

Determinants of Institutional Quality in Asian Countries



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06/M.Phil-Eco/PIDE/2012

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A thesis submitted to the Department of Economics, Pakistan Institute of Development Economics in partial fulfillment for the degree of Master of Philosophy in Economics.

April, 2015

DEDICATION

My this effort is dedicated to my parents, who provided me with an opportunity to study in this prestigious institution with devoted teachers & supporting class fellows, without their support my this effort would have never been worth viewing

ACKNOWLEDGEMENT

I am grateful to Almighty ALLAH, the one who makes me able to tackle the ups down and face the challenges of my life. It is one of HIS blessings, due to which I am able to complete my study.

I appreciate the patience and support of my supervisor, Dr. Anwar Husain and Akbar Ullah in the completion of my study. It was a good opportunity to work under his supervision and take advantage of his knowledge in a most humble way.

I am also thankful to my teachers who not only teach economics but also life and continuously encouraged me during my MPhil duration at PIDE. I cannot ignore the role of my respectable teachers: Dr. Muslehuddin, Dr. Eatzaz Ahmad, Dr. Ather Maqsood, Dr. Waseem Shahid Malik, Dr. Sajid amin Javaid, Sir shafiq Bangash and Dr. Muhammad Nasir and dear Mamu Dr, Rashid and Hamid Ali shah. Any task of life may get complete without friends and family but it will not be a perfect. I am indebted to my dear friends Sami Ullah Khan Khattak, Tahira Toheed, Sara Jabeen, and family especially my parents and aunt Waqar-un-Nisa for their moral support.

Sadaf

ABSTRACT

Institutions play a vital role in the economic development of a country. It is an important challenge to take into account those factors that determine quality of institutions. This study attempts to construct different indices of institutional quality using the method of PCA (principle component analysis) and tries to determine their potential determinants from Asian prospective. This analysis is based on panel data involving the time period from 1990-2013 for the Asian countries Pakistan, Sri Lanka, Philippines, India, Bangladesh, Thailand, Singapore, Malaysia, Indonesia, Iran, China and Jordan. The method of two stage least square is employed to analyse the impact of education, social media, population, Gini index, real GDP per capita, taxes and foreign aid on political, legal, economic and over all institutional quality. From the regression results we came to the conclusion that social media, taxes, GDP per capita and education significantly and positively determines institutional quality (legal, political, economic and overall institutional quality) while population, income inequality and foreign Aid have negative impact on institutional quality. Based on these findings it is recommended that a country with large population should adopt more educational policies (policies related to the provision of education) or improves its education quality through different trainings and reforms, if a large part of population is educated and skilled then they can contribute to the development of country. A country should increase GDP per capita in order to meet the demand and challenges of institutions, increase taxes in order to improve institutional quality and decrease dependence on foreign aid. While from the positively significant impact of social media on institutional quality we can conclude that media should be independent from government power so that people can voice their views about the actions taken by the state this will develop a direct relation between state and its citizens.

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CHAPTER 1

INTRODUCTION

1.1. Background of the Study

Countries like Cambodia, Ghana, Bolivia, and South Korea were likely poor in 1950s. But presently South Korea is sixteen times as rich as Bolivia, thirty-three times as rich as Ghana and thirty-six times as rich as Cambodia. Differences like these, occurring over time look quite surprising and attracted the attention of social scientists for in-depth analysis. After a vast analysis the empirical research has showed that trade, natural resource endowment, favorable geographic location etc. are no doubt responsible for economic growth but the institutional environment is particularly more important for economic growth and development (Rodrik et al., 2004; Bates, 2006; Acemoglu, Johnson & Robinson, 2001; Knack & Keefer, 1995). High quality institutional environment provides incentives, encourage investment and make countries richer than those who have no such environment (Acemoglu et al., 2002). For example, Western Europe incredible economic growth that started in 17th century is attributed to high quality of institutions (North, 1990). Studies with historical bent show how these differences in institutions have affected economic growth (Engerman and Sokoloff, 2000; North, 1993, 1994; Jones, 1981). If institutions are so vital for a country development then it is important to know how a country can improve its institutions in order to achieve higher growth rate. But before proceeding it is important to have an idea of what institutions exactly are and how they work.

The most widely and well-known used definition of institutions is attributed to North. As in his words

“Institutions provide the incentive structure of an economy; as the structure evolves; it shapes the direction of economic change towards growth, stagnation, or decline (North, 1989)”.

Institutions are devised to constrain/encourage agents to reduce the uncertainty of social interaction and to prevent transactions from being too costly and thus to allow the productivity gains of larger scale and improved technology to be realized (Bardhan, 1999). While economic institutions are defined as the rules of the game which are equilibrium outcomes of strategic interaction of agents. Political institutions define the structure of the state as well as the political process. Thus they shape the creation and enforcement of economic institutions, particularly economic policy and its administrative implementation. They influence the behaviour of politicians, political parties, voters and interest groups, and thus define how institutions are created, altered and enforced. Legal institutions are law regulatories and any other rules of the game to which people clearly subscribe. The emergence and evolution of the rules stem from the motivations and decisions of individual actors (Clague, 1997).

The economists and social scientists may differ on the definition of institutions but they are still unanimously agreed on the point that social, legal, political, and economic institutions are essential to the economic achievement and collapse of the nations. As can be clear from this statement that

“The institutions of a country create incentives for investment and technology adoption, for its businesses to invest, and the opportunity to accumulate human capital for its

workers, thus motivating economic growth. Opposite scenario could be that country's institutions may discourage such activities and as a result leading the economy to stagnation (Acemoglu, 2008)".

For example a country where institutional environment is good, property rights are secured this will lead to the reduction of outflow of capital, and investors will prefer it to invest in their own country which results in technological progress and greater efficiency in the use of resources, reducing poverty and leading to economic growth. In earlier literature infrastructure projects, education, foreign investment, foreign aid and human capital etc. were considered to be the key determinants of growth, but now this is acknowledged by the researchers that even these factors are failed to enhance the economic growth in the absence of effective institutions¹. Better institutional quality speeds up technical change, reduces macroeconomic volatility and leads to long term economic growth². If quality institutions are important for economic development then it is necessary to find out what determines institutional quality.

With a suitable definition of the quality of institutions and its link to economic development, one finally can focus on the determinants of institutional quality. The efficient allocation of scarce resources, especially in view of inter-temporal decisions (such as investment, saving, lending or research and development) requires efficient economic institutions. Furthermore, institutions are said to be efficient

"If there is no feasible alternative for the state to create and enforce property and contract rights that everyone finds at least as good and which at least one of the

¹ For more discussion see (Jones, 1981 and North, 1981).

² See Tang et al, (2003)

economic actors strictly prefers. It further assumes no wealth effects (Milgrom and Roberts, 1992).

It simply means that the political power and wealth of people have no effect on the rules and regulation of institutions, if we take the example of legal institutions and economic or overall institutions in a country then the efficient institutions will be those that implement property rights, ensure economic freedom in each situation and the political power of authority and wealth of individuals have no effect on these set of laws. Efficient institutions are not supposed to fall like manna on earth from heaven; neither will they emerge from logical self-interest. Slightly they have to be deliberately and collectively produced (Borner, Bodmer and Kobler, 2004). After the preceding explanation of what institutional quality means, a central question arises i.e. how to create these efficient institutions or what is needed to improve the quality of institutions.

There are two types of factors which may be essential for the improvement of institutional quality (IQ). Factors like colonial origin, ethno linguistic fragmentation, geographical location of a country, and endowment of natural resources may be important for IQ but these factors are beyond of economic policy. These variables indirectly affect institutional quality or these variables affect institutional quality through other variables (Alonso and Garcimartin, 2013). On the other hand, development level, education, taxes, income distribution, foreign aid, openness to trade, income inequality are the significant factors that are directly related to institutional quality and lie under the ambit of economic policy (Siba, 2008; Alonso and Garcimartin, 2013; Javiad and Iftikhar, 2011; Islam, 2002). Similarly, control of corruption, voice and accountability rule of law government effectiveness, labor freedom, civil liberties also matter for

political and economic institutional quality (Javed, 2013). Institutions are not only affected by non-institutional factors but the presence of other related institutions are also important for the health of the institution.

The concept of complementarities describes that Institutional complementarities exist if the co-existence of institutions enhances the returns available from other institutions.

“One set of institutional practices can be said to be complementary to another when each raises the returns available from the other (Hall & Gingerich, 2004)”.

Literature has shown that the capacity of the legal institutions to protect property rights, reduce transactions cost and lessen uncertainty lead to the development of economic institutions quality, which in turn lead to economic development (it means in the presence of legal institutions economic institutions work well). One reason behind the development community is trying to foster judicial and legal reforms is the belief that beyond their intrinsic worth these reforms will help to enhance economic development. This belief in the power of judicial, political and legal reforms to spur economic growth is now supported by a rising body of research which shows that economic progress is affected by the quality of a nation’s legal institutions and political institutions (Stephenson, 2005). The argument that the existence of some institutions is important for another will be taking into account in the complementarities of institutions.

The previous literature barely makes a clear difference between political and economic institutions. Empirical work frequently combines them with labels like ‘good

government' or 'political instability'³. Some studies combined legal institutional indicators with economic institutional indicators, so the aim of this study is to develop different indices as economic, legal, political and overall institutional quality following the definition of Joskov (2008) who defined institutions according to their subject category into three different groups (economic, legal, political), and the overall IQ will be developed so as to have a broad idea of every aspect of institutions. In this study we will take into account those variables that are missing from previously developed indices of institutions quality⁴. All institutional indicators will be clustered into three homogenous groups (economic, legal, and political) which will completely capture the formal institutions environment in a country. Asia is the region of interest because of its diverse scenario in terms of current state of economic growth, socio-cultural norms, institutional architecture and these above mentioned indices will be developed for the first time from Asian perspective. This study answers the questions: What determines institutional quality in Asian countries? How the co-existence of legal and political institutions affects economic institutional quality?

1.2. Objectives of the Study

The present study aims to achieve the following objective i.e.

- i) To construct economic, legal, political and over all institutional quality indices.

³ See Alesina *et al.*, (1996); La Porta *et al.*, (1999)

⁴ Investment profile, freedom from corruption, fiscal freedom, government spending, labor freedom, trade freedom, investment freedom, socioeconomic conditions, ethnic tensions, external conflict, government effectiveness indicators are missing from previous developed indices we will take into account these variables to capture the full environment of each aspect of institutional quality in a country.

- ii) To identify the potential determinants of political, economic, legal and overall institutional quality in Asian countries and finally.
- iii) To check institutional complementarities for economic institutions.⁵

1.2. Hypotheses of the Study

This study has hypothesis i.e.

- i) Development level (real GDP per capita), education, tax revenue and social media significantly improve the quality of institutions.
- ii) Population growth, income inequalities and foreign aid negatively affect the quality of institutions.
- iii) The co-existence of legal and political institutions positively affects economic institutions quality.

1.3. Organization of the Study

This study is preceded in a way that Chapter 1 discusses introduction of the study. Literature review of the study is presented in Chapter 2. Theoretical frame work, Data and Variables are discussed in Chapter 3, tests of the data, results and conclusion are discussed in Chapter 4, 5 and 6 respectively.

⁵ To check the impact of legal and political institutional quality on economic institutional quality.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

An important chain of thought is that developing countries should first increase their level of institutions quality if they are interested to step up the pace of economic development or economic performance. As literature has pointed out that building quality institutions are a panacea for bad economic growth/performance. In this chapter, we aim to highlight a broader perspective on development and growth and look at this process as an outcome of past and current actions and difficult connections among an array of the interconnected factors.

2.2. History of Institutions

Adam Smith was the first who underlined the importance of institutions long time ago (1976) as he described the role of institutions as

“Commerce and manufactures, in short, can seldom flourish in any state in which there is not a certain degree of confidence in them justice of government (or in other words, “rule of law” an important institutional factor) (Smith, 1976)”.

He further emphasized on the part played by institutions by saying that differences between different countries were explained by institutional factors. But sadly the neo-classical economics ignored the role played by institutions and assumed free-market and perfect competition base for Pareto Optimality just by taking into account the role of labor and capital in their production function (Ugur, 2010). Such type of

production function does not explain income differences across developed and developing countries and it's because this production function is mismatched with regard to the contract enforcement and efficient property rights (Rodrik, 2000). Attention to the importance of institutions was given in 1980's with the awareness through the liberalization reforms that institutions were mandatory for incentive structure of price signal to work for increasing state welfare (Rodrik, 2000).

A pro-development institutional structure puts in place the role played by institutions as this frame work considers institutions to protect property rights, enforce contracts and provide a better environment where a culture can grow in terms of human capital, good education and better demarcated civilization (Shirley, 2008).

The Solow Swan model is based on Cobb Douglas production function implies that the rate of return on capital in developing countries will be largest multiples of those in developed countries, but this assumption is not met by data (Mankiw, 1995). This was the indication of the fact that this model does not explain some of the facts about differences across developed and developing countries growth and income level. In sum this outcome gave rise to the new theories of growth as theories of conditional and unconditional convergence of per capita income⁶. Over the last few decades the emergence of NIE (new institutional economics) gave rise to the literature that pushed aside the power of other explanatory variables as it now takes into account that how institutions matter a lot in explaining differences in growth across countries. North (1992) described the importance of institution as

⁶ Unconditional convergence refers to the tendency of poor countries/regions to grow faster than rich countries, while conditional convergence refers to convergence that depends on a determinate steady-state income level.

“it is one thing to describe the characteristics of economic change; it is something else to prescribe the correct medicine to improve the performance of economies. We simply do not know how to transform ailing economies into successful ones but some fundamental characteristics of institutions suggest some clues (North, 1992)”.

This means that institutions matter a lot in determining cross country variation in economic development.

