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# Banking Supervisory and Regulatory Policy in Developing Countries: An Analysis of Determinants and Impacts

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# BANKING SUPERVISORY AND REGULATORY POLICY IN DEVELOPING COUNTRIES: AN ANALYSIS OF DETERMINANTS AND IMPACTS

by

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# BANKING SUPERVISORY AND REGULATORY POLICY IN DEVELOPING COUNTRIES: AN ANALYSIS OF DETERMINANTS AND IMPACTS

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A decade after the Great Recession in 2007/2008, many developing countries are still struggling to devise appropriate policy actions that enhance banking supervision and regulation and help mitigate large-scale crises in the future. This uncertainty has also left lingering impacts on economic growth, especially in developing countries that have weak institutional mechanisms. This study examines how banking supervision and regulatory reforms are determined in the cross-national context of advanced and developing countries. Using time series, cross-sectional data on 180 countries over a period of 12 years (1999-2011), the purpose is to explore the roles of exposure of financial crisis, trade openness, recipiency of financial assistance, level of democratization, and corruption in adopting the different degrees and forms of banking supervision and regulatory policies. The analysis is also extended to the potential impact of banking supervision and regulation on economic growth in the cross-national context.

Findings from multivariate analysis suggest that financial crisis experience, financial assistance, trade openness, are the most consistent predictors and hold significant explanatory power for the relatively stable policy context of banking supervision and regulation. This result supports the public interest theory of regulation. Findings also suggest that tighter forms of banking supervision and regulation may have contributed to faster economic growth before, although not after, the global financial crisis. Highlighting the experiences of advanced and

developing countries in a group as well as separately, this study helps comparative researchers understand how the contextual and institutional settings become a part of the equation determining banking regulations and growth across countries.

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# CHAPTER 1

# INTRODUCTION

It has been a decade since the global financial crisis of 2008/2009 that is considered by some economist to be the worst financial crisis since the Great Depression in the 1930s (Eichengreen & O'Rourke, 2010; Eigner & Umlauft, 2015; Business Wire, 2009; Temin, 2010). As the economy recovers from the crisis impact, the growth in many countries is continuously lower than its longer-term average. According to the World Bank, from t2013 to 2017, the global economy only grew around 2.5 percent, comparably lower than 3.3 percent during 1994-1997. The outlook estimated the global economy to grow 3 percent in 2017 from a rate of 2.4 percent in 2016 (Worldbank, 2018). Advanced-economy countries growth is expected to recover moderately to 2.3 percent in 2017, while the emerging and developing countries are estimated to grow to 4.3 percent in 2017 from 3.7 percent in 2016. From a different point of view, this outlook emphasizes not only the weaker activities after the global financial crisis, but also the potential risk of the deeper global financial market. Both of weaker activities and their potential risks stimulate to the more volatility, uncertainty, complexity, and ambiguity (VUCA) in the global economy.

VUCA creates financial vulnerabilities and reduces the potential growth in some developing countries. Policy formulation has assumed that politics, regulation, and technology factors remain stable. In the complex environment of systemic shocks, developing countries should consider these factors during the policymaking process, with the objective to maintain financial stability while strengthening the conditions for development. Given that faster

economic growth is the major goal in developing countries, how effective are the banking supervisory and regulatory policies in promoting economic growth?

When viewed by the burden on taxpayers, the eight most expensive banking crises between 1990 and 2011 happened in developing countries (Indonesia, Argentina, Jamaica, Thailand, Turkey, Macedonia, Greece, and the Dominican Republic). Indonesia, for example, spent 56.8% of its GDP to save the economy during the 1997 Asian crisis, which also took seven years to return to pre-crisis growth rates of 5%-6% (Laeven & Valencia, 2012). The systemic banking crises caused a detrimental impact on the people living in developing countries. The severe recession in advanced countries in 2007-2009 created by the deepening global banking crises had a contagion effect on the developing countries and contributed to reducing the output growth in developing countries from 8.1% in 2007 to 1.7% in 2009 through trade and financial market channels (World Bank, 2010). The deepening global financial crises severely affected the progress of developing countries in eradicating extreme poverty and hunger as a part of Millennium Development Goals (MDGs)[1]. The financial collapse combined with high unemployment pushed approximately 64 million more people into extreme poverty (UNICEF, 2009). The reduction of growth will further undermine progress towards MDGs. Banking crises are likely to accompany and reduce the potential benefits of financial development on growth. Given the impact of the systemic banking crises in slowing the countries' economic activities,

[1] The United Nations (UN) MDGs are seventeen objectives approved by 189 UN member countries that must be achieved by the year 2030. The MDGs were initiated and signed during the UN Millennium Declaration in 2000, as an attempt to fight poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women. And the 2030 agenda was set up in 2016.

the theory of development is in question, including the role of the banking sector within the government policy to spur long-term economic growth.

Between 1990 and 2011, surveys indicate that 61 of 131 countries surveyed reduced the power of banking supervision and regulation. Twenty-seven of them stayed the same, and the rest strengthened their powers[2] (Barth, Caprio, & Levine, 2013). Among countries that weakened the power of supervisory and regulatory agencies, most are developing countries, including countries that experienced systemic banking crises. If it is insufficient regulation to control the behavior of economic actors that causes the banking crises, then why do some countries reduce their supervision and regulation?

The contradictive phenomenon between the incident of banking crises and the reduction of banking supervision and regulation in developing countries generates two issues that remain unanswered. First, the reasons for the variation in adopting banking supervisory and regulatory policy are not well understood, especially in developing countries. Research on banking regulation reform also has inconclusive results about the determinant factors of adopting banking supervision and regulation. Some argue that political systems and economic factors are determinants of banking reform in a country (Abiad & Mody, 2005; Barth, Caprio, & Levine, 2006; Kim, Park, & Suh, 2014). Others conclude political institutions are not significant predictors of banking reform in a country (Li, 2007). Also, most studies on the determinant factors of banking reform have focused on analyzing all the countries in general, and the results have failed to explain the situation in developing countries. Some researchers argue that the characteristics of high income and developing countries may differ. Developing countries tend to

[2] Based on Barth, Caprio, and Levine (2013) report, the first survey was started in 1997 and the fourth survey was done in 2011. I assume that the answer for year 1990 would not be much different than the answer in 1997, because the environment of supervision was stable.

have a greater uncertainty of the economy, are more open to a crisis, have weaker institutions, and have more dominant roles of banks than developed countries (Kim, Park, & Suh, 2014; Prasad, 2010; Vives, 2006). So, there needs to be further analysis of the determinants of banking supervision and regulation reform in developing countries by comparing with developed countries. In this study, I use panel data information in advance and developing countries from 1999 until 2011 and explore explanations of determinant factors of banking reform that are unique to developing countries.

Second, it is not clear how effective the banking supervisory and regulatory policies are in promoting economic growth. One of the main arguments is that effective formal institutions are the important determinant of countries' long-term growth (Acemoglu, Gallego, & Robinson, 2014; Hall & Jones, 1999). Recent research in the nexus of finance and growth reveals that well-structured banking institutions have a powerful influence on economic growth in 84 countries from 1975-2004 (Demetriades & Rousseau, 2016). Banks support financial development by providing funds for investment projects with long-term economic benefits. When banks perform their due diligence to select appropriate borrowers, this step helps a country to allocate resources more productively, and spur economic growth. However, if the banking system allocates resources poorly (by distributing the funds to the cronies and politically connected firms without a proper selection process), these activities will not only distort the capital allocation but also hinder economic growth. Research on 51 developed and emerging countries over the period 1997-2009 reveals that private monitoring regulation has a positive significant influence in spurring economic growth (Akisik, 2013). Private monitoring regulation is a regulation that involves the member of the market to watch the banking activities. In addition, a study in 23 transition economies from 1992-1998 suggests that the quality of legal banking supervision and

regulation is associated with an increase in the growth rate (Neyapti & Dincer, 2005). However, differences in political systems, economic conditions, and corruption influence the regulatory environment and inhibit the implementation of effective banking policies. For example, during the 1997 Asian financial crisis, troubled banks in Thailand and Indonesia have continued their operations for many years because of their political connections with the governments, although the action causes harm to the financial stability of a country and decreases economic growth (Auerbach & Willet, 2009; Walter, 2008).

## Purpose Statements

Since developing countries see economic growth as the optimal goal, the objective of this study is to understand how and why country's experiences vary in banking regulation and oversight and how that has influenced their economic growth. This study examines the similarities and differences in banking supervision and regulation across countries and over time. Specifically, it explores several factors that shape a country in choosing policy that leads to a strong banking supervision and regulation. Particularly, this dissertation focuses on the five determinant factors (financial crisis experience, trade openness, financial assistance, level of democracy, and corruption control) that shape countries' decisions in adopting banking supervision regulation. Then, I examine the influence of banking supervision regulation and its determinant on spurring economic growth.

This analysis is cross-national of 180 countries. It also compares studies from 1999 to 2011. I chose the start year of 1999 because this year is unique, marking the financial crisis in some developing countries. This also coincided with the creation of the Financial Stability Forum by G7 countries with the aim of strengthening the international financial system. The year

1999 is also important because it is the year of significant changes in banking systems when the dual process of financial liberalization and Basel I were adopted in developing countries. The year 2011 is the end of the analysis, because it is the year after the global financial crisis and is used with the aim of understanding the influence of the banking supervision and regulation after the economy shock. Also, there is no additional survey held by the World Bank.

The objective of this study is to get a better understanding of the unique factors in the past 12 years that influenced the implementation of banking supervisory and regulatory policies. It also examines the role of banking supervisory and regulatory policies in promoting economic growth. The potential determinant factors of adopting prudent banking supervision and regulation policy may include trade openness, financial assistance, previous episodes of systemic banking crises, level of democratization, and corruption control in a country. A better understanding of the phenomenon can also help the key regulators in developing countries to consider significant changes in an institution that has an influence on the country's effort to spur economic growth.

## Limitations of the Study

There are several limitations from this dissertation as follows: first, there is data limitation in terms of number of countries included in this study. The study is limited to 180 countries. There are 218 countries based on the World Bank Classifications. However only 180 countries completed the World Bank survey on banking supervision and regulation from 1999 to 2011. Second, this dissertation has an inability to capture the influence of the financial crisis experience on the decision to adopt banking supervision regulation. Given that the last banking crisis was over a decade ago, its impacts may have faded and so are not easy to pinpoint. Third, it

is difficult to compare policies across the developing and high-income countries, which have very different contexts. Fourth, this study cannot capture the influence of unique characteristics of the banking system in a country based on the specific method used in this dissertation. For example, there is a close connection between banks and large family-owned corporations in Indonesia and Thailand. This dissertation does not capture the relationship between the bank ownership and the decision to adopt banking supervision regulation to spur economic growth. Fifth, the fluctuation in economic growth shows the instability of this variable and the possible impact of other important factors that affect economic growth which are outside the scope of this dissertation. For example, labor is an important factor in the study of economic growth as is level of education, such as elementary and secondary, both of which may influence economic growth. Technological process also may have an influence on economic growth.

## Delimitations of the Study

There is a need to examine some unique factors in each country that drive the adoption of strong banking supervisory and regulatory policies. To disclose this unique factor, qualitative analysis using the case study method would be useful to capture the influence of strong political ties with the decision to adopt banking supervision and regulation. A case in point is banks in Indonesia and Thailand are developed from large family-owned corporations. Banks are the property of the parent holding company and are used as a channel to acquire cheap credit to fund the holding companies' businesses. So, there is no Western-style arms-length relationship between banks and borrowers (Lee, Lee, & Lee, 2002; LoGerfo & Montinola, 2001; MacIntyre, 1993; Walter, 2008). It means that banks cannot take specific actions if the borrowers breach the contracts. In addition, bankers with strong political ties can influence the government to adopt

lax supervision and regulation in exchange for political and financial support for the next election (MacIntyre, 1993; Omori, 2014). This relationship cannot be captured using a quantitative study, and can only be examined using qualitative methods.

## Significance of the Study

This study is important because it expands our knowledge on the topic of banking regulation. This study contributes to the current research on banking oversight and regulation by giving information about the main determinant factors in adopting banking supervision and regulation in developing countries. This study examines whether a country with a banking crisis history adopts stronger regulation and supervision to prevent the next banking crisis episodes and looks at the influence of corruption on the evolution of the banking supervision and regulation over time.

This study also extends the current literature by examining how banking supervision and regulation is linked with economic growth. The role of government in spurring economic growth through a sound banking institution has received less attention in modern economic development studies. Much of the research on banking supervision and regulation focuses on measuring the influence of regulations on the onset of systemic banking crises (Beck, Demirguc-Kunt & Levine, 2006; Bouheni, Ameur, Cheffou, & Jawadi, 2014; Chortareas, Girardone & Ventouri, 2012; Demirgüç-Kunt, & Detragiache, 2002; Noy, 2004). This study examines the differences in banking regulation and supervision may also explain why some countries experienced higher economic growth while other countries have lesser, thus, adding to the literature in the study of regulation and economic growth.

This study utilizes the panel data analysis, which examines the changes in banking

supervision and regulation across developing countries and over time. One explanation for this lack of cross-country studies in developing countries is that in the past there may have been a problem with data availability. The existence of publicly available data, therefore, makes it easier to conduct a study in developing countries currently. There are no cross-national studies that have considered this role of banking supervisory and regulatory policy at a country level for developing countries only. Neyapti and Dincer (2005) present that 1% increase in the quality of banking regulation and supervision will increase 14.46%-24.79%in average real GDP growth rate. Their study only examines twenty-three transition countries between 1989 and 1994. Given that studies focused on developing countries' experiences have been lacking, findings from this study can inform policymakers in developing countries and provide a comparison for those from advanced economic countries to consider banking regulatory reform in developing growth policy.

This study contributes to the literature by focusing on 180 developing countries, by examining the experience of financial crisis, trade openness, financial assistance, level of democratization, and corruption control that may influence a country's variation in adopting banking supervisory and regulatory policy. The understanding from this study will go further to inspire developing countries in general and high-income countries as a comparison, to develop a prudent banking supervisory and regulatory policy. The results of this study can benefit the policymakers so that they can put into consideration the uniqueness of each developing country when adopting a policy from developed countries. Findings from this study can also inspire the public administrators of developing countries to consider the economic and political environment before transferring a policy from industrialized countries. This study also will provide a suggestion for further research, which can help students who focus on the political economies of

developing countries who are interested in learning about banking regulatory and supervisory policy.

# CHAPTER 2

# LITERATURE REVIEW

This chapter reviews the related literature on banking supervisory and regulatory policy. Banking supervisory and regulatory policy is defined as the involvement of the state in governing the financial sector. It is important to note that the enactment of banking supervision and regulation is intended to not only prevent and respond to financial crises, but also to ensure that the supervision and regulation of the financial sector supports economic growth and development. Thus, the quality of banking regulatory policy is judged by both the ability to safeguard the financial stability as well as its influence on economic growth.

The review is organized into five sections. In the first part, I explore the history of banking regulation. In the second section, I discuss the school of thought and economic policy. In the third section, I discuss the theoretical discourse in banking regulation and supervision. In the fourth section, I examine in detail the various contexts that explain the variation in developing banking policy in developing countries. These factors are described in five subsections: the experience of crisis, financial assistance, trade openness, level of democratization, and corruption control. Lastly, I explore how the banking supervision and regulation policy promote economic growth in developing countries.

## History of Banking Regulation in Developing Countries

The beginning of financial sector reform in developing countries started in the late 1980s, which was marked by an attempt to reduce the government control in economy such as

implementing interest rate deregulation and opening the banking sector or capital account (Abiad & Mody, 2005; Pepinsky, 2012). However, the financial liberalization has not been followed by strengthening the regulation, which dampen the economic turmoil as the effect of liberalization and to protect the depositors' money. Caprio and Klingebiel (1996) presented that twenty-six insolvent banks in twenty-one developing countries have poor supervision and regulation. The reasons of lacking banking regulation are, first, governments in developing countries are the owner of banks, they have full control over the banks to promote economic welfare (Brownbridge & Kirkpatrick, 2000; Li, 2007; Murshed & Subagjo, 2002). Second, most developing countries have been colonized for many years, therefore many of these countries, specifically countries in Sub-Saharan Africa, had inherited banking supervisory and regulatory policy from their colonizers. The tragedy of banking crisis exposed the inadequate regulation in the developing countries in reducing the impact of the crisis. Government or foreign ownership of banks cannot ensure that economic fragility will not destroy the banking systems. Less banking regulation combined with the systemic banking crises causes the severe impact to developing countries.

In 1973, Basel Committee on Banking Supervision (BCBS) was formed to prevent the contagion effect of the banking crises that followed the collapse of the Bretton Woods exchange rate system (Alexander, Dhumale, & Eatwell, 2006). The committee was created at the end of 1974 by the governors of central banks of G-10 countries[3]. The committee was headquartered at the Bank for International Settlement in Basel, Switzerland. Currently, the membership of BCBS consists of representatives of the central bank governors and banking supervisory

[3] The group of 10 consists of eleven countries now: Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, United Kingdom, and United States. The initiator of BCBS was the G-10 plus Luxembourg, and Spain (Lall, 2012).

authorities from 28 jurisdictions and three observer countries[4]. The purpose of the BCBS is "to strengthen the regulation supervision and practices of banks worldwide with the purpose of enhancing financial stability". The BCBS provides a forum for cooperation on banking supervision internationally. In addition, the level playing field concerns motivated much of the accord is the fear that some countries would relax regulation in order to create advantages for banks domiciled in one country but operating in other countries.

After the Latin American crisis in the mid-1980s, the BCBS recommended the Basel accord to lessen banking instability in domestic and across countries (Alexander et al, 2006; Gottschalk, 2010; Petersen and Mukuddam-Petersen, 2014). Basel accord is a comprehensive set of regulations that guide the banking regulation, supervision, and risk management. The first Basel accord focuses mostly on credit risk. The Basel I adopted a capital adequacy ratio (CAR), which is the ratio of bank capital and risk-weighted assets (RWA). The objective of Basel I is to make sure that banks have capital at least 8% of its RWA to absorb losses (Petersen & Mukuddam-Petersen, 2014). Meanwhile, banks tend to change their portfolio's composition by choosing lower quality assets to comply with the regulatory capital ratio. Using the Basel accord I, if banks shift the regulatory capital, the actual risks will increase.

The World Bank and IMF introduce the Basel Accord to the developing countries as a part of the IMF financial sector assessment programs and World Bank financial sector adjustment programs (Alexander, Dhumale, & Eatwell, 2006). The developing countries suffer

[4] The member countries are Argentina, Australia, Belgium, Brazil, Canada, China, European Union, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. The country observers are Chile, Malaysia, and United Arab Emirates.

from high inflation and huge deficit because of the financial crisis in the late 1980s. The World Bank and IMF offer loans to help the borrowing countries maintain financial stability and pursue higher economic growth. In return, the borrowing countries must follow economic policy commitments required by the World Bank and IMF, including the implementation of Basel Accords. The World Bank and IMF promote the Basel Accord as a broad standard and guideline to be implemented in a country, to encourage the convergence of banking regulation and supervision approaches and standards.

Then, the Basel II was introduced in 2004. This second Basel improved the limitation of Basel 1 and accommodated for flexible risk profiles, because the simple structure of the first Basel accord was unable to accommodate numerous types of banks with different risk profiles. The Basel II consists of three pillars: capital minimum requirements, supervisory review, and market disciplines. There is no change on the definition of capital and the minimum capital. However, the Basel II modifies the calculation of RWA by incorporating credit risk, market risk, and operational risk. Finally, the standards for liquidity are added on the third Basel to anticipate bank liquidity decreased aftermath 2007 global financial crisis. The Basel III capital and liquidity regulation were introduced in 2010, while still implemented the pillars for supervision and external governance.

However, developing countries, which adopted the Basel Accords have to deal with the biggest challenges in these countries, the underdeveloped governance and accounting systems that cause the regulators in these countries are susceptible to political interference and the incompetent human resources cannot supervise the banking systems properly (Brownbridge & Kirkpatrick, 2000; Murshed & Subagjo, 2002).

## School of Thought and Economic Policy

Since the beginning, the development of economic policy is influenced by several views on how the economy functions. There are two main schools of thought that have influenced the view of economists since about 1776: Keynesian, and new classical (Boyes & Melvin, 2015). The Keynesian approach was established as a response to the Great Depression, which created a reduction in an economic output while the inflation was stable. The Keynesian supports the government involvement in stabilizing the economy and achieving a satisfactory rate of economic growth (Boyes& Melvin, 2015). During the Great Depression, Keynes broke the classical theory assumption of laissez faire, by showing the role of government in maintaining the economy. Keynes agrees that private sectors are the important sources to drive the economic activities, however, when the private sectors create instability in the economy, government should intervene to maintain the stability, and the fiscal policy is the only effective government intervention to save the economy.

After the domination of Keynesian theory, there was an increase in the inflation and unemployment rate in US that could not be explained using Keynesian approach. Friedman had developed the monetarist theory since 1940, however, his idea of focusing on the role of money supply in influencing the economy was accepted several decades later (Boyes & Melvin, 2015). Friedman's theory becomes the basis of the emergence of the new classical approach. Friedman refused the idea of Keynesian in involving the government to guide the economy. The economic policy may take a long time to have an impact on the economy. When policymakers recognize a problem in the economy, they need time to understand and formulate an appropriate policy to solve the problem. The effect of the policy, consequently, cannot be felt instantly. And there is a possibility that the policymakers face another different problem from what they discussed before,

thus, the government involvement makes the problem worse. However, the monetarist approach suggests the importance of formal rules rather than the discretion of policymakers in solving the economic problem. The formal rule is the permanent policy that can last for a long time. In this context, the monetary policy is a key to influence money growth and achieve steady economic growth.

The new classical approach introduces the concept of rational expectation that emphasizes the role of the information in helping people to predict the future. The rational people will decide not only based on their past experiences but also from all the relevant information that enable them to predict the future. In addition, the new classical approach indicates the need of cooperation between market and government in pursuing the objectives of financial stability, low inflation, and high economic growth (Aikins, 2009). Market is governed by rational actions of producers and consumers. The interactions between rational producers and consumers need relevant information that enable them to allocate the economic resources efficiently. The proactive regulation and supervision from the government are one of the sources of information that is needed to predict the going concern of market activities. The mutualistic relationship of market and government, finally, can have a greater benefit to the society.

## Theoretical Discussion in Banking Supervision and Regulation

### Effective Banking System and Economic Growth

The banking system has an important role on economic growth. Money is the main source that sustains a country's economy. The banking system serves as the intermediary, which circulates the money throughout the economy. The banking system collects money from the depositors and then transforms the money into various forms of investments. The presence of the

banks lowers the borrowing cost per unit of transactions and minimizes the risk of lending default (Andoh, 2014). Banks enjoy the economic scale of borrowing by getting money from many depositors, and then doing thoroughly due diligence process before lending the money, thusreducing the cost charged to the borrowers. The minimum risk of total default is also the advantage of having a banking system. If one lender is in default, the loss will be absorbed by other lenders in the banking system, so the impact of default on the economy is small. These functions of the banks in collecting money, allocating the money, and managing the risk are important in accelerating economic growth.

In addition, when the public deposit their money to the bank, banks can lend the portion of the money to finance promising investment project. The allowed amount to loan out is based on the deposits minus the reserve requirement. The central bank determines the percentage to be reserved. The borrowers, then, spend the loan to pay their expenditures and some of the money may be redeposited to the bank. The process of distributing, spending, and saving the money continues in the long term, and increases the money supply in each process.

The supply of money is important in driving economic transactions. When the economy in a country is growing, people will spend more than save or invest their money. Meanwhile, the growing economy also encourages the central bank to put credit program with low interest rate in the market. The low interest rate influences people to finance their purchase with borrowing. Numerous credit facilities with low interest rate increase the purchasing power of the society, the purchasing activities increase the money supply. However, when the increase in aggregate demand is not followed by the increase in aggregate supply, there will be an increase in price of the products. When the rising of the price sustains over several periods, then a country will experience high inflation. High inflation influences people expectation about the return of

investment projects in the future, because inflation is associated with an increased in price. High inflation reduces the expected rate of return in investment and makes a country's export is more expensive from other countries' point of view, then causes a lower export and economic growth, with the assumption that the currency is not inflating. Consequently, the inflation should be controlled to pursue higher economic growth in developing countries.

Economists offer two classifications of inflation based on the impact of the inflation on the aggregate demand and aggregate supply: demand-pull inflation and cost-push inflation (Boyes & Melvin, 2015). Demand-pull inflation occurs when the four sectors of the economy (households, businesses, governments, and foreign transactions) increase their spending more than the economy can produce. When the increasing aggregate demand is greater than the amount of goods available, the price will be rising. If the price continues to rise, then inflation happens. The term cost-push inflation refers to the increase in the cost of production that causes the businesses to raise the product's price to pursue maximum profit. Higher cost of production and maximum production capacity causes businesses cannot maintain the targeted profit margin with the same amounts of production. Consequently, the increased costs are charged to consumers and raising the price level (inflation).

There are two differences in theories that explain the best approach in sustaining the economic growth with stable inflation. Keynesian believes that the price is not flexible, so the changes in government expenditures or revenue will affect the change in the output of the economy (Boyes & Melvin, 2015). Thus, Keynesian argues that government intervention through fiscal policy will have an influence on economic growth, because the change in government spending or tax rate have multiplier effect in influencing the changing in aggregate demand. Japan, for example, increased its tax rate in 2014 to restore the economic growth and

stimulate the inflation. On the contrary, new classical theorists believe that controlling the inflation is the key to maintain the long-term economic growth (Boyes & Melvin, 2015). High inflation is associated with an increase in price and lower expected return of investment. The lower expectation on the profitability of the investment reduces the investment level and economic growth. According to the new classical approach, the monetary policy has an important role to pursue economic growth rather than fiscal policy. The monetary policy influences economic growth by maintaining the inflation stability. The monetary policy works by changing the interest rate. When the monetary policy reduces the interest rate, for example, this action will reduce cost of borrowing, then increase the investment activities. The lower interest rate influences the expectations toward the economic activities and enable the bank to ease the lending policy, which increases the consumers' confidence level to spend their money. The low interest rate also causes the currency depreciation because the domestic products are cheaper than imported products. The combination of these factors increases investment and economic growth.

This dissertation follows the new classical approach in explaining the concept of banking supervision and regulation, its determinant and influence on economic growth in developing countries. The new classical approach emphasizes on rational expectations that government is assigned in the economy limited to provide public goods and create public administration, while market is left alone to functions efficiently (Khan & Aziz, 2011; Zouache, 2004). The reason that neoclassical approach tries to find out the lowest amount of government intervention on the market is so that the rational choice people can make decision using their cost-benefit analysis without any intervention from the regulation. However, the policy based on the neoclassical approach works effectively when there is an absence of market imperfections. Neoclassical offer

monetary policy in rule out the economic fluctuation, and once again it failed to handle serious crisis in the form of the great depression of 1930 and the global crisis in 2008. The market failure can be cured using Keynesian approach that offer quick liquidity injection in the market, although only in the short run. There is a need to mix Neoclassical and Keynesian prescription to ensure banking and financial institutions play fairly in the market. On one side, the market can be a supervisor of the government agency to minimize the imperfect market. On the other side, the market limitations can be addressed by the government intervention. Therefore, the effective banking supervision and regulation concept refers to the rules that are used to facilitate efficient resource allocation in supporting economic growth and maintaining financial stability through reducing asymmetric information.

The asymmetric information here is the situation in which one party has perfect information while others do not. The asymmetric information is the characteristic of a credit market (Ariccia, 1998; Bhattacharya & Thakor, 1993; Van Damme; 1994). When a bank offers loans to its borrower, the bank faces uncertainty in predicting the borrower's ability to repay the loan to the extent that bank cannot access borrower's characteristics and activities. This asymmetrical information problem leads to inappropriate credit decision. As time goes by, the bank can solve the informational problem by asking some important information pertinent to borrower's creditworthiness. On the other hand, the asymmetric information problem may also appear in the relationship between bank and taxpayers. When there is a banking crisis and the government should intervene on the banking industry using taxpayers' money, taxpayers may not have full information about the banking activities. However, the intervention must be carried out to protect the economy. Consequently, banking regulation and supervision are needed here to

reduce the asymmetric information problem both in the lender-borrower connection and the bank-taxpayer relationship.

**Political Economy of Banking Policy Reform**

Research on the role of regulation in the relationship between government and businesses is dominated by two discourses: the public interest theory and the private interest theory (Lehne 2006). According to public interest theory, the idea of regulation is established due to the significant market failure, a condition in which a market competition will be inefficient for the economy. This implies in the situation where the asymmetric information happens, in which one party has full information and seeks to pursue its self-interest, and another party has a lack of information needed to make the best decision. So, the market will produce an inefficient allocation of economic resources. The market failure influences the whole economy and the government has an obligation to cure the market failures by putting an appropriate regulation as a response to the public need (Goldstein & Turner, 1996; Lehne, 2006; Posner, 1974; Shleifer, 2005). The asymmetry of information induces banks to not disclose their risky activities to the government. However, economy and society are interdependent. When the banking failure happens, the government must intervene on behalf of the economy by bailing out the troubled bank. To prevent the future economic shock and make banks stronger, banking supervision and regulation is needed to reduce the informational asymmetry and maintain the economic stability. Banking regulation provides a guidance for the government to control the banks and an incentive for public to do private monitoring on the banks. And, banking supervision power enables the government to take specific actions in preventing and correcting the market failure.

From the public interest perspective, banking regulatory reform has been driven by the experience of banking crises, which triggered the search for ways to cut the use of taxpayers' money. The severe banking crisis forces government to bail out the trouble banks and save the economy. Thus, it leads a country to have budget deficit and high inflation. In the case of most developing countries, reforms in banking policy has been driven more by external pressures, including the use of international consultants on reforms and the lending agreements. When the developing countries experience banking crisis, the IMF and World Bank offer financial assistance in return for economic policy reform from the borrowing countries (Alexander, Dhumale, & Eatwell, 2006). To qualify for the loan, the developing countries implement the institutional reform in the area of financial market practices, and regulation.

In opposition to the public interest approach, the private interest perspective prefers little government involvement when it deals with markets. Regulation is not dedicated to serve the public interest but is a response to the demands of special interest groups, private actors who are trying to maximize the ultimate objectives of their members (Barth, Caprio, & Levine, 2008; Lehne, 2006; Keefer, 2001; Posner, 1974). This approach rejects the assumption that government is an agent of the public because individuals are self-interested in or out of the public place (Frederickson, Smith, Larimer, & Licari, 2012). Regulation is a result of pressures from political actors who receive private benefits from the regulation at the expense of the majority of citizens. Banks influence the politicians who involve in the policymaking process by creating politically connected groups. These politically connected groups will propose regulation that benefit banking industry in return of cheap credit, or to be reelected in the next elections.

According to the private interest approach, the adoption of banking supervision and regulation could be influenced by the domestic political conditions and institutions (Aikins,

2009; Tsebelis, 2002). The banking industry has a salient impact on the politicians and regulators. Banks are one of the financial sources for political campaigns, in another side, the bank failures can put the regulators and politicians into the difficulties to avoid bailing out the troubled banks. When government actors are influenced by the competitive pressures to respond to the banking failures, regulation is needed to protect the market from the political agenda. Based on this view, political conditions and institutions, such as level of democratization, have an important role in determining which regulations are being adopted. In the case of developing countries, the variations in adopting banking supervisory and regulatory policy highlight the fact that the policy choice is determined not only by external pressures or macroeconomic conditions, but also domestic political conditions. Political influence of banking interest is strong in developing countries, in which bank is a part of big family business. The bank is established to supply the business of holding company with cheap credit (Lee et al., 2002; LoGerfo & Montinola, 2001; MacIntyre, 1993; Walter, 2008). Since the compliance cost on the prudential regulation can reduce the banks' profits, banks will form a politically connected group and influence the policymaking process to adopt lax regulatory and supervisory policy. For example, Indonesian bankers use their political connected groups to influence government and evade strict financial supervision, in exchange for campaign financial support for the next election (MacIntyre, 1993; Pepinsky, 2009). In Thailand, the banking community also has the power to persuade government to modify the implementation of regulation and supervision to fit the interests of the banks (LoGerfo & Montinola, 2001).

The theory of regulation provides explanations regarding the determinant factors of banking sector policies in developing countries. The former approach presents that banking crisis experience, financial assistance, external factor, and the use of international consultant are

the determinants of the banking reform, and the latter argues that domestic political institution influences a country to implement banking reform. Therefore, the theory of regulation provides a theoretical framework to investigate the hypotheses on this study.

## Determinant Factors of Banking Regulatory Policy Reform in Developing Countries

This section explores in detail the various factors that explain the variation in adopting banking supervision and regulation policy. Five factors may influence a country's choice in reforming the banking supervision and regulation; financial crisis experience, trade openness, financial assistance, level of democratization and country's corruption level.

### Previous Episode of Financial Crisis

The financial crisis usually has a serious impact on the economy and leads to an increased demand for better banking supervision and regulation. The financial crisis is associated with the increased uncertainty in the banking sector when the economy shows poor performance. The increased uncertainty in the banking sector influences the banking customers to withdraw their money from the bank. The massive deposit withdrawals create bank panic and interrupt the function of the banks in supplying credit to the economy. The declining supply of credit reduces the ability of individuals and businesses to spend and invest, then it may have an adverse impact on the economic growth (Agenor, Gambacorta, Kharroubi, Pereira da Silva, 2018). Since the systemic banking failure influences the real economy, the banking supervision and regulation are needed to prevent the future crisis.

Several cross-national empirical studies have found the relationship between financial crisis and financial reform. Research in twenty-nine developed and less developed countries

revealed that the past financial crises increases the quality of banking supervision and regulation adopted between 1934 and 1999 (Dincer & Neyapti, 2008). A case study in Latin American countries also presents that the country's crisis experiences between 1985 and 1995 accelerated the banking sector reform (Lora & Olivera, 2004), although another study involving all 180 countries from 1999-2011 presents a significant negative impact of the crisis to the banking supervisory policy implementation (Kim, Park, & Suh, 2014). Specifically, Abiad and Mody (2005) argued that the previous episode of banking crises decreases the reform likelihood in 35 countries between 1973 and 1996.

