and is political constraints index of Henisz (2000).

Table 2 Summary statistics of main variables

Variables	Countries	Obs.	Mean	S.D.	Min	Max
Z-score	98	34021	-3.64	1.09	-11.44	3.77
σ (NIM)	98	34015	0.47	0.95	0	15.07
Political Constraints	98	34021	0.73	0.20	0	0.89
Political Rights	98	34021	-1.69	1.55	-7	-1
Democratic Accountability	98	34021	5.04	1.04	0	6
GOVFRAC	97	33916	0.29	0.22	0	0.83
POLARIZ	93	30866	1.15	0.97	0	2
Polity	98	34021	8.77	3.26	-10	10
Total Assets (log)	98	34021	13.45	1.82	9.38	18.95
Growth Total Assets	98	34021	11.55	23.64	-29.72	134.77
Loan Loss Provisions/Total Assets	98	34021	0.54	0.74	-0.84	4.48
Noninterest Income/Total Income	98	34021	27.38	19.63	-18.55	92.16
Bank Concentration	98	34021	61.69	18.83	21.84	100
Capital Stringency	98	34021	6.16	1.45	1	10
Activity Restrictions	98	34021	8.68	2.43	4	16
Deposit Insurance	98	34021	0.93	0.25	0	1
Creditor Rights	98	34021	2.23	0.94	0	4
GDP Per Capita (log)	98	34021	9.77	1.21	4.71	11.33
GDP Growth	98	34021	0.03	0.03	-0.17	0.34
Inflation	98	34021	0.03	0.05	-0.18	4.32
Law & Order	98	34021	4.71	0.97	0.50	6
Crisis_Dummy	98	34021	0.05	0.22	0	1

Note: This Table reports summary statistics of all important variables. Z-score is main, while σ (NIM) is alternative proxy of bank risk-taking. Political Constraints is main proxy of political institutions, represented by political constraints index from Henisz (2000). Alternative proxies of political institutions are political rights index, Political Rights, from Freedom_House (2013), democratic accountability index, Democratic Accountability, from ICRG database, government fractionalization, GOVFRAC, and POLARIZ, POLARIZ, indices from Beck *et al.* (2001), and Polity from Polity IV Project dataset. Total Assets (log), Growth Total Assets, Loan Loss Provisions/Total Assets and Noninterest Income/Total Income are bank level control variables. Bank Concentration, Capital Stringency, Activity Restrictions and Deposit Insurance are banking industry level control variables and represent banking industry structure and regulations. Creditor Rights, GDP Per Capita (log), GDP Growth, Inflation, Law & Order and Crisis_Dummy are country-level macroeconomic and institutional control variables.

Table 3 Correlations between main variables

Panel 1: Pearson Correlations between bank-level variables (main sample)						
Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) Z-score	1.00					
(2) σ (NIM)	0.36	1.00				
(3) Total Assets (log)	-0.14	-0.20	1.00			
(4) Growth Total Assets	0.18	0.30	-0.08	1.00		
(5) Loan Loss Provisions/Total Assets	0.17	0.20	-0.11	0.03	1.00	
(6) Noninterest Income/Total Income	0.21	0.18	-0.04	0.20	0.06	1.00

Panel 2: Pearson Correlations between political institutions variables (main sample)						
	(1)	(2)	(3)	(4)	(5)	(6)
(1) Political Constraints	1.00					
(2) Political Rights	0.61	1.00				
(3) Democratic Accountability	0.64	0.83	1.00			
(4) GOVFRAC	0.24	0.31	0.42	1.00		
(5) POLARIZ	0.43	0.43	0.41	0.59	1.00	
(6) Polity	0.76	0.81	0.79	0.23	0.36	1.00

Panel 3: Pearson Correlations between country-level variables (main sample)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Political Constraints	1.00									
(2) Bank Concentration	0.17	1.00								
(3) Capital Stringency	0.14	0.12	1.00							
(4) Activity Restrictions	-0.53	-0.41	-0.25	1.00						
(5) Deposit Insurance	0.56	-0.01	0.12	-0.31	1.00					
(6) Creditor Rights	0.20	0.09	0.08	-0.33	0.07	1.00				
(7) GDP Per Capita (log)	0.70	0.26	0.01	-0.40	0.46	0.19	1.00			
(8) GDP Growth	-0.44	-0.22	0.08	0.22	-0.29	-0.13	-0.50	1.00		
(9) Inflation	-0.30	-0.17	0.15	0.13	-0.17	-0.10	-0.51	0.33	1.00	
(10) Law & Order	0.58	0.35	0.00	-0.45	0.27	0.30	0.73	-0.32	-0.45	1.00

Note: This table reports Pearson correlation coefficients between each pair of bank-level (Panel 1), between different proxies of political institutions (Panel 2) and between country level variables (Panel 3). All correlations are significant at 5 percent level except bold-faced two correlations in Panel 3. Z-score is main, while σ (NIM) is alternative proxy of bank risk-taking. Political Constraints is main proxy of political institutions, represented by political constraints index from Henisz (2000). Alternative proxies of political institutions are political rights index, Political Rights, from Freedom_House (2013), democratic accountability index, Democratic Accountability, from ICRG database, government fractionalization, GOVFRAC, and POLARIZ, POLARIZ, indices from Beck *et al.* (2001), and Polity from Polity IV Project dataset. Total Assets (log), Growth Total Assets, Loan Loss Provisions/Total Assets and Noninterest Income/Total Income are bank level control variables. Bank Concentration, Capital Stringency, Activity Restrictions and Deposit Insurance are banking industry level control variables and represent banking industry structure and regulations. Creditor Rights, GDP Per Capita (log), GDP Growth, Inflation, Law & Order and Crisis_Dummy are country-level macroeconomic and institutional control variables.

