How do regulations affect the probability of a financial crisis?

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Abstract

The topic of financial crises is popular in the financial literature and among regulators. Previous researchers have studied the causes of financial crises and have investigated the regulation responses in the aftermath of the 2008/2009 global crises. However, no one has yet focused on how much existing regulations or country-level governance affect the probability of financial crises occurring. This paper explores this important yet understudied topic. We also compare the differential effects of governance has on different economies, specifically, developed versus developing countries. Our empirical results suggest that the same factor can have opposite effects on different countries.

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1. Introduction

There have been numerous studies on financial crises, likely because of their large impact on the financial markets and the inherent difficulties in forecasting them. This topic became even more popular after the sub-prime credit problems that started in the United States in 2007. The credit problems initially occurred in the U.S., but then grew rapidly into a problem that had a serious impact on the global financial sector.

Regulations and governance always come after a crisis, thus many studies have focused on how a government responds after a crisis. However, to have an in-depth understanding of the original causes of a financial crisis, the lack of regulation needs to be explored as a crucial reason for this catastrophe's extension to the financial market across the world.

Every coin has two sides, and so does regulation. On one hand, there is literature arguing that better governance can enhance governments' control on the market participants, and thus can protect the financial market from a financial crisis. On the other hand, the introduction of financial regulations always encourages participants to make financial innovations, which appears to be a good thing. However, such innovations are a way to bypass regulations, which can seriously damage the financial order during the crisis. Moreover, Moshirian (2011) argues that regulations can have negative effects on the financial market. He observes that, without a holistic global and inclusive framework, regulations would intensify the negative consequences of regulatory restrictions.

This paper studies how existing regulations affect financial crises. In our research, we examine financial crises across 88 countries from 1996 to 2013. We not only test using the full sample, but also divide our sample set into developed countries and developing countries, and in consequence we got different results. To begin our research, we conduct a regression analysis. However before building our model, we conduct a principal component analysis to reduce the dimensions, as there are many variables shown by the literature that are causes of financial crises. We review these variables in the literature review section. We choose to include seven principal components in our regression analysis as in aggregate they conveys 83.3% of the information carried by our macroeconomic, political risk and information variables. Then, we conclude our findings by

comparing the contemporary regressions and lag regressions using crisis/GDP growth as the dependent variable and governance variables and principal components as independent variables. We further conduct regressions by region and by variable groups as robustness checks. We also verify our results by examining the economic significance of the variables. The results confirm that both the information variables and governance variables have a significant impact on financial crises. Note that we also determine whether there is a difference between the impacts of regulations on emerging and developed markets.

We find that for a full sample test, the better the capability of a government to develop as well as implement policies and regulations which can facilitate private sector development the more likely a financial crisis occurs. Also, the higher the likely of political instability can increase the probability of a financial crisis.

Our study contributes to several strands of financial research, which can be divided into three parts. First, we fill in the gap in the literature by showing how the country-level governance and regulation impact the probability of financial crises and the performance of a country during a crisis. Many studies explore the causes of financial crises and how the regulations change as a result of the crises. To the best of our knowledge, no study has examined our research question. Second, we include all major global financial crisis periods over two decades instead of only the recent global financial crisis. Third, this study analyzes the impacts of regulation on the probability of financial crises occurrences.

The remains of the article is organized as follows. Section 2 gives the background and previous studies on its determinants for financial crises. Section 3 describes the data, including the introduction of both dependent and explanatory variables, and the results of the principal component analysis. Section 4 explains the regressions we conducted for the research. Section 5 discusses the empirical results and their implications. Finally, Section 6 concludes.

2. Literature Review

Previous literature has investigated what causes financial crises, such as financial globalization, the macro financial environment, structural causes, and so forth. The only research linking both financial crises and regulations together entirely focuses on the policy response to financial crises. There is no literature on how regulations or country-level governance affects financial crises; thus, we can only draw tentative conclusions through other related literature. Although researchers seldom examine the effect of country-level governance on financial crises, we find that numerous studies examine the relation between bank regulations and bank performance during financial crisis. We hypothesize that country-level governance and regulations may have a similar effect on the market performance as bank regulations have on bank performance during financial crisis periods.

Barth, Caprio, and Levine (2004) study the relationship between bank regulatory practices and banking-sector development, efficiency, and stability. Examining hundreds of countries, they find that three major actions that can undermine financial stability are restricting bank activities or discouraging the diversification of income, putting limits on foreign bank ownership, and exacerbating moral hazard by means of generous deposit insurance scheme fragility. They also argue both strict requests on capital and regulation powers would not have an effect on banking crises when other regulatory policies are under control. Based on Barth et al.'s (2004) research, Caprio et al. (2010) extend the macro financial indicator as an explanatory variable and also extended the sample period so that they could take into account the long-term evolution of the financial industry. Their contribution is not only on analyzing the macro financial determinants of the Great Financial Crisis of 2007 to 2009, but also contributing to policymakers formulating laws and regulations to achieve a balance between financial stability and economic growth. Similar to Barth et al. (2004), Beltratti and Stulz (2009) investigate why some banks perform better during the credit crisis. Specifically, they assess whether bank performance is related to bank-level governance, country-level governance, and country-level regulation. Their sample starts from 2007, which includes the Great Depression period. They challenge the previous thought that poor governance was a major cause of banks' poor performance. They find that regulation differences between banks across countries are uncorrelated with the performance of

banks during the crisis period. Only large banks from countries with more country-level restrictions on bank activities perform better.

In general, there are two explanations for how bank regulations are related to bank performance during financial crises. First, a branch of the literature raises that bank governance may influence executives' wiliness to take risks. For instance, Merton (1977) asserts that better governance leads to better performance during crises. They expect that with better governance, banks are likely to have set more controls on traders and executives, which would make them less likely to take risks. Thus these banks with better governance can perform better during a crisis since they have less exposure to risks. John, Litov, and Yeung (2008) find that banks with poor governance are likely to reduce the traders' willingness to take risks, and as a result banks with better governance would like to take more risks, which in contrast with Merton (1977) and taking more risks would have led these banks poor performance during the crisis. Second, bank regulations can affect bank performance during a financial crisis in a simple and direct manner in that banks with better governance can always make wiser and better decisions and thus have better return, and thus can fight against financial crises.

We also found some literatures investigating in how the corporate governance affects the financial crises. Simon et al. (1999) studies the causes of the Asian crisis from 1997 to 1998. Their results highlight the importance of the legal protection given creditors and minority shareholders, and the results argue that the effectiveness of protections for minority shareholders can explain the extent of exchange rate depreciation and stock market decline. Greenspan (1998) also argues that with inappropriate macroeconomic policy during the 1990a exacerbate the initial depreciation in 1997

Researchers have concluded that financial integration is highly correlated with country-level governance and regulations. For instance, Kose et al. (2009) notes that financial integration and globalization can also promote the development of local financial markets and can improve country-level governance in particular. Thus, besides the literatures on bank regulations, we also look into research on how financial integration affects financial crises. Tobin (2000) also argues that the integration of financial assets is not the same as, for example, physical capital or land.