2.3. Evolution of Institutions

Acemoglu et al (2008) have observed the evolution of institutions in a history under the influence of colonization experience and the extraction that took place, he took mortality rate as an instrument for institution and came to the conclusion that institutions development depends on the depth of these settlements and this determined current differences in per capita income across countries. Acemoglu et al (2003) furthermore pointed out that the countries having existing weak institutions because they inherited these institutions from the their colonizers this is resulted in their failure of formulation of micro and macroeconomic policies and this is now important to cure these institutions, as reforms should be made as this is the underlying reason of suboptimal micro and macro policies.

2.4. Role of Institutions

Countries where property rights are efficiently protected by institutions resulted in higher long run growth, increase in investment rates, good stock markets, while legal institutions (law and order, enforcement of property rights among citizens) may have not a direct impact on the economic growth rather it has an indirect influence on financial intermediation (Acemoglu and Johnson, 2005). Acemoglu (2006) also described the role

of political institutions as they put economic institutions under their preferences so as the resources from the public could be transferred to them this results in consolidating power, factor price manipulation and revenue extraction. He further pointed out that the purpose of fiscal instruments is to enhance economic development through better allocation of the resources but the measure of taxation gives more power to the ruling elite's results in political conflicts. Similarly institutional quality has a significantly positive impact on real GDP per capita (Alfonso and Jalles, 2011). The empirical framework uncovers three channels through which political institutions can influence economic development. The first is the direct effect on productivity (the Solow residual), the second operates through capital accumulation, and the third works through the effect of the quality of economic institutions. Political institutions are important only as determinants of efficient economic institutions. The simple two-way correlations between growth rates on the one hand and the measures of the form and stability of political institutions and the quality of economic institutions on the other indicate from the start that democracy and the quality of institutions are highly correlated with growth rates.

2.4. Policy Irrelevant Determinants

The NIE literature pointed out the sources that caused institutions of a country being underdeveloped but these factors are beyond of economic policy or policy irrelevant (Shirley, 2008).

The colonial heritage argument is based on the idea that historical institutions persist and play a vital role to shape the current institutions. According to this viewpoint the countries' having poor institutions is because they inherited these institutions from European colonizers. Legal origin is used as a proxy to investigate the power of colonial

institutions on present activities of the societies (La Porta et al 1999, Straub 2000 and Islam et al 2002). The areas where the disease atmosphere and climate were not encouraging for European colonizers to stay, then resources are to be extracted. They introduced extractive institutions in those areas and this is the reason that these same colonizers set up different institutions in different regions or countries (Acemoglu et al 2004). Europeans adopted high quality institutions in those regions where their mortality (mortality rates for bishops, soldiers and sailors) rate was low (Johnson and Robinson, 2001). But the later studies didn't support the argument of persistence of colonial institutions and came to conclude that colonial powers (identity of former colonizer variable) have no significant relationship with IQ (rule of law is used for the proxy of IQ) (Siba, 2008; Alonso and Garcimartin, 2013).

Country legitimacy hypothesis describes that the similarity between pre-colonial and colonial institutions matters a lot in forming the current quality of institutions. To understand the current environment of institutions it is necessary to consider colonial and post-colonial policies of the rulers (Fors and Olsson, 2005). The state legitimacy is positively related to the state capacity⁷ (Siba, 2008).

Ethnic fractionalization is also the major responsible factor of poor institutions in many countries that led these countries to adopt weak policies, social polarization and established interest groups in these countries and as a result increased the possibility of selecting sub-optimal policies from social point of view (Easterly and Levine, 1997). They found ethnic diversity⁸ is one of the significant determinants of poor institutions and weak policies and low growth in international cross section regressions. However

⁷ State capacity is proxied by ICRG indicators.

⁸ Measured by ethno-linguistic fractionalisation index

Alsono and Garcimartin (2013) didn't find significant relationship between IQ and Ethnic fractionalization and argues that ethnic fragmentation affect IQ but through the unequal income distribution in Asian countries as well as in European countries. While Englebert (2000) also did not find significant relationship between governance indices and ethnic fractionalization. He argued against the above mentioned proposition by saying that the stories of Africa's success are not much different from the stories of failures in terms of Africa ethnic composition and as a result failing to account for the changes in state capacity pragmatic across Africa.

Some of the arguments based on the proposition that poor institutions resulted from little political competition or lack of internal conflicts. As the structural conditions for institutions building and state formation in Europe were not present in Africa. There were no disputes over land in Africa unlike Europe, so in pre-colonial time period there was a little dispute over land so little incentives were there for the rulers to develop institutions, except the places where European were in large number. Even after independence these boundaries were made to determine the structure of newly formed states by United Nations and international state system so again preventing disputes over borders and as a result African countries again did not develop such institutions that might efficiently guard territories (Herbst, 2000; Nugent and Robinson, 2002).

Social conflict theory of institutions considers political constraints as the determinant of institutional quality because these constraints on ruling elites can limit their power and limit the range of policies they can follow and private property institutions are more expected to endure or raise (Acemoglu et al, 2004). Empirical results have shown that the higher the number of check and balance between legislative,

judicial power and executive are the important determinants of institutional quality and these checks and balances between various branches of government have significant effect on rule of law across countries (Islam et al, 2002; Siba, 2008).

2.6. Policy Relevant Determinants of IQ (Institutional Quality)

While there are some other factors identified by the literature that have a direct effect on institutional quality as development level (real GDP per capita), education, taxes, income distribution, foreign aid, openness to trade, income inequality are the significant factors which directly relate to institutional quality and lie under the ambit of economic policy (Siba, 2008; Alonso and Garcimartin, 2013; Javiad and Iftikhar, 2011; Islam, 2002). Similarly, control of corruption, voice and accountability rule of law government effectiveness, labor freedom, civil liberties also matter for political and economic institutional quality (Javed, 2013).

Actually New institutional economics highlights that institutions change is the result of a favorable environment where investment takes place in the presence of secure property rights, better law and order situation, more economic freedom, transaction cost decreases through providing education to the people, so that people can contribute to economic growth. The recent study aims to discover such factors that hold significance in enhancement of institutional quality (the legal, economic and political institutional quality).

2.7. Contribution of the Present Study

The present study contributed to the literature of institutional quality from three aspects. First, as previous studies have hardly differentiated political institutions from legal institutions or political institutions from economic institutions, while in this study

we divided institutional indicators into three groups as political, economic legal and overall IQ and constructed their separate indices⁹ (we considered those variables that are missing from previous developed indices in order to make them more comprehensive). Second, Social media has become an important pillar in the modern world in identifying pitfalls in government policies and creating public awareness about good and bad actions taken by different organizations and institutions. But the impact of this important factor has never been analyzed. The impact of social media and population on IQ's (political, legal, economic and over all institutional quality) analyzed for the first time in this study from Asian perspective. Third, this study took into account the complementarities of institutions that how one set of institutions can work in the presence of other set of institutions.

⁹ Investment profile, freedom from corruption, fiscal freedom, government spending, labor freedom, monetary freedom, trade freedom, investment freedom, Socioeconomic Conditions , Ethnic Tensions, External Conflict, government effectiveness indicators are missing from previous developed indices we will take into account these variables to capture the full environment of each aspect of institutional quality in a country.

CHAPTER 3

DATA AND METHODOLOGY

3.1. Theoretical Background

Different factors contribute to the bad development performance of a country but there is a general consensus that bad institutional quality is the major responsible factor in many Asian and African countries. The factors that can affect institutional quality are discussed below.

3.1.1. Foreign Aid and Institutional Quality

The capital fundamentalism started after World War 2, as the main source of development was thought to be lied in the accumulation of capital; this idea was presented in the models of Arthur Lewis and Harrod Domar. Countries exercised this idea and fell short of enough savings to finance their economic activities. This phenomenon generated the concept that foreign aid could be a good source to fill the gap between national savings and needed investment. But the described channel was proved to be empirically weak, unreliable and unstable.

“The aid-financed investment fetish has led us astray on our quest for growth for fifty years. The model should finally be laid to rest” (Easterly, 2001).

The recent aid institution paradox literature has been taken foreign aid as extractable rents present in most of countries (Siba, 2008). Dependence on foreign aid reduces the tax effort which is argued by many has a basic role in development of institutions in countries. As foreign aid provides non-earned source for state as a result

governments have less incentives to collect tax and to get better its tax administration (Brautigam and Knack, 2004). Another drawback of aid has been argued to weaken the relationship between government and its citizens. As high reliance on aid can result in reduction government accountability and less support from public, as then government no longer feel the need of public support and assent of legislatures when they are not going to raise revenues from their economy. This situation leads to an incredible social contract between state and its citizens (Moss, 2006).

3.1.2. Income Distribution and Institutional Quality

Income distribution can affect IQ through different channels, political as well as economic. For example if there is unequal distribution of income then economic activities will reduce as poor people will find rent seeking activities more attractive than market activities and will try to improve their life style or cope with rich part of population. If a large part of population is poor then under democratic system there will be more redistributive policies¹⁰. Such a deprived society will show less respect to the government rules and policies. This situation leads to political instability, conflicts and insecurity in a system (Alonso and Garcimartin, 2013). The higher is unequal distribution in a society the wider will be swings in policy as clear from the case of Latin America where large swings in policy and resulting macroeconomic cycles have been observed over time and in the end players will never accept such rules of the games which aims at improving the life of specific players (Keefer and Knack, 2000). The significance of Gini index implies that more equitable income distribution improves the quality of institutions (Alonso and Garcimartin, 2013).

¹⁰ For more discussion see (Alesina and Perotti, 1994; Keefer and Knack, 2000)

3.1.3. Development Level and Institutional Quality

Development level is defined as (log) real GDP per capita income (Chong and Zanforlinm 2000, Islam and Montenegro, 2002, Rigobon and Rodrik, 2004). The countries having higher rate of per capita GDP can afford and enhance demand for better quality institutions. If we take institution as public good then its effect will be efficient in those countries having higher rate of GDP and lower in countries with lower rate of GDP, if a country size is large then it is difficult for the state having lower rate of GDP to make available public good (law and order, property rights, accountability etc.) for all of its population. This will lead to chaos and failure of state to maintain its higher level of institutional quality and people will feel hesitation to invest and will suffer from other moral crises. On the other hand the opposite situation as higher per capita income countries have resources to build up strong institutions that helped those countries to invest and led to economic activities. As economic activities increase in a country, good institutions become affordable (North, 1981). If a country institutional quality is better it can be resulted in higher levels of output and higher economic growth (Islam, 2002). The positive relationship between both variables is confirmed by previous from research Asian perspective as well from other regions (Chong and Zanforlinm 2000; Islam and Montenegro, 2002; Rigobon and Rodrik, 2004; Alonso and Garcimartin, 2013; javed and iftikhar, 2011).

3.1.4. Education and Institutional Quality

The state responsibility is not only to protect property rights and to foster development but there are some other activities that are important for high quality institutions as an able civil service and dedicated citizens serve the common good and not

go for in pursuit of private interest can be only the output of an educated society. North (1994) underlined the importance of education as it promotes learning, understanding, competitiveness, innovation and thus as a result enhancing economic activity. Education has also an important role in improving political institutional quality as spending in education sector is likely to produce more enlightened political agents and political policy makers. An educated society demands transparent and more dynamic institutions and also permits to build them (Alonso and Garcimartin, 2013). The work of Alesina and Perotti (1996) found the significant impact of education on political institutional quality. Also, in the literature on corruption, the education effect has been detected in works as those of Glaeser and Sacks (2006). Education has significant impact on Doing Business Indicators (DBI) (Alonso and Garcimartin, 2013). Chong and Calderón (1997) analysed the correlation between institutions and education and came to the conclusion that educated population is expected to produce less corrupted bureaucracy and as a result efficient institutions.

3.1.5. Population and Institutional Quality

The idea of the relationship between country size and democracy is very old¹¹. The Greek philosophers Aristotle and Plato believed that a small size population was vital for a well-functioning democratic state. Such views about the importance of small population can be found in the writing of later philosophers Rousseau and Montesquieu. This is the reason that most of economists and political scientists are interested in the

¹¹ The country size can be measured through geographic size or population size but measuring country size through geographic size has the drawback that it may serve as good proxy for natural resources.

effects of population or country size on economic growth (Easterly and Kraay (2000); Diamond and Tsalik, 1999).

Geographic size may have a very little impact on economic growth it may be because the land area can serve as good proxy for natural resource profusion and there are very little evidences that land area is correlated to the economic development of a country (Armstrong, 2003).

The prosperity of a country depends on the standard of living of its individuals as the Americans have a better standard of living as compared to Asian countries as these countries are facing the problem of over population, too many people to feed and fewer resources on hands have a quite devastating impact on the economy of these countries (in India population growth is very higher than countries economy could handle). Institutions are just like public good, for example if we take an example of public road that is used by a lot of people in one day then it will become more prone to deterioration. It is hard for the state to keep check and balance on large population. In case of large population the rule of law then just becomes mere a helpless tool, so a more populated country is more corruption prone, more violation, less accountability thus lead lower the quality of institutions. Rigobon and Rodrik (2005) analysed the impact of land area and population on democracy and found that population had significantly negative impact on democracy while land area found to have no effect on democracy. Siba (2008) analysed the impact of country size on IQ and came to the conclusion that “institutional indicators (rule of law etc.) are taken as public good whose effects are less efficient when its country size increases. However in this study from a different perspective we are going to analyze the impact of population on IQ. The main reason for including population as an

explanatory variable is to see how a game (institutions) behaves in the presence of so many players.