Table 4 Political institutions and bank risk-taking: Main specification and alternative proxies

Variables	Z-score					
	(1)	(2)	(3)	(4)	(5)	(6)
Political Constraints	0.244***					
	(0.000)					
Political Rights		0.034***				
		(0.000)				
Democratic Accountability			0.031***			
			(0.000)			
GOVFRAC				0.291***		
				(0.000)		
POLARIZ					0.064***	
					(0.000)	
Polity						0.007***
						(0.002)
Country level control variables						
Deposit Insurance	0.159***	0.173***	0.177***	0.180***	0.143***	0.179***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Bank Concentration	0.002***	0.001***	0.001***	0.000	0.001	0.002***
	(0.000)	(0.002)	(0.000)	(0.218)	(0.185)	(0.000)
Capital Stringency	-0.028***	-0.022***	-0.026***	-0.028***	-0.028***	-0.026***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Activity Restrictions	-0.017***	-0.024***	-0.022***	-0.018***	-0.021***	-0.021***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Creditor Rights	0.017**	0.011*	0.015**	0.022***	0.006	0.013*
	(0.013)	(0.072)	(0.029)	(0.001)	(0.254)	(0.056)
GDP Per Capita (log)	-0.096***	-0.100***	-0.089***	-0.084***	-0.061***	-0.090***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP Growth	2.033***	2.315***	2.024***	1.527***	2.862***	2.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Inflation	0.797***	0.942***	0.877***	0.965***	0.794***	0.836***
	(0.004)	(0.003)	(0.003)	(0.008)	(0.004)	(0.004)
Law & Order	-0.197***	-0.182***	-0.187***	-0.179***	-0.193***	-0.184***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Crisis_Dummy	0.441***	0.434***	0.425***	0.436***	0.434***	0.432***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Bank level control variables						
Total Assets (log)	-0.046***	-0.049***	-0.048***	-0.049***	-0.050***	-0.046***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Growth Total Assets	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Loan Loss Provisions/Total Asset	0.114***	0.116***	0.115***	0.116***	0.121***	0.114***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Noninterest Income/Total Assets	0.008***	0.008***	0.008***	0.008***	0.007***	0.008***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year_Dummies						
Constant	Yes	Yes	Yes	Yes	Yes	Yes
	-1.586***	-1.282***	-1.592***	-1.558***	-1.588***	-1.558***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	34,021	34,021	34,021	33,916	30,866	34,021
Countries	98	98	98	97	93	98
R-squared	0.176	0.176	0.176	0.178	0.173	0.176

Note: Dependent variable is Z-score in all Models, where higher values of Z-score represent higher bank risk-taking and lower values represent lower bank risk-taking. Sample period is from 1998 to 2007. Main proxy of political institutions, Political Constraints, is political constraints index from Henisz (2000). Alternative proxies are political rights index, Political Rights, from Freedom_House (2013), democratic accountability index, Democratic Accountability, from ICRG database, government fractionalization, GOVFRAC, and POLARIZ, POLARIZ, indices from Beck *et al.* (2001), and Polity from Polity IV Project dataset. Other bank-level and country-level variables are used as control variables. Detailed definitions of variables are given in Appendix A. All Models are estimated using pooled panel OLS regressions. *P*-values are computed by the heteroskedastic-robust standard errors and are presented in parenthesis. ***, **, * represent statistical significance at 1%, 5%, and 10% levels respectively.

Table 5 Political institutions and bank risk-taking: Alternative specifications and endogeneity test