**Trade Openness**

Trade represents alternative activity to enter foreign market besides through foreign direct investment. Using the openness theory of financial development, Rajan and Zingales (2003) argue that the global integration can promote financial development in a country by reducing the domination of incumbent financial interest groups. The country openness to the international relationship, through both international trade and flow of investment, causes foreign companies enter the domestic market and create incentive for the domestic firms to access foreign funds in the same time. Thus, the trade openness promotes the financial development in a country and finally spur the economic growth. The empirical evidence presents that trade and financial openness have a positive and statistically influence on banking sector development (Baltagi, Demetriades, & Law, 2009; Law, 2009). Whereas Hauner, Prati, & Bircan (2013) finds that only trade openness has robust positive influence on the domestic financial development. In addition, using the microeconomic point of view, Ashraf (2018) tests the openness theory using three sets of banking development indicators and finds that the trade openness is robust predictor

of banking development by increasing the volume and reducing the cost and risk of bank credit. The reason is that the financially open countries force the banks to decrease the cost of credit to attract the customers, and in the same time it also forces the banks to lower the volume of credit.

Borrowing from the accounting theory, the legitimacy theory may explain that countries with greater trade openness with the developed countries will adopt strong banking supervision and regulation. The legitimacy theory argues that policy change is a result of social pressure faced by an institution (Lindbloom, 1994; Gibson, Caldeira, & Spence, 2005; DiMaggio & Powell, 2012). Countries with international trade attempts to be accepted by other countries they have social contract with, afterward these countries will seek to find conformity to the values, norms, or ideology of their partner countries. When developing countries, for example, have trade agreement with the developed countries, in return, the developed countries will introduce their value or ideology. Since international trade comes together with the financial development, then, these export-import oriented countries will attempt to adopt prudent banking regulation to not only follow the global regulation change but also to enhance the country's prestige in front of their partner countries. There is evidence, from research in monetary institution, indicating that the export-oriented countries prefer adopting a sound regulation as a sign of their country's prestige (Alexander, Dhumale, & Eatwell, 2006; Polilo and Guillén, 2005). Research by Kim and Kenny (2007) also reveals that trading with more developed countries increases the possibility to have regulatory reform.

**Financial Assistance**

The international agencies, that are responsible for lending money to countries in financial difficulty, usually attach a condition, including the implementation of prudent banking

supervision and regulation, to its lending agreements. Consequently, this assistance will influence a country to adopt prudent banking supervision and regulation to maintain their legitimacy within the international community (Alexander, Dhumale, & Eatwell, 2006; Meyer, Boli, Thomas, & Ramirez, 1997). It is well-known that almost all developing countries that have several financial problems are encouraged to sign an agreement with the IMF, which contains terms that will restructure the economic policy, including banking supervision and regulation. For instance, the letter of intent submitted by the government of Indonesia to the IMF in 1998, mentioned a commitment to strengthening the banking regulation to request financial support[5]. Similarly, the letter of intent sent to the IMF by the Thailand's government on September 21, 1999[6] mentions the submission of a financial regulation draft to the parliament to enhance the accountability of their banking system.

**Level of Democratization**

Democracy creates an environment which has a positive incentive for investment, innovation, and growth. Democracy facilitates transparent, competitive, and fair elections; considers the participation of citizen in policymaking process; and enables political leaders accountable to public. The regular, competitive, and fair elections reduce uncertainty for both politicians and the public policies that the political actors pursue. The stable political environment leads to predictability in public policies and economic institutions. All the economic decisions are taken based on the future consideration, and clear public policies increase the expected return of the economic decision. The democracy's concern on civil liberty

[5] http://www.imf.org/external/np/loi/101998.htm.
[6] http://www.imf.org/external/np/loi/1999/092199.htm.

enable the citizens to express their own interest during the elections. The free expression of political preferences encourages political actors to set up policies that is as close as possible to the preference of the citizens. As a result, policies tend to be predictable. The accountability of the political leaders to the broader population helps to limit the government actions. Thus, these features of democratic institutional environment are relevant for economic growth.

In the democracy, the expected rational people can express their preferences during the policymaking process. In return, the government should choose the preferences of the whole of population (Acemoglu & Robinson, 2006). According to median voter theory, the preferences of the median voter are important for electoral candidates to win the election. If the political actors want to maintain their powers, then the politicians will choose policies that fulfil the demands of voters.

Generally, developing countries had to have wars to gain their independence. Although the developing countries already gain their independence, the poor economies, and the conflict of the majority-minority of population cause political instability in these countries (Kim & Conceição, 2010). For instance, according to Freedom House's 2014 report, Thailand still experienced its 19$^{th}$ coup since 1932, developing countries in Africa also have problem of conflict at a regional level.

Developing countries have various levels of regime types including democracy, semi authoritarian, and authoritarian. Democracy, as characterized by policy in which reflects the preferences of most citizens, is the precondition to achieve the long-term economic growth (Agoraki, Kouretas, & Triantopoulos, 2019; Kirmanoglu, 2003). Democracy allows a competition among economic actors in the open market economy, because democracy's value enforces citizens to avoid harming others. The banking system is the center of and open

economy, therefore, a country must sustain the quality of the banking system to pursue economic growth. In another word, sustain the democratization is the necessary condition to sustain the reform of banking system (Quinn, 2000).

The empirical study in 76 developed and developing countries between 1998 and 2004 presents that country with an open and competitive political system is associated with strong banking regulation (Barth et al., 2006). The p-values for the coefficient on democracy and private monitoring regulation are consistently significant at the one percent level and the relationship is robust. However, the authors did not find any reliable relationship between the open-competitive political system and the banking supervisory power. In addition, Agoraki, et al. (2019) presents that democracy is associated with strong banking sector regulation in the transition banking systems. Based on the dynamic specifications, the democracy is statistically significant at 99% influence the regulation that promotes financial stability.

**Corruption Control in a Country**

There is still a debate in the literatures pertinent to the governments' involvement in regulating banking sector. While the debate over the appropriate roles of regulation in banking sector is ongoing, several studies have concluded that corruption is one factors that determine the poor or lax regulation in a country (Banerjee, 1997; Guriev, 2004). Corruption has been a hot issue in the world, especially for developing countries, that attract researchers and policymakers. According to the World Bank, corruption is the abuse of power by public officer for the sake of personal gain. The definition points out actions such as bribery, extortion, cronyism, nepotism, patronage, graft, and embezzlement (Park & Blenkinsopp, 2011). The empirical study describes corruption as a determinant factor of the effectiveness of the legal system (Herzfeld &Weiss,

2003). Corruption undermines the choice of regulation through several ways. The first way is indirect, when the institution is weak, the government agency reduces the quality of the regulation to increase the probability to receive the bribes in the future. The second way is direct method, when the regulator chooses lax regulation after receiving a bribe from the regulated parties. A study by Walter (2008) discloses that there is a close link between bankers and politicians especially in developing countries with traditional banking system. For example, in Indonesia, Thailand, and South Korea, whose banks are part of a holding company and operate to support the financial needs of the whole companies, the bankers bribe politicians to approve regulation that will benefit the bankers during the agenda-setting phase (Walter, 2008; Pepinsky, 2009; Logerfo & Montinola, 2001). Once the politicians agree with the bribe and reduce the quality of the regulation, the relationship between corruption and the regulation is obvious. However, the empirical studies in how corruption affects business regulation show the mixed result. Aidt (2009) finds that bribery is not a determinant of inefficient regulations; rather, a costly bureaucracy extracts the behavior of the businesses to avoid regulations. Guriev (2004) also has similar idea that although some types of corruption may reduce regulation, the impact is not big. On the contrary, study by Breen and Gillanders (2012) confirms that corruption has a negative significant effect on the quality of business regulation. Méon and Weill (2010) also find that corruption reduce the efficiency of regulation, particularly in countries with less effective institutions.

**Government Expenditure**

The government has an important role in the development of banking industries, particularly, in the developing world, where government ownership of the banking system is

relatively higher than in the developed countries. For instance, Indonesia's top ten biggest banks, based on their assets in 2018, are dominated by state-controlled banks. Though, in the developed economy countries, the government also takes responsibility for regulating and supervising the private sector. There are still no conclusions in the economic theory about the impact of government expenditures on the decision to adopt banking regulation or not. If governments attempt to increase their control to the private sector, the banking sector development might be inhibited because of the crowding out effect on the investment activities. However, almost every economist will agree that higher levels of government expenditure would enhance the successful implementation of the regulation and supervision.

Borrowing from Keynesian, that concerns about the importance of government intervention in the economy, government expenditure (government's policy in terms of expenses) influences the increase or decrease in the output of economy. The logic is that the increase in the government spending induced the demand for goods and services in the economy, so that it spurs the economic growth. In this case, government expenditure can be seen as the endogenous factor, in which only the beneficial expenditure that will positively influence the long run economic growth (Barro, 1990). The empirical works present the evidence that there is a long run relationship between government total expenditure on the economic growth (Samudram, Nair & Vaithilingam. 2009; Loizides & Vamvoukas, 2005; Okoro, 2013; Singh & Sahni, 1984). Another set of studies, follow Wagner's attempt, has opposite view pertinent to the relationship of economic growth and government expenditure. Wagner argue when economic growth is increasing, there is also an increase in the need of public goods and services, which will increase the amount of government expenditure to finance government activities. The empirical test of Wagner's views suggests that economic growth positively influence the

government spending in developing countries (Henrekson, 1993; Kolluri, Panik, & Wahab, 2000; Wijeweera & Garis, 2009)

### The Influence of Strong Banking Supervision and Regulation on Economic Growth

This section explores in detail how adopting banking supervision and regulation policy can influence the economic growth of a country. Research on the influenced factors of economic growth identifies two theories: exogenous and endogenous (Bennett, 1996). According to the exogenous theory, the rate of economic growth is constant in the long run. The exogenous assumes that a) the economic growth of a country is determined by two production functions: capital and labor; b) the production function follows the constant return to scale, in which, if the input of production increases proportionally then the output of production also increases proportionally; c) the increase in output of production follows the law of diminishing return, that the incremental of the last output of production, by adding one more input, is lower than the incremental of the previous output, while the amounts of all other is held constant; d) the growth of population is constant and is not influenced by other factors such as national income; e) the level of national saving is part of national income; f) the role of government is minimum, in which, government is responsible to encourage the citizen to save their money. However, the high amount of national saving does not have an effect to the growth rate; g) technology is exogenous factor of production. Based on these assumptions, whenever the amount of gross investment is larger than the depreciation and growth of population, then the investment will spur the economic growth through the capital deepening process. A process, in which the amount of capital per labor (capital-labor ratio) will increase until some points that the additional capital only can cover the additional labor with a new machine and the depreciation. Because there is no

additional capital in the economy, the income per capital level is constant, then there is steady economic growth. Through the exogenous model, it is impossible for developing countries to have better economic conditions without sustainable economic growth. The economic growth, measures the economic productivity in a country every year, is important for a country's stability and prosperity.

On the other hand, the endogenous growth theory explained by Romer (1986) and Lucas (1988) brought a new insight in economic growth analysis. There are two sources of economic growth: the quality of capital accumulation, and the efficiency in the production process. The quality of capital accumulation is the changes in input of productions, while the changes in the efficiency is the improvement in the process of transforming inputs into output. The sources of the efficiency are the use of technology, better allocation of resources, and better legal and political institutions. This theory improves the exogenous point of view by emphasize on the efficiency as the powerful source for a country to promote long-term economic growth. Another implication of the endogenous growth theory provides an opportunity for the government to promote long-term economic growth by creating a conducive environment that encourages the introduction of the new ideas and supports the innovative economic activities.

However, the endogenous theory alone cannot explain why some developing countries have banking system that spur high economic growth, and others do not. Acemoglu, Johnson, & Robinson (2005) argues that economic institution is the key factor that can explain the difference in economic growth. The meaning of institution, here, is having formal rules (the enforcement mechanism of the rules) and informal rules to guide human interaction in the society (North, 1990). The informal rules include the cultures, behavior, and norms of the individuals that either constrain or encourage them to implement the rules, regulations, and policies. The arrangement

of economic institution shapes the incentives of economic actors in producing and allocating the economic resources, so that explains the cross-country differences in economic growth.

As discussed in the previous section, the banking sector is an essential part of an economy that gather information, transform assets, and monitor the market. Generally, investors deal with risks associated with the large cost of collecting and interpreting information. These risks hinder investors' ability to make better economic decisions (Levine, 2005). A risk averse investor, for example, may avoid investing in the high return project with unknown risk. In this case, banking systems help to minimize the cost of investment by providing better information process and the risk-sharing. Banking systems pool savings, transform and distribute the savings to the highest return of investments. First, banks will persuade the depositors to deposit the money to the banks. Banking systems, then, do thorough due diligence to reduce the cost per individual of processing information to convince the depositors/investors about bank's ability to make sound investment (Boyd and Prescott, 1986). When banking systems lend to corporations, they also monitor and govern the operational management of the corporations to minimize the probability of borrowers' default (Barth, Caprio, & Levine, 2004; Macey and O'Hara, 2003). Finally, banks will channel the money from depositors to valuable projects.

The abovementioned shows that banks provide a valuable service to sustain the economic activities, so a proper mechanism must be implemented to reduce moral hazards and ensure the banks work soundly. Using the framework of the institution theory and endogenous approach, banking system needs banking supervision and regulation as a watchdog to ensure fair economic resources allocation that spur long-term economic growth (Akisik, 2013; Beck, Levine, & Loayza, 2000; Levine, 1997; Levine & Zervos, 1998; Levine, Loayza, & Beck, 2000; Neyapti & Dincer, 2005; Moshirian & Wu, 2012). The argument is that banking sector is subject to

asymmetric information, in which the banks have more information access about the prospect and risk of the projects than others. According the agency theory, the asymmetric information, in the banking sector, happen between the banks (agents) and government (principal). If both agents and principal are trying to maximize their utility, then there is a strong argument to believe that agents will not always follow the principal (Jensen & Meckling, 1976). Banks have profit motive and may be willing to take risks. Bank operations have not always been in the interest of the society as a whole. In this case, the efficient banking supervision and regulation will ensure society confidence by creating appropriate incentive structure to reduce the adverse selection and moral hazards problems. A sound banking supervision and regulation focuses on an amelioration of banking structure that enables efficient economic resource mobilization, supervises banking managers effectively, and helps reduce financial risks (Levine, 1997; Nissanke & Stein, 2003; Özatay & Sak, 2002). The effective banking supervision and regulation also contains better disclosure and monitoring rules, which will promote a credible financial reporting system that produces reliable and transparent financial information for investors to decide (Larson & York-Kenny, 1995; Nobes & Parker, 1995; Rajan & Zingales, 1998).

Therefore, this paper will put emphasis on the three components of economic growth: the quality of physical capital accumulation, the human capital, and the impact of regulation. Based on the endogenous theory, the human capital and the regulation are the powerful engine of economic growth. The combination of both components will create an efficiency that spurring economic growth. In the context of banking sector, the explanation of the components are the followings:

a) The Quality of Physical Capital Accumulation

Solow's growth model in exogenous theory presented the basic production function,

which was the combination between capital and labor (Solow, 1957). If a country wants to produce goods, it will need machine to accomplish the job efficiently and labor to run the machine. The model shows that capital is the main factor in spurring economic growth. The logic is if a country has more workers than the machine, it will create production less efficient, due to having less machine to work with. Increasing the quality of capital accumulation will provide each worker more machine to produce more output.

b) The Quality of Human Capital

According to endogenous growth theory, quality of human capital is the key contributor of economic growth (Lucas, 1988; Mekdad, Dahmani, & Louaj, 2014; Romer, 1986; Teles & Andrade, 2013). The endogenous growth theory assumes that the economic can grow continuously due to the action of the economic actors. Human capital incorporates knowledge and skills, while economic growth needs the advance in technology and scientific knowledge, so a country will depend on the investment in human capital in spurring its economic growth. The role of human capital also has a contribution in attracting physical capital formation. The effective use of physical capitals depends on the people who operate it. If the investment in human capital is low, then the utilization of physical capital will not be optimum. The under investment in human capital may be the reason some countries have limited capability to utilize physical capital and finally have an impact on economic growth.

The impact of quality human capital on economic growth has multiple dimensions. Some researchers measure human capital in terms of education level and health (Barro, 1999; Li & Liang, 2010; Sach &Warner, 1995), other researchers use only education level (Bosworth & Collins,2003; Khattak & Khan, 2012; Levine & Zerros, 1993). These studies, generally, agree that education has a positive and significant impact on income growth rate. Education

is the main factor in enhancing the quality of human capital. Education develops individuals to broaden their perspectives of life, so they can participate in policymaking process. Education also enables individuals to be productive and skilled labors, then they can contribute in promoting economic growth.

This dissertation views the impact of education on economic growth using public sector point of view. In this sense, this study will relate the quality of human capital with the government spending on education, because government in every country is responsible to ensure the quality of education in their country. The empirical evidences show that government spending on education has a direct relationship with the quality of human capital, and consequently has an impact on the economic growth (Blankenau, 2005; Blankenau & Simpson, 2004; Gloom & Ravikumar, 1992, 1997, 1998; Teles & Andrade, 2008).

c) The Influence of Capital Regulation on Economic Growth

According to the Basel Accord, the purpose of stronger capital regulation is to increase the resilience of the banking system in absorbing the financial shocks (Martinez-Miera & Suarez, 2014). The reasons are the higher the bank capital will a) reduce the probability of the bank to invest the fund in risky investment and b) minimize the bank losses. The asymmetric information causes banks enjoy the risk-taking behavior, because the depositors cannot asses the banks activities in managing depositors' fund (Kane, 1989; Cole, McKenzie, & White, 1995). The capital regulation, therefore, prevent the banks' intention to take a risk (Furlong & Keeley, 1989; Rochet, 1992). Later, the higher capital requirements increase banks' buffer against losses that can reduce banks' losses in a period of crisis (Diamond & Rajan, 2000; Beltratti & Stulz, 2012). And finally, these will affect financial stability and

increase economic growth. Using a dataset covering 153 countries, the empirical evidence shows that there is no evidence that capital regulation influences the economic growth (Bertus, Jahera, & Yost, 2007). However, an event study in fifty-three countries provides a robust evidence that 1% increase in capital regulation will increase 9.67% the GDP ratio of demand deposits in the banking sectors by improving savers' trust in the banking sector (Neyapti & Dincer, 2014).

d) The Influence of Banking Supervision on Economic Growth

The independent banking supervisor is important in fostering banking stability that influences the economic growth. Banking supervision is related to the regulation in which to ensure the compliance of the banking system with the regulation (Eisenbach, Lucca & Townsend, 2016). The key component of supervision is ensuring that banks do their activities safe and sound by evaluating the banks' risk management. Practically, banking supervisor will monitor the banks and use this information to ask corrective actions when banks are proven to do unsafe and unsound activities. The literatures show conflicting views about the importance of stronger supervision. Some researchers argue that banking supervision is important to prevent banks participate in risky activities that can endanger the banking stability (Stigler, 1971; Beck et al., 2006). On the other hand, the opponents argue that the stronger supervision means more corruption because the supervisors are only focused on their own benefits (Shleifer & Vishny, 1997; Djankov, La Porta, Lopez-De-Silanes, & Shleifer, 2002; Quintyn & Taylor, 2002). According to this point of view, supervisors use their authority to increase their own welfare rather than trying to improve bank performance and efficiency (Demirgüç-Kunt & Detragiache, 2011; Barth et al., 2004). Study in fifty-three countries provides a robust evidence that 1% increase in supervisory oversight will reduce

1.4% the nonperforming loans as percent of credit (Neyapti & Dincer, 2014). The test provides an evidence that increasing banking supervision delivers better banking performance. However, the empirical results using a dataset covering 153 countries shows that the supervisory oversight does not have a significant effect on the economic performance (Bertus, Jahera, & Yost, 2007).

e) The Influence of Private Monitoring on Economic Growth

The private monitoring is intended to improve the governance of banking systems by making bank managers more accountable to the public. The private monitoring regulation is expected to involve the market to correct the poor banking practices. This regulation requires the bank to disclose the quality of information to governments, public and specific entities such as auditors and rating agencies. The quality of information is reliable information to be disseminated by banks, including the accounting standards (Leuz & Verrecchia, 2000), the effectiveness of external audits (Healy & Palepu, 2001), transparency of financial statements (Llewellyn & Mayes, 2003; Moshirian & Szegö, 2003), and independent evaluation by rating agencies (Morgan, 2002; Morgan & Stiroh, 2000). Neyapti and Dincer (2014) found that 1% increase in the quality of banking regulation and supervision significantly increases 0.48% GDP ratio of investment in fifty-three countries by reducing the transaction costs. However, the empirical evidence in 153 countries finds that a country with stronger private monitoring regulation is associated with lower average GDP growth (Bertus, Jahera & Yost, 2007).

## Summary

This section reviewed the literature on the factors that may affect the adoption of stronger banking policy and the impact of stronger banking regulation and supervision on economic

growth in developing countries. In the case of developing countries, the review showed that there are domestic factors, including the level of democratization, banking crises experience, and corruption control that influence a country to adopt stronger banking supervision and regulation. There are also international factors that affect countries' decisions. The international trade, and international organization lending agreements may influence policymaking process. No single factor explains the developing countries' choices to adopt strong banking supervisory and regulatory policy, so it should consider several factors. In addition, the adoption of capital regulation, supervisory oversight and market discipline may have an impact on long-term economic growth through their ability to improve the depositor trust, lowering the non-returned loan and encourage the market discipline.

# CHAPTER 3

# CONCEPTUAL FRAMEWORK

In this section, I develop a conceptual framework considering the theoretical discussion outlined in the previous chapter. The framework tries to bring an understanding of the factors that influence the adoption of stronger banking regulation and supervision in developing countries and the assumed relationships between the factors. The framework also outlines how the strong banking regulation and supervision help developing countries to promote economic growth. Finally, the hypotheses are provided based on the framework.

## The Rationale of the Framework

There are five factors that influence developing countries to develop a policy that leads to strong banking supervision and regulation. These factors are the previous episode of financial crises, trade openness, financial assistance, level of democratization, and the corruption level. Figure 1.1 is a diagram, which shows the relationships between the five factors that drive a country to enact strong banking supervision and regulation, and also the relationship between strong banking regulatory policy and economic growth. Strong banking supervision and regulation spur the economic growth of developing countries.

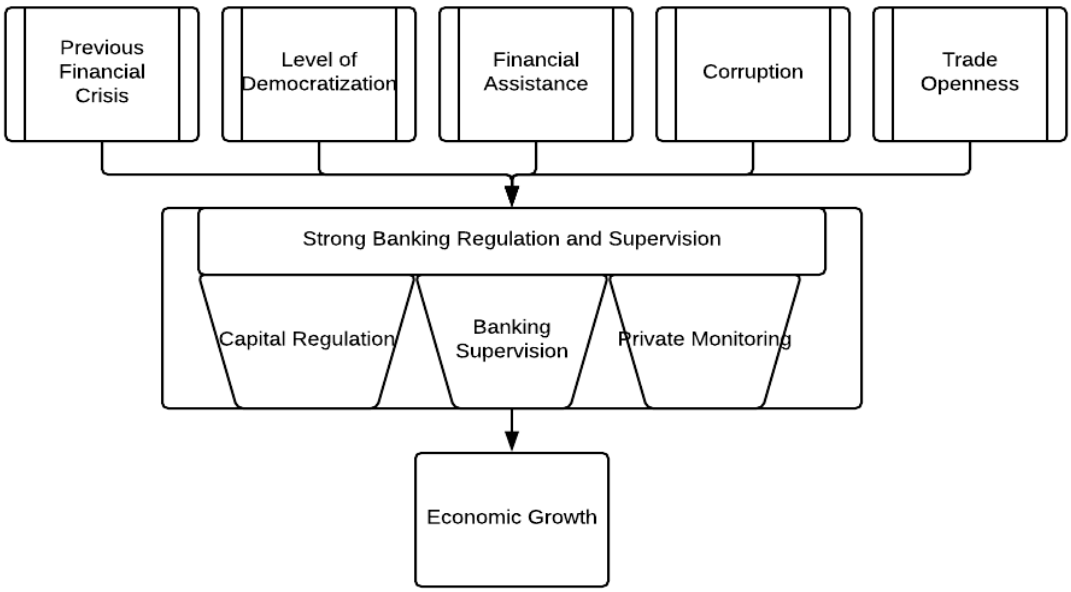


Figure 1.1 A Model of Factors Influencing a Developing Country Adopting Banking Supervision Regulation and the Impact of Regulation Supervision on Economic Growth.

There are two types of theory of regulation, public and private theory, provides a theoretical framework to analyze the factors influencing a developing country adopting banking supervision and regulation. The public interest theory is argued to be the most effective in explaining the reason of government involvement in economy. Although the government involvement is socially inefficient sometimes, the intervention must be carried out to save the whole economy. Based on the public interest theory, the macroeconomic conditions and external pressures are the main reasons developing countries adopt stronger banking supervision and regulation. In addition, the private interest approach suggests the domestic political conditions and institution (Aikins, 2009; Tsebelis, 2002) also influence the adoption of banking supervision and regulation. Political influence of banking policy is strong in developing countries, because banking is a part of big family business. So, level of democratization also has an impact on the adopting of banking policy.

Meanwhile, the impact of financial crisis reminds us of the importance of having strong banking supervision to monitor banking activities and financial conditions, and ensure that these are still within accordance of prudent risk-taking practice (Abiad & Mody, 2005). Based on this consideration, after experiencing a financial crisis, a country will be more likely to adopt stronger banking supervision regulation.

This study also uses the world system theory to explain the specific factors that influence a country to develop its banking regulation in developing context, which explains a country's tendency to emulate one another and the countries on which they are dependent (Chirot & Hall, 1982; DiMaggio & Powell, 2012; Kerbo, 2006). Thus, the demand for prudent banking supervision and regulation, especially in developing countries, can be explained by the increasing interconnectedness through trade and financial assistance.

The concept of democracy emphasizes the role of banking supervision and regulation to fulfill the demand of voters on economic well-being. The majority of people in the developing countries are poor. To ensure the well-being of the majority people, countries need a safe and sound banking system. The banking supervision and regulation bridges the majority voters' needs on a safe and sound banking system by increasing depositor trust on the banks, reducing the banks' risky investments, and increasing market discipline. Thus, the combination between the attitude of the majority voters and the demand of the population on having a safe and sound banking system link the democracy and the adoption of stronger banking regulation and supervision in developing countries. In another words, if a country has a higher level of democratization, it will adopt stronger banking regulation.

Finally, learning from the incidents during the 1997-1998 East Asian financial crises, the corruption was a contributor to the worldwide financial crises based on the deterioration of the

banks' balance sheet. In addition, studies in developing countries find the close connections between bankers and politicians is one of the causes of the developing countries having a lax banking supervision regulation (LoGerfo & Montinola's, 2001). Banks may bribe politicians to get a benefit from regulatory tolerance. As a result, the misallocation of loans will increase the amount of bad loans and lead to lower productivity of the private sector, and, finally, may reduce the economic growth.

## The Impact of Strong Banking Supervision Regulation on Economic Growth in Developing Countries

It is not clear in the literature how the strong banking supervision and regulation affects a country's effort to achieve higher economic growth. The second part of this paper examines the link between banking supervision regulation and economic growth in developing countries. Using the framework of endogenous theory and institution theory, the strong banking regulation and supervision is needed to be an effective watchdog to ensure the fair economic resources allocation, encourage the trust of the depositors, and to spur long-term economic growth in developing countries,

## Research Hypotheses

The main research questions addressed in this paper are: (a) what factors are influencing a country to enact strong banking supervision regulation in developing countries; (b) what impact does strong banking supervision regulation have on spurring economic growth? Based on the literature review above, I answer these two questions using the following hypotheses:

1. First research question:

a. The experience of financial crisis: countries experiencing severe financial crisis will adopt strong banking supervision and regulation.
b. Trade openness: countries that are actively doing international trade will have strong banking supervision and regulation.
c. Financial assistance: countries that receive financial assistance from international organizations will have greater exposure to adopt strong banking supervision and regulation.
d. Level of democratization: countries with full democracy will adopt strong banking supervision regulation.
e. Corruption control: less corrupt countries tend to adopt stronger banking supervision and regulation

2. Second research question:

f. Countries that adopt stronger banking supervision and regulation will experience higher economic growth.
    a. Countries that adopt higher capital regulation will have higher economic growth.
    b. Countries that have independent supervision will have higher economic growth.
    c. Countries that activate the private monitoring will have higher economic growth.

# CHAPTER 4

# RESEARCH DESIGN AND METHODOLOGY

In this chapter, I explain the research methods used in this study. This chapter consists of four sections. The first section is research design, in which I explain the time series cross sectional research design and the reasons for employing this research design. In the next sections, operational variables, I describe the variables used in this study and how I operationalize them to answer my research questions. In the third section, data sources, I explain all the data sources including the reliability and validity of the data sources. In the final section, I explain the statistical procedure employed in this study.

## Research Design

In this study, I use the panel (time series cross sectional) design. This panel design evaluates the differences between two or more groups on one or more dependent variables in a certain period of time. It involves observations of 180 advanced and developing countries on the influential factors of adopting prudent banking supervisory and regulatory policy and the impact of having strong banking supervisory and regulatory policy on the economic growth over a period of twelve years (1999-2011). Year 1999 was chosen because there is a growing importance of financial stability and better financial supervision and regulation, especially after the Asian Crisis that created a fear of worldwide economic meltdown because of financial contagion. The year 1999 is also the year of significant changes in the world when the economics of Asia began to recover. The year 2011 is chosen as the end of the observation, since this period

is a condition after the global financial crisis of 2008/2009, when economies strived to recover from the damage of the crisis. The panel design fits for this study because I can compare many country level data both cross-national and time (panel data) factors, and I can utilize the secondary data, which is less expensive and publicly available.

The advantages of utilizing a panel design are enhancing the quality and quantity of the data that can solve the problem of a small N (Gujarati & Porter, 2009). The problem with a small sample is that the potential explanatory variables is greater than the degree of freedom needed to test the relationship between the independent and dependent variables. Using the panel design, the limitation of a small sample can be overcome, because the design enables us to test the impact of a large number of predictors on the dependent variable within the framework of multivariate analysis (Gujarati & Porter, 2009). In this study, I examine the dependent variable, the adoption of banking supervision and regulation, in 180 advanced and developing countries over a period of twelve years (from 1999 to 2011).

Based on the World Bank country classification in June 2017, there are 218 countries in the world, in which 140 countries categorized as developing countries (low/lower middle/upper middle-income countries). The IMF also defines 138 countries as developing countries as of October 2017. This study combines the IMF and World Bank definition to decide the sample included in the analysis. I use survey data on banking supervision regulation held by the World Bank. The sample of the survey is 180 countries total, made up of developed (48) and developing (132) countries. This study focuses on these countries as the unit of analysis and the period under study is between 1999 and 2011. Previous studies on factors influencing the adoption of banking regulation has all the countries in the world and shorter time periods. However, this study focuses on 180 countries and longer periods to fill the gap in literature. In the second section, this

study explores the role of banking supervision regulation in spurring economic growth in high income and developing countries. More precisely, it assesses the impact of the banking supervision regulation on economic growth.

I use quantitative secondary data collected from various well-known sources. Secondary data is publicly available data from different sources and collected by others. I use data from the IMF, World Bank, the International Institute for Democracy and Electoral Assistance, Survey of World Value, and the International Country Risk Guide, which are credible, reliable, and valid sources that other researchers have employed previously and disclose any problems pertinent to the collection of data. If the data comes from more than one source, I cross check the different sources to confirm the validity.

There are advantages and disadvantages of using secondary data. The advantages are, first, that the data is readily and publicly available, so it is easier to do the real research, replication, and validation studies (Rudestam & Newton, 2007; Stewart & Kamins, 1993). Secondly, the archival data allows researchers to do cross-country analysis. The third advantage is that the data are generally more objective than the primary survey data because it is not contaminated by the perceptions of the respondent (Singleton & Straits, 2010). A fourth advantage is that the researchers can operationalize the archival data from survey and censuses to answer research questions that may different from the intentions of the researchers or institutions who collect the data (Singleton & Straits, 2010). Using secondary data research is also less costly, less time-intensive, and requires fewer personnel (Stewart & Kamins, 1993). Finally, the combination between archival data and other types of data enable researchers to investigate phenomena more thoroughly.

The disadvantage of using archival data sets is that the publicly available data sets often experience incomplete or missing values (Rudestam & Newton, 2007). For example, in this study, the data that I use to capture the strong banking regulatory policy adoption was collected in 1999, 2003, 2007, and 2011 by the World Bank, so there are many missing data. Another disadvantage of using secondary data is that researchers do not have any control on the data collection process, thus creating a bias. To overcome this problem, I will use only credible data sources to ensure the validity and reliability of the data.

I categorize the data to fit the needs of this study, after collecting data on all variables from various sources.

## Operational Variables for Banking Regulation and Economic Growth

### Dependent Variables

a. Banking Supervision Regulation

The first dependent variable is the banking supervision regulation score that is constructed based on the World Bank survey questions for the period from 1990 until 2011. In this study, following Bertus, Jahera, and Yost (2007), by focusing only on three pillars of Basel Accord, I use some questions in the World Bank's Bank Regulation Supervision survey, which include regulatory supervisory activities of the relevant authorities for 180 countries. The sample of the study is 180 countries (48 developed and 132 developing countries) from 1990 to 2011. There is a limitation of this dataset, the survey held in 1999, 2003, 2007, and 2011. The first survey was done between 1998 and 2000 and had 73 developing country respondents. The second survey was released in 2003 and had 104 developing country respondents. The third survey was in 2007 with 98 developing country responses. The fourth survey is reported after the global banking

crisis of 2007-2009 and provides information in banking supervision regulation for 100 developing countries. In this study, I use some questions of regulation and supervision database to account for Basel II and Basel III's pillars on bank regulation and supervision, including the capital regulation, supervision, and private monitoring.