3.1.6. Social Media and Institutional Quality

In the past decades the internet has become not only the key instrument of worldwide communication but also emerged as a tool through which institutions quality can be enhanced. Internet is an efficient medium through which people can express their views without any favour and fear about their political system which results in increasing demarcating accountability and transparency. It also provided opportunities to improve socioeconomic development (fosters exchange of goods and services, lessons transaction cost) and governance in the developing countries (UNDP, 2005). The countries where state has monopoly over mass media, it becomes difficult for the people to voice their political views. In Indonesia internet has played a major role in breaking the monopoly of state over mass media (Gumilar, 2003). Internet has played a significant role in forming relationship between its people and government (Rananand, 2003). It took the form of a forum through which human rights and democratic activists mobilize and advocate for social, political and economic reforms. Many democratic states have implemented restrictions in reaction to potential economic, legal and security challenges pointed out by the new media. This is the reason that freedom of media is often called the fourth power in a country after judicial, executive, and legislative powers (Borner *et al.*, 2013). So it is important to take into account the role of internet because it covers different aspects of social, economic, legal and political freedom.

3.1.7. Taxes and Institutional Quality

Taxes are the important determinants of IQ. Taxes affect IQ through different channels, but fiscal policy and government spending are very important. Government spending doesn't affect IQ directly but they serve as a proxy of IQ setting that a state creates and constitute policy measures (Tanzi and Zee, 1997). Sound system of taxes provides not only revenues for government spending (on education, health, infrastructure etc.) which leads to economic activities and provides means to build up better quality institutions but also improve the consolidation of a social contract that lead to a more demanding relationship between people and state and as a result there will be higher accountability and transparency, which lead to higher quality institutions (Tilly, 1992).

In this study from a different perspective we will analyze the impact of social media (internet) and population on institutional quality for the first time. Following our above theoretical framework, we can express that institutional quality (Political, legal, economic and over all institutional quality) is the function of development level, education, foreign aid, population, social media, taxes and income inequality as follow

Institutional quality= f(development level, education, foreign aid, population, social media, taxes, income inequality)

3.2. Data

This analysis is based on secondary data which covers the time period from 1990 to 2013 for Asian countries Pakistan, Sri Lanka, Philippines, India, Bangladesh, Thailand, Singapore, Malaysia, Indonesia, Iran, China and Jordan. The data on dependent variables as overall institutional quality, political, economic and legal institutional quality were

taken from different sources¹². Variables of the indices with definition and sources are given in appendix-I table 3.2 while the definitions and sources of the explanatory variables are given in table 3.1.

Table3. 1: Definitions and Sources of Explanatory Variables

Variable	Definition	sources
Real GDP per capita	GDP per capita, PPP (constant 2011 international \$) GDP Per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using PPP rates.	World Bank
GINI index	GINI index measures the extent to which the distribution of income or consumption expenditures among individuals or households within an economy deviates from a perfectly equal distribution.	World Bank
Population	Population represents all residents regardless of legal status or citizenship except for refugees	World Bank
Social media	Internet users (per 100 people), Mobile cellular telephone subscriptions are subscriptions to a public mobile telephone service using cellular technology, which provide access to the public switched telephone network. Post-paid and prepaid subscriptions are included.	WDI
Taxes	Tax revenue (% of GDP) refers to compulsory transfers to the central government for public purposes.	World Bank
Foreign aid(% of GNI)	Net official development assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies.	World Bank

Education	Adult Literacy rate (% of people ages 15 and above) is the percentage of the population age 15 and above who can, with understanding, read and write a short, simple statement on their everyday life.	WDI
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3.3. Construction of the Indices (Legal, Political, Economic and Overall IQ)

To measure the quality of institutions, researchers have either used all components of the index or taken few components or even a single component that best suited the objective of their study. Various studies have used composite index measure (for example see Rodrik, 1997; Hall and Jones, 1999) or a single indicator for example Rodrik (1999) used only bureaucratic quality indicator, Mauro (1995) employed only corruption indicator, Sala-i-Martin (1997) and G.siba (2008) used only the rule of law, Clarke (2001) used rule of law and risk of expropriation and so on. Papaioannou (2009) and Younus (2009) constructed an institutional quality index by taking the sum of all the twelve indicators included in the ICRG dataset. World Bank Governance indicators average (Voice and Accountability, Political Stability, Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption) is used by Alonso and Garcimartin (2013). But in this study we will employ principle component method to develop composite indices of institutional quality (political, economic, legal and over all institutional quality).

3.3.1. Principle Component Analysis for Construction of IQ Indices

Following Nagar and Basu (2002) who used a technique of PCA to construct a composite index where PCA is a multivariate statistical technique that can be used to

reduce the number of variables in a dataset by converting them into a smaller number of components, each component being a linear weighted combination of the initial variables x_1, x_2 so on (Vyas and Kumaranayka, 2006). The first component y_1 , which explains the largest part of the variation in the data is chosen as an index (Filmer and Pritchett 2001, Sahn and Stifel 2003, McKenzie, 2005). We postulate that IQ, PIQ, EIQ and LIQ are the latent indices which cannot be represented by a single variable and cannot be measured in a simple way rather it is linearly determined by several exogenous variables like $x_1, \dots, \dots, \dots, x_k$ using the method of PCA. Where these x_1, \dots, x_k are total numbers of those variables that are used to obtain y_1 which is the first component that explains the largest variance in these variables so its values will be used as weights for the computation of IQ index.

In order to construct an index we will follow the following steps.

1. The indicators (as reported in table appendix-1) will be normalised by using the following formula. This is important as our indicators contain different ranges in order to overcome this problem and data will be normalised between (0, 1).

$$I_n = \frac{X_t - X_{min}}{X_{max} - X_{min}}$$

Where I_n is normalised indicator, X_t is the current value of the indicator, X_{min} and X_{max} are the maximum and minimum values of the variable.

2. In order to obtain an index, the weights are assigned to these normalised variables and are obtained by using principle component analysis as below¹³

$$IQ = \frac{w_1 * I_{n1} \dots \dots \dots W_k * I_{nk}}{n}$$

Where n is the total number of normalised variables while IQ is overall institutional quality index the $w_1 \dots \dots w_k$ are the weights given to the normalised variables $I_{n1} \dots \dots \dots I_{nk}$ respectively. The same procedure will be repeated for the construction of other indices. The correlation matrixes of political, economic and legal institutional quality indicators are given in table 3.3, 3.4 and 3.5 respectively in appendix. The correlation between judicial independence and impartial courts is 0.9 which is very high, correlation between impartial courts and rule of law is 0.67, 0.84 between rule of law and property rights, in sum most of the indicators of legal institutional quality are highly correlated. While the correlation between economic institutional quality indicators mostly 0.7, 0.6, and 0.5, the correlation between political indicators is also high and some of the indicators as 0.9, 0.7 and 0.6.

From the correlation tables we can see that most of the correlation values (in absolute term) between indicators are greater than 0.4 which means most of our observed indicators are correlated with each other. This implies that there must be some unobserved latent factors that can be represented by an index.

¹³ In PCA the first component accounts for largest variance in data so we will use its values as weights. The standard approach is to take into account all those components for which Eigen values are greater than one.

3.4. Estimation Methodology

To measure the impact of explanatory variables as education, social media, population, Gini index, real GDP per capita, taxes and foreign aid on IQ_{it} , PIQ_{it} , EQ_{it} and LQ_{it} we employed a panel of Asian countries over 1990-2013. However before carrying out panel estimations, it is necessary to check the nature of the data and choose an appropriate estimation technique. The important issues that must be addressed here are to check that whether the data is stationary or having a unit root, individual effect exists or we should estimate a pool equation with both common intercept and slopes, if individual effects exist then whether they are period specific or cross-section specific or both, whether the unobserved individual effects are fixed constant or randomly distributed independent of the explanatory variables etc.

3.4.1. Panel Unit Root

Before proceeding it is important to check the nature of data because our selected time period is large enough and it requires testing whether our selected variables have unit root or stationary. It is important to know the nature of data because the regression of non-stationary variable on other non-stationary variable may lead to spurious results. There are two groups of panel unit root tests, one group treating the persistence parameters that is $\eta_i = \eta$ constant across the cross-section are the Breitung, Levin, Lin, and Chu (LLC) and Hadri tests and the other group treats these parameters as cross-section specific are the Fisher-ADF, Fisher-P, the Im-Pesaran, and Shin (IPS) tests. To be more certain about the results of stationarity we will use Im-Pesaran-Shin test (IPS), Chia-Chang James Chu test (LLC), the Fisher-Augmented Ducky Fuller-Chi-square test. Levin, Lin and Chu (2002) specified the following three alternative models.

$$\Delta y_{it} = \eta y_{it-1} + v_{it} \quad (3.1)$$

$$\Delta y_{it} = \alpha_{oi} + \eta y_{it-1} + v_{it} \quad (3.2)$$

$$\Delta y_{it} = \alpha_{oi} + \alpha_{1it} \eta y_{it-1} + v_{it} \quad (3.3)$$

The error term v_{it} assumed to be independent across all cross sections and follow the ARMA stationarity process for each of the cross section.

$$v_{it} = \sum_{p=1}^{\infty} \phi_{ip} v_{it-1} + \varepsilon_{it} \quad (3.4)$$

The above models are consisting three data generating processes. The first model test the null hypothesis that $H_0: \eta = 0$ against the alternative hypothesis $H_1: \eta < 0$ while in the second model y_{it} has no trend but a cross section specific mean, unit root test evaluate the null hypothesis of the second model as $H_0: \eta = 0$ and $\alpha_{oi} = 0$ against the null hypothesis that $H_1: \eta < 0$ and $\alpha_{oi} \in \mathcal{R}$. y_{it} series in the third model has cross section specific mean and a time trend, the null hypothesis of the model is $H_0: \eta = 0$ and $\alpha_{1i} = 0$ for all i against the alternative hypothesis that is $H_1: \eta < 0$ and $\alpha_{oi} \in \mathcal{R}$. The test proceeds as follow:

1. ADF regressions are carried out for each of the cross section and then two orthogonalized residuals generated
2. The ratio of long run innovation standard deviations to the short run innovation standard deviation is estimated and
3. In the last pooled t-statistics is estimated.

3.4.2. The Im-Pesaran-Shin Test

This test proceeds as follow;

$$y_{it} = \alpha_o + \eta_i y_{it-1} + v_{it} \quad (3.5)$$

Where $t = 1, 2, 3, \dots$

The null hypothesis of the study is

$$H_0: \eta_i = 1 \text{ and } i = 1, 2, 3, 4 \dots \dots N$$

And the alternative hypothesis is

$$H_1: \eta_i < 1, i = 1, 2, 3, 4 \dots N \quad \eta_i = 1, i = N_1 + 1, N_1 + 2 \dots \dots N$$

Im-Pesaran-Shin suggests separate unit root tests for the N cross-sections. The ADF regression:

$$\Delta y_{it} = \alpha_0 + \eta_i y_{it-1} + \sum_{j=1}^{\eta_i} \phi_{ij} \Delta y_{it-j} + \varepsilon_{it} \quad (3.6)$$

After the estimation of the above model, for testing hypothesis t-statistics is computed. This test is based on the assumption that t is same for the whole cross sections and mean and variance are also same for all cross sections, so IPS test is considered to be applied for balanced data. The third test used is the extension of ADF test.

3.4.3. Multi Co-linearity

The higher level correlation between explanatory variables lead to higher standard errors of the estimators, so as to take into account the problem of multi co-linearity the simple correlation coefficient matrix is calculated. The correlation coefficients values are reported in table 4.2.

3.5. Estimation Technique

To measure the impact of above mentioned variables on IQ, we employed a panel of 12 countries Pakistan, Bangladesh, India, Sri Lanka, Iran, Jordan, Singapore, Thailand, Philippines, China, Malaysia and Indonesia over 1990-2013. Thus our data constitutes the nature of panel data, the panel data estimation is known as the most efficient analytical tool for analysis because in this method we can include data for different countries and

different time periods, as it has time-series and cross sectional dimensions. Besides this property there are some other advantages of using panel data as the sample size increases it leads to better estimates. Panel data provides information on individual behavior, both across individuals and over time. We can also control for those variables that are not directly measureable or observable e.g. culture. Panel data accounts for the individual heterogeneity, tackle the problem of omitted variable bias. We can write our empirical model in a very general form as below:

$$IQ_{it} = a_0 + u_i + y_t + \beta_{it}X_{it} + e_{it} \quad (3.7)$$

This is the unrestricted form of equation, where intercept is consisted of three parts a_0 is same for all countries and periods u_i represents country specific unobservable effects, while y_t represents time specific unobservable effects. The mean of unobservable effects are represented by a_0 . β_{it} represents slope parameters that vary across countries and time periods. X_{it} is the vector of all explanatory variables. All unobservable effects are represented by the error term e_{it} . The above mentioned equation cannot be estimated in this form, so we rewrite the above equation (3.7) assuming β_{it} constant for all countries and time periods, thus it becomes a vector of parameters one parameter for each explanatory variable. Thus equation (3.7) becomes as follow:

$$IQ_{it} = \alpha_0 + u_i + y_t + \beta_1Dev_{it} + \beta_2Gin_{it} + \beta_3Tax_{it} + \beta_4Edu_{it} + \beta_5Som_{it} + \beta_6Pop_{it} + \beta_8Aid_{it} + e_{it}. \quad (3.8)$$

Where IQ_{it} is overall institutional quality in country i at time period t. While the explanatory variables are development level (real GDP per capita), Gini index, taxes, education, social media, population and foreign aid respectively. The same specification

of the model will be used for the dependent indices of PIQ_{it}, EQ_{it} and LQ_{it} (indices of political, economic and legal institutional quality respectively).