Variables	Z-score (country)	Z-score (bank)	Z-score	Z-score	Political Constraints (First stage)	Z-score (Second stage)
	Country-level means	Bank-level means	Drop German banks	Standard errors clustered at country- level	Endogeneity test: Instrumental variable regressions	
	(1)	(2)	(3)	(4)	(5)	(6)
Political Constraints	0.405** (0.021)	0.365*** (0.000)	0.161*** (0.001)	0.244** (0.019)		0.326*** (0.004)
Individualism					0.005*** (0.000)	
Country level control variables						
Deposit Insurance	0.013 (0.886)	0.089* (0.086)	0.173*** (0.000)	0.159** (0.023)	0.162*** (0.000)	0.202*** (0.000)
Bank Concentration	0.002 (0.425)	0.005*** (0.000)	0.001*** (0.004)	0.002* (0.056)	-0.002*** (0.000)	0.002*** (0.000)
Capital Stringency	-0.041** (0.037)	-0.061*** (0.000)	-0.033*** (0.000)	-0.028*** (0.006)	0.011*** (0.000)	-0.027*** (0.000)
Activity Restrictions	-0.002 (0.897)	-0.038*** (0.000)	-0.007* (0.083)	-0.017** (0.037)	-0.012*** (0.000)	-0.018*** (0.000)
Creditor Rights	-0.008 (0.793)	0.013 (0.334)	0.026*** (0.002)	0.017 (0.122)	-0.011*** (0.000)	0.018** (0.015)
GDP Per Capita (log)	-0.100*** (0.005)	-0.188*** (0.000)	-0.100*** (0.000)	-0.096** (0.025)	0.049*** (0.000)	-0.073*** (0.000)
GDP Growth	0.504 (0.796)	-1.955** (0.025)	1.816*** (0.000)	2.033** (0.018)	-0.294*** (0.000)	2.531*** (0.000)
Inflation	0.166 (0.625)	-0.111 (0.436)	0.870*** (0.005)	0.797** (0.040)	0.466*** (0.000)	1.211*** (0.000)
Law & Order	-0.103** (0.045)	-0.148*** (0.000)	-0.171*** (0.000)	-0.197** (0.000)	0.036*** (0.000)	-0.191*** (0.000)
Crisis_Dummy	1.489*** (0.000)	1.768*** (0.000)	0.419*** (0.000)	0.441*** (0.000)	-0.032*** (0.000)	0.439*** (0.000)
Bank level control variables						
Total Assets (log)	-0.023 (0.522)	-0.073*** (0.000)	-0.048*** (0.000)	-0.046*** (0.000)	-0.002*** (0.000)	-0.046*** (0.000)
Growth Total Assets	0.007* (0.098)	0.006*** (0.000)	0.005*** (0.000)	0.004*** (0.000)	-0.000 (0.130)	0.004*** (0.000)
Loan Loss Provisions/Total Assets	0.252* (0.075)	0.217*** (0.000)	0.116*** (0.000)	0.114*** (0.000)	0.002** (0.040)	0.119*** (0.000)
Noninterest Income/Total Income	0.015*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	-0.000*** (0.000)	0.008*** (0.000)
Year_Dummies						
Constant	-2.795*** (0.000)	-0.558** (0.024)	-1.532*** (0.000)	-1.586*** (0.000)	-0.030 (0.158)	-1.809*** (0.000)
Observations	98	7,205	22,378	34,021	32,933	32,933
R-squared	0.684	0.215	0.215	0.176	0.691	0.168

Note: Top row reports dependent variable for each Model. Z-score (country) is country-level average of main risk proxy Z-score. Z-score (bank) is at bank-level and is calculated as one value for each bank using data for all available years. Z-score is main proxy of bank risk-taking. Higher values of Z-score (country), Z-score (bank) and Z-score represent higher bank risk-taking and vice versa. Sample period is from 1998 to 2007. Main proxy of political institutions, Political Constraints, is political constraints index from Henisz (2000). In Models 1 and 2 control variables are also averaged in similar way as the dependent variable in each Model. Z-score in Models 3, 4 and 6 is the main risk proxy. Models 1 and 2 are estimated using cross-sectional OLS, while all other Models are estimated using pooled panel OLS regressions. *P*-values are computed by the heteroskedastic-robust standard errors in all models except Model 4 where standard errors are clustered at country-level. *P*-values are presented in parenthesis. ***, **, * represent statistical significance at 1%, 5%, and 10% levels respectively.

Table 6 Political institutions and bank risk-taking: Components of Z-score and σ (NIM)