To get the overall score, I sum up all necessary aspects of banking supervision and regulation based on the Basel Accords. The overall index presents the strength of banking supervision and regulation in a country, while the three sub-indices indicate the strength and weakness of the specific pillars of Basel Accords. The detailed index construction procedure is shown below. The overall banking supervision regulation index ($BSR_{overall}$) is constructed with the three sub-indices: 1. Supervisory Power ($BSR_{sp}$); 2. Capital Regulation ($BSR_{cr}$); 3. Private Monitoring ($BSR_{pm}$). The main equation to calculate the banking supervision regulation overall index is explained by the following equation:

$$BSR_{overall} = w_1 BSR_{sp} + w_2 BSR_{cr} + w_3 BSR_{pm}$$

Where,

$BSR_{sp}$ = Supervisory Power Index

$BSR_{cr}$ = Capital Regulation Index

$BSR_{pm}$ = Private Monitoring Index

To get the overall score of banking supervision and regulation, I equally weighted the sub-indices. I assign the proportional weights 1/3 for each index ($w_1=w_2=w_3=1/3$) to avoid any subjective decision. The value of each index explains that the higher index reflects stronger banking supervision regulation. Each component of BSR has different number of questions. The equal weighted, in effect, favor smaller number of question by according them the same

importance as large number of questions. The equal weighted indexes remove the bias, by giving an equal weight to every question within the index. This means that even the smallest number of questions exert more power in an equal weighted index than it would in one weighted aggregate BSR. So, the equation to calculate banking supervision regulation overall index is explained by the following equation:

$$BSR_{overall} = 1/3BSR_{sp} + 1/3BSR_{cr} + 1/3BSR_{pm}$$

In a balanced panel data, all the variables have measurements in all the time periods. However, the World Bank's Bank Regulation Supervision survey has been collected in 4 years: 1999, 2003, 2007, 2011. I will use year 1999 until 2011 as my proposed period of observation. In this case the total number of observations is not nT, because some years do not have any observations. In this case, I have an unbalanced panel because there are many missing values.

b. Economic Growth

In this part, first, I use the annual percentage growth rate on GDP as the second dependent variable. I use the data published in the World Bank's World Development Indicators (WDI). I use the WDI because it has a larger set of countries than the Penn World Tables. I use data for 180 developed and developing countries for 1999, 2003, 2007, and 2011.

**Independent Variables**

Independent variables are variables that influence or are the cause of changes in the dependent variable. Independent variables are intentionally changed by the researcher to see their impact on dependent variable. The followings are the independent variables used in this dissertation:

1. The Determinant Factors of Banking Supervision Regulation

**Financial Crisis Experience:** I operationalize the financial crisis experience using a two-category nominal variable, which informs whether a country experienced severe financial crisis during the period of study (value '1') or not (value '0). I use systemic banking crisis data taken from Laeven and Valencia (2012) dataset as a measure of previous financial crisis. The reason I used Laeven and Valencia (2012) dataset is because they have the most complete dataset on severe financial crisis among others. The limitations of using the dichotomy variable on describing the exposure of financial crisis are: a few countries have severe financial crisis, and the dichotomy variable- have vs does not have- does not explain the level of severe financial crisis. Consequently, the analysis will be limited.

**Trade Openness:** this variable is a continuous variable. I operationalize the trade openness variable as the value of import plus exports divided by GDP.

**Financial Assistance**: the financial assistance variable is operationalized using a two-category nominal variable, which are 1 for a country who has received stand-by arrangement from the IMF in the five years. Almost all countries which had severe financial crisis were asked to enter an agreement with the IMF. The agreement includes the advice to improve the banking regulation and supervision. I use the dataset from the IMF lending arrangements published by the International Monetary Fund as a proxy for financial assistance.

**Level of democratization:** level of democratization variable measures the level of democracy in a country and is an ordinal variable constructed using a scale from Polity IV. The scale ranges from minus 10 (more autocratic institution) to plus 10 (more democratic institution), with higher scores meaning greater democracy. I follow the

Polity IV suggestion in making dummy variables to analyze the impact of the political system in influencing a country to adopt stronger banking supervision regulation, where I use value 1 for "authoritarian" (-10 to -6), "partly authoritarian/democracy" (-5 to +5) and 3 for "democracy" when a country has +6 to +10.

**Corruption control:** this variable is an index of an evaluation of the degree of corruption in a country. I use the database from International Country Risk Guide. It is measured on a scale of 0 to 6 (where 6 is associated with lowest degree of corruption). This index explains the "actual or potential corruption in the form of excessive patronage, nepotism, and suspiciously close ties between business and politics".

2. The Impact of Banking Supervision Regulation

**Capital Regulation:** this variable measures the amount of capital that a bank is required to have. It is an ordinal variable constructed using a question from the World Bank survey. There are eight questions, where yes = 1 and no = 0. The score ranges from 0 to 8. The higher the score means the tighter the capital requirements implemented by a country.

**Supervisory Oversight:** this variable measures the authority and power of the banking supervisor to take actions to prevent and correct problems. This ordinal variable is constructed using the questions available in the World Bank survey. There are fourteen questions, where yes = 1 and no = 0. The score is in a range of 0 to 14 (where 14 is associated with the highest degree of power).

**Private Monitoring:** this ordinal variable explains the effectiveness of a bank's external audits, the transparency of a bank's financial statements, the compliance of a bank's accounting practices with the accounting standards, and the evaluation of a bank by

external agencies and creditors. It is constructed using the World Bank survey. The total number of questions for this part is eighteen questions, where yes = 1 and no = 0. So, the score would be range from 0 to 18, and the highest score means the highest external governance index.

**Control Variables**

Control Variables are other variables that may influence the dependent variable. The control variable needs to be constant during the statistical analysis process. However, if the result cannot be constant, the value of control variables must be disclosed to assess the influence on dependent variable.

1. The Determinant Factors of Banking Supervision Regulation

   **Level of Income:** this variable is a dummy variable. I operationalized this by recoding the country's GNI per capita into four classes, based on the World Bank's definition of income level. There are four class of countries: low-income, lower-middle income, upper-middle income, and high income. The current US Dollars are used as a measurement and for thresholds. In this dissertation, I transform the World Bank's category into three groups by grouping lower-middle and upper-middle into the middle-income countries. And the operationalization of the variables become 1). Lower income countries, 2) middle income countries, and 3) high income countries.

   **Government Spending**: this variable is continuous variable, which is operationalized using the government expenditure as percentage of GDP. The public spending presents the government expenditure in purchasing or producing goods and services, to pursue the citizen's welfare objectives.

**Region**: this variable is operationalized by using the world database from the World Bank. World is divided into six regions: Sub Sahara, Asia Pacific (without Australia and New Zealand), MENA and Central Asia, Latin America, Eastern Europe, and the developed countries (Western Europe, North America, Australia, New Zealand).

2. The Impact of Banking Supervision Regulation

**Capital Formation:** this variable is a continuous variable. I use gross capital formation as a percentage of GDP to show the investment of a country in preparing the infrastructures to spur the economic growth.

**Human Capital:** this variable is a continuous variable. I use the government spending on education as a percentage of GDP to measure the impact of human capital on economic growth. The reason I use the government spending on education is because it is difficult to find out the variables which explains the school attainment directly, especially in developing countries.

## Data Sources

### World Bank

Data for the dependent variable comes from the Supervision Regulation Database, the banking concentration percentage is obtained from the Financial Development and Structure Database, and the region dummy is taken from the countries database. These sources are considered reliable and valid because the World Bank gets the data officially from every country. Many researchers who are interested in economic development also use the data. However, for Banking Supervision Regulation database, the survey was only done in four years, which are 1999, 2003, 2007, and 2011.

### Polity IV Project

The variable political system is obtained from Polity IV project. Polity IV gathers data on authority characteristics of countries in the world, so we can use the data for comparative analysis. The type of political system is indicated by an index that measures about "the institutionalized regime authority," ranges from minus 10 (-10, fully institutionalized autocracy) to plus 10 (+10, fully institutionalized democracy) (Marshall, Gurr, & Jaggers, 2017). The index has been computed since 1800 for each country in the world every year. Data from Polity IV is widely used by researchers because of the accuracy and consistency of the coding of the country authority variables, thus the data is considered as very credible (Marshall, Gurr, & Jaggers, 2017).

### International Monetary Fund

Data for the inflation and international financial statistics are available from the International Monetary Fund (IMF). The data from the IMF uses estimates from surveys and censuses. A variety of sources are used, and careful objective analysis is carried out to produce the data in the International Financial Statistic. Thus, the IMF is regarded as a reliable and consistent source of data by most researchers.

### The International Country Risk Guide (ICRG)

The International Country Risk Guide rating provides 22 variables that explains three categories of risk: political, financial, and economic. The ICRG system shows a comprehensive risk structure for the country; it presents monthly data since 1980 for 140 developed, emerging, and frontier markets. The ICRG data is considered reliable and used extensively not only by researchers at the IMF, The Economist, and The Wall Street Journal, but also by investors and businesses.

## Data Analysis Plan

### Statistical Procedure

The statistical procedure is divided into two parts: descriptive analysis and multivariate analysis. First, I conduct the descriptive analysis of all the variables used in this study. The descriptive statistics explains the variations of the variables across countries and over time. The descriptive statistics also summarize the sample under study to present the data patterns. Then, I use panel data analysis first to analyze the determinants of cross-national variation in adopting banking supervision and regulation and secondly to analyze the impact of having strong banking supervision and regulation on economic growth. Panel data regression analysis is a statistical method of investigating the relationships between variables within multiple locations and over multiple defined periods. Panel data analysis enables researchers to investigate cross sectional and time series factors. In this study, I investigate the dependent variable strong banking supervision and regulation in 180 countries over a period of twenty-one years (from 1990 to 2011). Total countries participated in the survey are 180 countries, Thus, my data set consists of 3780 observations.

The advantages of panel data regression analysis are that the panel data enables more efficient estimation because it offers more variability, less collinearity, and more degrees of freedom (Wooldridge, 2016). Panel data also can control for unobserved heterogeneity that is one of the problems of non-experimental research (Gujarati & Porter, 2009).

### Estimation Model

As mentioned earlier, first, I use the time series cross sectional data analysis to analyze the determinants of cross-national variation in implementing banking supervision and regulation, and secondly to analyze the effect of adopting strong banking supervision and regulation on

spurring economic growth. The basic model for my analysis is presented below. I test two models. The first model tested for the influence of financial crisis experience, financial assistance, trade openness, democracy, and corruption control variables on adopting banking supervisory and regulatory policy. To identify the determinants of banking reform, I estimate the following regression equation:

$$\text{RegSup}_{it} = \alpha + \beta_1 CRISEXP_{it} + \beta_2 TRADE_{it} + \beta_3 FINASSIST_{it} + \beta_4 DEMOC_{it} + \beta_5 CORRUPT_{it} + \beta_6 control_{it} + \mu_{it} + e_{it} \quad (1)$$

where $\text{RegSup}_{it}$ is the banking regulatory and supervisory policy in a country *i* at period *t*; CRISEXP represents the vector for financial crisis experience; TRADE represents the vector for trade openness variables; FINASSIST is a vector for financial assistance variables; DEMOC explains the level of democratization; CORRUPT is a vector for corruption control variables; Control variables are level of income, region, and government spending; $\alpha$ is a parameter, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are vectors of parameters to be estimated, and $\varepsilon$ is randomly distributed error term. The dependent variable is the index score of banking supervision and regulation. The independent variables are *financial crisis experience*, *trade openness*, *financial assistance*, *level of democratization*, *corruption control*. And, the control variables are level of income, region, and government spending. To find out robustness, I also do statistical analysis for the determinant factors of each of BSR components.

The second model tested for the impact of adopting strong banking supervision and regulation on the economic growth. I test the aggregate BSR on economic growth then break down the component of banking supervision and regulation into three components: capital regulation, banking supervision, and private monitoring to find out their influence on economic growth. I use the following regression equation:

$$EconGrowth_{it} = \alpha + \beta_1 CAPREG_{it} + \beta_2 SUPER_{it} + \beta_3 PRIVMON_{it} + \beta_4 Control_{it} + \mu_{it} + e_{it} \quad (2)$$

where $EconGrowth_{it}$ represents the growth of GDP in a country *i* at period *t*; CAPREG is the vector for adopting strong capital regulation; SUPER is the vector for adopting strong supervision; PRIVMON is the vector for adopting strong private monitoring; Control variables are capital formation, education spending, financial crisis experiences, financial assistance, trade openness, level of democracy, corruption control, government expenditure, level of income and region. $\alpha$ is a parameter, $\beta_1, \beta_2, \beta_3, \beta_4$ are vectors of parameters to be estimated, and $\varepsilon$ is a randomly distributed error term.

There are two types of econometric models that can be used to analyze panel data that is fixed effects or random effects. To decide on whether to use the fixed effects model or random effects model, I use the Hausman specification test, which tests whether there is a significant correlation between the unobserved specific random effects and the regressors (Gujarati & Porter, 2009).

# CHAPTER 5

# STATISTICAL ANALYSIS: DESCRIPTIVE STATISTICS

In this chapter, I present the descriptive statistics of the data used in my dissertation. The descriptive statistics explain the features of the data and present how the data change over time. Understanding the variation provides an insight into the countries included in the analysis. I explain the descriptive statistics for each group of variables: dependent variables, independent variables, and control variables. The summary statistics for control variables is presented in Appendix A. In this dissertation, I use two dependent variables: banking supervision regulation (BSR), and economic growth. First, I present the descriptive statistics for the banking supervision and regulation then followed by the descriptive statistics for economic growth.

## Descriptive Statistics: Dependent Variable - Banking Supervision and Regulation

Descriptive statistics for the dependent variable banking supervision and regulation are presented in Table 5.1. The results of Table 5.1 show that the average score of banking supervision and regulation index is slightly higher after the global economic crisis (before = 7.5, after = 8,37). There is not much variation in the banking supervision and regulation before and after the global crisis (std. dev. below 2), meaning that most of the countries have shown a similar pattern. This clearly shows that countries tend to adopt stronger banking supervision regulation after a global economic crisis.

Table 5.1

Summary Statistics for Banking Supervision and Regulation Score: Before vs After Global Crisis

| Before Global Crisis 2008 | | | | | | After Global Crisis 2008 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| BSR | 481 | 7.5 | 1.82 | 0.33 | 11.3 | 136 | 8.37 | 1.58 | 1.67 | 10.7 |

Table 5.2 below shows how the banking supervision regulation score changes from 7.08 in 1999 to 8.37 in 2011. The average score of banking supervision regulation slightly increases from 7.08 in 1999 to 8.37 in 2011, which presents a significant increase over a short period of time, especially after the global economic shock. Although there is a slight decrease from 7.75 in 2003 to 7.68 in 2007, overall it shows an increase in the average score. The years before the global economic crisis, the world economy shows a relatively sound macroeconomic environment. In these years, the moral hazard problem related to the banking industry arises: while the macroeconomic environment spurs a sound economic growth, in this situation banks and regulatory authorities assumes that less banking supervision regulation is needed to support the economic development in a country.

Table 5.2

Summary Statistics for Banking Supervision and Regulation Score

| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** | **Changes in Mean Score** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **1999** | **2003** | **2007** | **2011** |
| Banking supervision regulation (cp 0.33, sp 0.33, pm 0.33) | 617 | 7.69 | 1.81 | 0.33 | 11.33 | 7.08 | 7.75 | 7.68 | 8.37 |

Figure 5.1 confirms the notion that there has been an increase in the banking supervision regulation in the past two decades and the multivariate analysis in the next chapter tests the assumptions/explanations about increases in the adoption of banking supervision regulation. As a result of these variations across countries and over time, I also examine these changes at a country level.

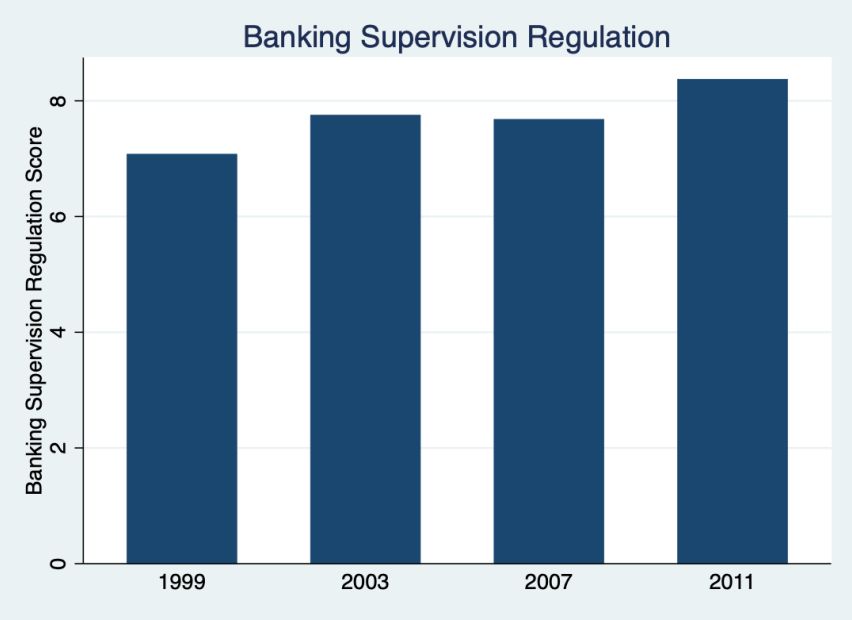


Figure 5.1 BSR Score Over Time (1999 to 2011)

Appendix B presents the score of the banking supervision regulation for each country for four different periods. The periods in Appendix B show the time and countries' variations in the score of banking supervision regulation. Overall, based on the total column, which presents the average for the four periods 1999 to 2011, the average score of banking supervision regulation ranges from 3 in Solomon Islands and 10.67 in Guinea and UAE. Guinea, UAE, Sierra Leone, USA, and Singapore are the top five countries with the scores above 9.70. And, Solomon Islands, Serbia and Montenegro, Ethiopia, Yemen, and Albania are the bottom 5 countries with a score below 4.20. The top five countries have variations in the level of democracy, from authoritarian

(UAE), partly democratic (Guinea and Singapore), and fully democratic (USA and Sierra Leone). On the other hand, two of the bottom countries, Ethiopia and Yemen, have partly democratic, and the rest is fully democratic. There is a huge gap score between top countries and the bottom countries, so there is a need to understand the reasons for adopting banking supervision regulation variations across countries. There is a pattern that emerges from Appendix B. There are countries that had a dramatic increase in BSR score over the four periods of surveys such as Ethiopia (1.33 to 9.33), Cook Islands (2.67 to 9.67), Zimbabwe (3.33 to 10.00), Madagascar (3.33 to 9.33), and Pakistan (4 to 10.33). The BSR score for these five countries jump from below 4.20 to above 9. Both Ethiopia and Pakistan received aid from international donor, for different causes, the first due to the extreme poverty and the latter because of the political instability. Pakistan followed the Basel framework since 1997; in the first survey its BSR score was 4. Then, the score was increasing until it reached 11 in 2007. The global economic recession in 2007/2008 has affected the economy of Pakistan by creating poverty, declining remittances and export earnings (Azzam, Imran, Batool, Hunjra, Jasra & Chani, 2011), and by that time, the BSR score drops to 10.33. Cook Islands had a serious economic crisis in mid-1996, due to the economic mismanagement (Sharma, 2008), when its BSR score was 2.67. And after the global economic crisis, its BSR score increased to 9.67. It is interesting to note that Madagascar had a severe banking crisis in 1988, and ten years after the crisis, its BSR score was 3.33 (1999). There was a political crisis in Madagascar following the 2001 presidential elections. At this time, the BSR score increased to 9.33, then decreased to 4 in the third survey. After the numerous protests, military groups, and assassination, its BSR score jumped back to 9.33 in the fourth survey. Zimbabwe has a similar story with Madagascar. Zimbabwe experienced a severe economic crisis from 1995 – 1999. Its BSR score was 3.33. After defeating the internal conflict,

the BSR score increased. Consequently, these five countries that had improvement in the BSR score do not have common causes. This means that there are various factors that influence a country to adopt stronger banking supervision regulation.

On the other hand, there are also countries that decreased the BSR score between 1999 to 2011 including Cambodia (from 8 to 4), South Korea (from 8.33 to 5.33), and Samoa (from 9 to 5.67). South Korea experienced a severe banking crisis in 1997-1998, when its BSR score reached 8.33. South Korea received the IMF assistance to survive the crisis, while Cambodia and Samoa had an impact of the global economic crisis, when their BSR score decreased below 6. These three countries have a central bank, which is dedicated to maintaining the price stability and fostering sustainable economic growth.

In addition, to understand how the BSR score varies across countries, I presented the summary statistics for each country in Appendix B. The summary presents the mean, standard deviation, and the maximum and minimum value of BSR score in each country. The mean of BSR score ranges from 3 in Solomon Islands to 10.67 in Guinea and UAE. Serbia and Montenegro have high standard deviations (4.24), which in each case shows a sharp decrease in BSR score over the period from 1999 to 2011.

The BSR score variation is not only across time and countries, but also across regions. The world is divided into six regions: Sub Sahara, Asia Pacific (without Australia and New Zealand), MENA and Central Asia, Latin America, Eastern Europe, and the developed countries (Western Europe, North America, Australia, New Zealand). I present the list of countries in each region in Appendix C. Sub-Sahara has 39 countries, Asia Pacific (exclude Australia and New Zealand) has 28 countries, MENA and Central Asia has 26 countries, Latin America has 36

countries, Eastern Europe has 24 countries, and the last group (Western Europe, North America, Australia, and New Zealand) has 26 countries.

Table 5.3 shows the statistical summary for the BSR score over the six regions of the world. The total column shows the means and standard deviation for the period from 1999 to 2011.

Table 5.3

Summary Statistics for BSR Score Across Regions

| Region | Total | | 1999 | | 2003 | | 2007 | | 2011 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** |
| Sub-Sahara | 7.23 | 2.04 | 6.13 | 2.03 | 7.82 | 1.87 | 7.15 | 1.87 | 7.91 | 2.00 |
| Asia Pacific (exc Australia New Zealand) | 7.73 | 2.04 | 6.88 | 1.91 | 7.77 | 2.10 | 7.79 | 2.22 | 8.63 | 1.60 |
| MENA and Central Asia | 8.15 | 1.62 | 7.83 | 1.63 | 8.36 | 1.32 | 8.20 | 1.47 | 8.21 | 2.11 |
| Latin America | 7.31 | 1.75 | 6.97 | 1.75 | 6.83 | 1.56 | 7.40 | 1.87 | 8.33 | 1.45 |
| Eastern Europe | 7.88 | 1.54 | 7.39 | 1.64 | 7.99 | 1.67 | 7.63 | 1.59 | 8.58 | 0.94 |
| Western Europe, North America, Australia, NZ | 8.24 | 1.41 | 7.88 | 1.89 | 8.17 | 1.36 | 8.26 | 1.20 | 8.63 | 1.08 |

In the total column, the average BSR score ranges from 7.23 in Sub Sahara to 8.24 in Western Europe, North America, Australia, and New Zealand. MENA and Central Asia has the second biggest mean in BSR score. Sub-Sahara and Asia Pacific (excluding Australia and New Zealand) have the highest standard deviation (2.04), which explains a wide variation among the countries. Based on the variation across time periods, it presents that MENA and Central Asia and the last group (Western Europe, North America, Australia, and New Zealand) have the biggest mean of BSR score in 1999, 2003, and 2007. A few countries may cause the biggest mean of BSR score

in these two regions, such as UAE, which has a very high mean of BSR score, and which may drive the mean BSR score for MENA and Central Asia. In the last group of Western Europe, USA may cause the highest mean of BSR score in the region. Most of the regions, except for Sub Sahara, has the biggest mean of BSR score in 2011. Sub-Sahara, Asia Pacific (exclude Australia and New Zealand), and MENA plus Central Asia have the highest standard deviation during the survey period.

The similarities for the bigger mean score are those countries in the last group and MENA (plus Central Asia) and do not receive any financial assistance from an international donor. And, countries in these regions are relatively upper middle- and high-income countries. However, the values group by region cannot be used in the first place as a benchmark to decide that region has an influence for a country to develop banking regulatory policy. Because some countries in other regions also develop strong banking regulatory policy, such as in Sahara and Asia Pacific, the high standard deviation in both regions explains that a few countries in these regions have higher BSR score than others in the same regions.

The dependent variable banking supervision regulation is also varied across the income level countries. Following the World Bank's Income level definition, I group countries into four levels of income: low, lower-middle, upper-middle, and high income. The total column shows the means and standard deviation for the period 1999 to 2011. Based on the total column, the BSR score ranges from 7.23 in low income countries to 8.27 in high income countries. High income countries have a larger BSR score mean than the low- and middle-income countries. The possible reason is that most countries in this group are initiators of banking supervision and regulation. It is interesting to note that countries in the low, lower-middle, and high-income group have a similar trend in BSR score. The BSR score is increasing from 1999 to 2003,

dipping in 2007 and rising after the global economic crisis. The possible explanation is that the high degree of interconnectedness of certain large banks across countries reduces the BSR level, before the global financial crisis in 2008 (Sironi, 2018; Agenor, Gambacorta, Kharroubi, & Pereira da Silva, 2018). However, the upper middle-income countries have a little different experience. This group of countries has a decreasing BSR score from 1999 to 2003, after which the BSR score trend is increasing in 2007 and 2011. The detail of the results is presented in Table 5.4

Table 5.4

Summary Statistics for BSR Score Across Level of Income

| Income Level | Total | | 1999 | | 2003 | | 2007 | | 2011 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Low Income | 7.23 | 1.89 | 6.44 | 1.63 | 7.68 | 1.86 | 7.38 | 1.85 | 8.21 | 2.12 |
| Lower-Middle Income | 7.54 | 1.83 | 7.03 | 1.80 | 7.85 | 1.50 | 7.41 | 1.83 | 7.93 | 2.15 |
| Upper-Middle Income | 8.08 | 1.43 | 7.93 | 1.52 | 7.64 | 1.52 | 8.06 | 1.40 | 8.56 | 1.26 |
| High Income | 8.27 | 1.34 | 7.77 | 1.61 | 8.33 | 1.29 | 8.14 | 1.27 | 8.69 | 1.12 |

**Descriptive Statistics: Components of Banking Supervision Regulation**

Descriptive statistics for the components of BSR are presented in Table 5.5. The results of Table 5.5 show that the average score of the BSR's components is slightly higher after the global economic crisis.

Table 5.5

Summary Statistics for Components of BSR Before and After Global Crisis 2008

| | Before Global Crisis 2008 | | | | | After Global Crisis 2008 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| Capital Reg | 433 | 5.92 | 1.77 | 1 | 10 | 134 | 7.34 | 1.64 | 3 | 10 |
| Supervision | 482 | 10.4 | 2.73 | 1 | 16 | 135 | 10.89 | 2.39 | 5 | 14 |
| Private Mon | 427 | 7.68 | 1.6 | 1 | 11 | 125 | 7.83 | 1.46 | 4 | 11 |

This is consistent with the change of aggregate BSR score before and after the global crisis of 2007/2008. The variation is also not much before and after the global crisis for the capital regulation and private monitoring regulation (std. dev. below 2), meaning that most of the countries have shown similar patterns. But, the variation is a little bit high for the banking supervision (std. dev. above 2). This explains that there is a country that drives the high score in banking supervision. Overall, this clearly shows that countries tend to adopt stronger BSR after a global economic crisis.

Table 5.6 below shows how the components of the BSR score change over time. The changes of capital regulation and private monitoring score are consistent with the changes of BSR aggregate score, while the banking supervision score shows a consistent increasing trend from 1999 to 2011.

Table 5.6

Summary Statistics for Components of BSR

| Total for all years 1999 to 2011 | | | | | | Changes in mean score over time | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** | **1999** | **2003** | **2007** | **2011** |
| Capital Regulation | 567 | 6.25 | 1.84 | 1 | 10 | 5.78 | 6.01 | 5.93 | 7.33 |
| Banking Supervision | 617 | 10.51 | 2.67 | 1 | 16 | 10.06 | 10.42 | 10.72 | 10.89 |
| Private Monitoring | 552 | 7.72 | 1.57 | 1 | 11 | 7.57 | 7.85 | 7.62 | 7.83 |

The capital regulation and private monitoring score increases from 1999 to 2003, slightly decreases in 2007, then rises in 2011. The possible explanation is during the period of 1999 until 2007, the increases of global financial interconnectedness may influence a country to loosen their capital regulation and private monitoring, so that inviting the investors to inject their capital in a home country. Thus, the capital regulation and private monitoring score is slightly decreased in 2007, whereas the reason the banking supervision is consistently increasing is because the increasing cross countries capital flows is conducted through the global banks' transactions. In this way, the banking supervision is an effective regulation to watchdog the capital flow transactions, and promote the financial stability (Neanidis, 2019).

Table 5.7 presents the summary statistics for the components of BSR score over the six regions. The capital regulation, banking supervision, and private monitoring score also vary across regions. However, the BSR component score across regions does not show the same pattern with the BSR aggregate score. The BSR aggregate score tends to smooth out the pattern across the regions.

Table 5.7

Summary Statistics for Components of BSR Score Across Region

| Region | 1999 | | 2003 | | 2007 | | 2011 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| **Capital regulation** | | | | | | | | |
| Sub Sahara | 6.63 | 1.38 | 6.03 | 1.58 | 5.26 | 2.51 | 7.25 | 1.39 |
| Asia Pacific (exc Australia New Zealand) | 5.05 | 1.47 | 5.67 | 1.62 | 5.83 | 1.86 | 7.62 | 1.75 |
| MENA and Central Asia | 5.33 | 1.59 | 5.86 | 1.36 | 6.40 | 1.43 | 8.17 | 1.50 |
| Latin America | 5.78 | 1.67 | 6.15 | 1.46 | 6.17 | 1.93 | 7.29 | 1.81 |
| Eastern Europe | 5.50 | 1.67 | 6.00 | 1.86 | 5.75 | 1.94 | 7.15 | 1.73 |
| Western Europe, North America, Australia, NZ | 6.48 | 1.88 | 6.19 | 1.75 | 6.28 | 1.91 | 6.80 | 1.55 |
| **Banking Supervision** | | | | | | | | |
| Sub Sahara | 9.02 | 2.52 | 10.87 | 3.22 | 10.75 | 2.35 | 10.63 | 2.84 |
| Asia Pacific (exc Australia New Zealand) | 10.46 | 1.73 | 11.15 | 2.41 | 10.96 | 2.83 | 11.29 | 2.00 |
| MENA and Central Asia | 11.05 | 2.57 | 10.80 | 3.37 | 10.88 | 2.69 | 10.17 | 2.53 |
| Latin America | 10.10 | 2.34 | 8.74 | 3.78 | 10.74 | 2.64 | 10.98 | 2.64 |
| Eastern Europe | 10.77 | 2.25 | 11.55 | 1.95 | 10.98 | 2.15 | 11.60 | 1.90 |
| Western Europe, North America, Australia, NZ | 9.71 | 2.56 | 10.09 | 2.77 | 10.06 | 2.44 | 10.64 | 2.19 |
| **Private Monitoring** | | | | | | | | |
| Sub Sahara | 7.45 | 1.50 | 7.69 | 1.10 | 7.28 | 1.39 | 8.00 | 1.18 |
| Asia Pacific (exc Australia New Zealand) | 7.57 | 1.59 | 8.20 | 1.36 | 8.75 | 1.29 | 8.05 | 1.36 |
| MENA and Central Asia | 8.28 | 1.84 | 8.14 | 1.61 | 8.00 | 1.65 | 7.67 | 1.72 |
| Latin America | 7.24 | 0.95 | 7.48 | 1.06 | 6.52 | 2.95 | 7.32 | 1.78 |
| Eastern Europe | 6.71 | 1.23 | 7.42 | 1.12 | 7.11 | 1.33 | 7.37 | 0.83 |
| Western Europe, North America, Australia, NZ | 8.41 | 1.44 | 8.23 | 1.37 | 8.42 | 1.30 | 8.44 | 1.45 |

The capital regulation score in Sub-Sahara and Eastern Europe show the decreasing trend, dipped in 2007, and increased after the global financial crisis, while banking supervision scores, all the regions except for Latin America experience dipped scores in 2007, which then go up in 2011. For private monitoring score, MENA and Central Asia present the decreasing score trend from

1999 to 2011. The variation across the different time periods also show that for the private monitoring score, Latin America's score drops below 7 in 2007 with the largest standard deviation among all the components. It is possible that a few countries may cause the mean score in this region. Case in point is Serbia and Montenegro, which have the lowest private monitoring score in 2007 and may cause the widest variation in Latin America.

Finally, Table 5.8 presents the statistical summary for components of BSR scores across level of income. The variation in banking supervision score across level of income is not too much over the observation period, as evidenced by the relatively small standard deviations. The largest standard deviation (std. dev.= 3.97) is for the banking supervision score in the upper middle-income countries in 2003. The capital regulation score in the middle-income countries is relatively lower than low income countries in the period before global financial crisis. The middle-income countries performed well in the period before the global financial crisis. These countries enjoyed the period of economic upturn, between 2003-2007, when the growth rates in Latin America, East Asia, and Eastern Europe reached 5.5%, 5.7%, and 6.6% respectively. During this golden period, the middle-income countries aggressively promote open market policy to attract capital inflow (Foxley, 2009) and extend the domestic credit to private investors. Loosening the capital regulation is one way to accommodate such an optimism in economy, to attract more capital inflow and credit extensions without paying sufficient attention to the quality of the credit (Barth, Caprio, & Levine, 2012; Hilbers, Inci Otker-Robe, Pazarbasioglu, & Johnsen, 2005).