Financial assets and debts are easier to globalize because of the development of modern technology. As the communication methods evolve, the financial markets can be borderless, and the transactions among several markets can be faster and easier. Such communication developments would lead to the most crucial barrier for financial globalization being national regulations and country governance.

Previous literature (Bekaert and Harvey, 2003) has stressed that the more integrated the markets, the fewer risks the economy will take during a financial crisis. The theory is that open and integrated markets lead to a lower cost of capital, and therefore increased investment opportunities and public savings, as a result, will finally reduce the loss during a global financial crisis. Bekaert et al. (2014) also support this result that there is no direct indication that the most integrated countries suffer the most during a crisis.

Berger and Pukthuanthong (2012) find that the more a country is exposed to a common global financial factor, the higher likelihood the economy will be sensitive toa global financial crisis will appear. Their theory is that if the markets are sharing common global financial factors, the negative shocks are easier to propagate the multiple markets at the same time. With a similar argument, Lehkonen (2014) also conclude that integration can make countries take fewer risks during global shocks, but the gains from integration were especially uncertain during global financial crisis since highly integrated market may help propagate the crisis across the global markets.

3. Data and Descriptive Statistics

To explore the probability of the existence and extent of regulations related to financial crises, we build a broad global sample. After deleting all missing data, 88 countries remain in our sample set. In the next subsections, we provide the basic terminology and notations that are necessary to understand the subsequent results, the descriptive statistics of our sample, and the details and results for our principal component analysis.

3.1 Data

3.1.1 Financial Crisis

As a direct method, we use a dummy variable "crisis," which equals one when there was a crisis during the year and zero if there was not. The research period for our paper was from 1996 to 2013. We set this research period due to the accessibility of the regulation variable, as the regulation data start from 1996. We include all global financial crises from 1996 to 2013. In total, three periods of financial crisis are discussed here. Regarding Lehkonen (2014), the first crisis is defined from October 1997 to December 1998, including both the Asian crisis and the collapse of long-term capital management (LTCM). The starting point is estimated according to the market crash of Hong Kong, and because the Asian crisis includes LTCM, we merely use a common name: Asian crisis and LTCM. The second period of crisis is from October 2000 to December 2002, the Dot-com bubble. And the latest period estimated was the global financial crisis from 2007 to 2009. Although the National Bureau of Economic Research defines the ending point of a financial crisis, the starting point of this global financial crisis differs. The beginning point of a global financial crisis can be defined according to the initial fall of the stock markets, which is on August 2007; it can also be defined due to the collapse of Lehman Brothers, which was in September 2008. We used the year 2007 as the starting point since it can fully include the crisis period.

We also use the annual GDP growth rate as a proxy of country performance. It refers to annual growth in real GDP and can be obtained directly from the World Development Indicators (WDI) database of the World Bank. The GDP growth rate is based on local currency and is calculated without making deductions for the depreciation of assets or the degradation of natural resources.

3.1.2 Governance Measures

It is reasonable that a quantitative proxy for county-level governance should reflect all processes of governing, which include the process of a government being selected and monitored, as well as the capability of a government to implement policies. According to this definition, we follow the measurement developed by Kaufmann, Kraay, and Mastruzzi (2009), in which six dimensions are used to measure country-level governance: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. A higher scores on the variable, the better the governance. The definition of each dimension can be found in Appendix A Variable Definitions. All six governance variables range from -2.5 to 2.5, with higher values indicating better governance.

Our governance variables can reflect different aspects of country level governance. Voice and accountability measures a country's citizens' ability to select their government, to select a free media and their freedom of expression and association. Political stability and absence of violence terrorism measures the likelihood of political instability and politically motivated violence and terrorism. Government effectiveness refers to the quality of public services, civil service, the independence of government when making and implementing policy from political pressures, and the credibility of a government's commitment. Rule of law measures the extent to which an agent abides by the regulations, specifically, the quality of contract enforcement, property rights, the police, the courts, and the likelihood of crime and violence. Control of corruption measures the extent to which public power is exercised for private gain. Regulatory quality measures the capability of a government to develop as well as implement policies and regulations that can facilitate private sector development.

We examine these dimensions separately and take the average of these six dimensions as the governance index (GI) as a whole. Governance variables can be accessed through Worldwide Governance Indicators (WGI) of the World Bank.

3.1.3 Other Explanatory/ Control Variables

To examine how regulations influence financial crises, we use the multivariate regression framework. We classify all the independent variables into four groups. The first group is country-

level governance and the power of regulations, as discussed above. In this section, we discuss the rest of the variables, including political risk, domestic macroeconomic fundamental and risk appetite, and information variables.

First, we control for political risk using the data from Heritage Foundation and Freedom House, which includes: freedom of the press, political rights, civil liberties, property rights, freedom from corruption, fiscal freedom, government spending, business freedom, monetary freedom, trade freedom, investment freedom, and financial freedom. Next, we control for factors previously shown to influence financial crises. These control variables include domestic credit to private, GNI per capita, unemployment, inflation, and current account balance. In addition, to control for the information frictions, we also include information variables, the number of telephone line subscribers per one hundred people, and the number of Internet users per hundred people.

To save space, we do not present the definition and data source of other explanatory variables here, but they can be found in Appendix A.

3.2 Descriptive Statistics

Originally, we had 147 countries in our sample set, but after deleting all missing data, only 88 countries were left in our sample. According to the United Nation, we can divide our sample into two groups, developed countries and developing countries. In general 28 countries from our sample are from developed countries, and the rest 60 countries are from developing countries. The list of countries can be found in Table II.

Our data set includes the time period from 1996 to 2013. All variables were measured on an annual basis since most only has annually information. Three financial crisis periods are counted in our research, as discussed above.

In total, we had 25 explanatory variables, in which, the governance variable is calculated by taking the average of the other six regulation variables. We choose all variables, excluding regulation variables, to conduct principal component analysis. Before conducting principal

component analysis, we test the multicollinearity of all variables used for the analysis, and the results showed that the VIF of every variable is lower than 10.

*** Insert Table I here ***

Table I provides descriptive statistics for the full sample. From the table, we can see that the variance for the gross national income (GNI) per capita (PPP method) is large, we assume this is normal since our research period is long, and our research targets are across the world. The maximum GNI is 99100, which happened in Kuwait in the year 2007, while the minimum GNI is Mozambique in 1996 and the value is 340. The GNI per capita was converted to U.S. dollars using the World Bank PPP method, divided by the midyear population. It is reasonable that the GNI per capita increases across time, thus although the range is large, so that we think there is no outlier for this variable.

We compare the statistic descriptive in Table II. Median, mean and standard deviation are reported by developed and developing countries in this table, we also include a tt test to test the whether there is a statistic significant difference between the two sample. From the result of the t- test, we can conclude that, except for inflation and crisis, all other variables are significantly different between the sub samples under 95% confidence level.