3.5.1. Tests for Individual Effects

Country specific effects are omitted under pooled OLS estimation. If the individual specific (unobservable) effects are correlated with regressors then OLS estimates will be biased (Cheng Hsiao, 2003). So as to test for the individual effects three types of restrictions will be imposed on the unrestricted model 3.8. First we take into account time specific effects and assume no cross section effects. We take the original unrestricted equation as follow:

$$IQ_{it} = a_0 + u_i + y_t + \beta X_{it} + e_{it} \quad (3.7)$$

In first case we only consider time specific effects and assume no cross section effects.

$$IQ_{it} = a_0 + y_t + \beta X_{it} + e_{it} \quad (3.10)$$

and test below hypothesis as;

$$H_0: u_1 = u_2 = u_3 = u_4 \dots u_N = 0$$

Under the null hypothesis $RSS_R - RSS_U$ (residual sum of square) of model is divided by variance and following by chi-square distributions with degree of freedom as $NT - (2K + 1)$ and RSS_U of unrestricted model (3.7) as divided by variance following chi-square distribution with degree of freedom $N(T - 1) - 2K$ and RSS_U /variance is not dependent with $RSS_R - RSS_U$ /variance which follows chi-square distribution having degree of freedom as $N-1$. Under null hypothesis the F statistic becomes as below:

$$F = \frac{(RSS_R - RSS_U) / (N-1)}{RSS_U / [N(T-1) - 2K]} \quad (3.11)$$

The null hypothesis will be rejected if F-test with degrees of freedom $[N(T - 1) - 2K]$ and $(N - 1)$ is significant and the model will be estimated only with cross section effects.

In the next step we consider only cross section effects and assume time specific effects equal to zero:

$$IQ_{it} = a_0 + u_i + BX_{it} + e_{it} \quad (3.12)$$

And test the hypothesis as below:

$$H_0: 1y_1 = y_2 = y_3 = \dots = y_T = 0$$

The F statistic becomes as;

$$F = \frac{(RSS_R - RSS_U)/(N-1)}{RSS_U/[N(T-1)-2K]} \quad (3.13)$$

If F test with degree of freedom is significant then null hypothesis will be rejected and we will estimate the model with only time specific effects.

The third restriction that will be imposed on the unrestricted model is to assume time specific and cross section specific effects equal to zero.

$$IQ_{it} = a_0 + BX_{it} + e_{it} \quad (3.14)$$

$$H_0 = u_1 + u_2 + u_3 \dots \dots u_n = 0, y_1 + y_2 + y_3 \dots \dots y_t = 0$$

The F statistic becomes as follow:

$$F = \frac{(RSS_R - RSS_U)/(N-1) + (T-1)}{RSS_U/[N(T-1)-2K]} \quad (3.15)$$

The null hypothesis will be rejected when F test with degree of freedom $(N - 1) + (T - 1)$ and $[N(T - 1) - 2K]$ is significant, then we will never use common effects model.

The same process is repeated for other three equations for which we just replaced IQ_{it} of equation (3.8) by PIQ_{it}, EQ_{it} and LQ_{it} (indices of political, economic and legal

institutional quality respectively) are given below. Results for the individual effects are reported in table 4.3.

$$LIQ_{it} = \alpha_0 + u_i + y_t + \beta_1 Dev_{it} + \beta_2 Gin_{it} + \beta_3 Tax_{it} + \beta_4 Edu_{it} + \beta_5 Som_{it} + \beta_6 Pop_{it} + \beta_8 Aid_{it} + e_{it}. \quad (3.16)$$

$$EIQ_{it} = \alpha_0 + u_i + y_t + \beta_1 Dev_{it} + \beta_2 Gin_{it} + \beta_3 Tax_{it} + \beta_4 Edu_{it} + \beta_5 Som_{it} + \beta_6 Pop_{it} + \beta_8 Aid_{it} + e_{it}. \quad (3.17)$$

$$PIQ_{it} = \alpha_0 + u_i + y_t + \beta_1 Dev_{it} + \beta_2 Gin_{it} + \beta_3 Tax_{it} + \beta_4 Edu_{it} + \beta_5 Som_{it} + \beta_6 Pop_{it} + \beta_8 Aid_{it} + e_{it}. \quad (3.18)$$

In order to find complementarities of institutions an interactive term of political and legal institutional quality is added in equation 3.17 the equation becomes as below:

$$EIQ_{it} = \alpha_0 + u_i + y_t + \beta_1 Dev_{it} + \beta_2 Gin_{it} + \beta_3 Tax_{it} + \beta_4 Edu_{it} + \beta_5 Som_{it} + \beta_6 Pop_{it} + \beta_8 Aid_{it} + \beta_9 PIQ_{it} * LIQ_{it} + e_{it}. \quad (3.19)$$

3.5.2. Fixed Effects versus Random Effects Hausman Test

There are two techniques to analyze panel data. These are Random effects model and Fixed effects model. We suppose there is unobservable heterogeneity across individuals that is captured by α_i 's and it may be the unobservable ability of individuals that affects IQ. Now the question arises if individual effects exist whether they are correlated with the regressors if these unobservable effects are correlated with the regressors x_i 's, then we have fixed effects model. The fixed effects term is due to the fact that each cross sectional units intercept remains same over time means time invariant. Each country has a different intercept and same slope parameter. If these effects are not

correlated with x_i 's then we have random effects model. In this model intercept is treated as random variable having the mean value of its intercept.

Our next step is to determine, whether these effects are correlated with explanatory variables (in this situation we will use fixed effects model) or independent of the explanatory variables and randomly distributed (this phenomenon favors random effects model). We conducted Hausman test which is based on the difference between the estimates of random effects and fixed effects and test the null hypothesis that there is no difference between the estimates of random effects and fixed effects. For the difference in estimates the chi square test becomes as below:

$$\chi^2 = (\beta_{fe} - \beta_{re})' [\text{var}(\beta_{fe}) - \text{var} \beta_{re}]^{-1} (\beta_{fe} - \beta_{re}) \quad (3.19)$$

The results of the Hausman test are given in table-4.6.

3.5.3. Endogeneity Problem

Before carrying out our final estimation it is necessary to take into account the existence of potential endogeneity. Endogenous variables may be per capita GDP, income distribution and tax revenue. As real GDP per capita increases it leads to better institutions, higher quality institutions leads to more equitable society and better institutions can lead to increase tax revenue because they lead to a better tax system design and improve tax administration capabilities (Alonso and Garcimartin, 2013). Instrumental variable method is used in literature to handle the problem of endogeneity, as TSLS (two stage least square) and GMM are the extension of IV method. When we have concerns of including endogenous variables in our model then using predetermined values as instrument is a natural source in TSLS method. As lagged values are likely to be correlated with its value at time t and not correlated with error term at time t . One

problem that may arise in this context is the problem of auto-correlated errors (the errors are themselves auto correlated and the exogeneity of pre-determined values will be in doubt. In case the autocorrelation exists, then more distant lags of the endogenous variable will be used to overcome this problem (Wooldridge, 4th edition). The second method is GMM which is used to handle the problem of Endogeneity, in this method a system of equations is estimated, in which lagged values are used as instrument for the current differences of explanatory variables. Both methods are not independent of criticism as the GMM faces the problem of optimum lag selection and the problem of identification and GMM is efficient technique for the case where number of cross section is greater than the number of time periods, while TSLS is facing the problem in selection of suitable instrument for the endogenous explanatory variable. Following Islam and Montenegro (2002) and Straub (2000) we used TSLS; lagged GDP, lagged income distribution and lagged tax revenue are used as instrument for the explanatory variable GDP, income distribution and taxes as these lagged variables are likely to be strongly correlated with GDP, income distribution and taxes in time t , but not correlated with error term at time t .

3.5.4. Two-Stage Least Squares (TSLS)

One of the fundamental assumptions of the regression analysis describes that the right hand side variables are not correlated with the error term if this assumption is violated then OLS is inconsistent and biased. The standard approach for such situation is to estimate the model by using instrumental variable regression. The basic idea behind this method is to choose an instrument for the endogenous variable that must have two

basics properties firstly, the variable should be correlated with the explanatory variable and secondly the variable should be uncorrelated with the error term.

As TSLS is an appropriate estimation method when some of the variables are endogenous in equation if we write the j th equation as below:

$$YT_j + XB_j + e_j = 0$$

Alternatively:

$$Y_j = jY_j\gamma_j + X_j\beta_j + e_j = Z_j\delta_j + e_j$$

$$\text{Where } T'_j = (-1, \gamma'_j, 0), B'_j = (\beta'_j, 0) Z'_j = (Y'_j, X'_j) \text{ and } \delta_j = (\gamma'_j, \beta'_j)$$

Y represents the endogenous variables matrix while X represents the matrix of exogenous variables. As this name suggests this method involves two stages, in the first stage endogenous variables y will be regressed¹⁴ on exogenous variables X and we will get the fitted values as

$$Y_j = X(X'X)^{-1}X'Y_j$$

While in the second stage Y_j is regressed on the Y_j and exogenous variables X to get TSLS parameters.

$$\delta_{2SLS} = (Z'_j, Z_j)^{-1} Z'_j Y$$

Where $Z_j = (Y_j, X_j)$

¹⁴ This stage involves estimating an OLS regression of each variable in the Model on the set of instruments. The second stage is a regression of the original equation, with all of the variables replaced by the fitted values from the first-stage regressions. The coefficients of this regression are the TSLS estimates.

As we are using eviews for estimation thus we will not estimate both stages separately as the software will perform both stages simultaneously by using IV method with fixed effects.

CHAPTER 4

EMPIRICAL RESULTS AND DISCUSSION

4.1. Introduction

This chapter is divided into three sections. In the first section (4.2) the results of different specification tests are being presented. In the second section (4.3) we present and discuss our main empirical results whereas in third section (4.4) we present the results for institutional complementarities.

4.2. Results of Specification Tests

To estimate the model with most appropriate econometric technique we have carried out different specification tests, as discussed in previous chapter. More specifically we have performed panel unit root, individual effects and Hausman specification tests. Results of these tests are reported in the following sequence.

4.2.1. Results of Panel Unit Root Tests

Our selected time period is large enough and it requires testing whether our selected variables have unit root or stationary. It is important to know the nature of data because the regression of non-stationary series on other non-stationary variable may lead to spurious results. The results of panel unit root sets are presented in table 4.1. It is clear from the results that all of our variables are stationary at level.

Table 4. 1: Unit Root Test Results

Variables	LLC test	Prob	IPS Test	Prob	Fisher -ADF Chi-square	Prob	Conclusion
<i>Gini</i>	-2.49	0.006	-3.2	0.000	34.56	0.004	stationary
<i>Real GDP per capita</i>	-1.97	0.024	-2.18	0.01	44.5	0.042	stationary
<i>Literacy</i>	-1.65	0.04	-2.22	0.01	72.45	0.00	stationary
<i>Population</i>	-7.55	0.000	-2.24	0.01	46.71	0.026	Stationary
<i>Taxes</i>	-3.58	0.0002	-2.18	0.01	44.03	0.04	Stationary
<i>Internet</i>	-2.47	0.006	-1.81	0.03	54.70	0.003	Stationary
<i>Aid</i>	-3.16	0.0008	-2.10	0.01	49.23	0.01	Stationary
<i>Overall IQ</i>	-2.41	0.007	-2.15	0.01	47.2	0.02	Stationary
<i>Political IQ</i>	-14.8	0.000	-7.05	0.000	56.28	0.002	Stationary
<i>Economic IQ</i>	-1.81	0.034	-2.04	0.02	56.4	0.002	Stationary
<i>Legal IQ</i>	-4.12	0.000	-3.05	0.001	46.1	0.03	Stationary

Source: Author's own calculation

4.2.2. Multi Co-linearity

The correlation coefficients values are reported in table 4.2 below. As evident from the table, all the values of correlation coefficients between variables are less than 0.7 in absolute term, so we can conclude that there is no problem of severe multi co-linearity.

Table 4. 2: correlation matrix of explanatory variables

	Taxes	Popul ation	Internet	Gini	Aid	Litera cy	GDPPr
Taxes	1.00						
Population	-0.48	1.000					
Internet	0.048	-0.09	1.00				
Gini	0.30	-0.20	0.35	1.00			
Aid	-0.48	0.53	-0.38	-0.48	1.00		
Literacy	0.43	-0.12	0.16	0.15	-0.204	1.00	
GDPPr	0.50	-0.35	0.57	0.45	-0.65	0.37	1.00

Source: Author's own calculation

4.2.3. Results of Tests for Individual Effects

To decide about the inclusion/exclusion of time and cross section specific effects we have performed individual effects tests on all of the equations separately (detail specification of the test can be found in chapter 3). Both Chi-square and F-tests didn't detect the existence of the period specific effects while the presence of cross section effects is confirmed by both of the tests (see table 4.3)

Table 4. 3: Test for Individual Effect Results

	Effects Test	Statistic	d.f	Prob	Conclusion
Dependent variables					
IQ	Cross-section F-Statistic	3.42	11,230	0.0002	Reject H_0 of redundancy
	Cross-section Chi-Square	41.24	11	0.0000	Reject H_0 of redundant effects
	Period F-Statistic	0.77	23,230	0.7603	Fail to reject H_0 of redundancy
	Period Chi-Square	20.31	23	0.6230	Fail to reject H_0 of redundancy
	Cross-Section/Period F	1.81	34,230	0.0058	Reject of redundancy H_0
	Cross-Section/Period Chi-square	64.64	34	0.0012	Reject of redundant effects H_0
EIQ	Cross-section F-Statistic	6.48	(11,244)	0.0000	Reject H_0 of redundancy H_0
	Cross-section Chi-Square	73.35	11	0.0000	Reject H_0 of redundant effects
	Period F-Statistic	0.45	(23,244)	0.9866	Fail to reject H_0 of redundancy
	Period Chi-Square	11.95	23	0.9712	Fail to reject H_0 of redundancy
	Cross-Section/Period F statistic	2.35	(34,244)	0.0000	Reject H_0 of redundancy
	Cross-Section/Period Chi-square	81.28	34	0.0000	Reject H_0 of redundant effects

LIQ	Cross-section F-Statistic	3.370	(11,244)	0.0002	Reject H_0 of redundancy H_0
	Cross-section Chi-Square	40.451	11	0.0000	Reject H_0 of redundant effects
	Period F-Statistic	1.340	(23,244)	0.1421	Fail to reject H_0 of redundancy
	Period Chi-Square	34.029	23	0.0647	Fail to reject H_0 of redundancy
	Cross-Section/Period F statistic	2.09	(34,244)	0.0007	Reject H_0 of redundancy
	Cross-Section/Period Chi-square	73.24	34	0.0001	Reject H_0 of redundant effects
PIQ	Cross-section F-Statistic	6.043	(11,244)	0.0000	Reject H_0 of redundancy H_0
	Cross-section Chi-Square	68.90	11	0.0000	Reject H_0 of redundant effects
	Period F-Statistic	0.647	(23,244)	0.8924	Fail to reject H_0 of redundancy
	Period Chi-Square	16.93	23	0.8124	Fail to reject H_0 of redundancy
	Cross-Section/Period F statistic	2.33	(34,244)	0.0000	Reject H_0 of redundancy
	Cross-Section/Period Chi-square	80.588	34	0.0000	Reject H_0 of redundant effects

Source: Author's own calculation

4.2.4. Fixed Effects versus Random Effects-Hausman Test

Now that we have decided to estimate cross section specific equations our next step is to check that whether the individual effects are correlated with the regressors or

not. If these effects are not correlated with x_i 's then random effects model is the best choice and vice versa. As discussed earlier, the popularly known technique for selecting between random effects model and fixed effects model is Hausman test. The results of the Hausman test are given below. Our test results favored fixed effects model so onward we will take into account fixed effects model.