Table 5.8

Summary Statistics for Components of BSR score Across Level of Income

| Capital Regulation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Income Level** | **1999** | | **2003** | | **2007** | | **2011** | |
| | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** |
| Low Income | 5.83 | 1.61 | 6.09 | 1.40 | 5.78 | 2.33 | 7.53 | 1.45 |
| Lower-Middle Income | 5.21 | 1.65 | 5.92 | 1.73 | 5.61 | 1.88 | 7.66 | 1.54 |
| Upper-Middle Income | 6.04 | 1.52 | 5.67 | 1.49 | 5.97 | 2.23 | 7.34 | 1.94 |
| High Income | 6.02 | 2.01 | 6.31 | 1.70 | 6.01 | 1.82 | 7.11 | 1.51 |
| **Banking Supervision** | | | | | | | | |
| Low Income | 9.65 | 2.10 | 10.47 | 3.09 | 10.65 | 2.18 | 11.33 | 2.58 |
| Lower-Middle Income | 10.59 | 2.44 | 11.23 | 2.85 | 10.88 | 2.60 | 10.82 | 2.48 |
| Upper-Middle Income | 10.56 | 2.72 | 9.65 | 3.97 | 11.13 | 2.65 | 10.93 | 2.54 |
| High Income | 9.87 | 2.42 | 10.42 | 2.58 | 10.56 | 2.12 | 11.10 | 2.07 |
| **Private Monitoring** | | | | | | | | |
| **Income Level** | **1999** | | **2003** | | **2007** | | **2011** | |
| | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** |
| Low Income | 7.03 | 1.38 | 7.66 | 1.17 | 7.27 | 1.45 | 7.82 | 0.98 |
| Lower-Middle Income | 7.40 | 1.44 | 7.46 | 1.27 | 7.55 | 1.97 | 7.34 | 1.61 |
| Upper-Middle Income | 7.75 | 1.65 | 7.88 | 1.03 | 7.25 | 2.36 | 7.62 | 1.56 |
| High Income | 8.14 | 1.53 | 8.47 | 1.43 | 8.20 | 1.84 | 8.44 | 1.31 |

The banking supervision score in high income countries is relatively lower than in the middle-income countries, while the private monitoring score in the high-income countries has the highest score among others. The possible reason is that in the high-income countries, in which the system has been well structured with proper regulation enforcement, and the market participants are well-educated. The private monitoring regulation is preferable, where the banks can voluntarily disclose their accurate financial information to the market and let the market value their performance based on the disclosure. Consequently, placing a greater reliance on private monitoring to promote better functioning of banking is more important than relying on banking supervisory policy.

**Descriptive Statistics: Dependent Variable – Economic Growth**

The statistical descriptive for the dependent variable economic growth is presented in Table 5.9. The results of Table 5.9 present that the average economic growth is slightly lower after the global economic crisis (before = 4.53, after = 4.10). There is some variation in the banking supervision and regulation before and after the global crisis (std. dev. = 4), meaning that most of the countries have shown a similar pattern.

Table 5.9

Summary Statistics for Economic Growth Before and After Global Crisis 2008

| Before Global Crisis 2008 | | | | | | After Global Crisis 2008 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| Econ Growth | 504 | 4.53 | 4.75 | -33.10 | 25.66 | 167 | 4.10 | 4.16 | -12.71 | 21.67 |

Table 5.10 below shows how the economic growth changes from 3.29 in 1999 to 4.09 in 2011. The average percentage of economic growth is 4.43%, which means that on average the country grows 4.43%. There is some variation in the economic growth (std. dev. = 4.61). Appendix D presents the summary statistics of economic growth for each country. There has been a relatively gradual increase in economic growth from 1999 to 2007, when the economic growth rose from 3.29% in 1999 to 4.22% in 2003 and peaked at 6.08% in 2007. After the global financial crisis, the average of economic growth shows a decline to 4.09% in 2011. The years before the global economic crisis is the golden period, which is characterized by a full optimism and euphoria in doing economic activities. In these periods, the government provides support through the creation of a macroeconomic environment that promotes the private sectors, for example, by loosening the capital regulation and offering very low lending rates for private

sectors to help private sectors grow. The loose regulation and intense competition among banks increases the credit growth without paying attention to the quality of the credit (Barth et al., 2012; Hilbers et al., 2005). When the economy slows down, a lower income causes borrowers to default, finally influencing the economic activities.

Table 5.10

Summary Statistics for Economic Growth Over Time

| **Total for all years 1999 to 2011** | | | | | | **Changes in mean score over time** | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variable** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** | **1999** | **2003** | **2007** | **2011** |
| Economic Growth | 671 | 4.43 | 4.61 | -33.1 | 25.66 | 3.29 | 4.22 | 6.08 | 4.09 |

Figure 5.2 shows how the economic growth evolved from 1999 to 2011. There is a steady increase in economic growth from 1999 to 2003 and a sharp increase after 2003 until 2007, then it declines sharply from 2007 to 2011. It is interesting to note that the economic growth for most countries change, especially after the global financial crisis, as shown by the large standard deviations.

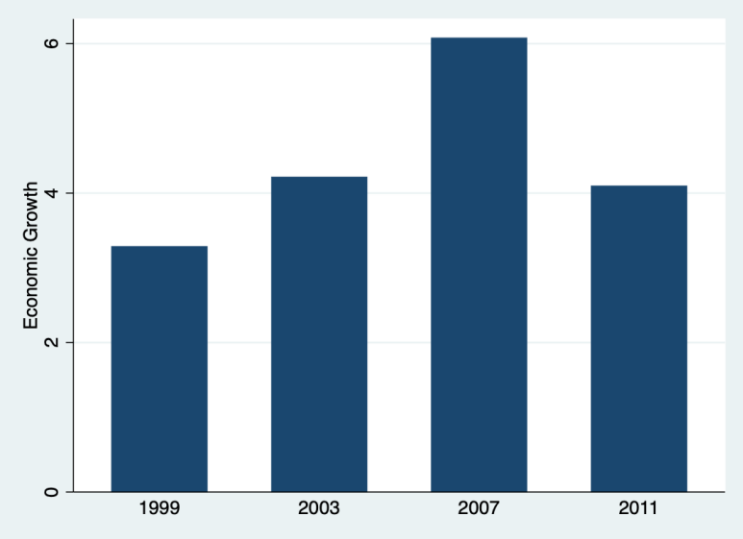


Figure 5.2: Economic Growth over Time (1999 to 2011)

Appendix E shows the means for the economic growth across periods of observations. There are eleven countries which have no data on economic growth at all. However, the pattern still emerges. Based on the total column, the economic growth ranges from -1.82% in Zimbabwe to 15.36% in Equatorial Guinea. Macao, Saudi Arabia, and Turkey show a sharp increase in the economic growth across periods of observations, that is from negative growth to positive growth above 10%. Conversely, Albania, Bosnia and Herzegovina, Trinidad, and Tobago show a decrease in economic growth across the observation period.

The next Table 5.11 presents the variation of economic growth across regions. There is much variation across regions and across time as shown by the high standard deviations. It may happen because of the missing data. All of the regions experience a decline in economic growth after the global crisis 2008. The mean of economic growth decreased from 2007 to 2011.

Table 5.11

Summary Statistics for Economic Growth Across Regions (%)

| Region | Total | | 1999 | | 2003 | | 2007 | | 2011 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** |
| Sub-Sahara | 4.65 | 4.71 | 3.49 | 5.07 | 3.93 | 5.59 | 6.11 | 3.71 | 5.07 | 3.97 |
| Asia Pacific (exc Australia New Zealand) | 5.95 | 4.13 | 4.79 | 3.82 | 5.96 | 3.44 | 7.22 | 4.62 | 5.84 | 4.42 |
| MENA and Central Asia | 5.20 | 6.57 | 3.55 | 5.22 | 4.90 | 9.03 | 7.47 | 5.09 | 4.79 | 5.83 |
| Latin America | 3.411 | 3.76 | 1.85 | 3.74 | 3.36 | 4.14 | 4.99 | 3.05 | 3.35 | 3.53 |
| Eastern Europe | 4.216 | 4.35 | 1.14 | 5.72 | 5.62 | 2.58 | 6.86 | 2.71 | 3.11 | 3.46 |
| Western Europe, North America, Australia, NZ | 3.07 | 2.58 | 5.01 | 3.12 | 1.69 | 1.88 | 3.85 | 2.11 | 1.74 | 1.27 |

Based on Table 5.12, The variation of economic growth across level of democracy also presents a similar pattern with the variation across regions. The standard deviation is relatively high, which indicates much variation across level of democracy. The economic growth increases gradually from 1999 until 2007 in all level of democracy the decline sharply after the global economy shock. Table 5.12 also presents that countries in the fully democracy group have relatively lower economic growth than other groups of countries. The possible reason is that countries in this group are relatively middle- and high-income countries.

Table 5.12

Summary Statistics for Economic Growth Across Level of Democracy

| Democracy | Total | | 1999 | | 2003 | | 2007 | | 2011 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Authoritarian | 4.97 | 7.07 | 3.20 | 6.28 | 3.75 | 9.19 | 7.73 | 5.74 | 6.15 | 4.87 |
| Partly Authoritarian/Democracy | 5.26 | 4.98 | 4.27 | 5.12 | 5.47 | 5.50 | 6.79 | 4.47 | 4.68 | 4.58 |
| Fully Democracy | 3.94 | 3.40 | 2.54 | 3.73 | 3.74 | 3.28 | 5.62 | 2.68 | 3.73 | 3.22 |

Table 5.13 also presents that the variation of economic growth across level of income is relatively wide, based on the standard deviation that is higher than 2. Similar to analysis across level of democracy, all countries regardless of the level of income experience a decline in economic growth because of global economic crises.

Table 5.13

Summary Statistics for Economic Growth Across Level of Income

| Economic Growth | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Income Level | 1999 | | 2003 | | 2007 | | 2011 | |
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Low Income | 4.14 | 4.81 | 5.20 | 5.08 | 6.21 | 3.24 | 5.48 | 3.76 |
| Lower-Middle Income | 2.03 | 4.92 | 4.78 | 3.88 | 6.64 | 5.08 | 4.58 | 4.36 |
| Upper-Middle Income | 2.36 | 3.57 | 4.78 | 4.38 | 6.77 | 2.89 | 4.39 | 3.47 |
| High Income | 4.08 | 3.29 | 2.90 | 3.52 | 5.04 | 3.58 | 3.07 | 4.32 |

## Descriptive Statistics: Independent Variables

There are five independent variables, which include financial crisis experiences, financial assistance, trade openness, level of democracy, and corruption control. Table 5.14 illustrates the

frequencies of financial crisis experiences overall and for each region. The overall frequencies for the financial crisis experiences from Table 5.14 informs that there are 409 countries that have financial crisis experiences, and 50 countries do not have (see Appendix F for the complete list of countries with financial crisis experiences). There are 409 country-years out of 459 with the financial crisis experience.

Table 5.14

Financial Crisis Experiences Across Regions

| Crisis Experiences | Overall Freq. | Sub-Sahara Freq. | Asia Pacific (excl Australia & New Zealand) Freq. | MENA and Central Asia Freq. | Latin America Freq. | Eastern Europe Freq. | Western Europe, North America, Australia, NZ Freq. |
|---|---|---|---|---|---|---|---|
| Doesn't Have | 50 | 0 | 1 | 3 | 1 | 7 | 38 |
| Have | 409 | 120 | 59 | 49 | 75 | 73 | 33 |
| Total | 459 | 120 | 60 | 52 | 76 | 80 | 71 |

Table 5.15 presents the comparison of BSR score in the countries with crisis experience and without. The table below describes that countries without financial crisis experiences tend to have higher BSR scores over year. This is interesting to note that countries without experience in managing financial crisis voluntarily adopt tighter BSR than countries with such experiences.

Table 5.15

BSR score Across Financial Crisis Experience Countries – Over Year

| Crisis Experiences | 1999 | 2003 | 2007 | 2011 |
|---|---|---|---|---|
| Doesn't Have | 7.79 | 7.92 | 7.95 | . |
| Have | 7.04 | 7.88 | 7.89 | 8.36 |

Table 5.16 shows the frequencies for the variable financial assistance across the six regions. The frequencies inform that the majority of the World does not receive financial assistance from the IMF. There are 214 countries out of 651 with financial assistance from the IMF. The regional variations are the most likely variation that can be seen for financial assistance, because there are no time variations in financial assistance during the observation period 1999 to 2011. Asia Pacific, without Australia and New Zealand, (81 out of 100) and Latin America (81 out of 116) have the highest number of countries that do not have financial assistance from the IMF. While Western Europe, North America, Australia, and NZ are regions with the lowest number of countries which receive financial assistance from the IMF.

Table 5.16

Financial Assistance Across Regions

| Financial Assistance | Overall Freq. | Sub-Sahara Freq. | Asia Pacific (excl Australia & New Zealand) Freq. | MENA and Central Asia Freq. | Latin America Freq. | Eastern Europe Freq. | Western Europe, North America, Australia, NZ Freq. |
|---|---|---|---|---|---|---|---|
| Doesn't Have | 437 | 66 | 81 | 72 | 81 | 58 | 79 |
| Have | 214 | 90 | 19 | 28 | 35 | 38 | 4 |
| Total | 651 | 156 | 100 | 100 | 116 | 96 | 83 |

Table 5.17 presents the comparison of BSR score in the countries with the IMF assistance and without. The table below describes that countries without financial assistance tend to have a higher BSR score over year. This is interesting to note that countries without financial assistance tend to adopt stronger BSR than countries with the IMF assistance.

Table 5.17

BSR score – Financial Assistance over Year

| Financial Assistance | | | | |
|---|---|---|---|---|
| Have | 1999 | 2003 | 2007 | 2011 |
| Doesn't Have | 7.33 | 7.85 | 7.82 | 8.61 |
| Have | 6.82 | 7.75 | 7.59 | 7.90 |

Table 5.18 illustrates the frequencies for the variable level of democracy over time. There are three levels of democracy in the world, which are authoritarian, partly authoritarian/

democracy, and democracy. There has been a change in the level of democracy from 1999 to 2011, therefore it is interesting to examine the changes over the observation period. Table 5.18 presents the changes in the level of democracy from 1999 to 2011. The interesting fact is the decline in the number of countries with authoritarian rule from 26 in 1999 to 15 in 2011. Although most countries have not changed to fully democracy, there is an increase in the frequency of countries with democratic rule. As of 2011, the most common level of democracy in the world is democracy (86 out of 147 countries). The second frequent level of democracy in 2011 is partly authoritarian/democracy (anocracy). Polity IV explains that countries with partly authoritarian/democracy are countries which are in the process of shifting from authoritarian to democracy but still not fully democratic. It is not surprising that most countries in the world are moving towards democracy, as it is shown by the steady increase in the number of countries with democracy.

Table 5.18

Number of Countries for Each Democracy Level from 1999 – 2011

| **Level of Democracy** | **1999** | **2003** | **2007** | **2011** |
|---|---|---|---|---|
| Authoritarian | 26 | 24 | 21 | 15 |
| Partly Authoritarian/Democracy | 44 | 41 | 41 | 46 |
| Democracy | 74 | 81 | 84 | 86 |

Table 5.19 informs the BSR score for each of democracy level. Fully democratic countries have the highest BSR score among all levels of democracy. The possible answer is that countries with democracy tend to have an open and competitive economic system. The economy, by design, is always competitive. It means that the economy is influenced by the competition. In the context of the banking sector, the adoption of BSR is one way to pursue the democracy's

value in protecting citizens from the risky activities of banking industry. Table 5.19 shows that countries with partly authoritarian/democracy have higher BSR score than authoritarian.

Table 5.19

BSR Score for Each Democracy Level from 1999 – 2011

| Democracy | 1999 | | 2003 | | 2007 | | 2011 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Authoritarian | 7.30 | 2.34 | 7.97 | 1.83 | 7.30 | 2.31 | 8.25 | 1.43 |
| Partly Authoritarian/Democracy | 6.50 | 1.92 | 7.88 | 1.92 | 7.21 | 1.61 | 7.78 | 2.16 |
| Fully Democracy | 7.43 | 1.63 | 7.92 | 1.29 | 8.09 | 1.68 | 8.65 | 1.38 |

The interesting point to note from Table 5.20 is that Asia Pacific (excluding Australia and New Zealand) has the highest mean of trade openness. The variation of trade openness in the region is high, as it is evidenced by the relatively higher standard deviation than other regions. The trade openness describes the relationship of a country with other countries, in this case through the international trade. The higher value of trade openness shows that a country has a high exposure of international relationship.

Table 5.20

Summary Statistics of Trade Openness Across Region

| Region | 1999 | | 2003 | | 2007 | | 2011 | |
|---|---|---|---|---|---|---|---|---|
| | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** |
| Sub Sahara Freq. | 0.64 | 0.56 | 0.65 | 0.36 | 0.73 | 0.39 | 0.77 | 0.37 |
| Asia Pacific (excl Australia & New Zealand) | 0.97 | 0.74 | 1.01 | 0.85 | 1.12 | 0.94 | 1.13 | 0.98 |
| MENA and Central Asia | 0.82 | 0.30 | 0.85 | 0.26 | 0.97 | 0.30 | 0.97 | 0.31 |
| Latin America | 0.77 | 0.45 | 0.88 | 0.65 | 1.01 | 0.97 | 1.04 | 1.22 |
| Eastern Europe | 0.82 | 0.28 | 0.88 | 0.25 | 1.03 | 0.32 | 1.09 | 0.35 |
| Western Europe, North America, Australia, NZ | 0.87 | 0.61 | 0.86 | 0.60 | 0.98 | 0.76 | 1.05 | 0.84 |

Based on Table 5.21, it is shown that the last region (Western Europe, North America, Australia, and New Zealand) has the highest mean of corruption control. It means that countries in this region have less corruption than other region. There is not much variation in the corruption level across region, as it is seen from the low standard deviation.

Table 5.21

Summary Statistics of Corruption Control Level Across Region

| Region | Total | | 1999 | | 2003 | | 2007 | | 2011 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| Sub-Sahara Freq. | 2.14 | 0.84 | 2.29 | 0.94 | 2.10 | 0.86 | 2.07 | 0.93 | 2.10 | 0.60 |
| Asia Pacific (excl Australia & New Zealand) | 2.60 | 0.96 | 2.76 | 0.83 | 2.21 | 1.12 | 2.59 | 0.91 | 2.82 | 0.90 |
| MENA and Central Asia | 2.35 | 0.77 | 2.50 | 0.80 | 2.30 | 0.84 | 2.16 | 0.73 | 2.43 | 0.71 |
| Latin America | 2.48 | 0.83 | 3.05 | 0.90 | 2.30 | 0.67 | 2.19 | 0.75 | 2.38 | 0.74 |
| Eastern Europe | 2.64 | 0.96 | 3.33 | 1.19 | 2.45 | 0.85 | 2.37 | 0.81 | 2.45 | 0.64 |
| Western Europe, North America, Australia, NZ | 4.54 | 0.95 | 4.60 | 1.19 | 4.38 | 0.95 | 4.52 | 0.86 | 4.64 | 0.84 |

## Conclusion

In this chapter, I presented the descriptive statistics for the dependent and independent variables used in the data analysis. The statistical descriptive described variations across countries, across regions, across time, across level of democracy, and across level of income. After discussing the results of the descriptive statistics for all the variables used, in the following chapter, I present the bivariate analysis. The reason I conducted the bivariate analysis is to further understand the relationships between variables.

# CHAPTER 6

# STATISTICAL ANALYSIS: BIVARIATE AND MULTIVARIATE ANALYSIS

In this chapter, I describe the bivariate and multivariate analysis, which are done to gain understanding of the relationships between the dependent and independent variables. In the first part, I do the bivariate analysis for the Banking Sector Regulation, then, BSR and economic growth. There are several ways of running the two-way analysis depending on the level of measurement of the variables. For the nominal and ordinal variables, I use the percentage tables, and for the continuous and interval variables, I use correlations and scatter plots. Firstly, I present the results of two-way analysis for banking sector regulation and the five independent variables. Secondly, I present the results of the bivariate analysis for the economic growth and its independent variables. Since bivariate analysis cannot explain the relationship of the dependent and independent variables, I use multivariate analysis on the next parts of this chapter.

## Bivariate Analysis: Banking Sector Regulation

Table 6.1 present the share of BSR and three of its components for each independent variable for the entire period 1999 to 2011. Countries without financial crisis experience have a higher mean score of BSR than countries with financial crisis experience. There is a low variation in each category of financial crisis experience, as shown by the narrow standard deviation, this also shows that the countries group together well. Countries with democracy have a higher mean score of BSR than those which are not democracy. Once again, there is a low variation in each category due to the narrow standard deviations. It is interesting to note that

countries that do not have financial assistance have a higher mean score of BSR than countries that have financial assistance.

Table 6.1 also shows that countries with financial experience, democracy, and financial aids have higher capital regulation. The share of banking supervision is similar to capital regulation, except for the case that partly authoritarian/democracy have a higher banking supervision score. For private monitoring, countries with no financial crisis experiences and no aids, but with democracy have higher private monitoring score. The share of the BSR and its components (capital regulation, banking supervision, and private monitoring) is not distributed fairly across three independent variables, although the variation is low. It is an indication that there would be some problems when doing multivariate analysis.

Table 6.1

Share of BSR and the Components for Independent Variables

| Variable | # of countries/obs. | BSR | | # of countries/obs. | Capital Regulation | | # of countries/obs. | Banking Supervision | | # of countries/obs. | Private Monitoring | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Dev. | | Mean | Std. Dev. | | Mean | Std. Dev. | | Mean | Std. Dev. |
| **Crisis Experience** | | | | | | | | | | | | |
| Don't have | 50 | 7.88 | 1.15 | 49 | 6.03 | 1.77 | 50 | 9.87 | 2.40 | 50 | 7.86 | 1.44 |
| Have | 363 | 7.8 | 1.68 | 338 | 6.21 | 1.94 | 365 | 10.75 | 2.47 | 321 | 7.81 | 1.46 |
| **Financial Assistance** | | | | | | | | | | | | |
| Don't have | 378 | 7.89 | 1.69 | 359 | 6.21 | 1.81 | 380 | 10.52 | 2.76 | 352 | 7.82 | 1.70 |
| Have | 185 | 7.45 | 1.84 | 160 | 6.25 | 1.95 | 186 | 10.63 | 2.40 | 156 | 7.55 | 1.38 |
| **Democracy** | | | | | | | | | | | | |
| Authoritarian | 66 | 7.64 | 2.07 | 59 | 6.17 | 1.71 | 68 | 10.26 | 2.95 | 58 | 7.93 | 1.85 |
| Partly Auto/Democratic | 137 | 7.29 | 1.96 | 116 | 5.88 | 2.11 | 135 | 10.85 | 2.65 | 117 | 7.37 | 1.50 |
| Democracy | 301 | 8.03 | 1.56 | 289 | 6.32 | 1.84 | 304 | 10.60 | 2.52 | 278 | 8.00 | 1.42 |

Figure 6.1 presents that countries with more trade openness have a higher BSR score. Figure 6.2, 6.3, and 6.4 present the two-way graph for capital regulation, banking supervision and trade openness, which presents the similar results, that when countries have higher trade openness, they tend to have higher score of the three components of BSR.

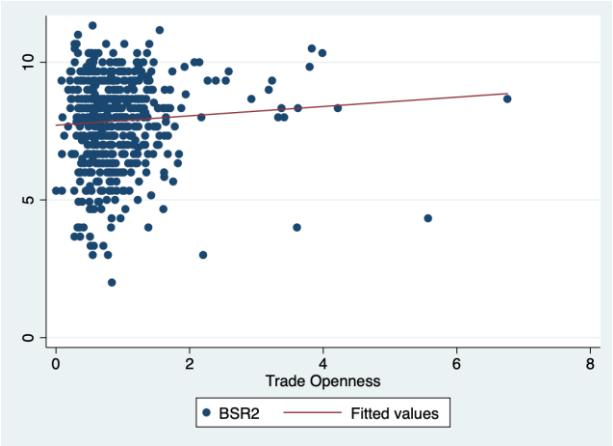


Figure 6.1 Two-way Graph BSR and Trade Openness

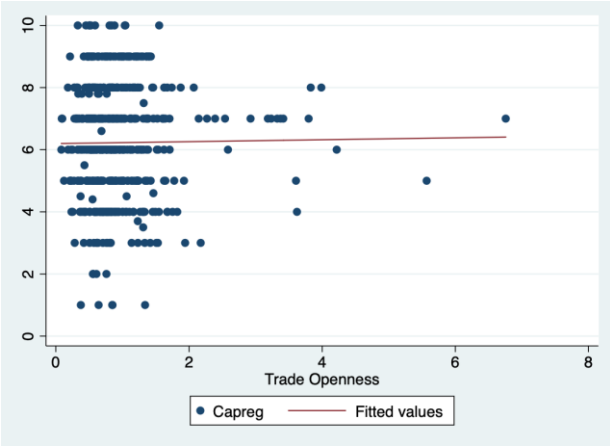


Figure 6.2 Two-way Graph Capital Regulation and Trade Openness

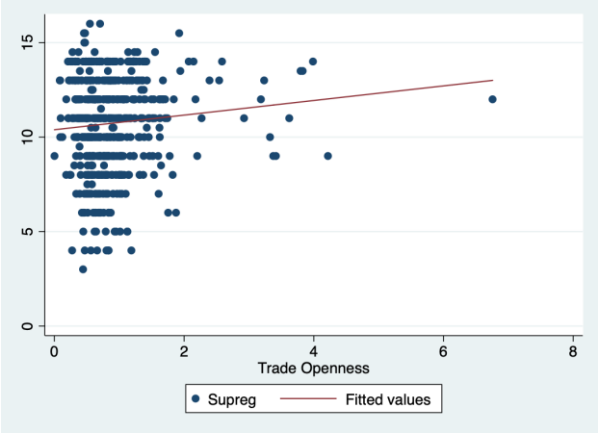


Figure 6.3 Two-way Graph Banking Supervision and Trade Openness

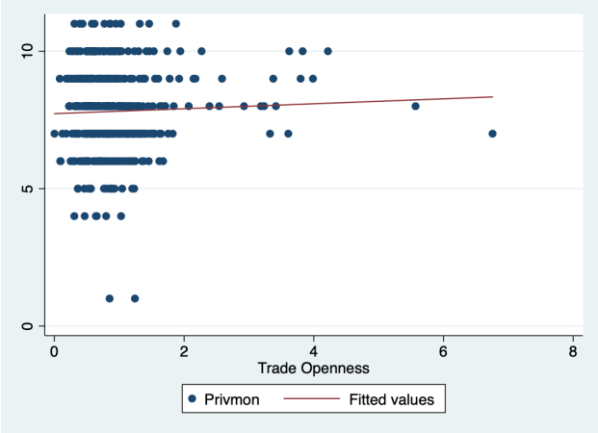


Figure 6.4 Two-way Graph Private Monitoring and Trade Openness

Figure 6.5 shows that countries with a higher score of corruption level (less corrupt countries) have a higher BSR score. Surprisingly, Figures 6.6 and 6.7 show the two-way graph

for capital regulation, and banking supervision with a negative relationship, indicating less corrupt countries have lower capital regulation and banking supervision score, whereas Figure 6.8 presents the similar result with BSR, indicating less corrupt countries have tighter private monitoring regulation.

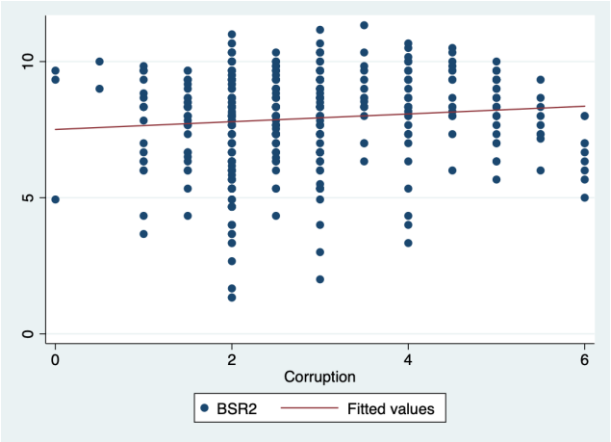


Figure 6.5 Two-way Graph Banking Supervision Regulation and Corruption

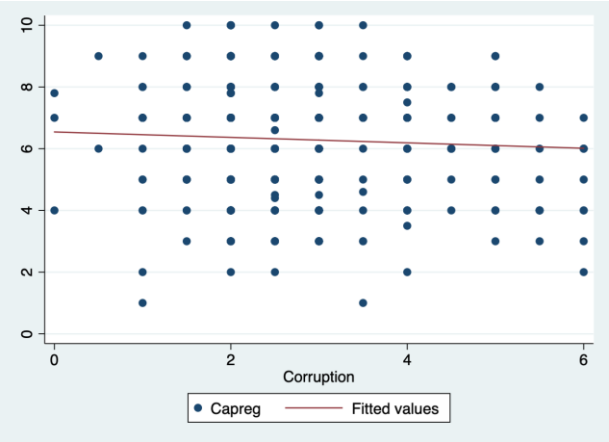


Figure 6.6 Two-way Graph Capital Regulation and Corruption

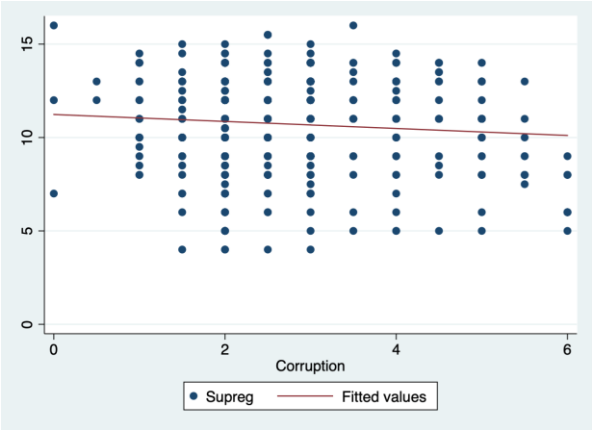


Figure 6.7 Two-way Graph Banking Supervision and Corruption

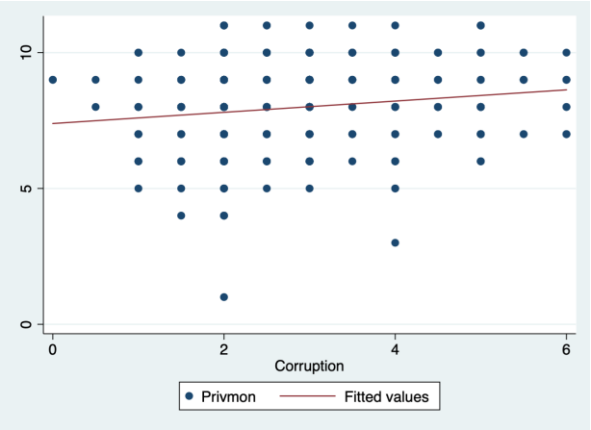


Figure 6.8 Two-way Graph Private Monitoring and Corruption

**Analysis of Correlations**

For all the independent variables, I used correlations to examine the two-way relationships among them and the dependent variables. The statistics for the correlations are presented in Table 6.2. Table 6.2 shows the correlations of the four dependent variables (BSR and three components of BSR) and the independent variables; crisis experience, financial assistance, trade, democracy, corruption control, and government expenditure.

Correlation analysis helps identify the strength and the relationship directions between dependent and independent variables. The dependent variable of the aggregate banking supervision regulation has a very weak (correlation coefficient between 0 and 0.3) significant positive relationship with two variables: democracy, and corruption control. It is surprising that banking supervision regulation has a weak negative relationship with crisis experience and financial assistance, which means that countries with crisis experience and assistance from a donor tend to adopt lax banking supervision and regulation, because one will expect that the inverse relationship between banking supervision regulation and crisis experience and also financial assistance will influence a country to adopt stronger banking supervision and regulation.

The correlations analyses between independent variables help to assess whether there is a multicollinearity or not. Multicollinearity exists when the independent variables used in the regression correlate with each other. The multicollinearity is a problem in multiple regression. The results show that there are no severely correlated independent variables (correlation score above 0.8). The strongest significant bivariate correlation is between region and level of income (0.66) and between banking supervision and BSR (0.65). However, the banking supervision is the component of BSR, so it is not a threat for multivariate analysis. The careful analysis should

be done to the region and level of income variables when performing the multiple regression analysis.

Banking supervision regulation consists of three components: capital regulation, banking supervision, and private monitoring. I expect that the correlation between BSR and its components should be a perfect correlation or at least have a moderate correlation. However, some components have low correlations with other components, such as private monitoring and banking regulation. Because of low correlation among its components, the aggregate BSR score is used in the multivariate analysis to smooth out the difference between its components.

The correlation between BSR and financial assistance suggest a weak negative correlation (-0.12). The correlation suggests that as the country receives financial assistance from the IMF, the score of BSR is getting lower. The weak correlation may happen due to the missing values. This variable may cause a problem in the multiple regression analysis.

The correlation between democracy and BSR is 0.13, which presents a weak positive correlation. The positive correlation explains that as a country adopts democracy, the BSR score will increase. Similar to financial assistance variable, the level of democracy variable may also pose a problem when doing multivariate analysis.

Table 6.2

Correlation for Independent Variables: BSR and its Independent Variables

| | BSR | Capital Regulation | Banking Supervision | Private Monitoring | Crisis Experience | Financial Assistance | Democracy | Trade | Corruption | Government Expenditure | Region | Level Of Income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BSR | 1 | | | | | | | | | | | |
| Capital Regulation | 0.42* | 1 | | | | | | | | | | |
| Banking Supervision | 0.65* | 0.04 | 1 | | | | | | | | | |
| Private Monitoring | 0.49* | 0.06 | 0.12* | 1 | | | | | | | | |
| Crisis Experience | -0.02 | 0.03 | 0.12* | -0.01 | 1 | | | | | | | |
| Financial Assistance | -0.12* | 0.01 | 0.02 | -0.08 | 0.23* | 1 | | | | | | |
| Democracy | 0.13* | 0.06 | 0.02 | 0.09 | -0.18* | -0.03 | 1 | | | | | |
| Trade | 0.07 | 0.01 | 0.095* | 0.04 | -0.12* | -0.1478* | 0.0192 | 1 | | | | |
| Corruption | 0.10* | -0.06 | -0.09 | 0.17* | -0.41* | -0.20* | 0.30* | 0.1782* | 1 | | | |
| Government Expenditure | 0.03 | -0.03 | -0.09* | 0.05 | -0.22* | -0.13* | 0.20* | 0.07 | 0.38* | 1 | | |
| Region | 0.14* | 0.03 | -0.02 | 0.02 | -0.43* | -0.23* | 0.38* | 0.0988* | 0.52* | 0.36* | 1 | |
| Level Of Income | 0.22* | 0.05 | 0.03 | 0.22* | -0.43* | -0.44* | 0.31* | 0.2998* | 0.56* | 0.39* | 0.66* | 1 |

Notes: * indicates statistical significance at the 0.05

**Bivariate Analysis: The Influence of BSR on Economic Growth**

One of the objectives of this dissertation is to examine the impact of adopting banking supervision regulation on the economic growth. The analyses of correlation between the dependent variable of economic growth and each of the independent variables are presented in Table 6.3. Although there is no severe correlation, similar to the BSR bivariate analysis, the careful analysis should be performed for the strongest correlation when doing multivariate analysis. The correlation between income and region, income and corruption, and region and corruption are the largest correlation here, with the rate 0.66, 0.56, and 0.52, respectively.