*** Insert Table II here ***

3.3 Principle Component Analysis

To reduce the dimensions, we obtain a general combination of all political risk, domestic macroeconomic fundamental, and information variables to perform the principal component analysis. However, we exclude the regulation variables from the analysis since we put them separately in our regressions. We choose seven principal components as our explanatory variables, since these principal components can explain 83.3% of the information carried by the entire data set. The rotated component matrix can be found in Appendix B.

According to the rotated component matrix, we can find that PC_1 and PC_2 together can stand for the political risks. Political rights, civil liberties and freedom of the press all have a heavy load on PC_1. All of these variables have more than 80% correlation with PC_1. The three predictors correlate with PC_1 with the correct sign. PC_2 includes the rest political risk variables, respectively, they are financial freedom, investment freedom, business freedom, property rights, freedom from corruption, and monetary freedom. However, we can find a negative correlation between political rights civil liberties, freedom of the press and PC_2.

PC_3 is a representative for information frictions, Internet users per hundred people (internet), and phone lines per hundred people (fixed phone) are all heavily positive correlated with it. So we can conclude that the PC_3 is a control for the information frictions.

PC_4 and PC_5 show the most significant correlation with domestic macroeconomic fundamentals. PC_4 has a negative relationship with government spending and fiscal freedom. Current account and GNI have a heavily loads on PC_5. It has a positive relationship with current account and GNI (PPP method).

PC_6 has a negative correlation with inflation, but a positive correlation with monetary freedom. According to the definition of the variables in Appendix A, monetary freedom represents the price stability and the power of price control by a country, and inflation stands for the general price level. Thus, although monetary freedom and inflation are from different categories, PC_6 can represent the price level of the country. Last, PC_7 shows a strong positive relationship with unemployment.

4. Methodology

4.1 Regression Analysis

A conventional method to examine the relationship between financial crises and existing regulations is to conduct regression analyses. We use OLS regression analysis for the GDP regressions and logistic regression for the Crisis regressions since the dependent variable Crisis is a dummy variable. However, since we include 25 macroscopic variables in the regression, which is too many relative to our sample size, this consequently reduces the veracity of our model. Therefore, we need to reduce the dimensions before conducting regression analysis. The most common way to reduce the dimensions of the variables is to apply principal component analysis. Principal component analysis generates a set of values of linearly uncorrelated variables. According to principal component analysis, we choose the principals who can represent more than 80% of the information and thus we categorize all variables (excluding the regulation ones) into 7 principal components, which can explain 83.3% of all the data. The results of principal component analysis can be found in the data section (section 3). Our dependent variables for all regressions are either the dummy variable crisis or GDP growth. The dummy variable crisis equals 1 if there is a crisis, and 0 if there is no crisis for the year. The independent variables are regulation proxies and principal components. First, we conduct the contemporaneous regressions:

$$\text{Crisis}_t = \alpha GI_t + \beta_{it} PC_{it} + \varepsilon_t,$$
$$\text{GDP Growth}_t = \alpha GI_t + \beta_{it} PC_{it} + \varepsilon_t,$$
$$\text{Crisis}_t = \alpha_1 VA_t + \alpha_2 GE_t + \alpha_3 RQ_t + \alpha_4 CC_t + \alpha_5 RL_t + \alpha_6 PS_t + \beta it PC_{it} + \varepsilon_t,$$
$$\text{GDP Growth}_t = \alpha_1 VA_t + \alpha_2 GE_t + \alpha_3 RQ_t + \alpha_4 CC_t + \alpha_5 RL_t + \alpha_6 PS_t + \beta it PC_{it} + \varepsilon_t,$$

where GDP_t stands for the GDP growth rate at year t; crisis is the dummy variable when there is a crisis at year t it equals to 1, otherwise equals to 0; GI_t stands for the governance index at year t, and can be separated into six components including VA_t, GE_t, PS_t, RQ_t, CC_t, and RL_t, which stand for voice and accountability, government effectiveness, political stability and absence, regulatory quality, control of corruption, and rule of law at time t correspondingly. PC_{it} stands for the principal components i at time t. (To save space, the abbreviations apply to the entire paper.)

Then to compare the effects of regulation factors at time t and at time t-1, we ran the full lag regression as well. For the lag regression, we do the same as the contemporary regressions but simply replace all data for the regulation variables (governance index, voice and accountability, government effectiveness, political stability and absence, regulatory quality, control of corruption, and rule of law) at year t with the data at year t-1; the dependent variables and principal components remained at year t. In addition, we conduct a regression by dividing the data into different economies, developed countries and developing countries.

Note that we also compare the regressions with principal components and the regression including all variables individually. We pool variables into groups and run separate regressions with each set of variables. The categories are the same as those shown in the data definition: country governance, macro-environment, political risk, and information risk. The group country governance includes voice and accountability, political stability and absence, government effectiveness, regulatory quality, control of corruption, and rule of law; macro-environment contains current account, GNI (PPP method), inflation, and unemployment; political risk covers freedom of the press, political rights, civil liberties, property rights, freedom from corruption, fiscal freedom, government spending, business freedom, monetary freedom, trade freedom, investment freedom, and financial freedom; and fixed phone usage and internet usage constitute the group information risk. For the regulation variable group, we measure the independent variable at time t-1 and dependent variables at time t; and for the rest regression in Table V, we measure all the variables at time t.

4.1 Test of Reverse Causality

Besides investigate in how governance affect the probability of a financial crisis, we also test the reverse causality of the relationship between country level governance and financial crisis to improve the completeness of our research. Thus we conduct the following OLS regression,

$$GI_t = \alpha Crisis_{t-1} + \beta_{it} GDP\ Growth_{t-1} + \gamma\ PC_{it-1} \varepsilon,$$

where GI stands for the governance index, Crisis is a dummy variable, PC stands for the principal components. We measure the governance index at time t, and all the independent variables at time t-1.

4.2 Economic Significance

After we obtain the final model, we look for a better perspective through which to examine the effect the regulations have on financial crises. Thus we investigate the economic significance of the independent variables, and this technique to examine on the effects of each of the variables on the crises is even more interesting and straightforward.

Following the method used by Bekaert et al. (2011) and Lehkonen (2015), the economic significance presents the changes in the dependent variable (financial crisis) when the independent variable moves one standard deviation from the average value for the entire market and regional markets. For all the variables, which experience only time-series variation, we examine their response to a one-standard deviation change. To determine the economic significance, we calculate the standard deviations for each of the explanatory variables and then multiplied the estimated coefficients calculated from the lag regressions; the larger the result, the greater contribution the variable made to the financial crisis. Using this method, we can conclude what contribute the most to the financial crises for both full sample and regional data.

5. Empirical Results

We report the results from the regression analysis in Table III, Table IV, and Table V. Our modeling strategy was to first compare full sample contemporary regressions versus lag regressions in Section 5.1 to examine how country-level governance affects the probability of financial crises. We also interpret the empirical results by different economies in Section 5.2 and by category in Section 5.3, which can further explain how country-level governance can affect financial crises, or the performance of a country during a crisis period. In Section 5.4, we discuss the results of economic significance.