Table 4. 4: Hausman Test Results

Dependent variable	Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
IQ	Cross-section random	57.513025	7	0.0000
EIQ	Cross-section random	65.877098	7	0.0000
LIQ	Cross-section random	34.873068	7	0.0000
PIQ	Cross-section random	16.365498	7	0.0220

Source: Author's own calculation

4.3. Results and Discussion of Main Models/Equations

In this section we discuss the results of our main models of interest as (3.8), (3.16), (3.17) and (3.18) as well as the results we obtained from using PCA for the panel of Asian countries over time period of 1990-2013. We compare these results with the previous results of the literature and interpret these results accordingly.

4.3.1. Institutional Quality Indices

Using principle component analysis the four indices of legal, political, economic and overall institutional quality have been developed. The normalised weights (assigned to the indicators are determined by the data itself, this is the main advantage of PCA) are

computed by using PCA for the four indices are given in appendix table 4.7, 4.8 and 4.9 respectively. PCA is a method which describes how much variance of an indicator is explained by a particular component, if there is no observed variation over time in an indicator then the value of the component for that indicator will be zero. In the method of PCA the number of components is always equals to the number of indicators. The standard approach is to use the first components for computation of an index as these describe a large portion of variance; however we can use other components as well for which the eigenvalues (the variance of indicators) are greater than one. The higher values of all indices represent the higher quality of political, economic, legal and over all institutional quality, the same pattern is represented by the indicators used in the computation of these indices. The average value of political institutional quality index is 0.6, overall institutional quality index is 1.0, legal institutional quality index is 0.53 and economic institutional quality index is 0.55 for the sample countries. The average value of overall institutional quality index for Singapore and Malaysia is 0.8 while 0.5 in Pakistan, Bangladesh, Indonesia, China and Iran, but as compare to these countries India and Sri Lanka have better overall institutional quality that is 0.55; while Jordan and Philippines have on average 0.64 institutional qualities. The values of legal, economic and political institutional quality index for Pakistan Bangladesh, India and Indonesia are on average 0.03 while 0.08 is in Sri Lanka. Thailand, Malaysia, Philippines and Singapore are among those countries having good political, economic and legal institutional quality that is 0.2 (round about). Graphs of these indices are given in appendix from figure 4.1 to 4.5.

4.3.2. Impact of Taxes on Legal, Economic, Political and Overall Institutional Quality

An efficient tax system enhances institutional quality as it is the main source of providing revenues to build up high quality institutions and to create a direct relationship between a state and its citizens. This argument is supported by the current analysis as it can be seen from table-4.8 that taxes have significantly positive impact on over all institutional quality this result is same to the results of Alonso and Garcimartin (2013), Javed and Iftikhar (2013). This is also evident from our results that taxes determine economic and legal institutional in Asian countries.

4.3.3. Impact of Foreign Aid on Legal, Economic, Political and Overall Institutional Quality

Earlier studies have analyzed that foreign aid has a destructive impact on institutional quality but this study analyzed the effect of foreign aid on the different aspects of institutional quality as political, legal, economic and overall institutional quality. As apparent from table -4.8 the foreign aid has a significantly negative impact on institutional quality, the same result is confirmed by the study of Siba (2008) who has shown that dependence on foreign aid lead to bad institutional quality. The significantly negative impact of foreign aid on the institutional quality in Asian countries indicates that dependence on foreign aid hinders development in economic, political and legal institutional quality as also confirmed by our results.

4.3.4. Impact of Development Level on Legal, Economic, Political and Overall Institutional Quality

Log of Real GDP per capita has a positive and significant bearing on economic, legal and political institutional quality. The positive and significant impact of development level on institutional quality is confirmed by Alonso and Garcimartin (2013), and Islam and Montenegro (2002). Our empirical results confirmed the claim that higher real GDP per capita leads to more investment opportunities, higher output and makes available more revenues to the state to finance the emerging needs for institutions thus leads to improve the quality and demand for institutions.

4.3.5. Impact of Social Media on Legal, Economic, Political and Overall Institutional Quality

Social media has a positively significant impact on legal, economic, political and overall institutional quality. These results indicated that in the presence of free media over all institutional quality flourish, as people can freely voice their views regarding their institutions this phenomenon creates demand for good institutions. As apparent from the case of Indonesia where internet has broken the monopoly of state over media. Internet has played a significant role in forming relationship between its people and government (Rananand, 2003).

4.3.6. Impact of Population on Legal, Economic, Political and Overall Institutional Quality

Population has a negative and significant impact on overall institutional quality and legal institutional quality. The negative affect of large population size is due to the fact that in the presence of large population it is difficult for government to finance them

or provide job opportunities for them, so unemployment rises and the economy will grow slowly, while less people to work. Taxes will go up as government has to finance its cost of medical care etc. Education facilities may fall short of the requirements of the population. Resources are diverted to ensure that people are well-fed rather than carrying out educational activities. The negative impact of population on legal institutional quality may be due to the fact that as it's become difficult for legal institutions to keep check and balance on large population as a result this situation leads to higher rate of crime due to unequal distribution of income and inadequate financial resources. Population has a negative impact on rule of law and political rights (Fors, 2007). The negative impact of population on democracy is confirmed by Diamond and Tsalik (1999), and Rigobon and Rodrik (2005).

4.3.7. Impact of Education on Legal, Economic, Political and Overall Institutional Quality

North (1994) underlined the importance of education as it promotes learning, understanding, competitiveness, innovation and thus as a result enhances economic development. Education has also an important role in improving political institutional quality as spending in education sector is likely to produce more enlightened political agents and policy makers. Our empirical results supported this argument as education has a positive and significant effect on overall institutional quality this result is same to the result of Alonso and Garcimartin (2013). While education has a positive bearing on other dependent variables like political institutional quality, legal institutional quality and economic institutional quality.

4.3.8. Impact of Income Distribution on Legal, Economic, Political and Overall Institutional Quality

From table-4.5 and equation 3.8, 3.16, 3.17, and 3.18 it is clear that income distribution has a negative impact on all dependent variables but not significant. The significance of Gini index implies that the more equitable distribution of income leads to improve a country institutional quality. The negative impact unfolds the fact that inequality hinders the development of all types of institution. Islam and Montenegro (2002) observed that the significance of Gini index disappears as they introduce dummies for Sub-Saharan Africa and Latin America while Alonso and Garcimartin (2009) confirmed that Gini index has a significant negative affect on institutional quality.

Table 4. 5: Regression Results of the Impact of Various Influencing Factor on Institutional Quality

Estimation Results of 2SLS						
Explanatory variables	Dependent Variables					
	Equation 3.8	Equation 3.16	Equation 3.17	Equation 3.18	Equation 3.8a	Equation 3.8b
	<i>IQ1</i>	<i>LIQ</i>	<i>EIQ</i>	<i>PIQ</i>	<i>IQ2</i>	<i>IQ3</i>
<i>C</i>	-0.39 (-0.94)	-4.56** (-2.54)	-1.55*** (-3.26)	0.57*** (4.83)	-0.24 (-0.59)	-0.50 (-1.26)
<i>Aid</i>	-1.61E-10*** (-4.55)	-1.13E-10* (-1.87)	-2.06E-10*** (-6.13)	-2.67E-16 (-0.939)	-1.63E-10*** (-4.39)	-1.59E-10*** (-4.43)
<i>Literacy</i>	7.23E-09** (2.01)	0.001 (1.05)	0.0004 (0.76)	2.03E-23*** (2.679)	7.45E-09** (2.17)	6.86E-09** (2.01)
<i>Internet</i>	0.004*** (3.42)	0.01*** (3.19)	0.001** (2.56)	1.77E-16 (0.69)	0.004*** (3.52)	0.003*** (3.29)
<i>log(GDP_{Pr})</i>	0.016 (0.36)	0.86*** (5.28)	0.107*** (3.05)	9.09E-20*** (0.005)		0.005 (0.15)
<i>Population</i>	-2.58E-09*** (-4.92)	-1.46E-08*** (-13.55)	2.29E-9*** (7.05)	3.30E-16 (0.38)	-2.5E-9*** (-4.82)	-2.54*** (-5.14)
<i>Taxes</i>	0.077*** (5.64)	0.09* (1.73)	0.017** (-2.22)	1.41E-15*** (2.75)	0.076*** (5.37)	0.07*** (6.11)
<i>Gini</i>	-0.004 (-0.62)	-0.01 (-1.34)	-0.001 (-0.55)	2.67E-16 (1.26)	-0.004 (0.62)	
<i>R-squared</i>	0.17	0.4	0.4	0.4	0.2	0.16
<i>Total panel (balanced) observations</i>	276	276	276	276	276	276

Source: Author's own calculation

T-Statistics of the coefficients given in the parentheses, IQ = overall institutional quality, PIQ= political institutional quality, LIQ= legal institutional quality, EIQ= economic institutional quality. *** p<0.01, ** p<0.05, * p<0.1. Hetro white test is applied.

The lagged values of endogenous variables are used as instruments. When we have concerns of including endogenous variables in our model then using predetermined values as an instrument is a natural source in 2SLS method. As lagged values are likely to

be correlated with its value in time t and not correlated with error term at time t . One problem that may arise in this context is the problem of auto-correlated errors, the errors are themselves auto correlated and the exogeneity of pre-determined values will be in doubt. As we used lagged values as instruments for endogenous variables, so there may exist serial correlation problem. To check this problem we re-estimated equation 3.8 as 3.8a and 4.8b dropped GDP_r and Gini but the significance of the explanatory variables still holds so we can conclude that there is no serial correlation problem.

4.4. Complementarities of Institutions

In order to find out the complementarities of institutions the interactive term $PIQ*LIQ$ is added in equation 3.17 and the results of this new model 3.19 are reported in table-4.6. The equation is estimated with 7 different specifications. The results show that the political institutions have a negative impact on economic institutions in all specifications while the coefficients of explanatory variables have their usual signs. While the coefficients of the interactive term are positive in all specifications it means in the presence of legal institutions political institutions perform well it is because the property rights are the main ingredients for the development of economic institutional quality. Acemoglu (2006) describes the negative impact of political institutions on economic institutions is due to the fact that political institutions put economic institutions under their interest so as to transfer the resources of a society to themselves which results in consolidating power. Acemoglu (2006) further describes the measures of taxation and resource allocation in order to enhance economic development, but this give more power to political elites which results in misallocation of resources and political conflicts. In the presence of legal institutions (Judicial independence from Government, Impartial courts,

Protection of property rights, law and order and rule of law) political institutions have a positive effect on economic institutions as our results tend to confirm the substantial complementarities between political institution and legal institutions. It means in the presence of legal institutions the returns available from the political institutions practices increases. Because the legal institutions take care of all aspects of property rights, law and order situations in a country and give little incentives to the political institutions to deviate from settled rules of the game. If this is true then the interactive term *PIQ*LIQ* should have a significant and positive coefficient. As clear from table 4.9 results the interactive term is significantly positive a significant coefficient shows that the effects of political institutional quality are dependent on the characteristics of legal institutional quality.

Table 4. 6: Complementarities of Institutions Results

TSLS estimates: Dependent variable economic institutional quality index

Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>C</i>	0.517*** (14.76)	0.067*** (5.10)	0.022 (1.297)	0.032* (1.911)	0.003 (0.033)	-0.027** (-1.993)	2.029* (1.681)
<i>LIQ</i>	0.113* (1.750)	-----	-----	0.079*** (6.099)	0.001*** (4.62)	0.093*** (3.847)	1.90*** (0.0186)
<i>PIQ</i>		-0.09*** (-9.977)	-----	-0.10*** (-10.89)	-0.063 (-0.32)	-0.10*** (-9.365)	-0.363*** (-8.305)
<i>PIQ*LIQ</i>			0.003*** (5.17)	0.003*** (4.660)	0.046*** (3.135)	0.003*** (5.655)	0.480*** (2.697)
<i>Internet</i>					0.004*** (8.58)	-----	-----
<i>Literacy</i>						2.7E-09** (2.38)	1.15E07*** (4.50)
<i>log(GDPr)</i>						1.33E-06 (1.116)	-----
<i>Aid</i>						-----	-3.33E-10 (-1.204)
<i>Taxes</i>						-----	0.231 (3.327)
<i>Gini</i>						-----	-0.053*** (-3.695)
<i>R2</i>	0.2	0.8	0.007	0.2	0.09	0.3	0.3
<i>observations</i>	288	276	276	288	276	276	275

Source: Author's own calculations

T-Statistics of the coefficients given in the parentheses,

*** p<0.01, ** p<0.05, * p<0.1.

CHAPTER 5

CONCLUSION AND POLICY RECOMMENDATIONS

5.1. Introduction

This chapter briefly discusses the major findings of the study and based on these findings make an overall conclusion about the study. While keeping in mind these results, some policy recommendations are given which are not beyond the Government policies.