The BSR and its components are tested to understand the relationship of each of the regulations on spurring economic growth. The correlation between private monitoring and economic growth is 0.02, which suggests zero correlation. This explains that as a country adopts strong private monitoring regulation the economic growth increases, but not so much. The correlation between capital regulation and economic growth, surprisingly, suggests a zero correlation (-0.02). The negative correlation means that as the capital regulation increases the economic growth decreases. Another surprise result comes from the correlation between banking supervision and economic growth, which also tells a zero correlation (-0.03). It means that the strongest banking supervision will reduce the economic growth. Based on the level of correlation, I would expect that the multiple regression will turn out to be rather a disappointment.

Table 6.3

Correlation for Independent Variables: Economic Growth and its Independent Variables

| | Growth | BSR | Capital Reg | Banking Supervision | Private Monitoring | Capital Formation | Edu Spending | Crisis Exp | Fin Assist | Democracy | Trade | Corruption | Govt Exp | Region | Level Of Income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Growth | 1 | | | | | | | | | | | | | | |
| BSR | 0.02 | 1 | | | | | | | | | | | | | |
| Capital Reg | -0.02 | 0.42* | 1 | | | | | | | | | | | | |
| Banking Supervision | -0.03 | 0.65* | 0.04 | 1 | | | | | | | | | | | |
| Private Monitoring | 0.02 | 0.49* | 0.06 | 0.12* | 1 | | | | | | | | | | |
| Capital Formation | 0.35* | 0.07 | 0.04 | 0.07 | -0.03 | 1 | | | | | | | | | |
| Education Spending | -0.13* | 0.12* | 0.05 | -0.07 | 0.06 | 0.02 | 1 | | | | | | | | |
| Crisis Experience | 0.08 | -0.02 | 0.03 | 0.12* | -0.01 | -0.01 | -0.18* | 1 | | | | | | | |
| Financial Assistance | -0.00 | -0.12* | 0.01 | 0.02 | -0.08 | -0.14* | -0.24* | 0.23* | 1 | | | | | | |
| Democracy | -0.11* | 0.13* | 0.06 | 0.02 | 0.09 | -0.00 | 0.22* | -0.18* | -0.03 | 1 | | | | | |
| Trade | 0.0215 | 0.069 | 0.0113 | 0.0950* | 0.0404 | 0.1025* | 0.1119* | -0.12* | -0.1478* | 0.0192 | 1 | | | | |
| Corruption | -0.17* | 0.10* | -0.06 | -0.09 | 0.17* | -0.01 | 0.35* | -0.41* | -0.20* | 0.30* | 0.1782* | 1 | | | |
| Govt Exp | -0.18* | 0.03 | -0.03 | -0.09* | 0.05 | -0.00 | 0.61* | -0.22* | -0.13* | 0.20* | 0.07 | 0.38* | 1 | | |
| Region | -0.14* | 0.14* | 0.03 | -0.02 | 0.02 | 0.08 | 0.27* | -0.43* | -0.23* | 0.38* | 0.0988* | 0.52* | 0.36* | 1 | |
| Level Of Income | -0.11* | 0.22* | 0.05 | 0.03 | 0.22* | 0.09* | 0.30* | -0.43* | -0.44* | 0.31* | 0.2998* | 0.56* | 0.39* | 0.66* | 1 |

Notes: * indicates statistical significance at the 0.05

Figure 6.9, 6.10, 6.11 and 6.12 show the scatterplot of the aggregate BSR and its components and the economic growth. The scatterplots present the similar results, where BSR and its components have a positive relationship with the economic growth, although not too much. Outliers and missing value may cause the weak correlation.

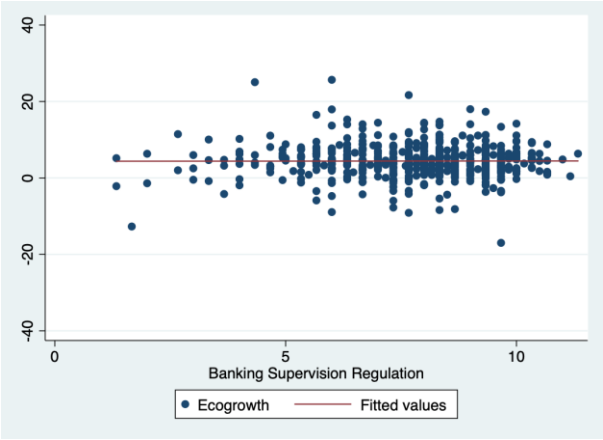


Figure 6.9 Scatter Plot: Economic Growth and Banking Supervision Regulation

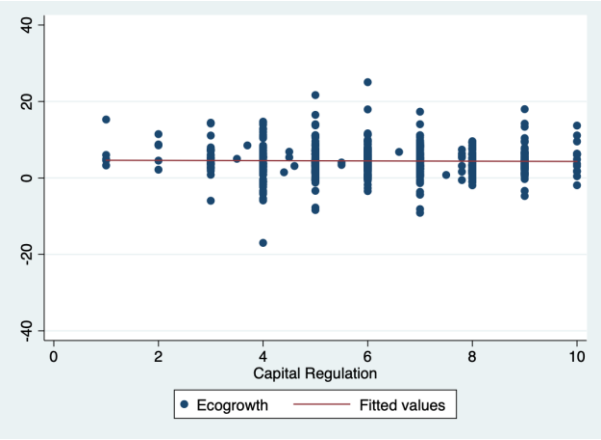


Figure 6.10 Scatter Plot: Economic Growth and Capital Regulation

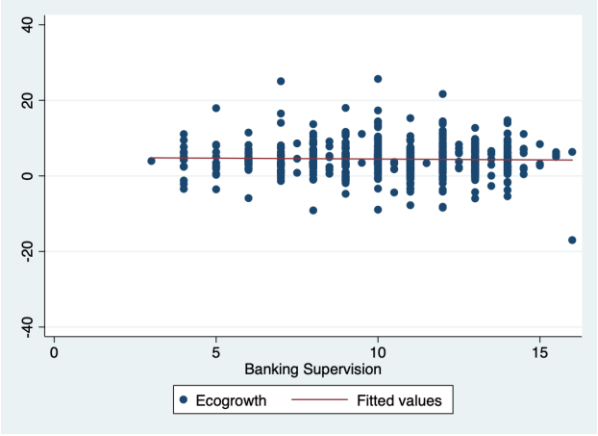


Figure 6.11 Scatter Plot: Economic Growth and Banking Supervision

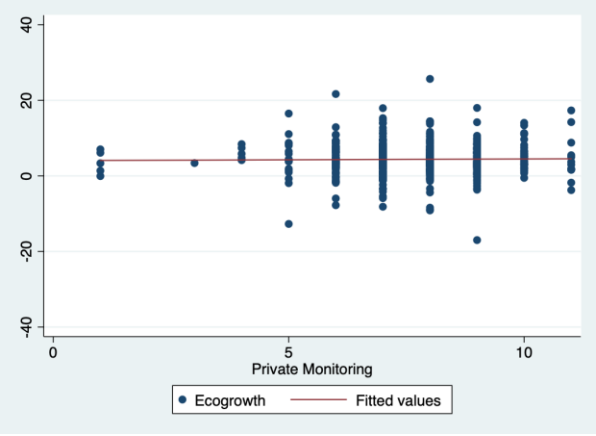


Figure 6.12 Scatter Plot: Economic Growth and Private Monitoring

## Multivariate Analysis

In this part, I present the result of multivariate analysis. As mentioned in the previous chapter, I use the panel regression to analyze the determinants of cross-national variation in adopting banking supervision and regulation, and secondly the effect of banking supervision and regulation on economic growth. I tested two models. The first model tested the effect of financial crisis experience, the trade openness, the IMF financial assistance, the level of democratization, and the corruption control on the adoption of banking supervision regulation. The second model tested for the effects of banking supervision and regulation on economic growth. In this model I test three components of banking supervision regulation, which are capital regulation, banking supervision, and private monitoring on economic growth. First, I present the result of the determinant of cross-country variation in adopting banking supervision and regulation, and finally show the analysis of the impact of banking supervision regulation on economic growth.

## Multivariate Analysis: The First Model

The first model tested for the influence of financial crisis experience, trade openness, financial assistance, level of democracy, and level of income on the BSR score. The basic equation of the first model is as the following:

$$\mathrm{BSR}_{it} = \alpha + \beta_1 FINEXP_{it} + \beta_2 TRADE_{it} + \beta_3 FINASSIST_{it} + \beta_4 DEMOC_{it} + \beta_5 CORRUPT_{it} + \beta_6 control_{it} + \mu_{it}$$

Where: FINEXP is for financial crisis experience, TRADE is for the influence of trade with other countries, FINASSIST is for the financial assistance from the IMF, DEMOC is for the level of democracy, CORRUPT is for the corruption control in a country, control variables used here are

the country's income level, government expenditure, and region. $\alpha$ is a parameter, $\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$, $\beta_5$, $\beta_6$ are estimated parameters, and $\mu$ is a randomly distributed error term. The dependent variable is the banking supervision and regulation.

The panel regression analysis offers two types of econometric models: fixed effects and random effects. I used the Hausman test to decide whether to use the fixed effects model or random effects model. According to Gujarati & Porter (2009), the Hausman specification test informs whether there is a significant correlation between the unobserved specific random effects and the regressors or not.

**Statistical Result: Determinant Factors of Banking Supervision and Regulation**

One of the objectives of this dissertation is to test whether financial crisis, trade openness, financial assistance, level of democratization, and corruption control have an influence on countries' decision in adopting strong banking supervision regulation or not. To test the influence of each of these factors, as a starting point I tested the full model (Model 1) using the aggregate banking supervision score and utilizing OLS regression, random effect model, and fixed effect model. In this model, I break down democracy into three groups: authoritarian, partly authoritarian/democracy, and fully democracy. Since I want to understand the effect of democracy on the adoption of banking supervision regulation, I include only partly authoritarian/democracy and fully democracy. For the control variables, region and level of income, both of them are time-invariant variables, so I also decompose these variables into six regions and three levels of income. I exclude region 6 (Western Europe, North America, Australia, and New Zealand) and high-income countries to understand the influence of these variables on adopting banking supervision regulation.

To test the sensitivity of the multivariate analysis, I check the coefficients' stability and significance in different model specifications. First, I conduct the fixed effect and random effect model with robust standard errors to see the stability and significance of the coefficients. The robust standard errors improve the model by correcting potential heteroskedasticity and auto-correlation. The significant variables and their coefficients in the fixed and random effect models without robust standard errors are similar to the results with standard errors. These results suggest the stability of the used variables. Second, I run the Breusch and Pagan Lagrangian multiplier and the Hausmann test to decide which model is appropriate to analyze the determinant factors of banking supervision regulation adoption. The result of the Breusch and Pagan Lagrangian multiplier is Prob > chibar2 = 0.0481. It means that the random effect is preferable than OLS. Another consideration is because the model for this dissertation is panel data, the random effect model is chosen, whereas the result of the Hausmann test is Prob>chi2 = 0.6102, it means that the random effect model is preferable to the fixed effect model. The variables used in doing the regression are aggregate banking supervision regulation score as the dependent variable, with financial crisis experience, financial assistance, democracy, trade openness, and corruption level as my independent variable, and region, level of income as the control variables. The coefficients and significance of all the determinant factors are similar and support consistently the relative robustness of the results. The only exception is democracy, which is significant only in the random effect models. Third, I check the heteroskedasticity of the fixed effect model and find that it exists using modified Wald test (Prob>chi2 = 0.000). Consequently, running the model with robust standard errors is preferable to improve the model. The random variable tends to be heteroskedastic if the variance is not constant. The robust standard errors help to obtain the unbiased standard errors of the coefficients under

heteroscedasticity. Fourth, I run the VIF test to understand if there is high multicollinearity, remembering that I have strong correlation between region and level of income variables. The result presents that the mean VIF >10 (3.15), which means that the model is free from high multicollinearity. Table 6.4 presents the three specification (OLS, robust fixed effect and random effect) to see the difference among them, but I use robust random effect to present regression for determinant factors of banking supervision regulation. In Model 1, the robust OLS regression explains 12% of the variation in the determinant factor of banking supervision regulation adoption ($r^2 = 0.12$), it is higher than the robust fixed effect model ($r^2 = 0.09$). Financial crisis experience and trade openness have a positive coefficient and are statistically significant at a 99% level. If a country has financial crisis experience, the aggregate banking supervision regulation score will increase 0.76 point. And, if a country has higher trade openness, its aggregate banking supervision regulation will increase 0.40 point.

Surprisingly, financial assistance is giving a negative influence and statistically significant at 99%. It means that if a country receives financial assistance from the IMF, the aggregate banking supervision regulation score will decrease by 0.65 point. This result is not consistent with my expectation. I expect that if a country receives assistance from an international donor, this country will develop tighter banking supervision regulation. When the international donor distributes financial aids to a needed country, this agency usually requires a country to implement a sound banking supervision regulation as a lending agreements.

Table 6.4

Model 1: Regression Results for Banking Supervision Regulation

| Variable | Robust OLS | | Robust FE | | Robust RE | |
|---|---|---|---|---|---|---|
| | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE |
| Financial Crisis Experience | 0.68 | 0.235*** | 1.01 | 0.335*** | 0.76 | 0.284*** |
| Trade Openness | 0.35 | 0.135*** | 1.15 | 0.494** | 0.40 | 0.154*** |
| Financial Assistance | -0.59 | 0.193*** | -0.75 | 0.269*** | -0.65 | 0.232*** |
| Partly Autho/Democratic | 0.26 | 0.424 | -0.20 | 0.309 | 0.23 | 0.322 |
| Fully Democracy | 0.76 | 0.435* | 0.15 | 0.484 | 0.73 | 0.359** |
| Corruption | 0.18 | 0.107* | 0.22 | 0.171 | 0.20 | 0.122* |
| Government Expenditure | -0.02 | 0.025 | -0.06 | 0.053 | -0.02 | 0.027 |
| Sub Sahara Region | 0.03 | 0.425 | (omitted) | | -0.01 | 0.499 |
| Asia Pacific (exc Australia New Zealand) Region | 0.04 | 0.385 | (omitted) | | -0.07 | 0.458 |
| MENA plus Central Asia Region | 0.63 | 0.392 | (omitted) | | 0.58 | 0.462 |
| Latin America Region | -0.25 | 0.387 | (omitted) | | -0.30 | 0.463 |
| Eastern Europe Region | -0.01 | 0.311 | (omitted) | | -0.03 | 0.371 |
| Low Income Countries | -0.16 | 0.344 | 0.65 | 1.04 | -0.02 | 0.35 |
| Middle Income Countries | 0.05 | 0.269 | 0.58 | 1.15 | 0.10 | 0.306 |
| Constant | 6.46 | 0.705*** | 6.17 | 5.95*** | 6.42 | 0.797*** |
| R2 | 0.12 | | 0.09 | | | |
| Observations | 345 | | 345 | | 345 | |

Notes: *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels respectively (one-tailed test)

Based on the Hausman test result (Prob>chi2 = 0.6102), the results of the robust random effect model on determinant factors of banking supervision regulation adoption shows that

While fully democracy and corruption control have positive coefficient and statistically significant at 95% and 90% levels respectively, when a country is fully democracy, the banking supervision regulation score is increase by 0.73 point, and when a country has stronger corruption control, the banking supervision regulation score will increase 0.20 point.

Table 6.5 presents the results of multivariate analysis to understand the determinant factors of each of banking supervision regulation components. Variable banking supervision regulation are composed from three components, which are capital regulation, banking supervision, and private monitoring regulation. I expect that the three components of BSR will have similar determinant factors with the aggregate BSR, because the banking supervision regulation is measured into the adoption of three regulations, namely: capital regulation, banking supervision, and private monitoring. I apply the same steps as it was applied to test the determinant factors of aggregate banking supervision regulation.

Based on Table 6.5, the results of the robust random effect model (Hausman test prob>chi2 = 0.5938) on determinant factors of capital regulation adoption shows that financial crisis experience has positive coefficient and statistically significant at 90% level. It means that when a country has financial crisis experience, its capital regulation score increases 0.72. The result is nearly similar to the relationship between financial crisis experience and aggregate BSR.

While the results of the robust random effect model for determinant factors of banking supervision development (Hausman test prob>chi2 = 0.6318) tells that financial crisis experience, and corruption control have positive influence and statistically significant at 95% level. The result shows the similarity with the relationship between these factors, financial crisis

experiences and corruption control, and aggregate BSR. If a country has a financial crisis experience and is less corrupt, its banking supervision score will increase 1.15 point and 0.33 point respectively. Another determinant factors, such as financial assistance has a negative statistically significant coefficient, at 99%. This result also consistent with the relationship between financial assistance and aggregate BSR. When a country has financial assistance, surprisingly, the banking supervision score will decrease 0.71 point. Usually, the financial assistance will require the receiver to implement stronger banking supervision as a part of lending agreements.

Table 6.5 also presents the results for determinant factors of private monitoring regulation. Different than the two former components of banking supervision, the Hausman test suggested to use the robust fixed effect model. I apply the same steps as I did on the other BSR components, including doing regression without robust, testing the Breusch and Pagan Lagrangian multiplier effect, running the Hausman test, testing for Heteroskedasticity, and running regression with robust standard errors. BLM test suggests the robust random effect model than robust OLS model (Prob > chibar2 = 0.00), but the Hausman test preferred the fixed effect model (Prob>chi2 = 0.0018). However, to compare the results consistently with other BSR components, I use the robust random effect model to understand the determinant factors of private monitoring regulation. The robust random effect model presents that trade openness and partly authoritarian/democracy are statistically significant at 95% level. The trade openness has a positive influence on private monitoring regulation, whereas partly authoritarian/democracy variable has a negative influence on private monitoring regulation. It means that one percent increase in a country's trade openness, its private monitoring score will increase by 0.38 point.

Table 6.5

Model 1: Regression Results for Banking Supervision Regulation Components

| Variable | Capital Regulation | | Supervision | | Private Monitoring | |
|---|---|---|---|---|---|---|
| | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE |
| Financial Crisis Experience | 0.72 | .43* | 1.15 | .54** | 0.44 | 0.29 |
| Trade Openness | 0.25 | 0.23 | 0.12 | 0.29 | 0.38 | .16** |
| Assistance | -0.22 | 0.28 | -0.71 | .26*** | -0.07 | 0.17 |
| Partly Autho/Democratic | 0.25 | 0.5 | 0.55 | 0.61 | -0.92 | .36** |
| Fully Democracy | 0.54 | 0.4 | 0.73 | 0.57 | -0.24 | 0.38 |
| Corruption | -0.05 | 0.14 | 0.33 | .15** | 0.12 | 0.11 |
| Government Expenditure | -0.04 | 0.03 | -0.07 | .035** | 0.04 | .022** |
| Sub Sahara Region | -0.20 | 0.69 | 1.63 | .87* | 0.54 | 0.53 |
| Asia Pacific (exc Australia New Zealand) Region | -0.67 | 0.59 | 0.76 | 0.79 | 0.81 | 0.5 |
| MENA plus Central Asia Region | 0.28 | 0.63 | 1.53 | 0.97 | 0.38 | 0.56 |
| Latin America Region | -0.28 | 0.65 | 0.83 | 0.79 | 0.00 | 0.53 |
| Eastern Europe Region | -0.13 | 0.51 | 1.51 | .63** | -0.78 | 0.45 |
| Low Income Countries | -0.10 | 0.5 | -0.26 | 0.47 | -0.59 | 0.36 |
| Middle Income Countries | -0.30 | 0.42 | 0.12 | 0.41 | -0.27 | 0.25 |
| Constant | 6.27 | .94*** | 8.52 | 1.18*** | 6.74 | .81*** |
| R2 | | | | | | |
| Observations | 325 | | 346 | | 309 | |

Notes: *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels respectively (one-tailed test)

And when a country is partly authoritarian/democracy, its private monitoring score decrease almost one point (0.92).

The abovementioned results present that the determinant factors of aggregate BSR and its three components are inconsistent. Financial crisis experience, trade openness, financial assistance, fully democracy and corruption are the main factors that influence a country to adopt BSR. However, financial crisis experience is a main determinant factor of capital regulation and banking supervision. The financial assistance and corruption are the main factors in adopting banking supervision. Whereas the determinant factors of private monitoring regulation are trade openness and partly authoritarian/democracy. These inconsistent results implied that each of BSR's components may have other determinant factors, which are different one and another.

**Sensitivity Analysis 1**

To see the effect of the aftermath of the global financial crisis, I repeat the similar steps as I did to produce the abovementioned results. I use the aftercrisis as a covariant, to understand the influence of global financial crisis on the BSR adoption. The Hausman test suggested to use the random effect model (Table 6.6 shows the Hausman result), except for the private monitoring. To be comparable, I use the random effect model for the determinant factors of private monitoring. Table 6.6 presents that afterward the global financial crisis has a positive relationship with aggregate BSR at 99%. It means that the aftermath global financial crisis influences a country's decision to adopt the BSR and increases the BSR score by 0.58 point. Besides that, trade openness, fully democracy, and corruption also have significantly positive associations with the adoption of BSR at 95%, 99%, and 90% respectively. It means that if a country has international trade, fully democracy, and less corrupt, then its banking supervision

regulation score will increase by 0.36, 0.63 and 0.21, respectively, whereas the financial assistance has a significantly negative association with BSR at 99%. Similar to the abovementioned, if a country has financial assistance from an international donor, its BSR score will decrease 0.61 point.

Table 6.6 also presents the determinant factors of BSR. The aftermath of a global financial crisis only has a significantly positive relationship with capital regulation at 99%, insignificant positive association with private monitoring and insignificant negative relationship with banking supervision. It is surprising that global financial crisis will decrease the banking supervision score, although it is not significant.

Table 6.6 also shows that financial crisis experiences and corruption have a significantly positive association with banking supervision at 95%. It explains that if a country has experience in managing crisis and less corrupt, the banking supervision score will increase by 1.27 and 0.33 point, respectively.

Whereas trade openness has a significantly positive relationship with private monitoring. If a country increases its international trade, the private monitoring score will increase by 0.37. Financial assistance has a significantly negative association with banking supervision. A country, which receives more financial assistance from an international donor, will have lower banking supervision score. Finally, being a partly democracy also has a significantly negative relationship with private monitoring.

Table 6.6

Model 1: Regression Results for Banking Supervision Regulation (the Influence of Global Financial Crisis)

| | Aggregate BSR | | Capital | | Supervision | | Private Monitoring | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | **Coeff** | **Robust SE** | **Coeff** | **Robust SE** | **Coeff** | **Robust SE** | **Coeff** | **Robust SE** |
| Financial Crisis Experience | 0.42 | 0.31 | -0.30 | 0.4 | 1.27 | 0.57** | 0.31 | 0.32 |
| Trade Openness | 0.36 | 0.16** | 0.16 | 0.26 | 0.13 | 0.28 | 0.37 | 0.16** |
| Financial Assistance | -0.61 | 0.22*** | -0.16 | 0.27 | -0.72 | 0.26*** | -0.06 | 0.17 |
| Partly Autho/Democratic | 0.09 | 0.34 | -0.20 | 0.45 | 0.61 | 0.61 | -0.99 | 0.36*** |
| Fully Democracy | 0.63 | 0.37* | 0.22 | 0.37 | 0.77 | 0.57 | -0.28 | 0.39 |
| Corruption | 0.21 | 0.12* | -0.03 | 0.13 | 0.33 | 0.15** | 0.12 | 0.11 |
| Government Expenditure | -0.02 | 0.03 | -0.04 | 0 .03 | -0.07 | 0.04** | 0.05 | 0.02** |
| Sub Sahara Region | -0.05 | 0.49 | -0.39 | 0.68 | 1.66 | 0.87* | 0.52 | 0.54 |
| Asia Pacific (exc Australia New Zealand) Region | -0.01 | 0.47 | -0.54 | 0.59 | 0.76 | 0.80 | 0.82 | 0.51 |
| MENA plus Central Asia Region | 0.62 | 0.45 | 0.37 | 0.65 | 1.53 | 0.98 | 0.39 | 0.57 |
| Latin America Region | -0.27 | 0.47 | -0.23 | 0.67 | 0.84 | 0.80 | 0.00 | 0.54 |
| Eastern Europe Region | 0.02 | 0.36 | 0.03 | 0.51 | 1.49 | 0.64** | -0.77 | 0.45* |
| Low Income Countries | 0.24 | 0.34 | 0.78 | 0.49 | -0.36 | 0.49 | -0.47 | 0.39 |
| Middle Income Countries | 0.25 | 0.3 | 0.18 | 0.41 | 0.06 | 0.41 | -0.20 | 0.26 |
| After Global Crisis | 0.58 | 0.19*** | 1.63 | 0.27*** | -0.18 | 0.25 | 0.19 | 0.20 |
| Constant | 6.50 | 0.81*** | 6.57 | 0.93*** | 8.46 | 1.18*** | 6.78 | 0.81*** |
| Hausman Test | Prob>chi2 = 0.3626 | | Prob>chi2 = 0.2143 | | Prob>chi2 = 0.6324 | | Prob>chi2 = 0.0049 | |
| Observations | 345 | | 325 | | 346 | | 309 | |

Notes: *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels respectively (one-tailed test)

To understand the determinant factors of Banking Supervision Regulation thoroughly, Table 6.7 presents the comparison of before and after global financial crisis. The difference between this table and the previous Table 6.3 is that the previous table uses aftercrisis variable as covariant to understand the influence of global financial crisis on the adoption of BSR, while

Table 6.7 compares the determinant factors of BSR and its components before and after global financial crisis. I did the similar steps as the abovementioned regression results. The Hausman test suggested to use the random effect model to understand the determinant factors of aggregate BSR and banking supervision (the result is shown in the Table 6.7) before the global crisis, but the Hausman suggested the fixed effect model for the determinant factors of capital regulation and private monitoring. To be comparable, I used the robust random effect model for the determinant factors of capital regulation and private monitoring before the global financial crisis. Whereas the determinant factors of aggregate BSR and its components after the global crisis, I use the robust OLS, because the data is only for one year (2011).

Table 6.7 also presents that trade openness, and corruption control have a significantly positive association with the aggregate BSR at 95% and 90%. Trade openness also has a significantly positive association with the private monitoring at 99%. While the financial assistance has a significantly negative association with aggregate BSR and banking supervision at 95%. All these associations happen before the global financial crisis. The partly democracy/authoritarian has a significantly negative association with capital regulation after the global financial crisis, while the similar significantly negative association between partly democracy/autocracy and private monitoring appears before the global financial crisis at 95%. The association shows that if a country is partly democratic/autocratic, the private monitoring score will decrease by 1.15 before the global financial crisis. The negative association between partly democratic/Autocracy and capital regulation describes that a country will have lower capital regulation score after the global economic shock, if a country is partly democratic/autocracy.

Table 6.7

Model 1: Regression Results for Banking Supervision Regulation: Before and After Global Financial Crisis

| Variable | Aggregate BSR | | | | Capital Regulation | | | | Banking Supervision | | | | Private Monitoring | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Crisis | | After Crisis | | Before Crisis | | After Crisis | | Before Crisis | | After Crisis | | Before Crisis | | After Crisis | |
| | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE |
| Financial Crisis Experience | 0.47 | 0.38 | Omitted | | 0.40 | 0.60 | Omitted | | 0.71 | 0.69 | Omitted | | 0.07 | 0.36 | Omitted | |
| Trade Openness | 0.44 | 0.17** | 0.22 | 0.38 | 0.20 | 0.33 | 0.32 | 0.03 | 0.05 | 0.29 | 0.40 | 0.59 | 0.47 | 0.18*** | -0.14 | 0.33 |
| Financial Assistance | -0.56 | 0.27** | -0.63 | 0.4 | -0.02 | 0.29 | -0.44 | 0.49 | -0.62 | 0.31** | -0.92 | 0.70 | 0.09 | 0.20 | -0.16 | 0.49 |
| Partly Autho/Democratic | 0.00 | 0.43 | -0.21 | 1.25 | -0.39 | 0.41 | -2.01 | 0.81** | 0.76 | 0.69 | -0.60 | 0.93 | -1.15 | 0.46** | -0.69 | 0.55 |
| Fully Democracy | 0.50 | 0.46 | 0.57 | 1.24 | -0.01 | 0.36 | -0.97 | 0.69 | 0.62 | 0.64 | -0.32 | 0.95 | -0.38 | 0.47 | -0.34 | 0.57 |
| Corruption | 0.20 | 0.12* | 0.16 | 0.26 | -0.05 | 0.14 | -0.51 | 0.32 | 0.34 | 0.16** | 0.64 | 0.47 | 0.04 | 0.12 | 0.25 | 0.24 |
| Government Expenditure | -0.02 | 0.03 | -0.02 | 0.06 | -0.03 | 0.03 | -0.08 | 0.05 | -0.05 | 0.04 | -0.10 | 0.08 | 0.06 | 0.03** | 0.03 | 0.04 |
| Sub Sahara Region | 0.29 | 0.56 | -1.87 | 1.05* | -0.62 | 0.88 | -2.23 | 0.82*** | 1.89 | 0.96** | 0.53 | 1.70 | 0.36 | 0.61 | 0.45 | 0.86 |
| Asia Pacific (exc Australia New Zealand) Region | 0.14 | 0.55 | -0.69 | 1.06 | -1.23 | 0.79 | -1.18 | 0.94 | 1.19 | 0.90 | -0.11 | 1.74 | 0.88 | 0.58 | 0.67 | 0.86 |
| MENA plus Central Asia Region | 0.85 | 0.57 | -0.27 | 0.77 | -0.25 | 0.78 | 0.40 | 0.79 | 1.71 | 1.08 | 0.53 | 1.44 | 0.54 | 0.62 | -0.24 | 0.71 |
| Latin America Region | -0.03 | 0.56 | -1.23 | 0.76 | -0.54 | 0.85 | -1.74 | 0.79** | 0.91 | 0.91 | 0.77 | 1.38 | 0.29 | 0.58 | -0.52 | 0.76 |
| Eastern Europe Region | 0.17 | 0.45 | -0.30 | 0.58 | -0.26 | 0.72 | -0.91 | 0.85 | 1.60 | 0.74** | 1.54 | 1.32 | -0.77 | 0.52 | -0.57 | 0.72 |
| Low Income Countries | -0.14 | 0.37 | 2.22 | 1.24* | 0.26 | 0.60 | 1.86 | 0.83** | -0.34 | 0.53 | 1.61 | 1.55 | -0.28 | 0.42 | -0.25 | 0.68 |
| Middle Income Countries | 0.00 | 0.34 | 1.13 | 0.68* | -0.20 | 0.49 | 0.83 | 0.57 | 0.54 | 0.45 | 0.35 | 1.02 | -0.24 | 0.29 | -0.28 | 0.40 |
| Constant | 6.45 | 0.93*** | 7.98 | 1.79*** | 6.67 | 0.99*** | 11.58 | 1.61*** | 8.30 | 1.29*** | 10.08 | 2.67*** | 6.88*** | 0.86*** | 7.82 | 1.62*** |
| Hausman Test | Prob>chi2 = 0.0719 | | | | Prob>chi2 = 0.0419 | | | | Prob>chi2 = 0.5833 | | | | Prob>chi2 = 0.000 | | | |
| Observations | 265 | | 80 | | 244 | | 81 | | 266 | | 80 | | 238 | | 71 | |

Notes: *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels respectively (one-tailed test)

To understand the determinant factors of banking supervision regulation deeply, Table 6.8 presents the determinant factors of BSR and its aggregate in developed and developing countries. I repeat the similar steps as presented above to get the results presented in Table 6.8. The Hausman test result is presented in the Table 6.8. Because the Hausman test suggested the fixed effect model, I use the fixed effect model to analyze the determinant factors of aggregate BSR in developing countries. To maintain the consistency and be comparable, I apply the fixed effect model to analyze the determinant factors of aggregate BSR and its components in developing and developed countries. In developing countries, financial crisis experience has significantly positive association with aggregate BSR, capital regulation, and banking supervision at 99%. Surprisingly, the financial crisis experience has a significantly negative relationship with private monitoring at 99% in the developing countries. It means that a country in a developing region, which has financial crisis experience, its private monitoring score decrease by 1.22. Trade openness also has a significantly positive association with aggregate BSR and private monitoring at 99% and 95% respectively in developing countries. It means that if developing countries have more international trade transactions, the BSR and private monitoring score will increase. Financial assistance has significantly negative relationship with the aggregate BSR and banking supervision in developing countries at 99% and 90%. Surprisingly, the financial assistance has a significantly negative association with banking supervision in developed countries at 95%, the magnitude also relatively bigger than the magnitude of other variables. It means that if developed countries receive financial assistance, the banking supervision score drop by 3.26.