5.1 Full Sample Regressions

Table III shows the results for full sample regressions, of which Panel A reports the results of GDP growth regressions, while Panel B reports the results of logistic regressions. Theoretically, the coefficients for the crisis regressions and GDP growth regressions should have different opposite signs; however, the coefficients of the governance index for all contemporary regressions and lag regressions are positive. So we need to further examine how the breakdowns of governance variables affect financial crises, and consider the influencing factor of region, which we discuss in the following sections.

*** Insert Table III here ***

First, we review the results for contemporary regressions in Panel A. The coefficients for governance variables are not statistically and economically significant when the dependent variable is the dummy variable crisis. From the contemporary regressions in Panel A, we can find that the coefficients of PC_3, PC_5 and PC_6 have a statistic significant negative effect on the dependent variable Crisis. PC3 stands for the information frictions, PC_5 has a positive relation with gross nation income and current account and PC6 represents the price stability of a country. The second and forth columns of Panel B shows the results for lag regressions for the logistic regressions. From the lag regressions we can find that political stability, rule of law and absence and regulatory quality both have a statistic significant effects on crisis with coefficients 0.209, -0.437 and 0.788. And governance index as a whole also has a significant positive effect on crisis with a coefficient 0.533. When the results are compared to the contemporary regressions, we find

that the coefficients of regulatory quality, and political stability and absence become more significant in the crisis lag regression. Panel D shows how the regulation affects country performance.

5.2 Developed vs. Developing Countries

In this part we reports the comparison between the effects of regulation on developing countries and developed countries.

*** Insert Table IV here ***

Panel A shows the effects of regulation on GDP growth, and in model I we use governance index as independent variable, while Model II use the breakdowns. From Panel A we can find that governance index as a whole both has a statistically positive effect on GDP growth. However, when we look into the breakdowns from Panel B, the plus-minus signs vary between developed countries and developing countries. The factor rule of law has a positive coefficient on GDP growth for developing countries with the coefficient 1.531, but negative effects on developed countries with a coefficient -2.906.

Panel B reports the results of the effects of regulation have on financial crisis. From Panel B, we can see that governance index as a whole has a positive effect on crisis for both of the developed countries and developing countries. However, we can find that differences appear between different economies. Specifically, voice and accountability and rule of law have different effects. Voice and accountability has a positive effect on developing countries, but has a significant negative effect on developed countries at 5% significance level. Similarly, rule of law and regulatory quality also have different effects on different economies, they both have a negative effect on developing countries, and however a positive effects on developed countries.

5.3 Regression by Category

We interpret the results for regressions by category in this section. Each panel in Table V reports a different group.

Panel A reports the results for the regressions of country-level governance with all governance variables measure at time t-1 and dependent variables measure at time t. Similar to the contemporary regressions mentioned in Section 5.1, only political stability and absence have a significant positive effect on crisis at 5% confidence level, and the rest governance variables are not significant for the crisis regression. Looking into the GDP growth regression, we find that the voice and accountability, rule of law and regulatory quality have negative effects on GDP growth. However, government effectiveness has a positive effect with one unit increase in to result to 0.9 units increase in GDP growth.

In panel A we also investigate the relationship between the macro-environment and financial crisis. The plus and minus signs for GDP growth regression and crisis regression are opposite, which is in accordance with our expectation. Inflation and unemployment have a negative correlation with the financial situation, while current account, and GNI have a positive correlation with it. The coefficients of current account, gross national income, inflation, and unemployment are all significant at 99% confidence level.

Panel C presents the relationship between financial crises and political risks. For the GDP growth regression, the coefficients of civil liberties, freedom from corruption, government spending and monetary freedom are positive and significant at a 99% confidence level. The coefficient of business freedom and political rights are significant as well, but negative. When the dependent variable is the dummy variable crisis, the results differ. Freedom of the press and fiscal freedom have a significantly inverse relationship with the dummy variable crisis, while civil liberties and governance spending have a positive association with crisis, but all these coefficients are significant.

Panel D shows the effects of information frictions. We can tell from the table that all information risk variables are quite important factors for GDP growth and financial crises, as fixed phone usage and Internet users per hundred people are both significant for GDP growth and crisis regressions under the significance level 99.9%. Thus we can interpret that the more fixed phone users per hundred people, the worse effect on the GDP growth, and more likely there is a

financial crisis. However, for the Internet users per hundred people, when there is one unit increase, there is 0.036 units decrease in the chance of financial crisis.

*** Insert Table V here ***

5.4 Results for Reverse Causality

We report the results of reverse causality in Table VI. In the table, we use governance index as dependent variables, and crisis dummy, GDP growth and principal components as independent variables. As of we are trying to investigate whether the crisis as a reverse causality effects on country level governance, we measure the dependent variable at time t and all independent variables at time t-1.

We found that all the independent variables from the past year have a statistical significant effect on the country level governance in the following year at 99% confidence level. From Table VI, we found that GDP growth and crisis dummy both have a positive effects on governance index, so do PC2, PC3, PC4, PC5 and PC6. However, PC1 and PC7 have negative effects on the governance, from the results for principal component analysis, we can know that PC1 stands for political risks (Political rights, civil liberties and freedom of the press), PC7 stands for the unemployment rate.

*** Insert Table VI here ***

5.5 Contribution of Variables

In this section, we report the contribution of each variable. In particular, we examine the response to a one standard deviation change. Table VII presents the economic significance of the annual variables. It shows the contributions each of the explanatory variables made to a one-standard deviation movement of a financial crisis. In Table VII columns I, II and III refer to full sample, developed countries and developing countries, respectively.

From the first column, we can find that voice and accountability, regulatory quality, rule of law, and Internet users per hundred people are the most important factors to the financial crisis.

Among them, an increase of the score of rule of law will increase the probability of the occurrence of financial crisis.

For the developed countries, we can conclude that voice and accountability, government effectiveness, regulatory quality, control of corruption, freedom of the press, inflation and internet contributes the most to the financial crisis. However, for the developing countries, rule of law and internet usage contributes the most. From column II and III, we can compare the different effects the regulation variables have on the probability of a financial crisis. Government effectiveness and regulatory quality show the different effects.

*** Insert Table VII here ***

6. Conclusions

This paper examines the important yet understudied topic of financial crises and how they affected by country-level governance and regulations. We find that the quality of regulation enforcement, political stability and absence of violence/terrorism are the most important factors.

Previous researchers have studied which factors cause a financial crisis and have also investigated the regulation responses in the aftermath of the recent global financial crisis. Only a few of previous literature, however, have focused on how regulations or country-level governance affect the occurrence of a financial crisis.

We apply the governance index and its breakdowns created by Kaufmann, Kraay, and Mastruzzi (2009) and conduct both contemporary regression and lag regression analyses. We also control for political risk, the macro financial environment, and information variables when estimating our multivariate regressions to allow for the relationship between governance and financial crises to be better understood. To determine how the impact of governance on crises differs in various financial markets, we conduct a regional analysis. We also examine the economic significance of our explanatory variables following methods used in Bekaert et al. (2011) and Lehkonen (2015).