5.2. Conclusion of the Study

It has been tried to analyze the relationship between different factors and institutional quality. As it is determined from the reviewed literature that institutions do matter for economic growth and the main reason of cross country differences in economic growth. As institutions incentivize a system and affect decisions of individuals, thus it can also influence the incentive structure in a country and decide distribution of resources. Societies with better institutional framework move more rapidly towards economic prosperity.

Considering the vital role of institutions in economic growth it is important to take into account the progress of institutions and to know which factors determine the institutional quality. This study has analyzed the impact of population, education, social media, income distribution, taxes, foreign aid and real GDP per capita on institutional quality and concluded from the magnitudes of the explanatory variables coefficients whether it has improved or deteriorated the institutional quality. But before this the first objective of study is achieved i.e. to develop comprehensive indices of legal, economic,

political and overall institutional quality by using PCA, following the definition of joskow (2008) and secondly to explore its potential determinants in Asian context. From the pattern of computed indices we came to the conclusion that Malaysia, Singapore, Jordan and Thailand are among those countries having good institutional quality, while Sari lanka, India and Philippines have better institutional environment than countries like Pakistan, Bangle dash and china. According to the literature review, an improvement in GDP, education, revenue collection and media freedom have the potential to increase while increase in income inequality, dependence on foreign Aid and population have a negative impact on institutional quality. As this study has individually analyzed the impact of these variables on four indices to conclude that aid has a very strong negative impact on overall institutional quality, economic, legal and political institutional quality, while the social media has positive impact on all indices of institutional quality. Population has a negative impact on all indices except political institutional quality. The income inequality has a negative impact on economic institutional quality. The literacy has very strong positive impact on all indices. The impact of taxes is positive on all indices. High quality institutions are the result of higher rate of GDP. In addition better quality institutions are expected to develop in countries where individuals have equal opportunities as more equitable societies with education will lead the countries to enhance institutional quality. If we improve the education of a country and reduce income inequality then the chances of corruption will reduce as an educated society is expected to have a positive impact on society and an equitable society has fewer incentives to deviate from the rules of game. The significantly negative impact of foreign aid on the institutional quality in Asian countries indicates that dependence on foreign aid hinders

development in economic, political, legal and overall institutional quality. The study empirical results also support the argument that aid has destructing effect on IQ. The main focus of this empirical analysis was to focus on those determinants that are not beyond of government policies. Earlier studies have identified some factors like, colonial origin, natural resource endowment etc. are the significant determinants of institutional quality but these factors are policy irrelevant, while this study focused only those factors that lie within the ambit of economic policy.

The results of complementarities indicate that in order to understand the development of economic institutions we must take into account the role played by political institutions as well as legal institutions. The superiority and independence of legal intuitions over political institution will enhance the performance and returns available from the political institutions.

5.3. Policy Recommendations

As for as the policy implication of the study are concerned, some care should be taken as there is no simple way to enhance institutional quality at once. This analysis concluded that a country with large population should adopt more educational policies (Government should increase spending in education sector and focus on quality education that can cope with market demands, and make provision of education to all of its citizens etc.) or improves its education quality trough different trainings and reforms, if a large part of population is educated and skilled then they can contribute to the development of country. A country should increase GDP per capita in order to meet the demand and challenges of institutions, to increase taxes in order to improve institutional quality and decrease dependence on foreign aid. Siba (2008) in his empirical analysis found the

negative impact of aid on IQ and argued that '*the mere expectations of foreign aid are sufficient in destructing IQ*'. In addition better quality institutions are expected to develop in countries where individuals have the equal opportunities as more just societies with more educated population will lead the countries to enhance their *IQ*. If we improve the education of a country and reduce income inequality then the chances of corruption will reduce as an educated society is expected to have a positive impact on society and an equitable society has fewer incentives to deviate from the settled rules of institutions. In sum high quality institutions are likely to develop in more equitable societies with educated population, people with freedom to express their views.

In sum the empirical results of our analysis suggest that the factors that determine IQ is not beyond of government policy.

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APPENDEX-1

Table3. 2: Definition and Sources of the Study Variables

Institutional Quality Variables	Definition	Source
Index 1	Economic institutional quality indicators	
Financial freedom	Financial freedom is an indicator of banking efficiency as well as a measure of independence from government control and interference in the financial sector. Ranging from 0-100 high scores represent high level of financial freedom.	The Heritage Foundation and WSJ
Business freedom	Business freedom is an overall indicator of the efficiency of government regulation of business. Ranging from 0-100. High scores represent high level of business freedom.	The Heritage Foundation and WSJ
Regulatory Quality	Regulatory Quality measuring the incidence of market-unfriendly policies Estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance).	WB WGI
Freedom to own foreign currency bank accounts	When foreign currency bank accounts are allowed without restrictions both domestically and abroad the rating is 10, when these accounts are restricted, the rating is zero.	Fraser Institute
Credit market regulations	<i>Ownership of banks, Private sector credit, Interest rate controls/negative real interest rates</i> In EFW(economic freedom in the world) ten (10) is the highest possible rating and zero (0) is the lowest. A higher rating indicates a greater degree of economic freedom.	Fraser Institute
Labor market regulations	This is the measure of hiring and firing of workers, wage bargaining is rating from 0-10 high scores show good labor market regulation.	Fraser Institute
Business regulations	This is the measure of administrative requirements, bureaucracy costs, Starting a business, extra payments/bribes/favoritism, Licensing restrictions and Cost of tax compliance rating from 0-10 (higher values represents higher level of business regulation).	Fraser Institute
Foreign ownership/investment restrictions	This is the measure of foreign ownership prevalence in a country and foreign capital inflow in a country. Rating from 0-10 (higher values represent higher level of business regulation).	Fraser Institute
Capital controls		Fraser

	Capital controls are residency-based measures such as transaction taxes, other limits, or outright prohibitions that a nation's government can use to regulate flows from capital markets into and out of the country's capital account. Rating from 0-10 (higher values represent higher level of business regulation).	Institute
Investment profile	This is an assessment of factors affecting the risk to investment including contract feasibility and expropriation, profit repatriation and payment delays. Ranges between 0 (very high risk) to 12 (very low risk).(the measure of risk involved in investment that affect investment decision like, lack of contract feasibility etc)	ICRG
freedom from corruption	Corruption erodes economic freedom by introducing insecurity and uncertainty into economic relations. Rating from 0–100 scale in which a score of 100 indicates very little perceived corruption (corruption in financial sector)	The Heritage Foundation and WSJ
fiscal freedom	The fiscal freedom component is a composite measure of the burden of taxes that reflects both marginal tax rates and the overall level of taxation, including direct and indirect taxes imposed by all levels of government, as a percentage of GDP. scale of 0 to 100(it's a measure of direct and indirect taxes imposed by government as percentage of GDP).	The Heritage Foundation and WSJ
government spending	The government spending component captures the burden imposed by government expenditures, which includes consumption by the state and all transfer payments related to various entitlement programs. Rating from 0 to 100.	The Heritage Foundation and WSJ
labor freedom	The labor freedom component is a quantitative measure that considers various aspects of the legal and regulatory framework of a country's labor market, including regulations concerning minimum wages, laws inhibiting layoffs, severance requirements, and measurable regulatory restraints on hiring and hours worked. Rating from 0 to 100.	The Heritage Foundation and WSJ
monetary freedom	Monetary freedom combines a measure of price stability with an assessment of price controls. Both inflation and price controls distort market activity. Price stability without microeconomic intervention is the ideal state for the free market. rating at the scale of 0 to 100 (a measure of price stability, inflation control).	The Heritage Foundation and WSJ
trade freedom	Trade freedom is a composite measure of the extent of tariff and non-tariff barriers that affect imports and exports of goods and services. Rating at the scale of 0 to 100.	The Heritage Foundation and WSJ

investment freedom	In an economically free country, there would be no constraints on the flow of investment capital. Individuals and firms would be allowed to move their resources into and out of specific activities, both internally and across the country's borders, without restriction. Such an ideal country would receive a score of 100 on the investment freedom component of the <i>Index</i> .0-100 scale.	The Heritage Foundation and WSJ
Index 2	Political institutional quality indicators	
Checks and balances	The system of checks and balances is an important part of the Constitution. With checks and balances, each of the three legislative, executive, and judicial branches. Branches of government can limit the powers of the others. This way, no one branch becomes too powerful. Each branch "checks" the power of the other branches to make sure that the power is balanced between them. Rating from 1 to 6.	WB DPI(data base of political indicators)
Democratic accountability	This is an assessment of how responsive government is to its people, by assuming that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a non democratic one. Ranges between 0 (very high risk) to 6 (very low risk).	ICRG
Corruption	This is an assessment of corruption within the political system that causes distortion in the economic and financial system, reduces the efficiency of public as well as private sector by enabling the people to hold positions of power through patronage (backing) rather than ability and creates instability in political system. Ranges between 0 (very high risk) to 6 (very low risk).	ICRG
Bureaucratic quality	This is an assessment of strengths and expertise of bureaucracy to govern independently and tend to be autonomous (independent) from political pressure. Ranges between 0 (very high risk) to 4 (very low risk).(the	ICRG
Internal conflict	An assessment of political violence in the country and its actual or potential impact on governance, is based on civil war/coup threat, terrorism/political violence and civil disorder poverty are being rated at the scale of 1—12; lower rating (closer to 1) indicating higher level of risks and vice versa.	ICRG
Military in politics	The military are not elected by anyone, so their participation in Government, either direct or indirect, reduces accountability and therefore represents risk. Rating from 1-6.	ICRG

Political terror scale	The PTS measures levels of political violence and terror that a country experiences in a particular year Level ranging from 1-5 higher values represent higher level of terror.	Political terror scale
Socioeconomic Conditions	This is an assessment of the socioeconomic pressures at work in society that could constrain government action or fuel social dissatisfaction. Rating from 0-12 (high to lower risk).	ICRG
Ethnic Tensions	This component is an assessment of the degree of tension within a country attributable to racial, nationality, or language divisions. Rating from 0– 6 Points lower values are given to higher ethnic tensions.	ICRG
External Conflict	The external conflict measure is an assessment both of the risk to the incumbent government and to inward investment. Rating from 1-12 (higher to lower external conflict).	ICRG
government effectiveness	<i>Government Effectiveness</i> – measuring the competence of the bureaucracy and the quality of public service delivery estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance).	WGI
Index 3	Legal institutional quality proxies	
Property rights	It measures the degree to which a country’s laws protect private property rights and the extent to which those laws are respected. The more effective the legal protection of property, the higher a country’s score these scores are rated from 0-100.	The Heritage Foundation and WSJ(wall street journal)
Judicial independence	This indicator measures the independence of judicial system from government and firms ranging from 1-7 high scores represent independent judicial system.	Fraser Institute
Impartial courts	The legal framework in your country for private businesses to settle disputes and challenge the legality of government actions and/or regulations is inefficient and subject to manipulation (= 1) or is efficient and follows a clear, neutral process (= 7).	Fraser Institute
Protection of property rights	Property rights in your country, including our financial assets, are: (1 = Poorly defined and not protected by law ; 7 = Clearly defined and well protected by law).	Fraser Institute

Law and order	This is an assessment of the strength and impartiality of the legal system and also the public observance of law. Ranges between 0 (very high risk) to 6 (very low risk).	ICRG
Religion in Politics	Religious tensions may stem from the domination of society and/or governance by a single religious group that seeks to replace civil law by religious law and to exclude other religions from the political and/or social process; rating from 1-6(higher to lower).	ICRG
Rule of Law	Measuring the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence Estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performances).	WB WGI

*These above indicators are grouped into three categories under the name of legal, economic and political institutional quality will be used in the construction of respective indices and in the end these three categories will be used in the construction of overall IQ. WSJ is wall street journal The data taken from economic freedom in the world are available on a five year basis while after 2000 it is available on yearly basis, in order to overcome this problem we computed the averages of before and after

Table3. 3: Correlation Matrix of Legal Institutional Quality Indicators

	E	F	G	H	I	A	D0
E	1.00						
F	0.46	1.00					
G	0.30	0.46	1.00				
H	0.16	0.31	0.53	1.00			
I	0.67	0.47	0.55	0.52	1.00		
A	0.57	0.20	0.42	0.39	0.84	1.00	
D0	0.900	0.46	0.30	0.16	0.67	0.57	1.00

A= Property rights, E= Impartial courts, G= Law and order, H =Religion in Politics, I =Rule of Law D0=Judicial independence, F =Protection of property righ

Table3. 4: Correlation Matrix of Economic Institutional Quality Indicators:

	U	T	V	AN	AO	AP	AQ	AR1	AS	AT	G	M	L	O	P	Q	R
U	1.00																
T	0.46	1.00															
V	0.46	0.26	1.00														
AN	0.60	0.36	0.49	1.00													
AO	0.21	0.158	0.42	0.31	1.00												
AP	0.30	0.14	0.26	0.29	0.19	1.00											
AQ	0.56	0.20	0.29	0.58	0.03	0.20	1.00										
AR1	0.58	0.54	0.47	0.65	0.32	0.32	0.39	1.00									
AS	0.46	0.27	0.56	0.63	0.39	0.26	0.38	0.45	1.00								
AT	0.60	0.64	0.30	0.46	0.17	0.0003	0.46	0.56	0.24	1.00							
G	0.51	0.12	0.41	0.50	0.02	0.30	0.42	0.34	0.34	0.19	1.00						
M	0.70	0.63	0.58	0.72	0.40	0.15	0.57	0.72	0.63	0.70	0.42	1.00					
L	0.56	0.38	0.34	0.68	0.21	0.26	0.55	0.52	0.54	0.47	0.41	0.70	1.00				
O	0.59	0.16	0.38	0.47	0.24	0.34	0.27	0.36	0.47	0.25	0.45	0.44	0.35	1.00			
P	0.48	0.50	0.56	0.47	0.49	0.097	0.25	0.52	0.52	0.40	0.20	0.65	0.30	0.36	1.00		
Q	0.4	0.27	0.29	0.34	0.14	0.47	0.24	0.48	0.31	0.23	0.21	0.35	0.30	0.24	0.31	1.00	
R	0.47	0.20	0.41	0.50	0.26	0.26	0.56	0.36	0.42	0.37	0.41	0.58	0.65	0.29	0.34	0.28	1.00

Source: author's own calculation

U =Capital controls, T = Foreign ownership/investment restrictions, V = Investment profile, AN = freedom from corruption, AO =fiscal freedom, AP = government spending, AQ =labour freedom, AR1=monetary freedom, AS = trade freedom, AT = investment freedom, G = financial freedom, M = Regulatory Quality I=business freedom, O = Freedom to own foreign currency bank accounts, P = Credit market regulations, Q =Labour market regulations, R = Business regulations.