Table 6.8

Model 1: Regression Results for Banking Supervision Regulation: Developing vs Developed Countries

| | Aggregate BSR | | | | Capital Regulation | | | | Banking Supervision | | | | Private Monitoring | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Developing | | Developed | | Developing | | Developed | | Developing | | Developed | | Developing | | Developed | |
| | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE |
| Financial Crisis Experience | 2.81 | 0.55*** | 0.83 | 0.51 | 4.01 | 0.29*** | 0.15 | 0.70 | 2.84 | 0.43*** | 2.00 | 0.85** | -1.22 | 0.29*** | 0.00 | 0.49 |
| Trade Openness | 1.63 | 0.59*** | -0.73 | 1.65 | 0.61 | 0.69 | 1.90 | 2.77 | 0.00 | 0.44 | -1.13 | 2.70 | 2.16 | 0.98** | 2.91 | 1.69* |
| Financial Assistance | -0.85 | 0.29*** | -0.63 | 0.74 | -0.38 | 0.33 | 0.27 | 1.23 | -0.79 | 0.29* | -3.26 | 1.33** | -0.20 | 0.18 | -0.40 | 0.48 |
| Partly Autho/Democratic | -0.26 | 0.31 | 0 | (omitted) | 0.74 | 0.65 | 0 | (omitted) | 0.30 | 0.79 | 0 | (omitted) | -1.07 | 0.29*** | 0 | (omitted) |
| Fully Democracy | 0.09 | 0.46 | 0 | (omitted) | 0.56 | 0.59 | 0 | (omitted) | 1.01 | 0.73 | 0 | (omitted) | -0.49 | 0.44 | 0 | (omitted) |
| Corruption | 0.32 | 0.21 | 0.24 | 0.28 | -0.18 | 0.22 | 0.14 | 0.37 | 0.41 | 0.26 | 0.09 | 0.28 | 0.07 | 0.14 | 0.18 | 0.36 |
| Government Expenditure | -0.10 | 0.06 | 0.11 | 0.06* | -0.04 | 0.05 | -0.04 | 0.11 | 0.41 | 0.05 | -0.03 | 0.07 | 0.10 | 0.04** | 0.17 | 0.06** |
| Sub Sahara Region | 0 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) |
| Asia Pacific (exc Australia New Zealand) Region | 0 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) |
| MENA plus Central Asia Region | 0 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) |
| Latin America Region | 0 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) |
| Eastern Europe Region | 0 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) |
| Constant | 4.87 | 1.05*** | 5.55 | 0.032** | 2.5 | 1.07** | 4.61 | 3.57 | 7.66 | 1.19*** | 10.82 | 3.25*** | 6.42 | 1.08*** | 1.70 | 2.34 |
| Hausman Test | Prob>chi2 = 0.0197 | | Prob>chi2 = 0.0828 | | Prob>chi2 = 0.4868 | | Prob>chi2 = 0.7745 | | Prob>chi2 = 0.5389 | | Prob>chi2 = 0.1307 | | Prob>chi2 = 0.0096 | | Prob>chi2 = 0.0395 | |
| R2 | 0.13 | | 0.15 | | 0.06 | | 0.04 | | 0.07 | | 0.22 | | 0.15 | | 0.24 | |
| Observations | 248 | | 98 | | 228 | | 98 | | 249 | | 98 | | 216 | | 94 | |

Notes: *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels respectively (one-tailed test)

**Multivariate Analysis: The Second Model**

The second part of this chapter is to analyze the influence of banking supervision regulation on economic growth. The assumption is that banking supervision regulation will act as an accelerator for public policies that help spurring economic growth. In this study I test the influence of the aggregate BSR first, then its three components. To test this assumption, I conducted the OLS, fixed effect and random effect regression analysis with economic growth as my dependent variable and aggregate banking supervision regulation and its components as the independent variable. I also run the Lagrange multiplier, Hausman test, heteroskedasticity test, autocorrelation test and tested for robustness to make sure of the consistency and robustness of the model. The following is the basic equation for the second model:

$$EconGrowth_{it} = \alpha + \beta_1 BSR_{it} + \beta_2 others_{it} + \mu_{it}$$

Where: BSR is the aggregate banking supervision regulation, and others are for control variables, $\alpha$ is a parameter, $\beta_1$, $\beta_2$, are estimated parameters, and $\mu$ is a randomly distributed error term. The dependent variable is economic growth. The independent variables are the aggregate BSR score. And the control variables are capital formation, education spending, financial crisis experience, trade openness, financial assistance, democracy, corruption control, government spending, region, and level of income. After analyzing the aggregate BSR, then I run multivariate analysis to see the influence of each components of BSR. The following equation describes the influence of the BSR components:

$$EconGrowth_{it} = \alpha + \beta_1 CAPREG_{it} + \beta_2 others_{it} + \mu_{it}$$

$$EconGrowth_{it} = \alpha + \beta_1 SUPER_{it} + \beta_2 others_{it} + \mu_{it}$$

$$EconGrowth_{it} = \alpha + \beta_1 PRIVMON_{it} + \beta_2 others_{it} + \mu_{it}$$

Where: CAPREG is capital regulation, SUPER is the banking supervision, PRIVMON is the private monitoring, others are control variables, $\alpha$ is a parameter, $\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$, are estimated parameters, and $\mu$ is a randomly distributed error term. The dependent variable is economic growth. The independent variables are three components of aggregate banking supervision regulation: capital regulation, banking supervision and private monitoring. And the control variables are capital formation, education spending, and all independent and control variables used in the first model.

I apply the similar steps with the one that I did to Model 1: the determinant factors of aggregate BSR and its components. Table 6.9 presents all the results of the influence of the aggregate BSR and its components on economic growth. I run OLS, fixed effect and random effect model with robust standard errors to find out the best model to analyze the influence of BSR on economic growth. I also did the VIF test, Lagrange Multiplier test, and Hausman test to help me decide the best model used.

Based on the Hausman test (prob>chi2=0.0834) for the second model: BSR's components on economic growth, I use the random effect model. Based on the result for robust random effect model on economic growth in Table 6.9, the banking supervision is negative and statistically significant on economic growth at 99%. It means that if a country implements a tighter banking supervision, surprisingly, the economic growth drops by 0.22. For the influence of aggregate BSR on economic growth, although the Hausman test suggested the fixed effect model, to be comparable with the BSR components the random effect model analysis is applied to analyze the influence of aggregate BSR on economic growth.

Table 6.9

Model 2: Regression Results for Economic Growth

| Variable | BSR Components | | Aggregate BSR | |
|---|---|---|---|---|
| | Coeff | Robust SE | Coeff | Robust SE |
| BSR | | | 0.02 | 0.18 |
| Capital Reg | -0.10 | 0.09 | | |
| Supervision | -0.22 | 0.08*** | | |
| Private Monitoring | 0.21 | 0.15 | | |
| Capital Formation | 0.19 | 0.04*** | 0.14 | 0.05*** |
| Education Spending | 0.10 | 0.21 | 0.11 | 0.28 |
| Financial Crisis Experience | 0.46 | 0.60 | 0.49 | 0.64 |
| Trade Openness | 0.15 | 0.41 | 0.44 | 0.39 |
| Financial Assistance | -0.57 | 0.50 | -0.95 | 0.62 |
| Partly Autho/Democratic | 1.79 | 1.03* | -0.51 | 1.50 |
| Fully Democracy | 0.63 | 1.26 | -1.26 | 1.54 |
| Corruption | -0.21 | 0.24 | -0.16 | 0.26 |
| Government Expenditure | -0.25 | 0.08*** | -0.25 | 0.09*** |
| Sub Sahara Region | 0.87 | 1.29 | -0.67 | 1.38 |
| Asia Pacific (exc Australia New Zealand) Region | -0.25 | 0.91 | -0.54 | 1.01 |
| MENA plus Central Asia Region | 0.56 | 0.99 | 1.09 | 1.26 |
| Latin America Region | 0.08 | 0.77 | -0.74 | 0.99 |
| Eastern Europe Region | 1.31 | 0.76* | 0.81 | 0.80 |
| Low Income Countries | 0.47 | 1.08 | 1.00 | 1.26 |
| Middle Income Countries | 0.46 | 0.70 | 0.56 | 0.76 |
| Constant | 3.33 | 2.63 | 4.73 | 4.30 |
| Hausman Test | Prob>chi2 = 0.0834 | | Prob>chi2 = 0.0147 | |
| R2 | | | | |
| Observations | 218 | | 248 | |

Notes: *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels respectively (one-tailed test)

**Sensitivity Analysis 2**

To see the effect of the aftermath of the global financial crisis, I repeat the similar steps as I did to produce the abovementioned results. The Hausman test suggested to use the random effect model (Table 6.10 shows the Hausman result). I use the random effect model for the influence of aggregate BSR and its components with the aftercrisis as the covariant variable. Table 6.10 presents the influence of aftercrisis variable on economic growth. The results show that, banking supervision is the only component that has an association with the economic growth. The banking supervision relationship with economic growth is negative and significant at 99%. It means that if a country has tighter banking supervision, the economic growth reduces by 0.22%.

To understand the influence of BSR on economic growth before and after the global financial crisis, Table 6.11 presents the comparison of before and after global financial crisis. I did the similar steps as the abovementioned regression results. The Hausman test suggested that I can use the fixed effect model to understand the influence of aggregate BSR (prob>chi2 = 0.000) and BSR components (prob>chi2=0.0095) on economic growth before the global crisis. Whereas the influence of aggregate BSR and its components on economic growth after the global crisis, I use the robust OLS, because the data is only for one year (2011). The World Bank survey on BSR was held in 1999, 2003, 2007, and 2011. Because I want to understand the influence of BSR on economic growth before versus after global financial crisis 2008, I have three years (1999, 2003, and 2007) before crisis and only one year after crisis (2011).

Table 6.10

Model 2: Regression Results for Economic Growth After Crisis

| Variable | BSR Components | | Aggregate BSR | |
|---|---|---|---|---|
| | Coeff | Robust SE | Coeff | Robust SE |
| BSR | | | 0.29 | 0.18 |
| Capital Reg | -0.08 | 0.09 | | |
| Supervision | -0.22 | 0.08*** | | |
| Private Monitoring | 0.21 | 0.15 | | |
| Capital Formation | 0.19 | 0.04*** | 0.04 | 0.09 |
| Education Spending | 0.12 | 0.21 | 0.27 | 0.45 |
| Financial Crisis Experience | 0.63 | 0.65 | 1.33 | 1.02 |
| Trade Openness | 0.14 | 0.42 | 0.61 | 2.28 |
| Financial Assistance | -0.58 | 0.50 | -0.82 | 0.73 |
| Partly Autho/Democratic | 1.82 | 1.04* | -1.52 | 2.27 |
| Fully Democracy | 0.65 | 1.26 | -3.14 | 2.46 |
| Corruption | -0.22 | 0.24 | -0.52 | 0.33 |
| Government Expenditure | -0.26 | 0.076*** | -0.69 | 0.23*** |
| Sub Sahara Region | 0.87 | 1.31 | 0.00 | (omitted) |
| Asia Pacific (exc Australia New Zealand) Region | -0.32 | 0.94 | 0.00 | (omitted) |
| MENA plus Central Asia Region | 0.49 | 1.01 | 0.00 | (omitted) |
| Latin America Region | 0.04 | 0.78 | 0.00 | (omitted) |
| Eastern Europe Region | 1.28 | 0.78* | 0.00 | (omitted) |
| Low Income Countries | 0.31 | 1.09 | -1.33 | 2.11 |
| Middle Income Countries | 0.37 | 0.76 | 0.12 | 1.45 |
| After Crisis | -0.33 | 0.43 | -0.86 | 0.70 |
| Constant | 3.29 | 2.63 | 13.81 | 5.72** |
| Hausman Test | Prob>chi2 = 0.0815 | | Prob>chi2 = 0.039 | |
| R2 | 0.24 | | 0.21 | |
| Observations | 218 | | 248 | |

Notes: *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels respectively (one-tailed test)

The aggregate BSR has a positive and significant association with the economic growth at 95% before the global crisis. It means that if a country implements tighter banking supervision and regulation before the global crisis, the economic growth will increase by 0.57. The aggregate BSR also has positive but insignificant relationship with economic growth after global economic recession. It implies that, one unit increase on banking supervision regulation aftermath the global crisis, the economic growth will increase by 0.07.

Table 6.11 also shows the influence of BSR components on economic growth before and after global crisis. The results show that there is different influence of BSR components on economic growth before and after the onset of global crisis. The capital regulation has negative insignificant relationship with economic growth before the crisis, but it has positive insignificant association with economic growth aftermath global financial crisis. The influence of private monitoring on economic growth before and after global crisis also shows the similar pattern as it is in the capital regulation, although the magnitude is different, whereas the influence of banking supervision on economic growth shows the positive insignificant relationship before the global recession and presents the negative insignificant association aftermath the global economic crisis.

Table 6.11

Model 2: Regression Results of Economic Growth: Before vs After Crisis

| | Aggregate BSR | | | | BSR Components | | | |
|---|---|---|---|---|---|---|---|---|
| Variable | Before Crisis | | After Crisis | | Before Crisis | | After Crisis | |
| | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE | Coeff | Robust SE |
| BSR | 0.57 | 0.23** | 0.07 | 0.30 | | | | |
| Capital Reg | | | | | -0.10 | 0.24 | 0.12 | 0.25 |
| Supervision | | | | | 0.06 | 0.16 | -0.23 | 0.17 |
| Private Monitoring | | | | | -0.10 | 0.24 | 0.38 | 0.27 |
| Capital Formation | -0.05 | 0.1 | 0.19 | 0.09** | 0.09 | 0.08 | 0.25 | 0.10** |
| Education Spending | -0.24 | 0.34 | 0.63 | 0.55 | -0.57 | 0.33* | 0.84 | 0.44* |
| Financial Crisis Experience | 4.72 | 3.39 | 0.00 | (omitted) | 3.68 | 3.89 | 0.00 | (omitted) |
| Trade Openness | 5.97 | 3.17* | 1.31 | 0.89 | 7.71 | 3.42** | 0.18 | 0.58 |
| Financial Assistance | -0.73 | 0.85 | 0.17 | 1.03 | 0.03 | 0.94** | 0.34 | 0.95 |
| Partly Autho/Democratic | -0.14 | 1.92 | 0.00 | (omitted) | -0.12 | 1.31 | 0.00 | (omitted) |
| Fully Democracy | -1.05 | 1.87 | 0.10 | 1.96 | 0.19 | 1.43 | -0.60 | 2.43 |
| Corruption | -0.86 | 0.35** | 0.22 | 0.51 | -0.94 | 0.34*** | 0.31 | 0.56 |
| Government Expenditure | -0.80 | 0.22*** | -0.19 | 0.19 | -0.48 | 0.14*** | -0.22 | 0.164 |
| Sub Sahara Region | 0.00 | (omitted) | 2.28 | 2.51 | 0.00 | (omitted) | 5.08 | 3.027 |
| Asia Pacific (exc Australia New Zealand) Region | 0.00 | (omitted) | 1.06 | 1.68 | 0.00 | (omitted) | 2.47 | 1.825 |
| MENA plus Central Asia Region | 0.00 | (omitted) | 3.49 | 1.49** | 0.00 | (omitted) | 3.16 | 1.52** |
| Latin America Region | 0.00 | (omitted) | 3.07 | 1.29** | 0.00 | (omitted) | 4.59 | 1.19*** |
| Eastern Europe Region | 0.00 | (omitted) | 1.43 | 1.20 | 0.00 | (omitted) | 2.70 | 1.26** |
| Low Income Countries | -0.82 | 2.46 | 1.39 | 2.73 | 0.72 | 2.40 | -0.39 | 3.01 |
| Middle Income Countries | 1.26 | 1.93 | 0.67 | 1.25 | 2.19 | 2.03 | -0.60 | 1.07 |
| Constant | 9.13 | 5.32* | -5.16 | 4.24 | 5.39 | 4.02 | -6.83 | 4.60 |
| Hausman Test | Prob>chi2 = 0.000 | | | | Prob>chi2 = 0.0095 | | | |
| R2 | 0.39 | | 0.37 | | 0.40 | | 0.55 | |
| Observations | 187 | | 61 | | 164 | | 54 | |

Notes: *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels respectively (one-tailed test)

The next sensitivity analysis is understanding the influence of BSR on economic growth in the developing and developed countries. To understand the different behavior between developing and developed countries, I separate the analysis to understand deeply how BSR and its components influence economic growth in developing and developed countries. Table 6.12 presents the comparison. I did the similar steps as the abovementioned regression results. The Hausman test suggested to use the random effect model to understand the influence of aggregate BSR and BSR components on economic growth in developing and developed countries. The results of the Hausman test is presented in Table 6.12.

Table 6.12

Model 2: Regression Results of Economic Growth: Developing vs Developed Countries

| | Aggregate BSR | | | | BSR Components | | | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | **Developing** | | **Developed** | | **Developing** | | **Developed** | |
| | **Coeff** | **Robust SE** | **Coeff** | **Robust SE** | **Coeff** | **Robust SE** | **Coeff** | **Robust SE** |
| BSR | 0.07 | 0.22 | -0.21 | 0.18 | | | | |
| Capital Reg | | | | | -0.2 | 0.13 | 0.03 | 0.14 |
| Supervision | | | | | -0.18 | 0.10 | -0.18 | 0.13 |
| Private Monitoring | | | | | 0.17 | 0.21 | 0.01 | 0.22 |
| Capital Formation | 0.13 | 0.06** | 0.21 | 0.08*** | 0.20 | 0.04*** | 0.26 | 0.07*** |
| Education Spending | 0.19 | 0.35 | 0.21 | 0.33*** | 0.29 | 0.27 | -0.27 | 0.39 |
| Financial Crisis Experience | 4.49 | 2.71* | -0.14 | 0.30 | 2.92 | 3.19 | 0.00 | 0.35 |
| Trade Openness | -0.23 | 0.69 | 1.64 | 0.64*** | -1.11 | 0.48** | 1.52 | 0.78* |
| Financial Assistance | -0.88 | 0.69 | -1.00 | 1.51 | -0.46 | 0.54 | -0.89 | 1.18 |
| Partly Autho/Democratic | -0.75 | 1.46 | 4.45 | 4.94 | 1.66 | 1.01 | 4.99 | 4.95 |
| Fully Democracy | -1.51 | 1.59 | 4.66 | 4.61 | 0.79 | 1.36 | 5.02 | 4.10 |
| Corruption | -0.19 | 0.33 | -0.33 | 0.37 | -0.40 | 0.31 | -0.41 | 0.36 |
| Government Expenditure | -0.26 | 0.10** | -0.18 | 0.16 | -0.26 | 0.09*** | -0.25 | 0.16 |
| Sub Sahara Region | -1.58 | 1.14 | 0.00 | (omitted) | -0.62 | 0.85 | 0.00 | (omitted) |
| Asia Pacific (exc Australia New Zealand) Region | -0.95 | 1.04 | -2.43 | 0.79*** | -1.15 | 0.99 | -2.78 | 1.09** |
| Central Asia | 0.28 | 1.69 | 2.32 | 0.75*** | -0.83 | 1.38 | 2.30 | 0.89* |
| Latin America Region | -1.97 | 0.83** | 1.96 | 1.26 | -1.62 | 0.81** | 1.6685814 | 1.485108 |
| Eastern Europe Region | 0.00 | (omitted) | -0.13 | 0.64 | 0.00 | (omitted) | -0.31 | 0.8910475 |
| Constant | 9.13 | 4.23 | 0.00 | (omitted) | 3.89 | 3.85 | 0.00 | (omitted) |
| Hausman Test | Prob>chi2 = 0.0680 | | Prob>chi2 = 0.0765 | | Prob>chi2 = 0.1151 | | Prob>chi2 = 0.0651 | |
| R2 | | | | | | | | |
| Observations | 167 | | 82 | | 140 | | 79 | |

Notes: *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels respectively (one-tailed test)

Finally, to understand the influence of aggregate BSR and its components on economic growth, Table 6.13 shows the regression results of economic growth in democratic vs non-democratic countries. It is known that democracy has an impact on economic growth, therefore I want to understand thoroughly how BSR and its components influence economic growth in two different settings: non-democratic vs democratic countries. The similar steps as in the previous table are applied to get the regression results. Based on the Hausman test (the results are presented in the table), the preferable model is the fixed effect model, except for the influence of BSR components on economic growth in non-democratic countries. However, to maintain consistency and comparability, I apply the fixed effect model for analyzing the influence of BSR components on economic growth in non-democratic countries.

Table 6.10 shows that the aggregate BSR has a positive and significant association with economic growth in non-democracy countries at 90%. It means that in the non-fully democratic countries, the tighter the banking supervision regulation is associated with an increase in economic growth. The magnitude tells that adopting stronger BSR will increase the economic growth by 0.64.

Table 6.13

Model 2: Regression Results of Economic Growth: Non-Democracy vs Democracy

| | Aggregate BSR | | | | BSR Components | | | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | **Non Democracy** | | **Democracy** | | **Non Democracy** | | **Democracy** | |
| | **Coeff** | **Robust SE** | **Coeff** | **Robust SE** | **Coeff** | **Robust SE** | **Coeff** | **Robust SE** |
| BSR | 0.64 | 0.34* | 0.22 | 0.18 | | | | |
| Capital Reg | | | | | -0.48 | 0.37 | -0.11 | 0.15 |
| Supervision | | | | | -0.29 | 0.26 | 0.05 | 0.14 |
| Private Monitoring | | | | | -0.32 | 0.32 | -0.21 | 0.17 |
| Capital Formation | 0.02 | 0.10 | 0.19 | 0.06*** | 0.42 | 0.11*** | 0.17 | 0.06*** |
| Education Spending | -2.77 | 0.89*** | 0.27 | 0.35 | 1.08 | 0.80 | 0.10 | 0.35 |
| Financial Crisis Experience | -5.61 | 2.33** | 0.56 | 0.75 | -0.39 | 2.44 | 0.41 | 0.76 |
| Trade Openness | 0.97 | 1.80 | 1.73 | 2.25 | 1.83 | 1.64 | 3.16 | 2.59 |
| Financial Assistance | -5.37 | 1.79*** | -0.10 | 0.73 | 1.17 | 1.74 | -0.22 | 0.85 |
| Corruption | -0.01 | 1.03 | -0.71 | 0.30** | -0.10 | 0.85 | -0.75 | 0.35** |
| Government Expenditure | -0.32 | 0.59 | -0.62 | 0.18*** | -1.35 | 0.62** | -0.46 | 0.17*** |
| Sub Sahara Region | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) |
| Asia Pacific (exc Australia New Zealand) Region | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) |
| MENA plus Central Asia Region | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) |
| Latin America Region | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) |
| Eastern Europe Region | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) | 0.00 | (omitted) |
| Low Income Countries | -1.69 | 1.94 | 1.21 | 1.47 | 4.32 | 1.23*** | 1.24 | 1.74 |
| Middle Income Countries | 0.00 | (omitted) | 0.70 | 1.18 | 0.00 | (omitted) | 1.14 | 1.37 |
| Constant | 22.65 | 8.47** | 6.24 | 3.19* | 15.30 | 10.77 | 7.71 | 4.08* |
| Hausman Test | Prob>chi2 = 0.0001 | | Prob>chi2 = 0.0220 | | Prob>chi2 = 0.4681 | | Prob>chi2 = 0.0439 | |
| R2 | 0.57 | | 0.30 | | 0.73 | | 0.24 | |
| Observations | 66 | | 192 | | 54 | | 174 | |

Notes: *, **, *** indicate statistical significance at the 0.01, 0.05, and 0.01 levels respectively (one-tailed test)

## Conclusion

In this chapter, I presented the bivariate and multivariate analysis to investigate patterns and relationships of the determinant factors of banking supervision regulation and also the influence of banking supervision regulation on economic growth. The next chapter discusses the findings from the multivariate analysis.

# CHAPTER 7

# DISCUSSION

The objectives of this study are to understand the factors influencing a country in adopting banking supervision regulation and to examine the influence of banking supervision regulation, capital regulation, banking supervision, and private monitoring on spurring economic growth. I referred to a broad literature review on banking supervision regulation to construct a model that guides this study. I constructed the hypothesis and the operational variables, then I tested using models explained in Chapter 4. I showed the results of the descriptive statistics in Chapter 5, bivariate analysis and multivariate analysis in Chapters 6 and 7, respectively. I discuss the important findings of this study, in this chapter, and the relationship of the findings regarding the theory used in the literature review.

## The Findings of Banking Supervision Regulation

Based on the descriptive analysis, we can see that there has been an increase in banking supervision regulation, from 7.08 in 1999 to 8.37 in 2011. The variation is low (std. dev. = 1.82), which means that countries across the regions tend to adopt strong banking supervision regulation. There are some countries with a high BSR score over the period of observation, and other countries have a lower BSR score.

The BSR average score is slightly decreased before the global economic crisis. The macroeconomic environment was relatively good, this condition attracts international capital flow with “cheap” incentives and creates the excessive domestic credit. The availability of funds

can encourage the firms to develop more economic activities. But the moral hazard problem was following this phenomenon by reducing the banking supervision regulation to support the economic growth. The variation across time periods and regions presents that MENA and Central Asia, Western Europe, North America, Australia, and New Zealand have the biggest average of BSR score. The BSR is also varied across the income level countries, where the high-income level countries have larger BSR score than the low-and middle-income countries.

The variation of capital regulation and private monitoring regulation (std. dev. below 2) is not much before and after global crisis. However, the variation is a little bit high for the banking supervision (std. dev. above 2). The capital regulation and private monitoring score increases from the period of 1999 to 2003, slightly decreases in 2007, then rises in 2011. The banking supervision has a steady increasing trend from 1999 to 2011. The BSR components scores are varied across regions, although the score does not have a similar pattern with the variation of aggregate BSR score. The aggregate BSR tends to smooth out the pattern across the regions.

The capital regulation score in the middle-income countries (lower and upper) is relatively lower than low-income countries in the period before a global crisis. Before the global economic crisis happen, the middle-income countries tended to attract more capital inflow. Consequently, loosening the capital regulation is assumed to be an incentive to attract more investors, whereas the banking supervision score in high income countries is relatively lower than in the middle-income countries, and the private monitoring score in the high-income countries is the highest among low and middle-income countries.

The results of the random effects model on banking supervision regulation is consistent with the results suggested in previous studies, although there is a new finding which is opposite

to my hypothesis. The findings confirm the hypothesis that financial crisis experience, trade openness, corruption control and level of democratization are the main significant drivers in adopting strong banking financial regulation. Although the financial assistance is also a significant predictor in adopting strong banking supervision regulation, it has surprising result, which is a different direction than the prediction.

Results of this dissertation give more support to the argument that banking supervision regulation has increased in attention in the last two decades. The findings from this study suggest that the experience of crises, international donor assistance, trade openness, democracy, and corruption control are the main determinants of banking supervision regulation adoption.

## Influence of Financial Crisis Experience

Results from the two-way analysis present that countries without crisis experience tend to have higher scores of BSR, although the difference is only a bit. The hypothesis is that a country which has severe financial crisis experience will adopt tighter banking supervision regulation. Since not all crises are the same and lead to the same reaction, the severe financial crisis is the keyword to operationalize this variable using the systemic banking crisis database published by Laeven and Valencia (2012). Based on the random effect model, the regression results suggest that financial crisis experience is a positive and a significant predictor of adopting tighter banking supervision and regulation. The results support the hypothesis outlined in Chapter 3, and are also consistent with previous research findings which show that a previous episode of crisis is the main reason of adopting BSR. Research has shown that countries with past financial crisis accelerate banking sector reform, by strengthening supervision and regulation as one of agenda of reform in developed and developing countries (Dincer & Neyapti, 2008; Lora & Olivera,

2004). The findings of this dissertation focus on whether a country has severe financial crisis experiences or not, which is different than the previous research that includes all the crisis. The results also expanding the number of cases, since the previous researches are done in the transition and Latin America countries, while this study is done in 180 countries (developing and developed countries).

The findings suggested that the financial crisis experience is a major driver of stronger capital regulation and banking supervision. The results support the hypothesis on the influence of having severe financial crisis experiences on adopting capital regulation and banking supervision outlined in chapter 3. However, this finding is not consistent with the results of Kim, Park, Suh (2014) that suggested the years of financial crisis since 1970 has negative influence on supervision discretion. My findings may have been different with the previous research because I have different way in measuring financial crisis. I emphasize on how the influence of having severe financial crisis experience shapes the decision on adopting banking supervision, while Kim, et al., (2014) try to explain that the longer effect of financial crisis will decrease the supervisory discretion.

The severe financial crisis experience is the significant predictor of the aggregate BSR and its three components in developing countries. It is interesting to note that the financial crisis experience is the only significant predictor of banking supervision in developed countries. Findings from this analysis show that having experience of severe financial crisis provides wake-up calls for the developing countries to more actively seek a way to strengthen banking supervision regulation to monitor banking risk-taking activities. A severe financial crisis has serious and adverse impacts, especially in developing countries, which causes economic and social disruptions. Given the complexity of the banking sectors, the impact of financial crisis

experience on the adoption of banking regulation supervision may need a few years to come into effect, for example the Dodd-Frank Act is finalized in 2010, three years aftermath the global financial crisis in the US. This study cannot explain this phenomenon.

This, of course, has an implication on the sustainability of the trend of banking supervision regulation in the future. For example, financial crisis experience seems to be the main determinant in the increase of banking supervision regulation adoption. There are two main problems of relying on the financial crisis experience: first, there is no guarantee that the severe financial crisis will exist in the future. Second, there is also no guarantee that countries without financial crisis experience will not adopt stronger banking supervision regulation. A case in point is Kazakhstan, which does not have financial crisis experiences and shows gradual increase in the BSR score from 7.67 in 1999 to 8.67 in 2007.

### Influence of Trade Openness

Generally, based on the statistical descriptive, the trade openness in Asia Pacific (excluding Australia and New Zealand) has the highest mean with relatively high variation. The higher value of trade openness shows that a country has a higher exposure of international relationship, so that as hypothesized, higher trade openness influences a country to have higher aggregate BSR score. The finding confirms Alexander, Dhumale, and Eatwell's (2006) and Polilo and Guillén's (2005) research on monetary institution that find the tendency of export-oriented countries to adopt regulation to increase their legitimacy. This finding is significant in that it is the first time the variable has been tested and it shows the effect of trade openness on the banking supervision regulation reform.

However, trade openness is the only significant predictor of the private monitoring regulation. This result is consistent in the context of before global financial crisis, in the developing and developed countries. These findings support the private empowerment view that BSR should focus on enhancing the role of external parties' ability to monitor banking activity. Why the trade openness only influences the adoption of private monitoring? One possible explanation is that a country that is connected through international trade with other countries tends to adopt values, norms, or ideologies their partner countries. Tighter capital regulation and banking supervision tend to limit the private actors' activities; therefore, these regulations are less attractive for foreign investors to have international transactions with other countries. To maintain the social contract between a country and international community, the trade openness has a greater tendency to reinforce monitoring and evaluation of banks by creditors/investors and external rating agencies as the size of the trade openness increases.

It is worth noting that trade openness enables developing countries to have more stringent private monitoring obligations. Kim, Park, and Suh (2014) argue that developing countries have weak institutional structure, lack of human capital, and underdeveloped private sector to maintain the adequate standards for private monitoring. Findings from this study show that the trade openness plays as social pressure that elaborate institutional structure and high standards for private monitoring system in developing countries.

### Influence of Financial Assistance

The statistical descriptive shows that 67% of the observed countries does not have financial assistance. And, the bivariate analysis presents that countries without financial assistance have higher BSR score than countries with financial assistance. The most surprising

finding from this dissertation is that the financial assistance is significant in lowering the BSR score, which means that countries with more international donor assistances during the financial crisis, are likely to adopt lax banking supervision regulation, while I expected to find that financial assistance is a positive and significant determinant of adopting BSR. The possible reason is because those with stronger BSR do not receive financial assistance which then automatically leads to this otherwise inconsistent result. The financial assistance is a significant predictor in lowering the banking supervision by 0.71. The bigger magnitude of the impact of financial assistance on banking supervision may also explain the reason of the aggregate BSR turns out to be as not expected. Then, the robust fixed effect model also explains that financial assistance is the negative significant predictor of banking supervision in developed countries, and private monitoring before the global economic recession in 2007/2008.

The result is deviated from the suggestion of Alexander, Dhumale, and Eatwell, (2006) and Meyer et al., (1997) that the international agencies usually inquire a lending country to implement prudent banking supervision regulation as one condition to receive the aids, although they do not have any empirical results. The finding of this study provides the empirical evidence on the influence of financial assistance on the context of banking supervision regulation reform. Financial support assistance from an international donor, especially the IMF, plays a major role in the decision to adopt stronger banking supervision and regulation. However, the inverse result tells that countries without financial assistance also have an urgency to adopt BSR. The possible explanations of this phenomenon are that the proxy for financial assistance – the amount of IMF lending arrangements in a country in the year of observations – does not appropriately capture the financial assistance. Another explanation is because the lending arrangements happen with a

condition that the receiving country has severe financial crisis, so this variable may have correlation with the financial crisis experience and produce reverse causality.

### Influence of Level of Democracy

The interesting fact is that the number of countries with authoritarian regime decreases during the observation period from 1999 to 2011. Democracy is a process, and the decrease in number of countries with authoritarian does not dramatically increase the number of countries with fully democracy. But, there is an increase in the number of countries with partly democratic rule (anocracy), which is 46 out of 147 countries in 2011. The BSR score in fully democratic countries is relatively higher among the other regimes. Based on the random effect model, democracy is a significant predictor of the aggregate BSR. As expected, having democracy is a significant positive influence of adopting aggregate BSR. This means that countries with fully democracy adopt stronger aggregate BSR. The previous studies only focus on the influence of an open and competitive political system and banking regulation (Barth et al., 2006), not across the regime type. The finding in this dissertation is similar to the result suggested by the previous research, but offer a different perspective by testing the influence of democracy and anocracy on the adoption of banking supervision regulation. The level of democracy is measured using polity IV, which explains the stability of political structures and regime type. However, the level of democracy is not a significant predictor of the BSR components. If the findings apply to BSR, then the results should apply to its components. One possible explanation is because BSR has multiple dimensions, the use of an aggregate BSR captures only the composite influences of its determinants and ignores the unique characteristics of the individual components of BSR. So, this study finds that the effect of democracy to aggregate BSR is different with the influence of

its components. Another explanation is because there are no observations for the authoritarian countries in this sample. The level of democracy also is not a significant predictor for the aggregate BSR and its components either before and after global shock or in developing versus developed countries.