Using a sample of 88 countries from 1996 to 2013, we conduct a regression analysis and find that governance has a positive effect on GDP growth and also on the occurrence of crises. To further explore this surprising relationship, we conduce a regression analysis to compare the effects of regulation on developed and developing countries.

We conclude that political stability and the absence of violence/terrorism and regulatory quality are more important factors than other aspects of country-level governance. With higher scores in regulatory quality, the probability of financial crises tends to decrease and GDP growth tends to increase. What's more, a more stable political environment can reduce the probability of financial crisis and increase GDP growth.

However, GDP growth cannot fully represents financial crisis. Since there are lots of indicators for a financial crisis, such as oil price, stock price index or nominal exchange rate, no indicators

itself can act as a proxy for financial crisis, while using GDP growth can help us understand the effects of country governance and it can also be used as a proxy of country performance.

In addition to country-level governance, information risk also plays a significant role in financial markets. Based on our empirical results, we conclude that with better communication methods, in other words, with less information friction, we can protect the GDP growth rate during financial crisis periods and can directly reduce the probability of financial crises as well.

However, there are several areas we can focus on in further research that are not related in a study of global financial crises; thus, further studies should focus on regional crises, such as the Euro zone sovereign debt crisis that happened around the end of 2009 or Asia's financial crisis in 1997; we can also test the complementary effects among factors by examining the interactions.

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Appendix A: Variable Definitions

Variable	Source	Definition
Crisis Periods	Lehkonen (2014)	Asian financial crisis and LTCM: 10/1997–12/1998. Dot-com bubble: 10/2000–12/2002. Global financial crisis: 8/2007–6/2009 and 9/2008–6/2009.
GDP Growth (annual %)	WDI	GDP growth rate measured at market prices based on local currency, calculated yearly.

Country Governance and Power of Regulations

Variable	Source	Definition
Voice and Accountability	WDI	Voice and accountability measures a country's citizens' ability to select their government, their freedom of expression and association, and to select free media.
Political Stability and Absence of Violence/Terrorism	WDI	Political stability and absence of violence/terrorism measures the likelihood of political instability and politically motivated violence and terrorism.
Government Effectiveness	WDI	Government effectiveness refers to the quality of public services, civil service, the independence of government when making and implementing policy from political pressures, and the credibility of a government's commitment.
Rule of Law	WDI	Rule of law measures the extent to which an agent abides by the regulations—specifically, the quality of contract enforcement, property rights, the police, the courts, and the likelihood of crime and violence.
Control of Corruption	WDI	Control of corruption measures the extent to which public power is exercised for private gain.
Regulatory Quality	WDI	Regulatory quality measures the capability of a government to develop as well as implement policies and regulations that can facilitate private sector development.
Governance Index (Average)	WDI	The average of governance indicators used by Kaufmann, Kraay, and Mastruzzi (2009): voice and accountability, political stability and absence, government effectiveness, the rule of law, control of corruption, and regulatory quality.

Political Risk

Freedom of the Press	Freedom House	Freedom of the press measures the degree of freedom to which new agencies exercise their power in each country, and the extent to which the government respects their freedom.
Political Rights	Freedom House	Political rights represent the degree of freedom of people participating in the political process.
Civil Liberties	Freedom House	Civil liberties measure the freedoms of an individual's expression and belief, associational and organizational rights, rule of law, and self-rule without disturbance from the state.
Property Rights	Heritage Foundation	Property rights measure the ability of individuals to accumulate private property and wealth.
Freedom from Corruption	Heritage Foundation	Freedom from corruption measures the level of perceived corruption. Mainly derived from the CPI.
Fiscal Freedom	Heritage Foundation	Fiscal freedom measures the freedom given by the government to individuals and enterprise to keep, manage, use, and benefit their own wealth and income.
Government Spending	Heritage Foundation	Government spending refers to all government consumption, investment, and transfer payments as a percentage of GDP.
Business freedom	Heritage Foundation	Business freedom measures the extent of freedom from interference from the state when an individual establishes and runs a company.
Monetary Freedom	Heritage Foundation	Monetary freedom measures the price stability as well as the power of price control in a country.
Trade Freedom	Heritage Foundation	Trade freedom measures not only the economy's openness to the inflow and outflow of goods and services around the world, but also the ability of a citizen to act as a buyer and a seller in the international market.
Investment Freedom	Heritage Foundation	Investment freedom measures the freedom of investment, ie. it evaluates the restrictions imposed on investment.

Financial Freedom	Heritage Foundation	Financial freedom is a measurement of banking efficiency and independence from both government and financial sectors.

Domestic Macroeconomic Fundamentals and Risk Appetite

Domestic Credit to the Private Sector (% of GDP)	WDI	Domestic credit to the private sector represents the financial resources provided to the private sector by financial enterprises.
GNI per Capita (PPP Method)	WDI	GNI per capita ppp is the gross national income divided by the midyear population, using the World Bank's PPP method to convert to U.S. dollars.
Unemployment	Heritage Foundation/IMF	The unemployment rate refers to the total unemployment over the total labor force.
Inflation (Consumer Prices annual %)	WDI	Inflation is measured based on the consumer price index (CPI).
Current Account Balance	IMF	Current account balance is the sum of net exports of goods and services, net primary income, and secondary income. Data are denoted in U.S dollars.

Information Friction

Phone Lines per 100 People	WDI	Number of fixed lines and mobile phone subscribers per 100 people.
Internet Users per 100 People	WDI	Number of internet users per 100 people.

Appendix B: Principal Component Analysis

This table reports the result for principal component analysis. We report the rotated component matrix of our control variables, including political risk variable, macroeconomic fundamental variables and information friction variables. All variables used to extract principal components are measured in year t. The numbers represent the correlation between each variable used in the principal component and the principal component itself. It shows how much each variable influences each principal component.

Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
Political Rights	0.904	-0.176	-0.176	-0.198			
Civil Liberties	0.870	-0.227	-0.264	-0.236			
Freedom of the Press	0.851	-0.260	-0.118	-0.314			
Financial Freedom	-0.269	0.783	0.230				
Investment Freedom	-0.363	0.739	0.115				0.179
Business Freedom		0.693	0.368	0.300	0.188		
Property Rights	-0.302	0.607	0.208	0.465	0.309		
Freedom from Corruption	-0.212	0.565	0.340	0.482	0.343	0.116	-0.117
Trade Freedom	-0.223	0.212	0.850				
Internet Users	-0.225	0.286	0.720	0.201	0.244	0.111	
Fiscal Freedom	0.272		0.103	-0.862			
Government Spending	0.313	-0.144	-0.371	-0.727	-0.109		-0.111
Fixed Line Users	-0.362	0.350	0.483	0.549	0.197		
Current Account					0.957		
GNI (PPP Method)	-0.124	0.348	0.564	0.254	0.582		-0.134
Inflation						-0.927	
Monetary Freedom		0.437			0.235	0.542	-0.233
Unemployment			-0.106				0.960

Table I: Descriptive Statistics

In this table, we report the descriptive statistic for the full sample. We state the minimum, maximum, mean, median and standard deviation of our dependent variable as well as independent variables.