Variables	CAR (1)	ROA (2)	σ (ROA) (3)	σ (NIM) (4) (5) (6) (7) (8) (9)					
Political Constraints	-3.686*** (0.000)	-0.101** (0.046)	-0.033 (0.314)	0.073** (0.043)					
Political Rights					0.014** (0.041)				
Democratic Accountability						-0.003 (0.708)			
GOVFRAC							0.185*** (0.000)		
POLARIZ								0.049*** (0.000)	
Polity									0.004* (0.069)
Country level control variables									
Deposit Insurance	0.471** (0.046)	-0.004 (0.949)	0.149*** (0.000)	0.093*** (0.003)	0.072** (0.021)	0.086*** (0.005)	0.064** (0.032)	0.101*** (0.001)	0.070** (0.029)
Bank Concentration	-0.038*** (0.000)	-0.001** (0.048)	0.000 (0.822)	-0.001* (0.096)	-0.001** (0.017)	-0.001 (0.192)	-0.002*** (0.000)	-0.001 (0.213)	-0.001 (0.152)
Capital Stringency	-0.121*** (0.003)	0.014 (0.104)	-0.037*** (0.000)	-0.026*** (0.000)	-0.025*** (0.000)	-0.026*** (0.000)	-0.027*** (0.000)	-0.017*** (0.003)	-0.026*** (0.000)
Activity Restrictions	0.070** (0.013)	0.001 (0.934)	-0.010*** (0.009)	-0.039*** (0.000)	-0.039*** (0.000)	-0.038*** (0.000)	-0.035*** (0.000)	-0.025*** (0.000)	-0.038*** (0.000)
Creditor Rights	-0.967*** (0.000)	-0.084*** (0.000)	-0.064*** (0.000)	-0.067*** (0.000)	-0.070*** (0.000)	-0.067*** (0.000)	-0.064*** (0.000)	-0.099*** (0.000)	-0.068*** (0.000)
GDP Per Capita (log)	0.400*** (0.001)	-0.199*** (0.000)	0.021 (0.253)	-0.016 (0.384)	-0.027* (0.068)	-0.018 (0.249)	-0.025 (0.143)	0.011 (0.514)	-0.025 (0.162)
GDP Growth	31.460*** (0.000)	6.006*** (0.000)	1.479*** (0.007)	1.829*** (0.000)	2.093*** (0.000)	1.858*** (0.000)	1.602*** (0.001)	2.582*** (0.000)	2.007*** (0.000)
Inflation	19.444*** (0.004)	3.170*** (0.001)	3.117*** (0.002)	4.783*** (0.000)	4.816*** (0.000)	4.772*** (0.000)	4.653*** (0.000)	4.627*** (0.000)	4.772*** (0.000)
Law & Order	-0.327*** (0.001)	-0.079*** (0.002)	-0.207*** (0.000)	-0.277*** (0.000)	-0.276*** (0.000)	-0.279*** (0.000)	-0.274*** (0.000)	-0.294*** (0.000)	-0.276*** (0.000)
Crisis_Dummy	-0.017 (0.941)	-0.364*** (0.000)	0.447*** (0.000)	0.418*** (0.000)	0.421*** (0.000)	0.420*** (0.000)	0.422*** (0.000)	0.362*** (0.000)	0.420*** (0.000)
Bank level control variables									
Total Assets (log)	-1.411*** (0.000)	-0.059*** (0.000)	-0.083*** (0.000)	-0.056*** (0.000)	-0.056*** (0.000)	-0.055*** (0.000)	-0.056*** (0.000)	-0.059*** (0.000)	-0.055*** (0.000)
Growth Total Assets	-0.019*** (0.000)	0.002*** (0.000)	0.003*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)
Loan Loss Provisions/Total Assets	0.071 (0.433)	0.675*** (0.000)	0.100*** (0.000)	0.100*** (0.000)	0.102*** (0.000)	0.100*** (0.000)	0.105*** (0.000)	0.101*** (0.000)	0.101*** (0.000)
Noninterest Income/Total Income	0.082*** (0.000)	0.013*** (0.000)	0.011*** (0.000)	0.001*** (0.001)	0.001*** (0.001)	0.001*** (0.001)	0.002*** (0.000)	0.001*** (0.004)	0.001*** (0.001)
<i>Year_Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	27.983*** (0.000)	3.628*** (0.000)	2.385*** (0.000)	3.027*** (0.000)	3.137*** (0.000)	3.024*** (0.000)	3.087*** (0.000)	2.668*** (0.000)	3.025*** (0.000)
Observations	34,021	34,021	34,021	34,015	34,015	34,015	33,910	30,860	34,015
R-squared	0.288	0.275	0.266	0.356	0.357	0.356	0.354	0.357	0.357

Note: Dependent variables are three components of Z-score in Models 1 to 3 and σ (NIM) in Models 4 to 9. CAR is annual equity to total assets ratio. ROA is annual return on assets before loan loss provisions and taxes. σ (ROA) is standard deviation of annual values of return on assets before loan loss provisions and taxes calculated over 3-years overlapping periods. σ (NIM) is standard deviation of annual values of net interest margins over 3-years overlapping periods. Sample period is from 1998 to 2007. Main proxy of political institutions, Political Constraints, is political constraints index from Henisz (2000). Alternative proxies are political rights index, Political Rights, from Freedom_House (2013), democratic accountability index, Democratic Accountability, from ICRG database, and government fractionalization, GOVFRAC, and POLARIZ, POLARIZ, indices from Beck *et al.* (2001). Other bank-level and country-level variables are used as control variables. Detailed definitions of variables are given in Appendix A. All Models are estimated using pooled panel OLS regressions. *P*-values are computed by the heteroskedastic-robust standard errors and are presented in parenthesis. ***, **, * represent statistical significance at 1%, 5%, and 10% levels respectively.