## Influence of Corruption Control

The statistical descriptive presents that countries in Western Europe, North America, Australia, and New Zealand region, have less corruption than other regions. The two-way graph explains the variety of the relationship between aggregate BSR and its components, and the corruption control. Findings from this study suggest that corruption control is a significant predictor of the aggregate BSR, as hypothesized, a country with less corruption has a likelihood to have strong BSR and banking supervision. This maybe because banking supervision involves banking supervisors that sometimes pursue their personal gain in supervising banking industry. Consistent with the findings of this study, previous findings have shown that countries with high corruption control (fewer effective institutions), have a negative impact on the quality of regulation (Meon & Weil, 2010; Breen & Gillanders, 2012; Walter, 2008; Pepinsky, 2009; LoGerfo & Montinola, 2001; Guriev, 2004).

Findings from this dissertation also support the idea that corruption tends to decrease the motivation of a country to adopt stronger BSR. The two possible explanations are the weak institution (corruption is high) motivates the government agency to reduce the quality of BSR to increase personal gain in the future. The second explanation would be that the weak institution makes a regulator implement lax BSR due to bribes from the regulated parties. These phenomena happen in the countries with a traditional banking system. Case in point is Indonesia, Thailand,

and South Korea, which have evidence on the bribe given by bankers to have less quality banking regulation (Walter, 2008; Pepinsky, 2009; Logerfo & Montinola, 2001).

## The Findings on the Economic Growth

The statistical descriptive shows that the economic growth is a little bit lower after the global crisis. The economic growth shows an increasing trend and reaches its peak in 2007, before the crisis, then drops after the global economic shock in 2008. The banking supervision is the only significant predictor of economic growth, but with a negative coefficient. The results of the second analysis of this study, the influence of BSR and its components does not confirm the hypothesis that the banking supervision regulation accelerates the actual growth performance. This is an interesting finding since previous research had only identified the relationship between banking supervision and nonperforming loans (Neyapti & Dincer, 2014) or provides an evidence that banking supervision is not significant predictor of economic performance in 153 countries (Bertus, Jahera, & Yost, 2007). In this dissertation, the 1-point increase in banking supervision, the economic growth is reduced by 0.22%. The findings of this study lead to explain the influence of BSR on economic growth by extending the number of country-year observations.

Since there is slightly different economic growth before and after the global economic shock, the findings suggested that the aggregate BSR is the significant predictor of economic growth in the period before global economic crisis. The finding of this dissertation suggests that in the period before the global economic crisis, if a country adopts stronger banking supervision, the economic growth will increase by 0.57%. Another interesting finding from this dissertation is that the aggregate BSR is the significant predictor for non-democratic countries.

## Policy Implications

A number of practical implications of this dissertation are reasonable based on the findings in this study. Understanding that all the banking systems are subject to open and competitive market influences, the findings of this study have implications for adopting banking supervision regulation in a country. Having an effective institution is a foundation for adopting efficient banking supervision regulation, especially for developing countries. Because the banking supervision regulation is a complex issue and not all citizens have an incentive to expertly informed on this issue, the politicians and regulatory agencies are usually influenced by the banking industry.

The developing countries leaders need to understand that the less corrupt environment is an underlying basis to produce a high quality of regulation and make the necessary changes help improve the public governance of their countries. The finding also emphasizes that the effective institution is important in producing banking supervision. The banking supervision involves the banking supervisor to evaluate and monitor banks' performance. The banking supervision usually means more corruption, since supervisors can use the power to increase personal benefits rather than improve the performance of the banks. Therefore, the more effective institution will help to produce more public-oriented banking policy to watchdog the banking activities.

The findings of the trade openness as a predictor of BSR imply that developing countries should broaden their international connectedness to adopt international ideals that promote a quality regulation. The international connectedness can be a revelation for a country by seeing the experience of other countries deal with banking supervision regulation.

In addition to the second analysis of this study, the finding on the influence of banking supervision on economic growth should be read carefully, as it is mentioned previously that

banking supervision usually is followed by the practice of corruption, because the banking supervision involves the supervisor who sometimes focuses on the personal benefit. Consequently, the negative association of banking supervision on economic growth can be read as the importance of having more effective institution (less corrupt institution) to ensure that the economic activities can be done efficiently and effectively to spur the economic growth.

Finally, learning from the finding that the adoption of banking supervision before the global economic crisis will increase the economic growth, developing countries should improve the banking supervision in the period of sound macroeconomics to watchdog the risky banking activities. A country cannot prevent the episode of financial crisis in the future, however, improving the banking supervision before the next crisis is an important step and part of ongoing efforts in developing early warning detection of financial crisis.

# CHAPTER 8

# CONCLUSION

A decade aftermath the global financial crisis in 2007/2008, the developing countries are still struggling to fasten their economic growth. Arguing that banking supervision regulation is a precondition to mitigate the financial crisis in the future and pursue faster economic growth in developing countries which have weak institutions. This time series cross national study examines the determinant factors of banking supervision regulation in the context of developed and developing countries, which includes 180 countries, over the period 1999-2011. By using World Bank Banking Regulation Survey data, banking supervision regulation is operationalized through three components of Basel Accord: capital regulation, banking supervision, and private monitoring. The purpose of the study is to understand the influences of financial crisis experience, trade openness, financial assistance, level of democratization, and corruption control in adopting banking supervision regulation. The study also tries to understand the potential influence of banking supervision and regulation on economic growth across the developed and developing countries. A set of appropriate control variables is also used to test the hypotheses of the predictors of banking supervision regulation in aggregate as well as its three components and how banking supervision regulation influences economic growth.

A series of analytical techniques including statistical descriptive, bivariate analysis, and panel data regressions are used to understand the determinant factors of banking supervision regulation adoption and the potential impact of banking supervision and regulation on economic growth. Findings from the robust panel data analysis suggests that the exposure of severe

financial crisis, financial assistance, trade openness, democracy, and corruption control have significant relationship with the adoption of banking supervision regulation in the advanced and developing countries. In addition, an in-depth analysis by the various economic, the exposure of global financial crisis, and regime classifications suggests that the importance of banking supervision regulation's predictors depends on the certain groups of countries. For example, financial crisis experiences are significant predictors of aggregate banking supervision regulation and its three components in developing countries, whereas trade openness are significant predictors of aggregate BSR and private monitoring before the global financial crisis and in the developing countries, financial assistance are also significant for aggregate BSR and banking supervision before global crisis in 2007/2008 and in developing countries.

Lehne (2006) divided existing views on the role of regulations into public and private interests' theory. This study's findings suggest that public interest theory provides more evidence pertinent to the determinant factors of banking sector policies in developing countries. Given that developing countries have underdeveloped financial markets and weak institutional structures, the determinant factors involving public interest perspective is more stringent in developing economies. Public interest theory explains that market failure disturbs the open market economy. To prevent the future economic failure, the government must be involved to correct the market. The exposure of financial crisis, trade openness, and financial assistance are the determinant factors of the banking policy reform, especially in developing countries, based on the public interest perspective. The findings of this study are consistent with the public interest framework.

The panel data regressions also suggest that banking supervision has negative significant relationship with economic growth. Tighter forms of banking supervision may have contributed to lower economic growth. The possible explanation is that excessive authority of banking

supervisor to extract personal gains can be detrimental for spurring economic growth. This may happen in the economies with weak institutional structure, in which the supervisors are working in order to maintain future private benefits. Finally, the results suggest that tighter banking supervision regulation, before global recession, contributes to faster economic growth. Prior to crisis, credit booms usually accompany a period of economic upturn. During this period, the optimism describes the investment climate and the credit flows faster to the private sector. If a country implements tighter banking supervision regulation, this action will support faster economic growth. As lending standards are tighter, banks are more prudent in sorting good credits from the bad ones when credit is abundant. Consequently, when the economy slows down, the impact does not jeopardize the economic growth.

The findings of this study are nuanced. Specifically, the contributions that banking supervision regulation may contribute to boosting economic growth. Governments and policymakers, especially in the developing countries, have to strengthen the multiple dimensions of banking supervision regulation in order to sustain economic growth.

## Suggestions for Future Research

This dissertation was able to provide evidence that there is an association of financial crisis experiences, financial assistance, trade openness, fully democratic countries, and less corruptive environment on the policymaking process in adopting BSR. However, there are some factors that I cannot include in this study because of limited data and lack of resources. I cannot use cultural perceptions in a country as an example. In addition, I also cannot explain the complexity of the determinants of banking supervision regulation such as how politic affects internal conflict and influences a country's decision in adopting banking supervision regulation.

There is a need for future research that is able to include these factors of banking supervision regulation. Findings from this study on economic growth are indicative and not conclusive. I suggest a more comprehensive study of the influence of capital regulation, banking supervision and private monitoring on economic growth. A different methodology is needed that can capture the different roles of the three components of banking supervision regulation on economic growth, such as adopting the case study approach and use qualitative research analysis.

In determining economic growth, this study uses the government expenditure on education, instead of the education attainment, to explain the influence of human capital. I acknowledge that this measurement cannot explain directly the impact of human capital on spurring economic growth. The education attainment data, especially for developing countries, has not been publicly available. I recommend to use the education quality variable that combine education outcome measures which focus on different geographical areas and different skills. This combination may capture the more comprehensive perspective on educational outcomes across the world.

The result of the relationship between financial crisis experience and BSR adoption, cannot tell us how the depth of financial crisis influences a country decision to adopt banking supervision regulation. There is an opportunity for the future research to use different measurement to capture the depth of financial crisis. The next study may measure the depth of the financial crisis by grouping the country with systemic banking crisis based on the output cost of the crisis and then categorized this group into low, medium, worst. Then, testing the influence of the three level of financial crisis on BSR adoption.

From the findings of the negative association between financial assistance and BSR adoption, there are two possible things can be done: first, the future research may use the lagged of financial assistance in order to handle the reverse causality between financial assistance and BSR, second, there is a need also to understand the motivation of a country without financial assistance from the IMF to adopt BSR by examining a single case in depth.

Although this dissertation used panel data for four years, due to the use of World Bank survey data, it has facilitated a better understanding of the determinant factors that influence a country to adopt BSR.

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# Appendix A

## The Summary Statistics for Control Variables

| Variable | Obs. | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Government Expenditure | 593 | 15.61 | 5.38 | 0.95 | 44.3 |
| Region | 718 | 3.31 | 1.72 | 1.00 | 6 |
| Level Of Income | 598 | 23.50 | 7.52 | 0.29 | 67.7 |
| Capital Formation | 413 | 4.43 | 1.66 | 0.79 | 13.2 |
| Education Spending | 656 | 1.47 | 1.14 | 0.00 | 3 |

Appendix B

Banking Supervision Regulation Score for Each Country

| Country | 1999 | 2003 | 2007 | 2011 | Total | Country | 1999 | 2003 | 2007 | 2011 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Albania | 6.67 | 5.33 | 4.33 | | 4.08 | Liechtenstein | 9.00 | 9.33 | 8.33 | 8.33 | 8.75 |
| Algeria | 3.67 | 8.50 | 8.50 | | 6.89 | Lithuania | 6.67 | 8.00 | 9.17 | 8.33 | 8.04 |
| Angola | | 4.67 | 6.33 | 5.33 | 5.44 | Luxembourg | 9.33 | 9.33 | 8.00 | 9.33 | 9.00 |
| Anguilla | 7.00 | 5.33 | 6.33 | | 6.22 | Macao, China | 7.33 | 7.67 | 8.00 | 7.67 | 7.67 |
| Antigua and Barbuda | 7.00 | 6.33 | 8.33 | | 7.22 | Macedonia | 8.67 | 7.00 | 7.67 | | 7.78 |
| Argentina | 9.67 | 8.00 | 7.67 | 8.00 | 8.33 | Madagascar | 3.33 | 9.33 | 4.00 | 9.33 | 6.50 |
| Armenia | 7.67 | 6.67 | 8.33 | 6.33 | 7.25 | Malawi | 7.00 | | 8.33 | 10.33 | 8.56 |
| Aruba | 8.00 | 8.17 | 5.17 | | 7.11 | Malaysia | 8.00 | 8.83 | 9.83 | 7.33 | 8.50 |
| Australia | 9.67 | 9.33 | 9.33 | 9.67 | 9.50 | Maldives | 7.67 | | 6.67 | 9.00 | 7.78 |
| Austria | 9.33 | 9.33 | 7.00 | 8.00 | 8.42 | Mali | 4.93 | 7.83 | 8.17 | 4.67 | 6.40 |
| Azerbaijan | 5.33 | 7.00 | 4.33 | | 5.56 | Malta | 9.33 | 10.00 | 9.67 | 9.00 | 9.50 |
| Bahrain | 9.00 | 9.50 | 9.50 | 9.67 | 9.42 | Mauritius | 8.00 | 8.33 | 10.00 | 9.67 | 9.00 |
| Bangladesh | 6.67 | 3.67 | 8.33 | 9.67 | 7.08 | Mexico | 8.00 | 6.33 | 9.17 | 7.83 | 7.83 |
| Belarus | 4.33 | 6.33 | 6.17 | 8.00 | 6.21 | Moldova | 7.67 | 9.33 | 9.67 | 10.00 | 9.17 |
| Belgium | 9.33 | 8.17 | 7.00 | 9.00 | 8.38 | Montenegro | | | | 9.00 | 9.00 |
| Belize | 6.33 | 8.67 | 8.67 | 8.67 | 8.08 | Montserrat | 7.00 | 5.67 | 8.33 | | 7.00 |
| Benin | 4.93 | 7.67 | 8.33 | 4.67 | 6.40 | Morocco | 9.00 | 8.83 | 8.33 | 9.67 | 8.96 |
| Bhutan | 7.33 | 8.67 | 6.00 | 8.33 | 7.58 | Mozambique | | | 6.67 | 8.00 | 7.33 |
| Bolivia | 8.67 | 8.00 | 9.33 | | 6.50 | Myanmar | | | | 5.33 | 5.33 |
| Bosnia and Herzegovina | 8.67 | 8.67 | 7.67 | 7.33 | 8.08 | Namibia | 7.67 | 8.33 | 8.50 | 8.00 | 8.13 |
| Botswana | 10.00 | 9.33 | 7.00 | 9.33 | 8.92 | Nepal | 6.00 | | | | 6.00 |
| Brazil | 9.33 | 10.00 | 9.00 | 8.67 | 9.25 | Netherlands | 7.00 | 6.33 | 8.33 | 10.00 | 7.92 |
| Bulgaria | 8.33 | 8.67 | 8.67 | 9.33 | 8.75 | New Zealand | 7.67 | 7.17 | 7.33 | 7.33 | 7.38 |
| Burkina Faso | 4.93 | 7.83 | 8.33 | | 7.03 | Nicaragua | | 8.00 | 10.00 | 7.33 | 8.44 |
| Burundi | 6.67 | 5.33 | 7.17 | 7.17 | 6.58 | Niger | 4.93 | 7.83 | 8.33 | | 7.03 |
| Cambodia | 8.00 | 6.90 | 4.00 | | 6.30 | Nigeria | 8.33 | 9.67 | 6.50 | 5.33 | 7.46 |
| Cameroon | 6.00 | 8.33 | 6.33 | | 6.89 | Norway | | 7.33 | 8.33 | 8.00 | 7.89 |
| Canada | 6.33 | 8.67 | 5.67 | 8.33 | 7.25 | Oman | 9.33 | 9.50 | 8.00 | 9.33 | 9.04 |
| Cayman Islands | 6.83 | 2.67 | 7.60 | 8.33 | 6.36 | Pakistan | 4.00 | 9.00 | 11.00 | 10.33 | 8.58 |
| Central African Republic | 6.00 | 8.33 | 6.33 | | 6.89 | Palestinian Territory | | | | | |
| Chad | 6.00 | 8.33 | 6.33 | | 5.17 | Panama | 8.33 | 8.00 | 7.67 | 8.33 | 8.08 |
| Chile | 7.33 | 8.33 | 8.00 | 9.67 | 8.33 | Papua New Guinea | | 9.83 | 8.83 | | 9.33 |
| China | 6.00 | 3.33 | 8.00 | 10.00 | 6.83 | Paraguay | | 6.33 | | 7.67 | 7.00 |
| Colombia | 3.67 | 9.67 | 9.33 | 8.33 | 7.75 | Peru | 8.33 | 8.33 | 7.00 | 10.00 | 8.42 |
| Congo, Rep. | | 7.33 | 8.00 | | 7.67 | Philippines | 8.33 | 8.00 | 9.33 | 8.67 | 8.58 |
| Cook Islands | 2.67 | 2.67 | 8.67 | 9.67 | 5.92 | Poland | 8.67 | 7.00 | 6.00 | 9.00 | 7.67 |

| Country | 1999 | 2003 | 2007 | 2011 | Total | Country | 1999 | 2003 | 2007 | 2011 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Costa Rica | 8.67 | 5.33 | 7.33 | 6.33 | 6.92 | Portugal | 8.33 | 8.33 | 10.00 | 8.00 | 8.67 |
| Côte d'Ivoire | 8.10 | 7.33 | 8.50 | 8.50 | 8.11 | Puerto Rico | 7.67 | 7.17 | | 7.67 | 7.50 |
| Croatia | 7.67 | 8.33 | 7.33 | 9.67 | 8.25 | Qatar | 10.33 | 8.00 | 9.00 | 9.67 | 9.25 |
| Cyprus | 8.17 | 7.33 | 9.33 | 9.67 | 8.63 | Romania | 6.33 | 6.33 | 7.33 | 9.00 | 7.25 |
| Czech Republic | 7.33 | 7.67 | 7.00 | | 7.33 | Russia | 7.00 | 9.17 | 7.33 | 7.00 | 7.63 |
| Denmark | 8.00 | 8.33 | 8.00 | 8.67 | 8.25 | Rwanda | 7.33 | 9.00 | | | 8.17 |
| Dominica | 7.00 | 5.67 | 8.33 | | 7.00 | Saint Kitts and Nevis | 7.00 | 5.67 | 6.67 | | 6.44 |
| Dominican Republic | 6.33 | 6.00 | 8.33 | 9.67 | 7.58 | Saint Lucia | 7.00 | 5.67 | 6.67 | | 4.83 |
| Ecuador | 6.00 | 8.00 | 6.67 | 6.33 | 6.75 | Saint Vincent and The Grenadines | 7.00 | 5.67 | 6.67 | | 6.44 |
| Egypt | 8.67 | 9.67 | 9.33 | 9.67 | 9.33 | Samoa (Western) | 9.00 | 10.67 | 2.00 | 5.67 | 6.83 |
| El Salvador | 7.00 | 7.67 | 8.00 | 7.33 | 7.50 | Saudi Arabia | 9.67 | 9.33 | 10.00 | | 9.67 |
| Equatorial Guinea | 6.00 | 8.33 | 6.33 | | 6.89 | Senegal | 4.93 | 8.33 | 7.83 | 4.67 | 6.44 |
| Estonia | 9.00 | 8.33 | 6.00 | 6.67 | 7.50 | Serbia | | | | 8.67 | 8.67 |
| Ethiopia | 1.33 | 1.33 | 2.67 | 9.33 | 3.67 | Serbia & Montenegro | | 6.33 | 0.33 | | 3.33 |
| Fiji | 5.00 | 8.67 | 7.33 | 9.67 | 7.67 | Seychelles | 6.00 | 5.67 | 6.33 | 10.00 | 7.00 |
| Finland | 8.00 | 6.67 | 7.00 | 6.00 | 6.92 | Sierra Leone | | | | 10.00 | 10.00 |
| France | 6.33 | 5.50 | 8.17 | 9.33 | 7.33 | Singapore | 8.33 | 10.50 | 10.33 | 9.83 | 9.75 |
| Gabon | 6.00 | 8.33 | 6.33 | | 6.89 | Slovakia | 7.67 | 9.67 | 7.33 | 8.33 | 8.25 |
| Gambia | 7.33 | 8.00 | 5.33 | 6.67 | 6.83 | Slovenia | 10.00 | 9.67 | 9.33 | 9.33 | 9.58 |
| Georgia | 6.67 | | | | 6.67 | Solomon Islands | 3.00 | | | | 3.00 |
| Germany | 7.33 | 7.33 | 8.00 | 8.67 | 7.83 | South Africa | 6.67 | 7.33 | 10.33 | 7.00 | 7.83 |
| Ghana | 8.33 | 8.67 | 8.00 | 9.00 | 8.50 | Spain | 8.67 | 8.67 | 10.17 | 8.67 | 9.04 |
| Gibraltar | 10.33 | 9.67 | 9.33 | 7.67 | 9.25 | Sri Lanka | 9.00 | 8.33 | 7.53 | 7.33 | 8.05 |
| Greece | 7.00 | 8.67 | 8.67 | 7.67 | 8.00 | Sudan | | 9.33 | | | 9.33 |
| Grenada | 7.00 | 5.67 | 6.67 | | 6.44 | Suriname | 2.00 | 5.67 | 6.00 | 5.33 | 4.75 |
| Guatemala | 5.33 | 6.00 | 7.67 | 5.67 | 6.17 | Swaziland | 1.33 | 7.00 | 1.67 | 7.00 | 4.25 |
| Guernsey | 8.33 | 9.00 | 9.00 | 7.00 | 8.33 | Sweden | 5.00 | 6.00 | 6.33 | | 5.78 |
| Guinea | | 10.67 | | | 10.67 | Switzerland | 9.33 | 8.67 | 8.33 | 10.00 | 9.08 |
| Guinea-Bissau | 8.00 | 7.83 | 5.83 | 4.67 | 6.58 | Syria | | | 7.67 | 7.00 | 7.33 |
| Guyana | 7.67 | 7.33 | 5.67 | 10.33 | 7.75 | Taiwan | 6.67 | 9.00 | 4.33 | 9.00 | 7.25 |
| Honduras | 7.67 | 6.67 | 8.67 | 8.00 | 7.75 | Tajikistan | 7.00 | 6.67 | 6.67 | 5.33 | 6.42 |
| Hong Kong, China | 3.00 | 8.67 | 8.33 | 8.33 | 7.08 | Tanzania | 4.00 | 4.00 | 8.00 | 9.33 | 6.33 |
| Hungary | 9.33 | 9.00 | 11.17 | 8.33 | 9.46 | Thailand | 7.33 | 6.67 | 8.67 | 10.67 | 8.33 |

| Country | 1999 | 2003 | 2007 | 2011 | Total | Country | 1999 | 2003 | 2007 | 2011 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iceland | 5.67 | 6.00 | 7.67 | 9.33 | 7.17 | Togo | 4.67 | 8.33 | 7.83 | | 6.94 |
| India | 6.67 | 8.00 | 8.33 | 9.67 | 8.17 | Tonga | 8.00 | 7.67 | 7.67 | 8.33 | 7.92 |
| Indonesia | 8.33 | 6.00 | 11.33 | 10.33 | 9.00 | Trinidad and Tobago | 5.33 | 7.00 | 7.00 | 10.00 | 7.33 |
| Iraq | | | | 9.33 | 9.33 | Tunisia | | 9.33 | | 8.00 | 8.67 |
| Ireland | 8.33 | 8.53 | 8.33 | 8.33 | 8.38 | Turkey | 7.33 | 9.83 | 9.83 | 10.00 | 9.25 |
| Isle of Man | 6.00 | 10.50 | 9.33 | 8.67 | 8.63 | Turkmenistan | 5.67 | 5.67 | 4.67 | | 5.33 |
| Israel | 7.33 | 8.00 | 8.67 | 8.67 | 8.17 | Turks and Caicos Islands | | | | | |
| Italy | 5.33 | 6.67 | 6.47 | 9.00 | 6.87 | Uganda | 5.67 | 6.00 | 9.00 | 10.33 | 7.75 |
| Jamaica | 9.33 | 6.00 | 9.33 | 9.67 | 8.58 | Ukraine | 5.33 | 8.67 | 5.33 | 8.67 | 7.00 |
| Japan | 9.00 | 8.33 | 8.67 | | 8.67 | United Arab Emirates | | 10.67 | | | 10.67 |
| Jersey | 2.00 | 8.67 | 7.67 | 7.00 | 6.33 | United Kingdom | 9.67 | 9.67 | 8.33 | 9.67 | 9.33 |
| Jordan | 8.00 | 9.33 | 7.67 | 10.33 | 8.83 | United States | 9.67 | 8.67 | 10.50 | 10.67 | 9.88 |
| Kazakhstan | 7.67 | 8.67 | 8.00 | | 8.11 | Uruguay | 4.00 | 9.00 | 10.33 | 10.33 | 8.42 |
| Kenya | 8.33 | 9.83 | 9.00 | 9.67 | 9.21 | Vanuatu | 8.67 | 9.00 | 5.00 | 9.67 | 8.08 |
| Korea, Rep. | 8.33 | 8.67 | 8.67 | 5.33 | 7.75 | Venezuela | 7.33 | 7.33 | 6.67 | 9.67 | 7.75 |
| Kosovo | 3.33 | 3.00 | 8.67 | 10.00 | 6.25 | Vietnam | 6.67 | | | | 6.67 |
| Kuwait | 9.33 | 9.33 | 9.33 | 6.67 | 8.67 | Virgin Islands, British | 4.00 | 4.00 | 4.33 | 8.67 | 5.25 |
| Kyrgyz Republic | 7.67 | 7.00 | 8.00 | 9.00 | 7.92 | Yemen | 6.33 | | | 1.67 | 4.00 |
| Latvia | 7.00 | 9.67 | 8.33 | 9.33 | 8.58 | Yugoslavia | 8.67 | | | | 8.67 |
| Lebanon | 9.67 | 8.33 | 8.33 | 8.00 | 8.58 | Zambia | 8.67 | | | | 8.67 |
| Lesotho | 7.67 | 10.33 | 6.00 | 7.67 | 7.92 | Zimbabwe | 3.33 | 9.67 | 9.33 | 10.00 | 8.08 |

Appendix C

List of Countries in 6 Regions

| Sub Sahara | Asia Pacific (exc Australia NZ) | MENA | Latin America | Eastern Europe | Western Europe, North America, Central Asia, Australia, NZ |
|---|---|---|---|---|---|
| Angola | Bangladesh | Algeria | Anguilla | Albania | Australia |
| Benin | Bhutan | Armenia | Antigua and Barbuda | Austria | Belgium |
| Botswana | Cambodia | Azerbaijan | Argentina | Belarus | Canada |
| Burkina Faso | China | Bahrain | Aruba | Bosnia and Herzegovina | Denmark |
| Burundi | Cook Islands | Cyprus | Belize | Bulgaria | Finland |
| Cameroon | Fiji | Egypt | Bolivia | Croatia | France |
| Central African Republic | Hong Kong, China | Honduras | Brazil | Czech Republic | Germany |
| Chad | India | Iraq | Chile | Estonia | Gibraltar |
| Congo, Rep. | Indonesia | Israel | Colombia | Georgia | Guernsey |
| Côte d'Ivoire | Japan | Jordan | Costa Rica | Greece | Iceland |
| Equatorial Guinea | Korea, Rep. | Kazakhstan | Dominica | Hungary | Ireland |
| Ethiopia | Macao, China | Kuwait | Dominican Republic | Kosovo | Isle of Man |
| Gabon | Malaysia | Kyrgyz Republic | Ecuador | Latvia | Italy |
| Gambia | Maldives | Lebanon | El Salvador | Lithuania | Jersey |
| Ghana | Myanmar | Morocco | Grenada | Macedonia | Liechtenstein |
| Guinea | Nepal | Oman | Guatemala | Moldova | Luxembourg |
| Guinea-Bissau | Pakistan | Palestinian Territory | Guyana | Montenegro | Malta |
| Kenya | Papua New Guinea | Qatar | Jamaica | Poland | Netherlands |
| Lesotho | Philippines | Saudi Arabia | Mexico | Romania | New Zealand |
| Madagascar | Samoa (Western) | Syria | Montserrat | Russia | Norway |
| Malawi | Singapore | Tajikistan | Nicaragua | Serbia | Portugal |
| Mali | Solomon Islands | Tunisia | Panama | Slovakia | Spain |
| Mauritius | Sri Lanka | Turkey | Paraguay | Slovenia | Sweden |
| Mozambique | Taiwan | Turkmenistan | Peru | Ukraine | Switzerland |
| Namibia | Thailand | United Arab Emirates | Puerto Rico | | United Kingdom |
| Niger | Tonga | Yemen | Saint Kitts and Nevis | | United States |
| Nigeria | Vanuatu | | Saint Lucia | | |
| Rwanda | Vietnam | | Saint Vincent and The Grenadines | | |
| Senegal | | | Serbia & Montenegro | | |
| Seychelles | | | Suriname | | |
| Sierra Leone | | | Trinidad and Tobago | | |
| South Africa | | | Turks and Caicos Islands | | |
| Sudan | | | Uruguay | | |
| Swaziland | | | Venezuela | | |
| Tanzania | | | Virgin Islands, British | | |
| Togo | | | Yugoslavia | | |
| Uganda | | | | | |
| Zambia | | | | | |
| Zimbabwe | | | | | |