Table3. 5: Correlation Matrix of Political Institutional Quality Indicators

	Y	AC	AD	AE	AF	AH	AI	AJ	AK	AL	AM
Y	1.00										
AC	0.008	1.00									
AD	0.226	0.56	1.00								
AE	0.16	0.47	0.37	1.00							
AF	0.02	0.94	0.49	0.40	1.00						
AH	0.2	0.57	0.48	0.60	0.53	1.00					
AI	0.15	0.48	0.35	0.48	0.43	0.62	1.00				
AJ	0.26	0.48	0.41	0.71	0.42	0.63	0.46	1.00			
AK	0.64	0.21	0.15	0.34	0.16	0.36	0.26	0.31	1.00		
AL	0.008	0.64	0.74	0.44	0.59	0.71	0.63	0.44	0.33	1.00	
AM	0.41	0.34	0.59	0.05	0.29	0.36	0.14	0.10	0.28	0.499	1.00

Source: Author's own calculation

Y=Checks and balances, AC= Corruption, AD= Bureaucratic quality, AE= Internal conflict, AF= Military in politics, AH= Political terror scale, AI =Socioeconomic Conditions, AJ =Ethnic Tensions, AK =External Conflict, AL= government effectiveness, AM= voice and accountability

Table 4. 7: Legal Institutional Quality Normalized Weight

Legal Indicators	IQ	India	Bangladesh	Pakistan	China	Jordan	Indonesia	Malaysia	Philippines	Singapore	Thailand	Iran	Srilanka
Property right		1.268	-0.630	0.22	-0.52	0.75	0.30	-0.35	0.15	0.26	0.41	0.33	0.15
judicial		-0.867	0.309	0.19	0.61	1.06	-0.28	0.41	0.17	0.50	0.08	0.28	0.25
independence		-1.218	0.421	0.26	0.43	1.00	0.07	0.39	0.17	0.60	-0.36	0.32	0.24
Impartial courts		-0.765	-0.237	0.21	0.58	1.00	0.11	0.41	0.15	-0.31	-0.32	0.01	0.074
Protection of													
property rights		0.213	0.557	-0.15	0.004	-0.12	0.23	-0.17	0.15	-0.57	0.36	0.0058	-0.17
Law and order		0.2133	0.57928	0.08	-0.37	-0.55	0.30	0.07	0.02	0.50	0.36	0.04	0.24
Religion in		0.213	0.421	0.17	0.26	-1.06	0.25	0.22	0.16	0.50	0.42	0.04	0.21
Politics													
Rule of Law													

Source: authors' own calculation

The above normalised weights constructed by using PCA method are used in the construction of legal institutional quality index.

Table 4. 8: Economic Institutional Quality Normalized Weights

Economic IQ indicators	Bangla Deh	Pakistan	Sri Lanka	China	Jordan	Iran	Indone sia	Malaysia	Philippine s	Singapore	Thailand	Ind
Financial freedom	-0.166	-0.19	-8.23	0.77	-0.17	0.04	-0.27	0.17	0.107	0.28	-0.29	0.09
Business freedom	0.290	0.19	-6.25	0.25	-0.15	0.03	-0.26	0.24	0.29	0.49	0.03	-0.1
Regulatory Quality	0.278	-0.14	-3.12	0.57	0.19	0.11	-0.35	0.21	0.45	0.59	-0.10	0.07
Freedom to own foreign currency bank accounts	0.104	-0.23	8.14	-0.50	0.20	0.14	0.032	0.27	0.402	0.381	0.43	0.078
Credit market regulations	0.281	0.02	7.00	-0.74	0.15	0.14	-0.361	-0.19	0.034	0.163	-0.02	0.12
Labor market regulations	-0.01	0.09	5.04	0.54	0.20	0.12	0.322	0.01	0.171	0.554	0.04	0.12
Business regulations	0.02	-0.04	1.36	-0.56	0.08	0.05	0.26	-0.01	-0.32	-0.25	-0.33	0.10
Foreign ownership/investment restrictions	0.33	-0.03	5.48	0.42	-0.20	0.11	-0.11	-0.18	0.401	0.464	0.30	0.12
Capital controls	0.268	0.12	-6.63	-0.30	0.19	0.14	0.37	0.25	0.397	-0.54	0.43	0.07
Investment profile	0.29	0.21	4.52	0.06	0.18	0.15	0.16	-0.16	-0.38	-0.50	-0.30	0.11
freedom from corruption	0.213	0.20	4.71	0.39	0.20	-0.10	0.38	0.26	-0.29	-0.58	0.33	0.10
fiscal freedom	-0.26	0.23	-4.39	-0.57	0.20	-0.13	0.323	-0.28	-0.40	-0.42	0.34	-0.11

government spending	-0.18	0.10	-7.79	0.04	-0.20	0.12	-0.05	-0.16	-0.12	0.51	0.14	0.07
labor freedom	-0.29	0.17	-2.92	0.62	0.9	0.05	0.34	-0.05	0.45	-0.09	0.13	-0.00
monetary freedom	-0.16	0.22	5.22	-0.63	0.1	-0.01	0.06	0.20	-0.03	-0.55	0.17	0.06
trade freedom		0.06	7.15	0.61	-0.5	0.39	0.12	-0.43				
investment freedom			-8.31			-0.25	0.27	0.30				

Source: Author's own calculation

Table 4. 9: Political Institutional Quality Normalized Weights

Political IQ indicators	Bangladesh	Pakistan	Sri Lanka	China	Jordan	Iran	Indonesia	Malaysia	Philippines	Singapore	Thailand	India
Checks and balances	0.10	0.40	0.38	0.73	0.98	-0.01	0.20	0.46	-0.02	0.46	0.44	-0.04
Democratic accountability	0.10	0.41	0.16	-1.13	-1.75	0.09	0.11	-0.51	0.20	0.45	-0.34	0.01
Corruption	0.10	0.29	-0.52	0.55	0.83	0.17	0.12	-0.002	0.21	-0.44	-0.35	0.16
Bureaucratic quality	0.01	0.07	0.37	0.63	-0.9	0.18	0.16	0.51	0.209	0.483	0.35	0.15
Internal conflict	-0.005	-0.22	-0.52	-1.13	2.10	0.17	0.05	0.24	0.10	0.45	0.32	0.11
Military in politics	0.10	-0.31	0.47	1.10	-1.82	0.17	0.13	0.31	0.21	-0.04	-0.35	0.16
Control of Corruption	0.062	0.39	-0.01	0.69	1.91	-0.01	-0.02	-0.50	-0.08	-0.11	0.38	0.16
Political terror scale	0.091	-0.08	-0.22	-0.76	0.07	0.05	-0.12	0.50	0.04	-0.29	0.49	-0.08
Socioeconomic Conditions	0.02	0.03	0.29	-0.28	-0.54	-0.08	-0.02	-0.05	-0.02	-0.34	-0.28	0.04
Ethnic Tensions	0.12	0.09	0.51	0.30	-1.45	0.16	0.17	0.03	0.23	0.06	0.44	0.07
External Conflict	0.11		0.04	-0.83	-0.5	0.03	0.21	0.04	-0.14	-0.08	0.07	0.07

government effectiveness	0.09	0.06	1.12	2.07	0.04	0.17	0.05	0.13	0.41	-0.18	0.11
Voice and accountability	0.05				0.01	0.12	0.04	-0.06			0.04