Table 7 Political institutions and bank risk-taking: Other control variables

Variables	Z-score								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Political Constraints	0.237*** (0.000)	0.166*** (0.001)	0.116** (0.033)	0.095* (0.098)	0.220*** (0.000)	0.213*** (0.000)	0.203*** (0.000)	0.100* (0.075)	0.201*** (0.001)
Country level control variables									
Deposit Insurance	0.134*** (0.000)	0.148*** (0.000)	0.155*** (0.000)	0.128*** (0.000)	0.151*** (0.000)	0.164*** (0.000)	0.158*** (0.000)	0.128*** (0.000)	0.134*** (0.000)
Bank Concentration	0.000 (0.818)	0.002*** (0.000)	0.001* (0.052)	-0.000 (0.671)	0.001*** (0.007)	0.001*** (0.001)	0.001* (0.076)	-0.001 (0.201)	0.001 (0.154)
Capital Stringency	-0.034*** (0.000)	-0.026*** (0.000)	-0.024*** (0.000)	-0.028*** (0.000)	-0.029*** (0.000)	-0.023*** (0.000)	-0.024*** (0.000)	-0.025*** (0.000)	-0.026*** (0.000)
Activity Restrictions	-0.012*** (0.001)	-0.017*** (0.000)	-0.020*** (0.000)	-0.015*** (0.000)	-0.015*** (0.000)	-0.020*** (0.000)	-0.018*** (0.000)	-0.015*** (0.000)	-0.014*** (0.000)
Creditor Rights	0.002 (0.748)	0.001 (0.844)	0.012* (0.070)	-0.010 (0.147)	0.015** (0.028)	0.015** (0.030)	0.014** (0.041)	-0.011 (0.120)	0.013* (0.081)
GDP Per Capita (log)	-0.121*** (0.000)	-0.034*** (0.009)	-0.114*** (0.000)	-0.069*** (0.000)	-0.124*** (0.000)	-0.128*** (0.000)	-0.141*** (0.000)	-0.088*** (0.000)	-0.065*** (0.000)
GDP Growth	2.604*** (0.000)	2.384*** (0.000)	2.546*** (0.000)	3.086*** (0.000)	2.116*** (0.000)	2.053*** (0.000)	2.115*** (0.000)	2.912*** (0.000)	2.490*** (0.000)
Inflation	0.856*** (0.002)	0.703*** (0.005)	0.957*** (0.003)	0.856*** (0.002)	0.893*** (0.005)	0.862*** (0.004)	0.918*** (0.005)	0.876*** (0.003)	1.860*** (0.000)
Law & Order	-0.227*** (0.000)	-0.168*** (0.000)	-0.193*** (0.000)	-0.190*** (0.000)	-0.214*** (0.000)	-0.208*** (0.000)	-0.217*** (0.000)	-0.201*** (0.000)	-0.204*** (0.000)
Crisis_Dummy	0.442*** (0.000)	0.367*** (0.000)	0.436*** (0.000)	0.373*** (0.000)	0.449*** (0.000)	0.442*** (0.000)	0.448*** (0.000)	0.370*** (0.000)	0.413*** (0.000)
Bank level control variables									
Total Assets (log)	-0.045*** (0.000)	-0.047*** (0.000)	-0.049*** (0.000)	-0.048*** (0.000)	-0.049*** (0.000)	-0.047*** (0.000)	-0.048*** (0.000)	-0.049*** (0.000)	-0.054*** (0.000)
Growth Total Assets	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)
Loan Loss Provisions/Total Assets	0.112*** (0.000)	0.110*** (0.000)	0.117*** (0.000)	0.111*** (0.000)	0.116*** (0.000)	0.114*** (0.000)	0.116*** (0.000)	0.111*** (0.000)	0.108*** (0.000)
Noninterest Income/Total Income	0.008*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.008*** (0.000)
Additional Country level control variables									
Corruption	0.103*** (0.000)			0.076*** (0.000)				0.061*** (0.000)	
Socio-economic		-0.052*** (0.000)		-0.046*** (0.000)				-0.054*** (0.000)	
Press Freedom			0.004*** (0.000)	0.002*** (0.001)				0.001 (0.417)	
Govt. Effectiveness					0.088*** (0.000)		0.059*** (0.006)	0.061** (0.020)	
Political Stability						0.088*** (0.000)	0.072*** (0.000)	0.057*** (0.001)	
IND + Inv UAI + Inv PDI									0.002** (0.013)
Year_Dummies									
Constant	-1.400*** (0.000)	-1.813*** (0.000)	-1.155*** (0.000)	-1.383*** (0.000)	-1.242*** (0.000)	-1.236*** (0.000)	-1.075*** (0.000)	-1.178*** (0.000)	-1.711*** (0.000)
Observations	34,021	34,021	34,021	34,021	33,965	33,965	33,965	33,965	32,933
R-squared	0.178	0.178	0.177	0.180	0.176	0.177	0.177	0.181	0.183

Note: This table reports results after including other related control variables in main specification. Dependent variable is Z-score in all Models, where higher values of Z-score represent higher bank risk-taking and vice versa. Sample period is from 1998 to 2007. Political Constraints, is political constraints index from Henisz (2000). Other bank-level and country-level variables are used as control variables. Detailed definitions of variables are given in Appendix A. All Models are estimated using pooled panel OLS regressions. *P*-values are computed by the heteroskedastic-robust standard errors and are presented in parenthesis. ***, **, * represent statistical significance at 1%, 5%, and 10% levels respectively.