Appendix D

Summary Statistics of Economic Growth

| country | mean | sd | min | max | country | mean | sd | min | max | country | mean | sd | min | max |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Albania | 6.74 | 4.37 | 2.55 | 12.89 | Honduras | 3.46 | 2.96 | -0.74 | 6.19 | Saint Kitts and | 0.38 | 2.88 | -3.44 | 3.22 |
| Algeria | 4.17 | 2.03 | 2.89 | 7.2 | Hong Kong, China | 4.21 | 1.80 | 2.51 | 6.46 | Saint Lucia | 2.98 | 1.26 | 1.37 | 4.34 |
| Angola | 5.66 | 5.59 | 2.18 | 14.01 | Hungary | 2.28 | 1.54 | 0.43 | 3.85 | Saint Vincent an | 3.33 | 3.34 | -0.42 | 7.69 |
| Anguilla | . | . | . | . | Iceland | 4.41 | 3.45 | 1.96 | 9.43 | Samoa (Western) | 4.70 | 1.84 | 2.19 | 6.32 |
| Antigua and Barb | 4.24 | 4.79 | -2.08 | 9.26 | India | 8.29 | 1.35 | 6.64 | 9.80 | Saudi Arabia | 4.83 | 7.08 | -3.76 | 11.24 |
| Argentina | 5.12 | 5.83 | -3.39 | 9.01 | Indonesia | 4.52 | 2.58 | 0.79 | 6.35 | Senegal | 4.86 | 2.39 | 1.46 | 6.68 |
| Armenia | 8.95 | 5.74 | 3.3 | 14.04 | Iraq | -1.65 | 22.01 | -33.10 | 17.58 | Serbia | -0.11 | 8.24 | -12.15 | 5.89 |
| Aruba | 2.11 | 0.94 | 1.24 | 3.45 | Ireland | 5.48 | 3.57 | 2.98 | 10.62 | Serbia & Montene | . | . | . | . |
| Australia | 3.56 | 1.12 | 2.45 | 5.02 | Isle of Man | 7.37 | 4.83 | 2.00 | 13.69 | Seychelles | 3.57 | 7.25 | -5.89 | 10.42 |
| Austria | 2.79 | 1.28 | 0.94 | 3.73 | Israel | 3.70 | 2.15 | 0.77 | 5.77 | Sierra Leone | 5.43 | 5.09 | -1.98 | 9.31 |
| Azerbaijan | 10.93 | 10.49 | 0.07 | 25.05 | Italy | 0.94 | 0.69 | 0.15 | 1.56 | Singapore | 6.50 | 1.94 | 4.44 | 9.11 |
| Bahrain | 5.15 | 2.67 | 1.98 | 8.29 | Jamaica | 1.97 | 1.17 | 1.05 | 3.67 | Slovakia | 4.71 | 4.67 | -0.21 | 10.80 |
| Bangladesh | 5.73 | 1.21 | 4.67 | 7.06 | Japan | 0.70 | 1.03 | -0.25 | 1.65 | Slovenia | 3.93 | 2.76 | 0.65 | 6.94 |
| Belarus | 6.11 | 2.23 | 3.39 | 8.6 | Jersey | . | . | . | . | Solomon Islands | 6.63 | 5.60 | -0.48 | 13.20 |
| Belgium | 2.39 | 1.35 | 0.77 | 3.56 | Jordan | 4.58 | 2.48 | 2.59 | 8.18 | South Africa | 3.50 | 1.29 | 2.40 | 5.36 |
| Belize | 5.34 | 4.31 | 1.11 | 9.33 | Kazakhstan | 7.08 | 3.03 | 2.70 | 9.30 | Spain | 2.61 | 2.46 | -1.00 | 4.48 |
| Benin | 4.43 | 1.46 | 2.96 | 5.99 | Kenya | 4.55 | 2.26 | 2.31 | 6.85 | Sri Lanka | 6.36 | 1.71 | 4.30 | 8.40 |
| Bhutan | 10.37 | 5.04 | 7.66 | 17.93 | Korea, Rep. | 5.85 | 3.79 | 2.93 | 11.31 | Sudan | 5.10 | 5.83 | -1.97 | 11.52 |
| Bolivia | 3.23 | 2.15 | 0.43 | 5.2 | Kosovo | 6.03 | 1.24 | 4.81 | 7.29 | Suriname | 3.96 | 3.61 | -1.40 | 6.30 |
| Bosnia and Herze | 5.1 | 3.61 | 0.96 | 9.59 | Kuwait | 7.79 | 7.94 | -1.79 | 17.32 | Swaziland | . | . | . | . |
| Botswana | 7.16 | 2.25 | 4.63 | 9.67 | Kyrgyz Republic | 6.30 | 2.06 | 3.66 | 8.54 | Sweden | 3.25 | 0.96 | 2.39 | 4.53 |
| Brazil | 2.91 | 2.59 | 0.47 | 6.06 | Latvia | 6.85 | 3.18 | 2.62 | 9.98 | Switzerland | 1.88 | 1.68 | 0.04 | 4.11 |
| Bulgaria | 1.5 | 6.97 | -8.41 | 7.34 | Lebanon | 3.24 | 4.35 | -0.53 | 9.34 | Syria | 0.92 | 4.63 | -3.55 | 5.70 |
| Burkina Faso | 6.87 | 0.95 | 5.66 | 7.8 | Lesotho | 4.19 | 2.69 | 0.48 | 6.90 | Taiwan | . | . | . | . |
| Burundi | 1.31 | 2.82 | -1.22 | 4.03 | Liechtenstein | 11.09 | 6.20 | -1.94 | 10.41 | Tajikistan | 7.45 | 2.96 | 3.70 | 10.93 |
| Cambodia | 9.62 | 2.42 | 7.07 | 12.71 | Lithuania | 6.63 | 5.65 | -1.13 | 11.09 | Tanzania | 7.02 | 1.60 | 4.84 | 8.46 |
| Cameroon | 4.47 | 0.34 | 4.13 | 4.9 | Luxembourg | 5.25 | 3.68 | 1.63 | 8.48 | Thailand | 4.51 | 2.68 | 0.84 | 7.19 |
| Canada | 3.04 | 1.53 | 1.8 | 5.16 | Macao, China | 11.35 | 10.07 | -2.36 | 21.67 | Togo | 4.03 | 1.99 | 2.29 | 6.40 |
| Cayman Islands | 2.43 | 1.04 | 1.17 | 3.4 | Macedonia | 3.84 | 2.00 | 2.22 | 6.47 | Tonga | 1.15 | 3.62 | -4.17 | 3.88 |
| Central African | 1.53 | 4.65 | -5.39 | 4.61 | Madagascar | 5.53 | 3.46 | 1.45 | 9.78 | Trinidad and Tob | 6.73 | 6.17 | -0.29 | 14.44 |
| Chad | 4.35 | 7.12 | -0.68 | 14.72 | Malawi | 5.80 | 2.77 | 3.04 | 9.60 | Tunisia | 3.89 | 3.96 | -1.92 | 6.71 |
| Chile | 3.67 | 2.85 | -0.41 | 6.11 | Malaysia | 5.88 | 0.44 | 5.29 | 6.30 | Turkey | 4.59 | 5.98 | -3.39 | 11.11 |
| China | 10.37 | 2.77 | 7.67 | 14.23 | Maldives | 9.05 | 3.28 | 6.18 | 13.75 | Turkmenistan | 11.38 | 5.86 | 3.27 | 16.50 |
| Colombia | 3.48 | 5.34 | -4.2 | 7.36 | Mali | 5.39 | 2.72 | 3.24 | 9.12 | Turks and Caicos | . | . | . | . |
| Congo, Rep. | 0.02 | 2.68 | -2.58 | 3.42 | Malta | 3.14 | 1.51 | 1.32 | 4.72 | Uganda | 8.08 | 1.21 | 6.47 | 9.39 |
| Cook Islands | . | . | . | . | Mauritius | 4.02 | 1.30 | 2.61 | 5.73 | Ukraine | 5.59 | 4.20 | -0.20 | 9.52 |
| Costa Rica | 5.17 | 2.01 | 3.94 | 8.17 | Mexico | 2.54 | 0.92 | 1.45 | 3.66 | United Arab Emir | 5.45 | 2.89 | 2.90 | 8.80 |
| Croatia | 2.39 | 3.52 | -0.94 | 5.58 | Moldova | 3.26 | 4.75 | -3.37 | 6.80 | United Kingdom | 2.59 | 0.87 | 1.45 | 3.33 |
| Cyprus | 3.28 | 2.23 | 0.4 | 5.09 | Montenegro | 0.78 | 7.04 | -9.40 | 6.80 | United States | 2.72 | 1.42 | 1.60 | 4.69 |
| Czech Republic | 3.1 | 1.92 | 1.43 | 5.6 | Montserrat | . | . | . | . | Uruguay | 2.64 | 3.91 | -1.94 | 6.54 |
| Côte d'Ivoire | -0.59 | 2.91 | -4.39 | 1.76 | Morocco | 3.95 | 2.17 | 1.08 | 5.96 | Vanuatu | 2.76 | 2.34 | 0.33 | 5.17 |
| Denmark | 1.39 | 1.1 | 0.39 | 2.95 | Mozambique | 7.22 | 0.56 | 6.50 | 7.82 | Venezuela | -0.20 | 7.95 | -7.76 | 8.75 |
| Dominica | 3.21 | 3.64 | -0.22 | 6.35 | Myanmar | 10.59 | 3.54 | 5.59 | 13.84 | Vietnam | 6.26 | 1.06 | 4.77 | 7.13 |
| Dominican Republ | 3.79 | 3.85 | -1.35 | 7.42 | Namibia | 4.52 | 0.91 | 3.37 | 5.37 | Virgin Islands, | -1.49 | 6.18 | -8.16 | 4.04 |
| Ecuador | 2.01 | 5.18 | -4.74 | 7.87 | Nepal | 3.80 | 0.48 | 3.41 | 4.41 | Yemen | -0.46 | 8.17 | -12.71 | 3.78 |
| Egypt | 4.52 | 2.47 | 1.76 | 7.09 | Netherlands | 2.67 | 2.12 | 0.28 | 5.05 | Yugoslavia | . | . | . | . |
| El Salvador | 2.35 | 1.01 | 1.56 | 3.81 | New Zealand | 4.05 | 1.07 | 2.70 | 5.19 | Zambia | 6.38 | 1.62 | 4.65 | 8.35 |
| Equatorial Guine | 15.36 | 7.88 | 6.52 | 25.66 | Nicaragua | 5.24 | 1.98 | 2.52 | 7.04 | Zimbabwe | -1.82 | 12.79 | -17.00 | 14.19 |
| Estonia | 5.48 | 4.22 | -0.86 | 7.75 | Niger | 2.54 | 2.43 | -0.57 | 5.30 | | | | | |
| Ethiopia | 6.41 | 6.41 | -2.16 | 11.46 | Nigeria | 4.96 | 3.03 | 0.58 | 7.35 | | | | | |
| Fiji | 2.91 | 4.18 | -0.85 | 8.79 | Norway | 1.72 | 0.98 | 0.92 | 2.99 | | | | | |
| Finland | 3.55 | 1.51 | 1.99 | 5.18 | Oman | 0.14 | 3.06 | -2.67 | 4.45 | | | | | |
| France | 2.17 | 1.06 | 0.82 | 3.41 | Pakistan | 4.02 | 1.01 | 2.75 | 4.85 | | | | | |
| Gabon | 1.6 | 7.32 | -8.93 | 7.09 | Palestinian Terr | 10.33 | 3.47 | 6.59 | 14.02 | | | | | |
| Gambia | 3.15 | 5.17 | -4.29 | 6.87 | Panama | 7.86 | 4.39 | 3.92 | 11.98 | | | | | |
| Georgia | 8.43 | 4.34 | 2.87 | 12.58 | Papua New Guinea | 4.06 | 4.72 | 1.11 | 11.10 | | | | | |
| Germany | 2.05 | 1.97 | -0.71 | 3.66 | Paraguay | 3.16 | 3.06 | -1.37 | 5.42 | | | | | |
| Ghana | 7.00 | 4.72 | 4.35 | 14.05 | Peru | 5.13 | 3.00 | 1.49 | 8.52 | | | | | |
| Gibraltar | . | . | . | . | Philippines | 4.58 | 1.57 | 3.08 | 6.62 | | | | | |
| Greece | 0.75 | 6.71 | -9.13 | 5.79 | Poland | 3.89 | 1.45 | 3.56 | 7.03 | | | | | |
| Grenada | 5.81 | 3.66 | 0.76 | 9.46 | Portugal | 0.90 | 2.72 | -1.83 | 3.89 | | | | | |
| Guatemala | 4.21 | 1.56 | 2.53 | 6.30 | Puerto Rico | 0.98 | 2.98 | -1.16 | 5.39 | | | | | |
| Guernsey | . | . | . | . | Qatar | 11.69 | 7.28 | 3.72 | 17.99 | | | | | |
| Guinea | 4.38 | 2.42 | 1.25 | 6.83 | Romania | 3.50 | 3.31 | -0.40 | 6.86 | | | | | |
| Guinea-Bissau | 3.24 | 3.44 | 0.57 | 8.08 | Russia | 6.88 | 1.38 | 5.28 | 8.54 | | | | | |
| Guyana | 3.64 | 3.29 | -0.63 | 7.02 | Rwanda | 5.48 | 2.73 | 2.20 | 7.78 | | | | | |

Appendix E

Annual Economic Growth (%)

| Country | Total | 1999 | 2003 | 2007 | 2011 | Country | Total | 1999 | 2003 | 2007 | 2011 | Country | Total | 1999 | 2003 | 2007 | 2011 | Country | Total | 1999 | 2003 | 2007 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Albania | 6.74 | 12.9 | 5.53 | 5.98 | 2.55 | Fiji | 2.91 | 8.8 | 1 | -0.9 | 2.71 | Malta | 3.14 | 4.72 | 2.54 | 3.99 | 1.32 | Suriname | 3.96 | -1.40 | 6.30 | 5.10 | 5.85 |
| Algeria | 4.17 | 3.2 | 7.2 | 3.37 | 2.89 | Finland | 3.55 | 4.44 | 1.99 | 5.18 | 2.57 | Mauritius | 4.02 | 2.61 | 3.66 | 5.73 | 4.08 | Swaziland | | . | . | . | . |
| Angola | 5.66 | 2.18 | 2.99 | 14 | 3.47 | France | 2.17 | 3.41 | 0.82 | 2.36 | 2.08 | Mexico | 2.54 | 2.75 | 1.45 | 2.29 | 3.66 | Sweden | 3.25 | 4.53 | 2.39 | 3.40 | 2.66 |
| Anguilla | | | . | | . | Gabon | 1.6 | -8.9 | 2.25 | 6.01 | 7.09 | Moldova | 3.26 | -3.4 | 6.6 | 3 | 6.8 | Switzerland | 1.88 | 1.69 | 0.04 | 4.11 | 1.69 |
| Antigua and Barbuda | 4.24 | 3.71 | 6.06 | 9.26 | -2.1 | Gambia | 3.15 | 6.4 | 6.87 | 3.63 | -4.3 | Montenegro | 0.78 | -9.4 | 2.5 | 6.8 | 3.2 | Syria | 0.92 | -3.55 | 0.60 | 5.70 | . |
| Argentina | 5.12 | -3.4 | 8.84 | 9.01 | 6 | Georgia | 8.43 | 2.87 | 11.1 | 12.6 | 7.22 | Montserrat | | . | . | . | . | Taiwan | | . | . | . | . |
| Armenia | 8.95 | 3.3 | 14 | 13.7 | 4.7 | Germany | 2.05 | 1.99 | -0.7 | 3.26 | 3.66 | Morocco | 3.95 | 1.08 | 5.96 | 3.53 | 5.25 | Tajikistan | 7.45 | 3.70 | 10.93 | 7.76 | 7.40 |
| Aruba | 2.11 | 1.24 | 1.98 | 1.8 | 3.45 | Ghana | 7 | 4.4 | 5.2 | 4.35 | 14 | Mozambique | 7.22 | 7.82 | 6.5 | 7.43 | 7.12 | Tanzania | 7.02 | 4.84 | 6.89 | 8.46 | 7.90 |
| Australia | 3.56 | 5.02 | 2.99 | 3.78 | 2.45 | Gibraltar | | . | . | . | . | Myanmar | 10.59 | 10.9 | 13.8 | 12 | 5.59 | Thailand | 4.51 | 4.57 | 7.19 | 5.44 | 0.84 |
| Austria | 2.79 | 3.56 | 0.94 | 3.73 | 2.92 | Greece | 0.75 | 3.07 | 5.79 | 3.27 | -9.1 | Namibia | 4.52 | 3.37 | 4.24 | 5.37 | 5.09 | Togo | 4.03 | 2.48 | 4.95 | 2.29 | 6.40 |
| Azerbaijan | 10.9 | 7.4 | 11.2 | 25 | 0.07 | Grenada | 5.81 | 6.9 | 9.46 | 6.12 | 0.76 | Nepal | 3.80 | 4.41 | 3.95 | 3.41 | 3.42 | Tonga | 1.15 | 3.88 | 2.11 | -4.17 | 2.79 |
| Bahrain | 5.15 | 4.3 | 6.02 | 8.29 | 1.98 | Guatemala | 4.21 | 3.85 | 2.53 | 6.3 | 4.16 | Netherlands | 2.67 | 5.05 | 0.28 | 3.7 | 1.66 | Trinidad and Tobago | 6.73 | 8.02 | 14.44 | 4.75 | -0.29 |
| Bangladesh | 5.73 | 4.67 | 4.74 | 7.06 | 6.46 | Guernsey | | . | . | . | . | New Zealand | 4.05 | 5.19 | 4.54 | 3.76 | 2.7 | Tunisia | 3.89 | 6.05 | 4.70 | 6.71 | -1.92 |
| Belarus | 6.11 | 3.4 | 7.04 | 8.6 | 5.38 | Guinea | 4.38 | 3.81 | 1.25 | 6.83 | 5.61 | Nicaragua | 5.24 | 7.04 | 2.52 | 5.08 | 6.32 | Turkey | 4.59 | -3.39 | 5.61 | 5.03 | 11.11 |
| Belgium | 2.4 | 3.56 | 0.77 | 3.45 | 1.8 | Guinea-Bissau | 3.24 | 1.03 | 0.57 | 3.26 | 8.08 | Niger | 2.54 | -0.6 | 5.3 | 3.15 | 2.28 | Turkmenistan | 11.38 | 16.50 | 3.27 | 11.06 | 14.70 |
| Belize | 5.34 | 8.78 | 9.33 | 1.11 | 2.16 | Guyana | 3.64 | 2.96 | -0.6 | 7.02 | 5.2 | Nigeria | 4.96 | 0.58 | 7.35 | 6.59 | 5.31 | Turks and Caicos Islands | | . | . | . | . |
| Benin | 4.43 | 5.34 | 3.44 | 5.99 | 2.96 | Honduras | 3.46 | -0.7 | 4.55 | 6.19 | 3.84 | Norway | 1.72 | 2.01 | 0.92 | 2.99 | 0.97 | Uganda | 8.08 | 8.05 | 6.47 | 8.41 | 9.39 |
| Bhutan | 10.4 | 7.98 | 7.66 | 17.9 | 7.89 | Hong Kong, China | 4.21 | 2.51 | 3.06 | 6.46 | 4.81 | Oman | 0.14 | -0.1 | -2.7 | 4.45 | -1.1 | Ukraine | 5.59 | -0.20 | 9.52 | 7.59 | 5.47 |
| Bolivia | 3.23 | 0.43 | 2.71 | 4.56 | 5.2 | Hungary | 2.28 | 3.19 | 3.85 | 0.43 | 1.66 | Pakistan | 4.02 | 3.66 | 4.85 | 4.83 | 2.75 | United Arab Emirates | 5.45 | 2.90 | 8.80 | 3.18 | 6.93 |
| Bosnia and Herzegovina | 5.1 | 9.6 | 4 | 5.86 | 0.96 | Iceland | 4.41 | 3.89 | 2.36 | 9.43 | 1.96 | Palestinian Territory | 10.33 | 8.28 | 14 | 6.59 | 12.4 | United Kingdom | 2.59 | 3.22 | 3.33 | 2.36 | 1.45 |
| Botswana | 7.15 | 9.67 | 4.63 | 8.28 | 6.05 | India | 8.29 | 8.85 | 7.86 | 9.8 | 6.64 | Panama | 7.86 | 3.92 | 4.21 | 12 | 11.3 | United States | 2.72 | 4.69 | 2.81 | 1.78 | 1.60 |
| Brazil | 2.91 | 0.47 | 1.14 | 6.06 | 3.99 | Indonesia | 4.52 | 0.79 | 4.78 | 6.35 | 6.17 | Papua New Guinea | 4.06 | 1.86 | 2.16 | 11.1 | 1.11 | Uruguay | 2.64 | -1.94 | 0.81 | 6.54 | 5.16 |
| Bulgaria | 1.5 | -8.4 | 5.16 | 7.34 | 1.91 | Iraq | -1.65 | 17.6 | -33 | 1.38 | 7.55 | Paraguay | 3.16 | -1.4 | 4.32 | 5.42 | 4.25 | Vanuatu | 2.76 | 0.33 | 4.29 | 5.17 | 1.22 |
| Burkina Faso | 6.87 | 7.4 | 7.8 | 5.66 | 6.63 | Ireland | 5.48 | 10.6 | 3.12 | 5.21 | 2.98 | Peru | 5.13 | 1.49 | 4.17 | 8.52 | 6.33 | Venezuela | -0.20 | -5.97 | -7.76 | 8.75 | 4.18 |
| Burundi | 1.31 | -1 | -1.2 | 3.45 | 4.03 | Isle of Man | 7.37 | 13.7 | 6.33 | 7.46 | 2 | Philippines | 4.58 | 3.08 | 4.97 | 6.62 | 3.66 | Vietnam | 6.26 | 4.77 | 6.90 | 7.13 | 6.24 |
| Cambodia | 9.62 | 12.7 | 8.51 | 10.2 | 7.07 | Israel | 3.7 | 3.62 | 0.77 | 5.77 | 4.66 | Poland | 5.06 | 4.64 | 3.56 | 7.03 | 5.02 | Virgin Islands, British | -1.49 | . | -0.33 | 4.04 | -8.16 |
| Cameroon | 4.47 | 4.29 | 4.57 | 4.9 | 4.13 | Italy | 0.94 | 1.56 | 0.15 | 1.47 | 0.58 | Portugal | 0.90 | 3.89 | -0.9 | 2.49 | -1.8 | Yemen | -0.46 | 3.78 | 3.75 | 3.34 | -12.71 |
| Canada | 3.04 | 5.16 | 1.8 | 2.06 | 3.14 | Jamaica | 1.97 | 1.05 | 3.67 | 1.43 | 1.73 | Puerto Rico | 0.98 | 5.39 | 0.05 | -1.2 | -0.4 | Yugoslavia | | . | . | . | . |
| Cayman Islands | 2.43 | 3.4 | 2 | 3.16 | 1.17 | Japan | 0.7 | -0.3 | 1.53 | 1.65 | -0.1 | Qatar | 11.69 | . | 3.72 | 18 | 13.4 | Zambia | 6.38 | 4.65 | 6.94 | 8.35 | 5.56 |
| Central African Republic | 1.53 | 3.6 | -5.4 | 4.61 | 3.3 | Jersey | | . | . | . | . | Romania | 3.50 | -0.4 | 5.52 | 6.86 | 2.01 | Zimbabwe | -1.82 | -0.82 | -17.00 | -3.65 | 14.19 |
| Chad | 4.35 | -0.7 | 14.7 | 3.27 | 0.08 | Jordan | 4.58 | 3.41 | 4.16 | 8.18 | 2.59 | Russia | 6.88 | 6.4 | 7.3 | 8.54 | 5.28 | | | | | | |
| Chile | 3.67 | -0.4 | 4.09 | 4.91 | 6.11 | Kazakhstan | 7.08 | 2.7 | 9.3 | 8.9 | 7.4 | Rwanda | 5.48 | 4.26 | 2.2 | 7.68 | 7.78 | | | | | | |
| China | 10.4 | 7.67 | 10 | 14.2 | 9.54 | Kenya | 4.55 | 2.31 | 2.93 | 6.85 | 6.11 | Saint Kitts and Nevis | 0.38 | 3.22 | -3.4 | -0.1 | 1.78 | | | | | | |
| Colombia | 3.48 | -4.2 | 3.92 | 6.85 | 7.36 | Korea, Rep. | 5.85 | 11.3 | 2.93 | 5.46 | 3.68 | Saint Lucia | 2.98 | 2.71 | 4.34 | 1.37 | 3.52 | | | | | | |
| Congo, Rep. | 0.02 | -2.6 | 0.81 | -1.6 | 3.42 | Kosovo | 6.03 | . | 5.98 | 7.29 | 4.81 | Saint Vincent and The Grenadines | 3.33 | 2.71 | 7.69 | 3.34 | -0.4 | | | | | | |
| Cook Islands | | . | . | . | . | Kuwait | 7.79 | -1.8 | 17.3 | 5.99 | 9.63 | Samoa (Western) | 4.70 | 2.19 | 4.52 | 6.32 | 5.78 | | | | | | |
| Costa Rica | 5.17 | 3.94 | 4.26 | 8.17 | 4.31 | Kyrgyz Republic | 6.3 | 3.66 | 7.03 | 8.54 | 5.96 | Saudi Arabia | 4.83 | -3.8 | 11.2 | 1.85 | 10 | | | | | | |
| Côte d'Ivoire | -0.59 | 1.62 | -1.4 | 1.77 | -4.4 | Latvia | 6.85 | 2.62 | 8.43 | 9.98 | 6.38 | Senegal | 4.86 | 6.35 | 6.68 | 4.94 | 1.46 | | | | | | |
| Croatia | 2.4 | -0.9 | 5.58 | 5.28 | -0.3 | Lebanon | 3.24 | -0.5 | 3.23 | 9.34 | 0.92 | Serbia | -0.11 | -12 | 4.42 | 5.89 | 1.4 | | | | | | |
| Cyprus | 3.28 | 5 | 2.62 | 5.1 | 0.4 | Lesotho | 4.19 | 0.48 | 4.56 | 4.83 | 6.9 | Serbia & Montenegro | | . | . | . | . | | | | | | |
| Czech Republic | 3.1 | 1.43 | 3.6 | 5.6 | 1.78 | Liechtenstein | 3.93 | 10.4 | -1.9 | 3.33 | . | Seychelles | 3.57 | 1.87 | -5.9 | 10.4 | 7.89 | | | | | | |
| Denmark | 1.4 | 2.95 | 0.39 | 0.91 | 1.34 | Lithuania | 6.63 | -1.1 | 10.5 | 11.1 | 6.04 | Sierra Leone | 5.43 | -2 | 9.31 | 8.06 | 6.32 | | | | | | |
| Dominica | 3.21 | 0.35 | 6.35 | 6.35 | -0.2 | Luxembourg | 5.25 | 8.48 | 1.63 | 8.35 | 2.54 | Singapore | 6.50 | 6.1 | 4.44 | 9.11 | 6.35 | | | | | | |
| Dominican Republic | 3.79 | 5.94 | -1.3 | 7.42 | 3.13 | Macao, China | 11.35 | -2.4 | 11.7 | 14.4 | 21.7 | Slovakia | 4.71 | -0.2 | 5.42 | 10.8 | 2.82 | | | | | | |
| Ecuador | 2.01 | -4.7 | 2.72 | 2.19 | 7.87 | Macedonia | 3.84 | 4.34 | 2.22 | 6.47 | 2.34 | Slovenia | 3.93 | 5.27 | 2.84 | 6.94 | 0.65 | | | | | | |
| Egypt | 4.52 | 6.05 | 3.19 | 7.09 | 1.76 | Madagascar | 5.53 | 4.66 | 9.78 | 6.24 | 1.45 | Solomon Islands | 6.63 | -0.5 | 6.5 | 7.32 | 13.2 | | | | | | |
| El Salvador | 2.35 | 2.16 | 1.56 | 1.86 | 3.81 | Malawi | 5.80 | 3.04 | 5.71 | 9.6 | 4.85 | South Africa | 3.50 | 2.4 | 2.95 | 5.36 | 3.28 | | | | | | |
| Equatorial Guinea | 15.4 | 25.7 | 14 | 15.3 | 6.52 | Malaysia | 5.88 | 6.14 | 5.79 | 6.3 | 5.29 | Spain | 2.61 | 4.48 | 3.19 | 3.77 | -1 | | | | | | |
| Estonia | 5.48 | -0.9 | 7.42 | 7.75 | 7.6 | Maldives | 9.05 | 6.18 | 13.8 | 7.71 | 8.57 | Sri Lanka | 6.36 | 4.3 | 5.94 | 6.8 | 8.4 | | | | | | |
| Ethiopia | 6.41 | 5.16 | -2.2 | 11.5 | 11.2 | Mali | 5.39 | 5.7 | 9.12 | 3.49 | 3.24 | Sudan | 5.10 | 3.1 | 7.73 | 11.5 | -2 | | | | | | |

Appendix F

Banking Crises Dates and Cost: Costliest Banking Crises Based on Output Cost

| No | Country | Start | End | Output cost | Fiscal cost (bailout) | No | Country | Start | End | Output cost | Fiscal cost (bailout) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Kuwait | 1982 | 1985 | 143.4 | | 74 | Mexico | 1994 | 1996 | 13.7 | 19.3 |
| 2 | Congo Democratic Republic | 1991 | 1994 | 129.5 | | 75 | Argentina | 1989 | 1991 | 12.6 | 6 |
| 3 | Burundi | 1994 | 1998 | 121.2 | | 76 | Nicaragua | 1990 | 1993 | 11.4 | |
| 4 | Thailand | 1997 | 2000 | 109.3 | 43.8 | 77 | Germany | 2008 | | 11 | 1.8 |
| 5 | Jordan | 1989 | 1991 | 106.4 | 10 | 78 | Zimbabwe | 1995 | 1999 | 10.4 | |
| 6 | Ireland | 2008 | | 106 | 40.7 | 79 | Central African Republic | 1995 | 1996 | 9 | |
| 7 | Latvia | 2008 | | 106 | 5.6 | 80 | Chile | 1981 | 1985 | 8.6 | 42.9 |
| 8 | Cameroon | 1987 | 1991 | 105.5 | | 81 | Cameroon | 1995 | 1997 | 8.1 | |
| 9 | Lebanon | 1990 | 1993 | 102.2 | | 82 | Mauritania | 1984 | 1984 | 7.5 | 15 |
| 10 | Ecuador | 1982 | 1986 | 98.2 | | 83 | Senegal | 1988 | 1991 | 5.6 | 17 |
| 11 | Niger | 1983 | 1985 | 97.2 | | 84 | Norway | 1991 | 1993 | 5.1 | 2.7 |
| 12 | Philippines | 1983 | 1986 | 91.7 | 3 | 85 | Ukraine | 2008 | | 2 | 4.5 |
| 13 | Panama | 1988 | 1989 | 85 | 12.9 | 86 | Sao Tome and Principe | 1992 | 1992 | 1.9 | |
| 14 | Congo Democratic Republic | 1994 | 1998 | 79 | | 87 | Congo Democratic Republic | 1983 | 1983 | 1.4 | |
| 15 | Israel | 1977 | 1977 | 76 | 30 | 88 | Tunisia | 1991 | 1991 | 1.3 | 3 |
| 16 | Argentina | 2001 | 2003 | 71 | 9.6 | 89 | Venezuela | 1994 | 1998 | 1.2 | 15 |
| 17 | Indonesia | 1997 | 2001 | 69 | 56.8 | 90 | Egypt | 1980 | 1980 | 0.9 | |
| 18 | Brazil | 1990 | 1994 | 62.3 | 0 | 91 | Argentina | 1995 | 1995 | 0 | 2 |
| 19 | Bulgaria | 1996 | 1997 | 59.5 | 14 | 92 | Bangladesh | 1987 | 1987 | 0 | |
| 20 | Spain | 1977 | 1981 | 58.5 | 5.6 | 93 | Bolivia | 1994 | 1994 | 0 | 6 |
| 21 | Argentina | 1980 | 1982 | 58.2 | 55.1 | 94 | Brazil | 1994 | 1998 | 0 | 13.2 |
| 22 | Korea | 1997 | 1998 | 57.6 | 31.2 | 95 | Cape Verde | 1993 | 1993 | 0 | |
| 23 | Peru | 1983 | 1983 | 55.2 | | 96 | Central African Republic | 1976 | 1976 | 0 | |
| 24 | Kenya | 1992 | 1994 | 50.3 | | 97 | Chad | 1983 | 1983 | 0 | |
| 25 | Bolivia | 1986 | 1986 | 49.2 | | 98 | Chad | 1992 | 1996 | 0 | |
| 26 | Congo Republic | 1992 | 1994 | 47.4 | | 99 | Costa Rica | 1987 | 1991 | 0 | |
| 27 | Colombia | 1982 | 1982 | 47 | 5 | 100 | Costa Rica | 1994 | 1995 | 0 | |
| 28 | Swaziland | 1995 | 1999 | 45.7 | | 101 | El Salvador | 1989 | 1990 | 0 | |
| 29 | Ghana | 1982 | 1983 | 45.3 | 6 | 102 | Equatorial Guinea | 1983 | 1983 | 0 | |
| 30 | Cote d'Ivoire | 1988 | 1992 | 45 | 25 | 103 | Guinea | 1985 | 1985 | 0 | 3 |
| 31 | Japan | 1997 | 2001 | 45 | 14 | 104 | Guinea | 1993 | 1993 | 0 | |
| 32 | Colombia | 1998 | 2000 | 43.4 | 6.3 | 105 | Guyana | 1993 | 1993 | 0 | |
| 33 | Greece | 2008 | | 43 | 27.3 | 106 | Hungary | 1991 | 1995 | 0 | 10 |
| 34 | Iceland | 2008 | | 43 | 44.2 | 107 | India | 1993 | 1993 | 0 | |
| 35 | Djibouti | 1991 | 1995 | 42.6 | | 108 | Kazakhstan | 2008 | | 0 | 3.7 |
| 36 | Algeria | 1990 | 1994 | 41.4 | | 109 | Macedonia FYR | 1993 | 1995 | 0 | 32 |
| 37 | Hungary | 2008 | | 40 | 2.7 | 110 | Madagascar | 1988 | 1988 | 0 | |
| 38 | Spain | 2008 | | 39 | 3.8 | 111 | Mali | 1987 | 1991 | 0 | |
| 39 | Togo | 1993 | 1994 | 38.8 | | 112 | Mongolia | 2008 | | 0 | 4.2 |
| 40 | Uruguay | 1981 | 1985 | 38.1 | 31.2 | 113 | Mozambique | 1987 | 1991 | 0 | |
| 41 | Slovenia | 2008 | | 38 | 3.6 | 114 | Nepal | 1988 | 1988 | 0 | |
| 42 | Jamaica | 1996 | 1998 | 37.8 | 43.9 | 115 | Nicaragua | 2000 | 2001 | 0 | 13.6 |
| 43 | Haiti | 1994 | 1998 | 37.5 | | 116 | Nigeria | 1991 | 1995 | 0 | |
| 44 | Portugal | 2008 | | 37 | 0 | 117 | Philippines | 1997 | 2001 | 0 | 13.2 |
| 45 | Turkey | 2000 | 2001 | 37 | 32 | 118 | Poland | 1992 | 1994 | 0 | 3.5 |
| 46 | Denmark | 2008 | | 36 | 3.1 | 119 | Romania | 1990 | 1992 | 0 | 0.6 |
| 47 | Luxembourg | 2008 | | 36 | 7.7 | 120 | Russia | 2008 | | 0 | 2.3 |
| 48 | Turkey | 1982 | 1984 | 35 | 2.5 | 121 | Sloval Republic | 1998 | 2002 | 0 | |
| 49 | Sierra Leone | 1990 | 1994 | 34.5 | | 122 | Switzerland | 2008 | | 0 | 1.1 |
| 50 | Sweden | 1991 | 1995 | 32.9 | 3.6 | 123 | Tanzania | 1987 | 1988 | 0 | 10 |
| 51 | Italy | 2008 | | 32 | 0.3 | 124 | Uganda | 1994 | 1994 | 0 | |
| 52 | Malaysia | 1997 | 1999 | 31.4 | 16.4 | 125 | Ukraine | 1998 | 1999 | 0 | 0 |
| 53 | Zambia | 1995 | 1998 | 31.1 | 1.4 | 126 | United States | 1988 | 1988 | 0 | 3.7 |
| 54 | United States | 2007 | | 31 | 4.5 | 127 | Vietnam | 1997 | 1997 | 0 | 10 |
| 55 | Guinea-Bissau | 1995 | 1998 | 29.6 | | 128 | Albania | 1994 | 1994 | | |
| 56 | Uruguay | 2002 | 2005 | 27.4 | 20 | 129 | Armenia | 1994 | 1994 | | |
| 57 | Mexico | 1981 | 1985 | 26.6 | | 130 | Azerbaijan | 1995 | 1995 | | |
| 58 | Ecuador | 1998 | 2002 | 25.4 | 21.7 | 131 | Belarus | 1995 | 1995 | | |
| 59 | Sweden | 2008 | | 25 | 0.7 | 132 | Belgium | 2008 | | | 19 |
| 60 | United Kingdom | 2007 | | 25 | 8.8 | 133 | Bosnia and Herzegovina | 1992 | 1996 | | |
| 61 | Thailand | 1983 | 1983 | 24.8 | 0.7 | 134 | Burkina Faso | 1990 | 1994 | | |
| 62 | Kenya | 1985 | 1985 | 23.7 | | 135 | Croatia | 1998 | 1999 | | 6.9 |
| 63 | France | 2008 | | 23 | 1 | 136 | Czez Republic | 1996 | 2000 | | 6.8 |
| 64 | Netherlands | 2008 | | 23 | 12.7 | 137 | Dominican Republic | 2003 | 2004 | | 22 |
| 65 | Morocco | 1980 | 1984 | 21.9 | | 138 | Eritrea | 1993 | 1993 | | |
| 66 | Chile | 1976 | 1976 | 19.9 | | 139 | Estonia | 1992 | 1994 | | |
| 67 | Sri Lanka | 1989 | 1991 | 19.6 | 5 | 140 | Finland | 1991 | 1995 | | 1.9 |
| 68 | China Mainland | 1998 | 1998 | 19.4 | 18 | 141 | Georgia | 1991 | 1995 | | |
| 69 | Yemen | 1996 | 1996 | 16.4 | | 142 | Kyrgyz Republic | 1995 | 1999 | | |
| 70 | Paraguay | 1995 | 1995 | 15.3 | 12.9 | 143 | Latvia | 1995 | 1996 | | 3 |
| 71 | Benin | 1988 | 1992 | 14.9 | 17 | 144 | Liberia | 1991 | 1995 | | |
| 72 | Austria | 2008 | | 14 | 4.9 | 145 | Lithuania | 1995 | 1996 | | 3.1 |
| 73 | Nigeria | 2009 | | 14 | 11.8 | 146 | Russia | 1998 | 1998 | | 0.1 |
| | | | | | | 147 | Slovenia | 1992 | 1992 | | 14.6 |