	Minimum	Maximum	Mean	Median	Std. Deviation
Business Freedom	28.8	100.0	68.1	70.0	13.6
Civil Liberties	1.0	7.0	2.9	3.0	1.5
Control of Corruption	-1.4	2.6	0.2	-0.14	1.0
Current Account	-42.3	45.2	-1.1	-2.0	8.3
Financial Freedom	20.0	90.0	56.4	50.0	16.6
Fiscal Freedom	29.8	99.9	70.9	73.0	14.6
Fixed Line Users	0.2	74.8	22.6	16.3	20.0
Freedom from Corruption	10.0	100.0	46.0	38.0	23.2
Freedom of the Press	5.0	99.0	40.7	40.0	20.8
Governance Index	-1.2	2.0	0.2	0.0	0.8
Government Effectiveness	-1.3	2.4	0.3	0.0	0.9
Government Spending	0.0	99.3	64.3	71.4	24.6
Inflation	-8.5	1058.4	6.9	3.7	28.6
Internet Users	0.0	95.1	23.8	11.2	26.5
Investment Freedom	5.0	95.0	58.3	60.0	17.5
Monetary Freedom	0.0	94.3	75.2	77.7	13.1
Political Rights	1.0	7.0	2.8	2.0	1.8
Political Stability and Absence of Violence/Terrorism	-2.4	1.7	0.0	0.1	0.9
GNI (PPP Method)	340.0	99100.0	15785.4	9395.0	15903.7
Property Rights	10.0	95.0	54.9	50.0	21.9
Regulatory Quality	-1.3	2.2	0.4	0.2	0.8
Rule of Law	-1.5	2.1	0.2	-0.1	0.9
Trade Freedom	0.0	90.0	71.1	74.2	13.7
Unemployment	0.7	35.9	8.4	7.2	5.4
Voice and Accountability	-1.9	1.8	0.2	0.1	0.9
GDP Growth (%)	-14.8	17.3	3.8	3.8	3.6
No. of Observations	1548	1548	1548	1548	1548

Table II: Summary Statistics for Developed vs. Developing Countries

This table reports descriptive statistics for our subsamples of developed and developing countries. Column I and II report for the tests for mean and median of developed vs. developing countries. Column I reports the p-value of the t-test on mean and column II reports the p-value for Wilcoxon median tests. The list of developed countries and developing countries can be found at the end of the table.

	Developed Countries			Developing Countries			I	II
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation		
Business Freedom	78.3	77.4	11.1	63.4	62.4	12.0	0.000	0.000
Civil Liberties	1.3	1.0	0.5	3.6	4.0	1.2	0.000	0.000
Control of Corruption	1.3	1.4	0.8	-0.3	-0.4	0.6	0.000	0.000
Current Account	-0.2	-0.8	6.0	-1.5	-2.7	9.2	0.000	0.000
Financial Freedom	67.6	70.0	15.1	51.2	50.0	14.5	0.000	0.000
Fiscal Freedom	58.3	61.0	13.2	76.7	77.7	11.2	0.000	0.000
Fixed Line Users	46.6	47.6	13.1	11.7	9.7	11.0	0.000	0.000
Freedom from Corruption	69.1	73.0	20.4	35.5	32.0	15.5	0.000	0.000
Freedom of the Press	19.0	18.0	8.7	50.6	52.0	16.8	0.000	0.000
Governance Index	1.2	1.6	0.5	-0.2	-0.2	0.5	0.000	0.000
Government Effectiveness	1.3	40.3	0.6	-0.2	80.1	0.6	0.000	0.000
Government Spending	37.7	2.3	18.6	76.5	5.0	15.7	0.000	0.000
Inflation	6.0	52.0	48.9	7.4	6.1	9.8	0.457	0.000
Internet Users	47.0	70.0	28.4	13.2	50.0	17.2	0.000	0.000

Investment Freedom	69.9	82.1	12.5	53.0	75.7	16.8	0.000	0.000
Monetary Freedom	80.2	1.0	10.9	72.9	3.0	13.4	0.000	0.000
Political Rights	1.1	1.0	0.3	3.6	-0.3	1.7	0.000	0.000
Political Stability And Absence of Violence/Terrorism	0.9	28640.0	0.4	-0.4	6160.0	0.7	0.000	0.000
GNI (PPP Method)	29144.9	90.0	12003.6	9671.7	50.0	13555.6	0.000	0.000
Property Rights	76.5	1.3	17.3	45.1	-0.2	16.0	0.000	0.000
Regulatory Quality	1.3	1.4	0.4	-0.1	-0.4	0.5	0.000	0.000
Rule of Law	1.3	81.4	0.6	-0.3	69.7	0.5	0.000	0.000
Trade Freedom	80.4	7.0	7.1	66.9	7.4	13.9	0.000	0.000
Unemployment	7.7	1.3	3.8	8.7	-0.2	6.0	0.000	0.000
Voice and Accountability	1.2	2.4	0.3	-0.2	4.7	0.6	0.000	0.000
GDP Growth	2.2	77.4	2.9	4.5	62.4	3.7	0.000	0.000
No. of Observations	486	486	486	1062	1062	1062		

List of developed countries: Austria, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, Malta, New Zealand, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States.

List of developing countries: Albania, Algeria, Armenia, Bahrain, Benin, Bolivia, Botswana, Brazil, Burkina Faso, China, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, El Salvador, Ethiopia, Fiji, Gabon, Georgia, Ghana, Guatemala, Honduras, India, Indonesia, Israel, Jordan, Kenya, Kuwait, Madagascar, Malaysia, Mali, Mexico, Moldova, Morocco, Mozambique, Nepal, Niger, Panama, Paraguay, Peru, Philippines, Saudi, Arabia, Senegal, Singapore, South Africa, Sri Lanka, Suriname, Swaziland, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, Uruguay, Vietnam, Zambia.