Table 8 Political institutions and bank risk-taking: Sample extension

Variables	Z-score					
	(1)	(2)	(3)	(4)	(5)	(6)
Political Constraints	0.077** (0.034)					
Political Rights		0.009** (0.045)				
Democratic Accountability			0.007 (0.177)			
GOVFRAC				0.110*** (0.000)		
POLARIZ					0.025*** (0.001)	
Polity						0.003** (0.035)
Country level control variables						
Deposit Insurance	0.097*** (0.000)	0.087*** (0.000)	0.088*** (0.000)	0.086*** (0.000)	0.070*** (0.000)	0.088*** (0.000)
Bank Concentration	0.001*** (0.005)	0.001** (0.033)	0.001** (0.027)	0.000 (0.409)	0.000 (0.555)	0.001*** (0.007)
Capital Stringency	-0.023*** (0.000)	-0.022*** (0.000)	-0.023*** (0.000)	-0.024*** (0.000)	-0.025*** (0.000)	-0.023*** (0.000)
Activity Restrictions	-0.007*** (0.003)	-0.007*** (0.001)	-0.007*** (0.002)	-0.004* (0.078)	-0.012*** (0.000)	-0.006*** (0.006)
Creditor Rights	0.007** (0.033)	0.006* (0.074)	0.006* (0.073)	0.007* (0.051)	-0.015*** (0.008)	0.006** (0.040)
GDP Per Capita (log)	-0.078*** (0.000)	-0.083*** (0.000)	-0.080*** (0.000)	-0.079*** (0.000)	-0.074*** (0.000)	-0.082*** (0.000)
GDP Growth	0.793*** (0.000)	0.848*** (0.000)	0.809*** (0.000)	0.625*** (0.002)	1.046*** (0.000)	0.890*** (0.000)
Inflation	1.689*** (0.000)	1.747*** (0.000)	1.719*** (0.000)	1.831*** (0.000)	1.745*** (0.001)	1.726*** (0.000)
Law & Order	-0.112*** (0.000)	-0.111*** (0.000)	-0.111*** (0.000)	-0.107*** (0.000)	-0.112*** (0.000)	-0.109*** (0.000)
Crisis_Dummy	0.151*** (0.000)	0.152*** (0.000)	0.150*** (0.000)	0.143*** (0.000)	0.133*** (0.000)	0.152*** (0.000)
Bank level control variables						
Total Assets (log)	-0.034*** (0.000)	-0.034*** (0.000)	-0.034*** (0.000)	-0.033*** (0.000)	-0.034*** (0.000)	-0.034*** (0.000)
Growth Total Assets	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.004*** (0.000)	0.005*** (0.000)
Loan Loss Provisions/Total Assets	0.174*** (0.000)	0.175*** (0.000)	0.175*** (0.000)	0.176*** (0.000)	0.179*** (0.000)	0.175*** (0.000)
Noninterest Income/Total Income	0.008*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.007*** (0.000)	0.008*** (0.000)
Year Dummies						
Constant	-2.044*** (0.000)	-1.980*** (0.000)	-2.053*** (0.000)	-2.070*** (0.000)	-1.950*** (0.000)	-2.060*** (0.000)
Observations	72,940	72,940	72,940	72,661	66,281	72,940
R-squared	0.220	0.220	0.220	0.220	0.216	0.220

Note: This table reports results for extended sample over the period 1998-2014. Dependent variable is Z-score in all Models, where higher values of Z-score represent higher bank risk-taking and lower values represent lower bank risk-taking. Main proxy of political institutions, Political Constraints, is political constraints index from Henisz (2000). Alternative proxies are political rights index, Political Rights, from Freedom_House (2013), democratic accountability index, Democratic Accountability, from ICRG database, government fractionalization, GOVFRAC, and POLARIZ, POLARIZ, indices from Beck *et al.* (2001), and Polity from Polity IV Project dataset. Other bank-level and country-level variables are used as control variables. Detailed definitions of variables are given in Appendix A. All Models are estimated using pooled panel OLS regressions. *P*-values are computed by the heteroskedastic-robust standard errors and are presented in parenthesis. ***, **, * represent statistical significance at 1%, 5%, and 10% levels respectively.