Table III: The Effect of Country Governance on Financial Crises

This table examines the effect of regulations on financial crises using a contemporary and lagged regression setup. In the contemporary regressions, all variables are measured in year t; in the lagged regressions, all governance variables are measured in year t-1, while other control variables (macroeconomic, political risk and information variables) and dependent variables (GDP growth and crisis dummy) are measured in year t. In panel A, the dependent variable is the GDP growth of country i in year t. In Panel B, the dependent variable is a dummy variable that measures the occurrence of a financial crisis of country i in year t. The crisis dummy equals 1 when there is a crisis, and 0 otherwise. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Model I		Model II	
	Contemporary	Lagged	Contemporary	Lagged
Panel A: GDP growth regression				
Voice and Accountability			-1.236***	-0.813
			(0.008)	(0.132)
Political Stability and Absence			-0.077	-0.113
of Violence/Terrorism			(0.620)	(0.482)
Government Effectiveness			0.883**	1.072***
			(0.025)	(0.009)
Rule of Law			0.372	0.337
			(0.335)	(0.399)
Regulatory Quality			1.225***	0.753*
			(0.004)	(0.096)
Control of Corruption			1.069***	1.131***
			(0.001)	(0.001)
Governance Index	2.808***	2.784***		
	(0.000)	(0.000)		
PC 1	1.661***	1.614***	0.846***	0.999***
	(0.000)	(0.000)	(0.005)	(0.004)
PC 2	-1.698***	-1.723***	-1.887***	-1.902***
	(0.000)	(0.000)	(0.000)	(0.000)
PC 3	-1.497***	-1.456***	-1.564***	-1.538***
	(0.000)	(0.000)	(0.000)	(0.000)
PC 4	-1.775***	-1.784***	-1.733***	-1.837***
	(0.000)	(0.000)	(0.000)	(0.000)
PC 5	-0.669***	-0.655***	-0.872***	-0.866***
	(0.000)	(0.000)	(0.000)	(0.000)
PC 6	0.029	0.005	-0.030	-0.060
	(0.741)	(0.959)	(0.732)	(0.525)
PC7	0.017	0.006	0.068	0.073
	(0.852)	(0.947)	(0.452)	(0.448)
Intercept	3.151***	3.142***	3.045***	3.037***
	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R^2	0.155	0.149	0.173	0.164
F- Statistic	36.385	33.009	25.902	23.005
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
No. of Observations	1548	1462	1548	1462

	Model I		Model II	
	Contemporary	Lagged	Contemporary	Lagged

Panel B: Crisis regression

	Contemporary	Lagged	Contemporary	Lagged
Voice and Accountability			-0.403	-0.172
			(0.170)	(0.620)
Political Stability and Absence of Violence/Terrorism			0.101	0.209**
			(0.303)	(0.041)
Government Effectiveness			0.214	-0.002
			(0.396)	(0.994)
Rule of Law			-0.258	-0.437**
			(0.287)	(0.088)
Regulatory Quality			0.418	0.877***
			(0.121)	(0.004)
Control of Corruption			0.073	0.098
			(0.712)	(0.647)
Governance Index	0.323	0.533**		
	(0.135)	(0.025)		
PC 1	0.141	0.247**	-0.089	0.150
	(0.153)	(0.021)	(0.634)	(0.497)
PC 2	-0.017	-0.054	-0.022	-0.129
	(0.869)	(0.637)	(0.857)	(0.354)
PC 3	-0.422***	-0.657***	-0.406***	-0.676***
	(0.000)	(0.000)	(0.000)	(0.000)
PC 4	0.029	0.064	0.118	0.169
	(0.777)	(0.568)	(0.310)	(0.194)
PC 5	-0.119**	-0.148**	-0.126	-0.119
	(0.093)	(0.050)	(0.100)	(0.146)
PC 6	-0.329***	-0.875***	-0.322***	-0.863***
	(0.001)	(0.000)	(0.001)	(0.000)
PC7	-0.075	-0.070	-0.087	-0.097
	(0.190)	(0.248)	(0.134)	(0.122)
Intercept	-0.299***	-0.159**	-0.314***	-0.244**
	(0.000)	(0.041)	(0.001)	(0.024)
Chi-square	65.550	141.960	71.856	153.459
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Pseudo R^2	0.056	0.124	0.061	0.133
No. of Observations	1548	1462	1548	1462

Table IV: The Effects of Country Governance in Developed vs. Developing Countries

This table compares the effects of country governance on different types of economies, i.e. developed and developing countries. Panel A reports for OLS regressions in which the dependent variable is GDP growth, and Panel B presents results for logistic regressions in which the dependent variable is crisis dummy. We measure the regulation variables at time t-1 while all other independent variables and dependent variables are measured at time t. In model I, we use the governance index to represent country governance, while in model II, we use the underlying factors of the governance index as proxies of country governance, ie. voice and accountability, political stability and absence of violence/terrorism, government effectiveness, rule of law, regulatory quality, and control of corruption. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Developed Countries		Developing Countries	
	Model I	Model II	Model I	Model II
Panel A: GDP growth regression				
Voice and Accountability		2.611**		-0.965
		(0.022)		(0.134)
Political Stability and Absence of Violence/Terrorism		0.003		-0.227
		(0.994)		(0.225)
Government Effectiveness		1.431*		0.470
		(0.052)		(0.363)
Rule of Law		-2.906***		1.531***
		(0.001)		(0.002)
Regulatory Quality		2.206***		0.880
		(0.009)		(0.137)
Control of Corruption		0.752		0.603
		(0.175)		(0.161)
Governance Index	2.777***		2.548***	
	(0.000)		(0.000)	
PC 1	0.412	0.632	1.373***	0.812*
	(0.517)	(0.366)	(0.000)	(0.053)
PC 2	-1.259***	-1.598***	-1.652***	-1.947***
	(0.000)	(0.000)	(0.000)	(0.000)
PC 3	-2.099***	-2.116***	-0.970***	-1.145***
	(0.000)	(0.000)	(0.000)	(0.000)
PC 4	-1.220***	-1.324***	-1.674***	-1.916***
	(0.000)	(0.000)	(0.000)	(0.000)
PC 5	-0.769***	-0.658**	-0.629***	-0.921***
	(0.003)	(0.013)	(0.000)	(0.000)
PC 6	0.035	0.017	0.410*	0.423*
	(0.753)	(0.880)	(0.062)	(0.053)
PC7	-0.304	-0.452**	0.121	0.250**
	(0.134)	(0.026)	(0.299)	(0.036)
Intercept	1.816***	0.431	3.405***	3.195***
	(0.006)	(0.606)	(0.000)	(0.000)
Adjusted R^2	0.228	0.260	0.055	0.073
F- Statistic	17.885	13.391	103.241	7.028
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)

	Developed Countries		Developing Countries	
	Model I	Model I	Model I	Model II
No. of Observations	459	459	1003	1003
Panel B: Crisis regression				
Voice and Accountability		-2.039**		-0.965
		(0.045)		(0.134)
Political Stability and Absence of Violence/Terrorism		0.406		-0.227
		(0.267)		(0.225)
Government Effectiveness		0.099		0.470
		(0.881)		(0.363)
Rule of Law		0.620		1.531***
		(0.411)		(0.002)
Regulatory Quality		0.312		0.880
		(0.676)		(0.137)
Control of Corruption		0.293		0.603
		(0.574)		(0.161)
Governance Index	0.676		0.268	
	(0.268)		(0.326)	
PC 1	0.540	0.160	0.168	0.214
	(0.324)	(0.795)	(0.202)	(0.395)
PC 2	-0.411	-0.314	0.084	-0.062
	(0.113)	(0.290)	(0.555)	(0.725)
PC 3	-1.013***	-0.913***	-0.529***	-0.596***
	(0.000)	(0.000)	(0.000)	(0.000)
PC 4	-0.069	0.114	0.106	0.170
	(0.779)	(0.679)	(0.520)	(0.351)
PC 5	-0.403**	-0.462**	-0.067	-0.049
	(0.064)	(0.048)	(0.423)	(0.603)
PC 6	-0.544**	-0.537	-0.930***	-0.926***
	(0.086)	(0.109)	(0.000)	(0.000)
PC7	-0.534***	-0.477***	-0.029	-0.043
	(0.007)	(0.019)	(0.667)	(0.544)
Intercept	0.272	1.041	-0.125	-0.250
	(0.634)	(0.163)	(0.328)	(0.108)
Chi-square	76.303	81.297	89.012	97.914
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Pseudo R^2	0.204	0.217	0.113	0.124
No. of Observations	459	459	1003	1003

Table V: Regressions by Variable Category

This table reports regressions by variable category, namely country governance, macro-environment, political risk, and information risk variables. All dependent and independent variables are measured at year t. Panel A reports the group of country governance, Panel B states the group macro-economic variables, Panel C states the group of political risk variables, and Panel D states the group of information variables. We report both standardized and unstandardized coefficients. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable	GDP Growth (OLS Regression)	Crisis (Logistic Regression)
Panel A		
Voice and Accountability	-0.882***	-0.113
	(0.000)	(0.297)
Political Stability and Absence of Violence/Terrorism	-0.055	0.167**
	(0.745)	(0.089)
Government Effectiveness	0.900**	-0.129
	(0.028)	(0.584)
Rule of Law	-0.721*	-0.298
	(0.067)	(0.193)
Regulatory Quality	-0.933***	0.191
	(0.008)	(0.350)
Control of Corruption	0.379	0.223
	(0.247)	(0.241)
Intercept	4.099***	-0.116**
	(0.000)	(0.068)
Adjusted-R^2 / Pseudo R^2	0.077	0.005
F- Statistic / Chi-square	21.193	5.870
(P-value)	(0.000)	(0.438)
No. of Observations	1462	1462
Panel B		
Current Account	0.059***	-0.001
	(0.000)	(0.847)
GNI (PPP Method)	0.000***	0.000
	(0.000)	(0.134)
Inflation	-0.009***	0.023***
	(0.003)	(0.003)
Unemployment	-0.064***	-0.008
	(0.000)	(0.422)
Intercept	5.627***	-0.085
	(0.000)	(0.549)
Adjusted-R^2 / Pseudo R^2	0.073	0.020
F- Statistic/ Chi-square	31.486	21.655
(P-value)	(0.000)	(0.000)
No. of Observations	1548	1548

Panel C

Freedom of the Press	0.007	-0.023***
	(0.481)	(0.001)
Political Rights	-0.243**	-0.117
	(0.037)	(0.121)
Civil Liberties	0.468***	0.548***
	(0.005)	(0.000)
Property Rights	-0.016*	0.017***
	(0.057)	(0.001)
Freedom from Corruption	0.025***	0.000
	(0.002)	(0.977)
Fiscal Freedom	0.013	-0.022***
	(0.109)	(0.000)
Government Spending	0.018***	0.012***
	(0.001)	(0.000)
Business Freedom	-0.042***	-0.002
	(0.000)	(0.692)
Monetary Freedom	0.020***	-0.025***
	(0.007)	(0.000)
Trade Freedom	-0.019**	-0.012**
	(0.018)	(0.028)
Investment Freedom	-0.005	0.000
	(0.485)	(0.943)
Financial Freedom	-0.005	0.003
	(0.473)	(0.495)
Intercept	3.751***	2.172***
	(0.000)	(0.002)
Adjusted-R^2 / Pseudo R^2	0.123	0.104
F- Statistic / Chi-square	19.080	118.504
(P-value)	(0.000)	(0.000)
No. of Observations	1548	1548

Panel D

Fixed Line Users	-0.027***	0.034***
	(0.000)	(0.000)
Internet Users	-0.024***	-0.036***
	(0.000)	(0.000)
Intercept	4.995***	0.009
	(0.000)	(0.908)
Adjusted-R^2 / Pseudo R^2	0.089	0.135
F- Statistic / Chi-square	76.961	155.554
(p-value)	(0.000)	(0.000)
No. of Observations	1462	1462

Table VI: Reverse Causality Test

Table VI reports the results for a reverse causality test. The dependent variable in the reverse causality regression is the governance index measured at time t, whereas all independent variables, i.e., GDP growth, the crisis dummy and the principal components are measured at time t-1. We report both standardized coefficients and unstandardized coefficients for each independent variables. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Unstandardized Coefficients	Standardized Coefficients
GDP Growth	0.014 ***	0.062 ***
	(0.000)	(0.000)
Crisis	0.047 ***	0.028 ***
	(0.000)	(0.000)
PC 1	-0.394***	-0.473 ***
	(0.000)	(0.000)
PC 2	0.425 ***	0.510 ***
	(0.000)	(0.000)
PC 3	0.306 ***	0.362 ***
	(0.000)	(0.000)
PC 4	0.413 ***	0.492 ***
	(0.000)	(0.000)
PC 5	0.208 ***	0.254 ***
	(0.000)	(0.000)
PC 6	0.079 ***	0.094 ***
	(0.000)	(0.000)
PC7	-0.090***	-0.107 ***
	(0.000)	(0.000)
Intercept	0.150 ***	
	(0.000)	
Adjusted-R^2	0.925	
F- Statistic	2012.719	
(p-value)	(0.000)	
No. of Observations	1642	

Table VII: Contribution of Variables

Columns I, II and III refer to the full sample, developed countries, and developing countries respectively. We report the effect of each integration variable on the dummy variable crisis when it experiences a one standard deviation change.

	I	II	III
Voice and Accountability	-0.468	-1.379	-0.139
Political Stability and Absence of Violence/Terrorism	0.209	0.315	0.133
Government Effectiveness	0.243	-0.858	0.345
Rule of Law	-0.465	0.218	-0.313
Regulatory Quality	0.506	0.713	0.279
Control of Corruption	-0.226	0.698	-0.233
Current Account	-0.109	-0.144	-0.116
Freedom of the Press	-0.523	-0.969	-0.275
Political Rights	-0.094	-0.361	0.004
Civil Liberties	0.351	0.339	0.244
Property Rights	0.260	-0.230	0.207
Freedom from Corruption	0.296	0.267	0.065
Fiscal Freedom	-0.299	-0.478	-0.174
Government Spending	0.241	0.103	0.177
Business Freedom	0.145	0.126	0.078
Monetary Freedom	-0.247	-0.379	-0.298
Trade Freedom	0.023	0.707	-0.036
Investment Freedom	-0.035	-0.277	0.038
Financial Freedom	-0.082	0.061	-0.096
GNI (PPP Method)	0.194	0.097	0.289
Inflation	0.455	3.948	0.069
Unemployment	-0.097	-0.296	-0.046
Fixed Line Users	0.280	0.176	0.242
Internet Users	-1.055	-1.308	-0.888
No. of Observations	1462	459	1003