Table 9 Political institutions and bank risk-taking: Crisis period analysis

Variables	Z-score			
	Extended sample 1998-2014	Exclude 2008-2014 country-years for crisis countries from extended sample	Exclude 2008-2014 country-years for all countries from extended sample	Exclude 2008-2014 country-years for all countries and all data of those countries which remained under crisis for two or more years over the period 1998-2007 from extended sample
	(1)	(2)	(3)	(4)
Political Constraints	0.077** (0.034)	0.102*** (0.002)	0.273*** (0.000)	0.398*** (0.000)
<i>Country level control variables</i>				
Deposit Insurance	0.097*** (0.000)	0.039* (0.051)	0.159*** (0.000)	-0.017 (0.618)
Bank Concentration	0.001*** (0.005)	0.000 (0.252)	0.003*** (0.000)	-0.002** (0.015)
Capital Stringency	-0.023*** (0.000)	-0.011*** (0.001)	-0.027*** (0.000)	-0.037*** (0.000)
Activity Restrictions	-0.007*** (0.003)	-0.012*** (0.000)	-0.014*** (0.000)	-0.042*** (0.000)
Creditor Rights	0.007** (0.033)	0.004 (0.473)	0.019*** (0.005)	-0.102*** (0.000)
GDP Per Capita (log)	-0.078*** (0.000)	-0.048*** (0.000)	-0.097*** (0.000)	-0.083*** (0.000)
GDP Growth	0.793*** (0.000)	1.316*** (0.000)	1.868*** (0.000)	0.760 (0.185)
Inflation	1.689*** (0.000)	1.372*** (0.000)	0.768*** (0.004)	1.502*** (0.000)
Law & Order	-0.112*** (0.000)	-0.148*** (0.000)	-0.207*** (0.000)	-0.154*** (0.000)
Crisis_Dummy	0.151*** (0.000)	0.386*** (0.000)	0.444*** (0.000)	
<i>Bank level control variables</i>				
Total Assets (log)	-0.034*** (0.000)	-0.059*** (0.000)	-0.043*** (0.000)	-0.011 (0.171)
Growth Total Assets	0.005*** (0.000)	0.005*** (0.000)	0.004*** (0.000)	0.004*** (0.000)
Loan Loss Provisions/Total Assets	0.174*** (0.000)	0.117*** (0.000)	0.105*** (0.000)	0.091*** (0.000)
Noninterest Income/Total Income	0.008*** (0.000)	0.007*** (0.000)	0.008*** (0.000)	0.007*** (0.000)
<i>Year_Dummies</i>				
Constant	<i>Yes</i> -2.044*** (0.000)	<i>Yes</i> -1.835*** (0.000)	<i>Yes</i> -1.628*** (0.000)	<i>Yes</i> -1.375*** (0.000)
Observations	72,940	46,930	34,755	5,404
R-squared	0.220	0.222	0.175	0.193

Note: This table reports results for crisis-period effects. Dependent variable is Z-score in all Models, where higher values of Z-score represent higher bank risk and lower values represent lower bank risk. Political Constraints, is political constraints index from Henisz (2000). Other bank-level and country-level variables are used as control variables. Detailed definitions of variables are given in Appendix A. All Models are estimated using pooled panel OLS regressions. *P*-values are computed by the heteroskedastic-robust standard errors and are presented in parenthesis. ***, **, * represent statistical significance at 1%, 5%, and 10% levels respectively.

Table 10 Political institutions and bank risk-taking: Legal institutions and deposit insurance

Variables	Z-score					
	Other legal origins	Common law legal origin	Lower legal rights	Higher legal rights	No explicit deposit insurance	Explicit deposit insurance
	(1)	(2)	(3)	(4)	(5)	(6)
Political Constraints	0.159*** (0.004)	0.244** (0.013)	0.180*** (0.003)	0.878*** (0.000)	-0.023 (0.815)	0.397*** (0.000)
Country level control variables						
Deposit Insurance	0.304*** (0.000)	-0.118* (0.064)	0.303*** (0.000)	-0.212*** (0.000)		
Bank Concentration	0.003*** (0.000)	-0.003* (0.051)	0.002* (0.067)	-0.002*** (0.000)	-0.000 (0.842)	0.003*** (0.000)
Capital Stringency	-0.032*** (0.000)	-0.003 (0.815)	-0.034*** (0.000)	-0.024*** (0.000)	-0.018 (0.159)	-0.033*** (0.000)
Activity Restrictions	-0.018*** (0.000)	0.031** (0.018)	-0.028*** (0.000)	-0.006 (0.221)	-0.011 (0.386)	-0.012*** (0.002)
Creditor Rights	0.051*** (0.000)	-0.140*** (0.000)			0.023 (0.305)	0.033*** (0.000)
GDP Per Capita (log)	-0.090*** (0.000)	-0.120*** (0.000)	-0.153*** (0.000)	-0.090*** (0.000)	-0.186*** (0.000)	-0.065*** (0.000)
GDP Growth	2.036*** (0.000)	-1.084 (0.316)	3.325*** (0.000)	1.542*** (0.006)	0.101 (0.886)	3.565*** (0.000)
Inflation	0.999*** (0.000)	0.373 (0.109)	1.328*** (0.000)	0.396** (0.029)	2.456*** (0.000)	0.571** (0.017)
Law & Order	-0.242*** (0.000)	0.013 (0.633)	-0.210*** (0.000)	-0.155*** (0.000)	-0.070** (0.015)	-0.240*** (0.000)
Crisis_Dummy	0.438*** (0.000)	0.766*** (0.000)	0.848*** (0.000)	0.264*** (0.000)	-0.636*** (0.000)	0.448*** (0.000)
Bank level control variables						
Total Assets (log)	-0.047*** (0.000)	-0.053*** (0.000)	0.003 (0.598)	-0.085*** (0.000)	-0.000 (0.978)	-0.049*** (0.000)
Growth Total Assets	0.003*** (0.000)	0.006*** (0.000)	0.003*** (0.000)	0.005*** (0.000)	0.002 (0.122)	0.004*** (0.000)
Loan Loss Provisions/Total Assets	0.112*** (0.000)	0.120*** (0.000)	0.075*** (0.000)	0.146*** (0.000)	0.083*** (0.000)	0.119*** (0.000)
Noninterest Income/Total Income	0.008*** (0.000)	0.011*** (0.000)	0.007*** (0.000)	0.009*** (0.000)	0.010*** (0.000)	0.008*** (0.000)
Year_Dummies						
Constant	Yes -1.548*** (0.000)	Yes -1.958*** (0.000)	Yes -1.388*** (0.000)	Yes -1.340*** (0.000)	Yes -1.800*** (0.000)	Yes -1.726*** (0.000)
Observations	31,862	2,160	8,777	25,245	2,332	31,689
R-squared	0.174	0.262	0.214	0.134	0.186	0.174

Note: This table reports results for the non linear effects of political institutions depending upon legal institutions and deposit insurance. Dependent variable is Z-score in all Models, where higher values of Z-score represent higher bank risk-taking and lower values represent lower bank risk-taking. Sample period is from 1998 to 2007. Political Constraints, is political constraints index from Henisz (2000). Other bank-level and country-level variables are used as control variables. Detailed definitions of variables are given in Appendix A. All Models are estimated using pooled panel OLS regressions. *P*-values are computed by the heteroskedastic-robust standard errors and are presented in parenthesis. ***, **, * represent statistical significance at 1%, 5%, and 10% levels respectively.

Table 11 Political institutions and bank risk-taking: Countries' income levels

Variables	Z-score					
	Developing	Developed	Low income	Lower middle income	Higher middle income	Higher income OECD
	(1)	(2)	(3)	(4)	(5)	(6)
Political Constraints	0.281*** (0.000)	1.192*** (0.000)	0.365*** (0.000)	0.139** (0.039)	0.070 (0.212)	1.571*** (0.000)
<i>Country level control variables</i>						
Deposit Insurance	0.135*** (0.000)	-0.051 (0.489)	-0.154** (0.022)	0.190*** (0.000)	0.692*** (0.000)	-0.085 (0.543)
Bank Concentration	-0.001 (0.451)	0.001 (0.231)	-0.003* (0.065)	-0.003*** (0.006)	-0.006*** (0.005)	0.002* (0.051)
Capital Stringency	-0.045*** (0.000)	-0.021*** (0.000)	-0.020 (0.144)	-0.057*** (0.000)	0.003 (0.832)	-0.026*** (0.000)
Activity Restrictions	-0.018*** (0.003)	0.005 (0.334)	0.022 (0.116)	-0.018* (0.059)	0.006 (0.698)	0.017** (0.014)
Creditor Rights	-0.079*** (0.000)	0.087*** (0.000)	-0.052* (0.054)	-0.013 (0.624)	0.041 (0.280)	0.102*** (0.000)
GDP Per Capita (log)	-0.070*** (0.000)	-0.123** (0.030)	-0.080 (0.108)	-0.179*** (0.000)	-0.181 (0.209)	-0.219*** (0.000)
GDP Growth	2.120*** (0.000)	7.059*** (0.000)	0.663 (0.451)	2.059* (0.066)	3.574*** (0.001)	9.583*** (0.000)
Inflation	0.970*** (0.001)	-5.590*** (0.000)	0.858** (0.038)	0.749* (0.056)	3.151*** (0.000)	-7.265*** (0.000)
Law & Order	-0.172*** (0.000)	-0.170*** (0.000)	-0.090*** (0.001)	-0.098*** (0.000)	-0.162*** (0.000)	-0.171*** (0.000)
Crisis_Dummy	0.917*** (0.000)	0.251*** (0.000)	1.188*** (0.000)	0.692*** (0.000)	0.468*** (0.000)	0.273*** (0.000)
<i>Bank level control variables</i>						
Total Assets (log)	0.010 (0.109)	-0.079*** (0.000)	-0.009 (0.502)	0.016* (0.081)	-0.037*** (0.005)	-0.080*** (0.000)
Growth Total Assets	0.003*** (0.000)	0.005*** (0.000)	0.002** (0.033)	0.004*** (0.000)	0.004*** (0.000)	0.005*** (0.000)
Loan Loss Provisions/Total Assets	0.064*** (0.000)	0.166*** (0.000)	0.071*** (0.002)	0.055*** (0.000)	0.082*** (0.000)	0.165*** (0.000)
Noninterest Income/Total Income	0.006*** (0.000)	0.009*** (0.000)	0.007*** (0.000)	0.007*** (0.000)	0.007*** (0.000)	0.010*** (0.000)
<i>Year_Dummies</i>						
Constant	-1.944*** (0.000)	-2.012*** (0.000)	-2.229*** (0.000)	-1.360*** (0.001)	-1.226 (0.256)	-1.521** (0.038)
Observations	8,588	25,434	2,236	3,987	2,364	25,155
R-squared	0.143	0.101	0.146	0.111	0.247	0.102

Note: This table reports results for the effects of political institutions on bank risk-taking depending upon the income level of countries. Dependent variable is Z-score in all Models, where higher values of Z-score represent higher bank risk-taking and lower values represent lower bank risk-taking. Sample period is from 1998 to 2007. Political Constraints, is political constraints index from (Henisz (2000)). Other bank-level and country-level variables are used as control variables. Detailed definitions of variables are given in Appendix A. All Models are estimated using pooled panel OLS regressions. *P*-values are computed by the heteroskedastic-robust standard errors and are presented in parenthesis. ***, **, * represent statistical significance at 1%, 5%, and 10% levels respectively.