Source: Author's own calculations

Graphs of overall Institutional Quality Index of Asian Countries

Figure 4. 1: Graph of Overall Institutional Quality Index of India

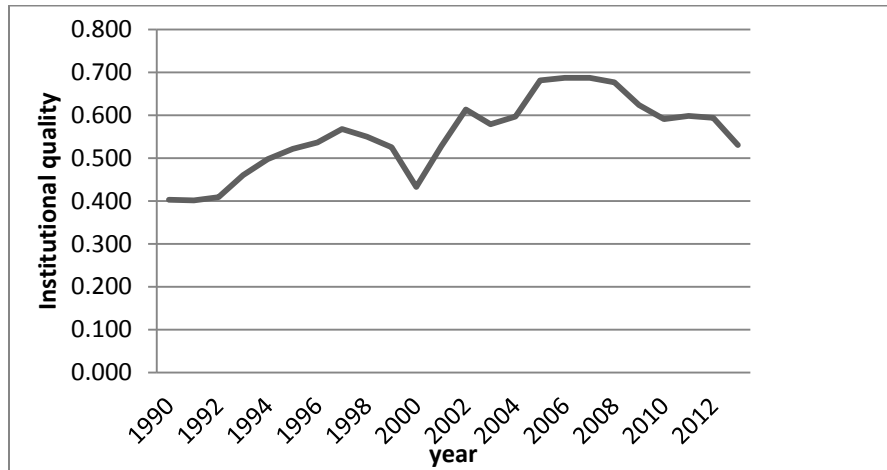


Figure 4. 2: Graph of Overall Institutional Quality Index of Bangladesh

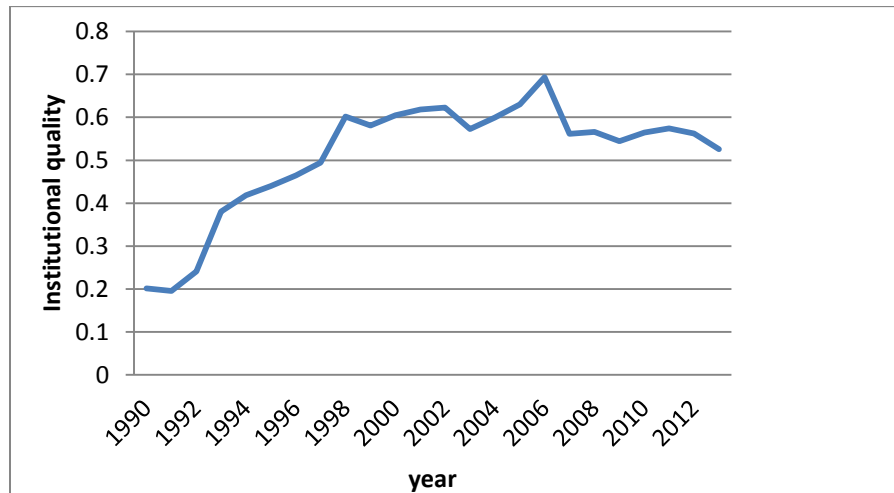


Figure 4. 3: Graph of Overall Institutional Quality Index of Singapore

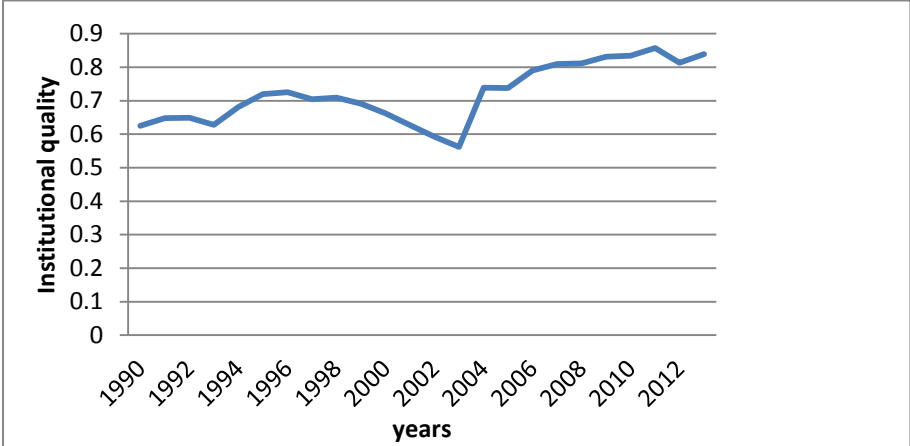


Figure 4. 4: Graph of Overall Institutional Quality Index of Pakistan

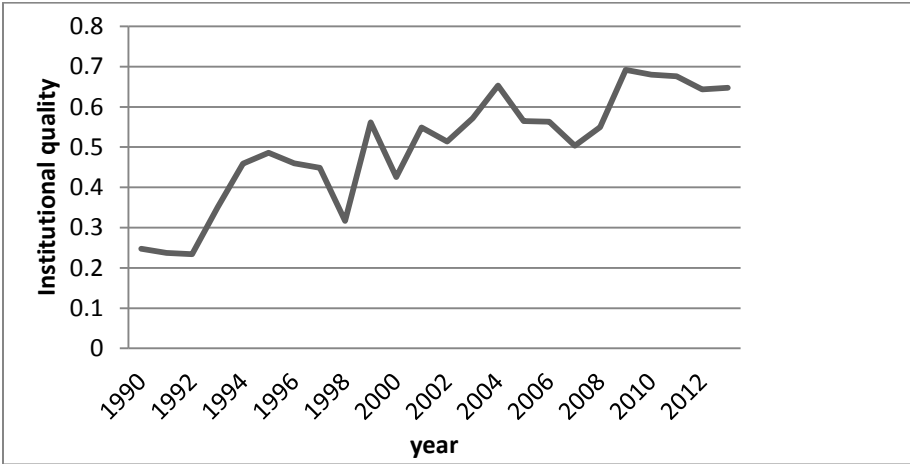


Figure 4. 5: Graph of overall Institutional Quality Index of Sri Lanka

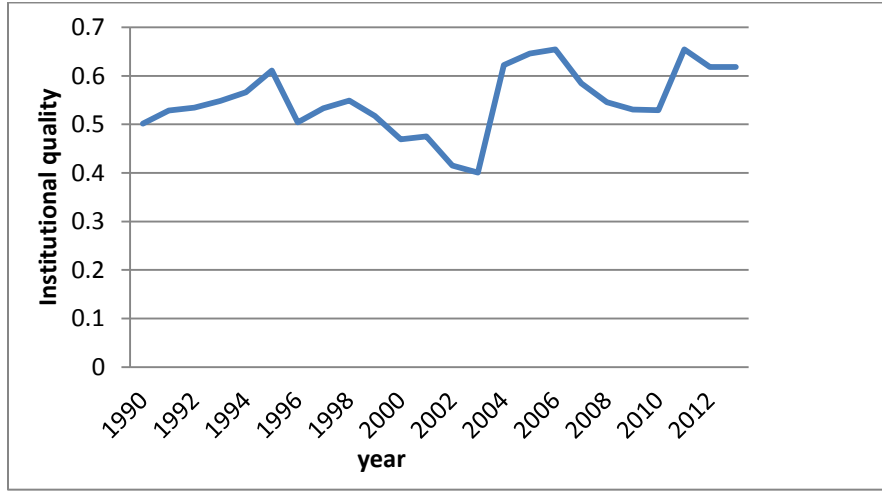


Figure 4. 6: Graph of Overall Institutional Quality Index of China

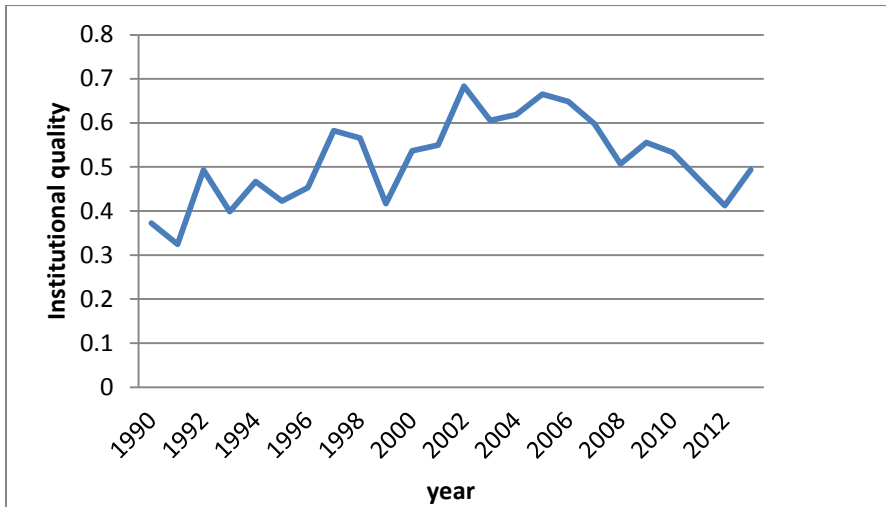


Figure 4. 7: Graph of Overall Institutional Quality Index of Jordan

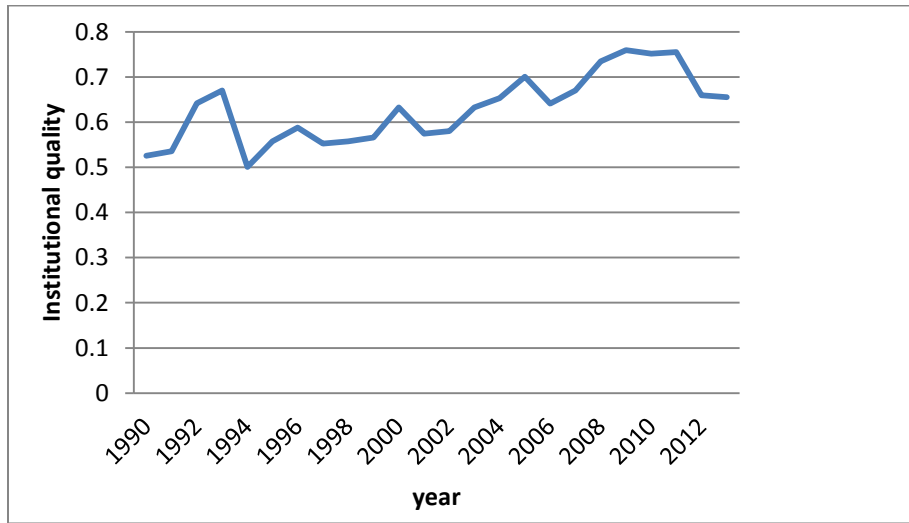


Figure 4. 8: Graph of Overall Institutional Quality Index of Iran

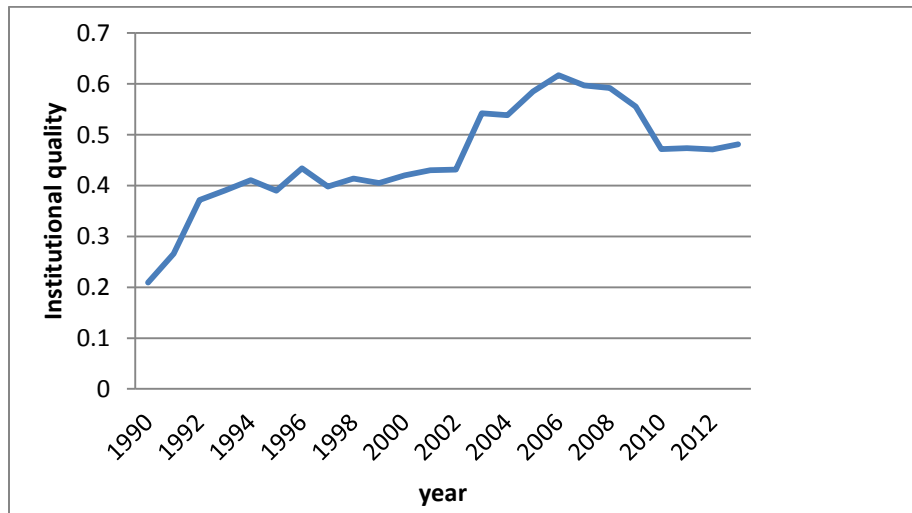


Figure 4. 9: Graph of Overall Institutional Quality Index of Malaysia

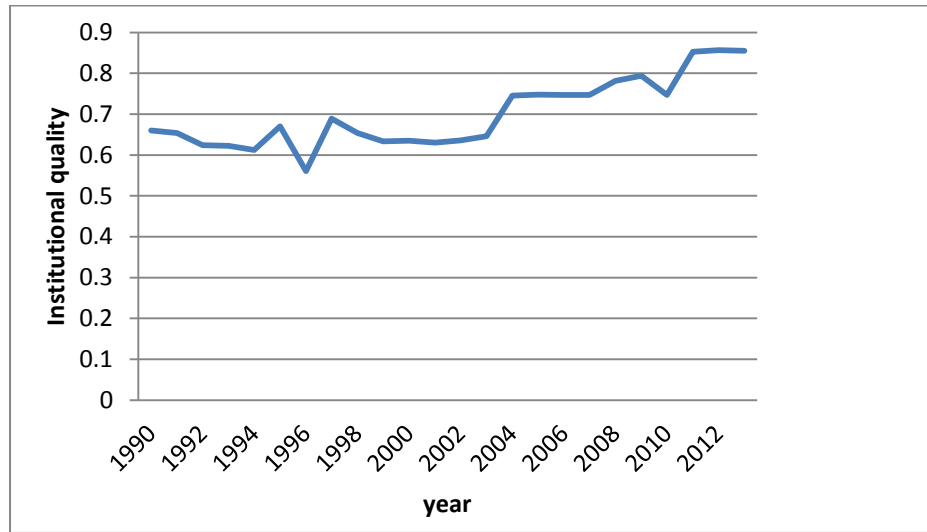


Figure 4. 10: Graph of Overall Institutional Quality Index of Philippines

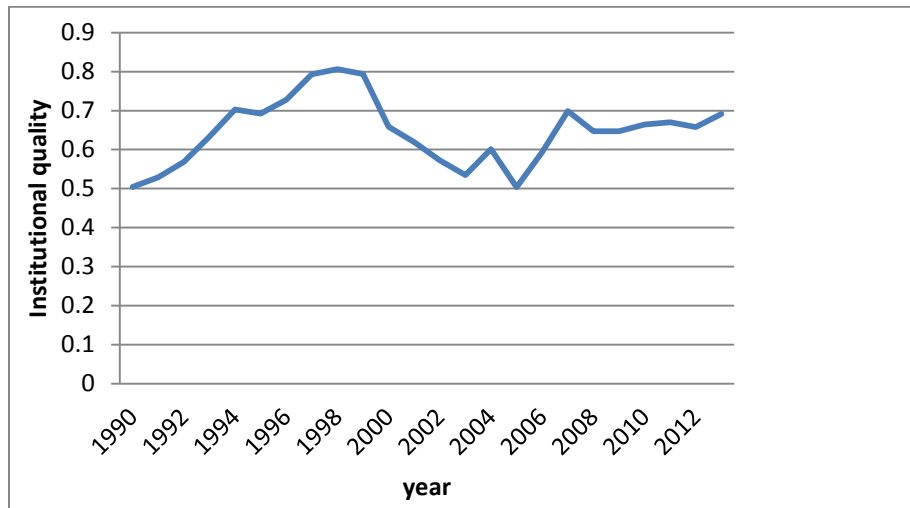


Figure 4. 11: Graph of Overall Institutional Quality Index of Thailand

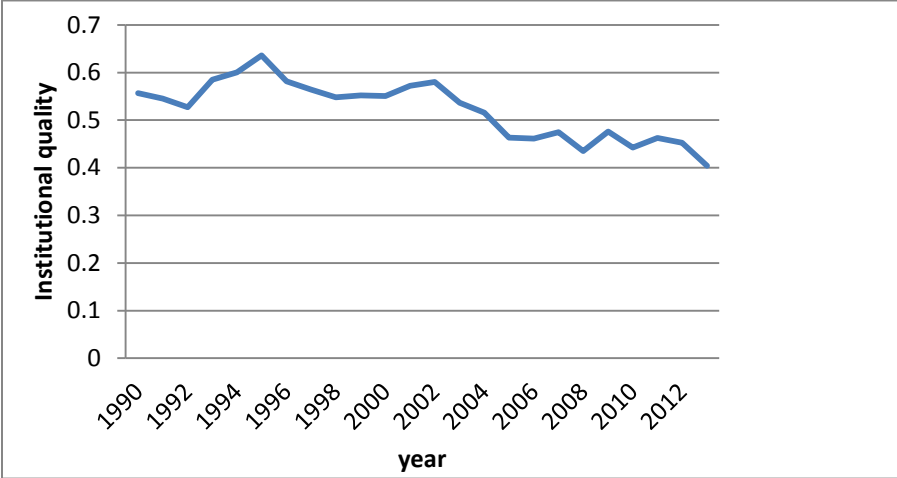


Figure 4. 12: Graph of Overall Institutional Quality Index of Indonesia

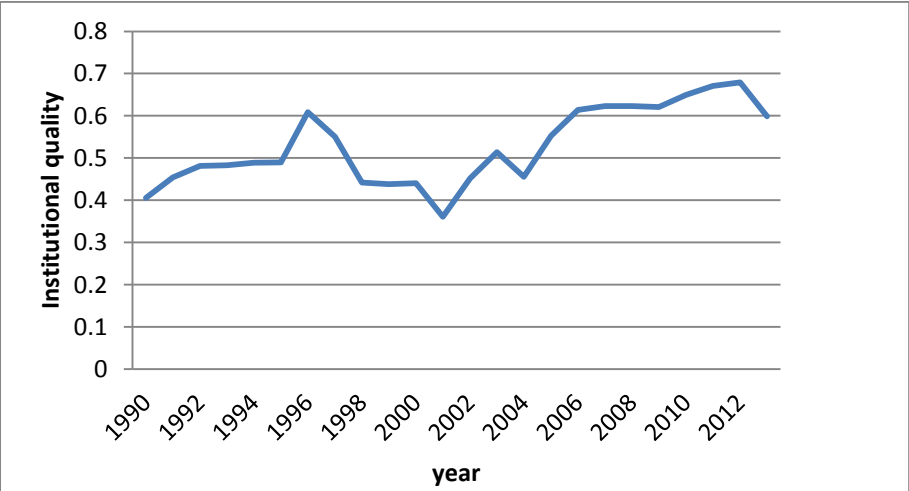


Figure 4. 13: Combined Graphs of Overall Institutional Quality Index of Asian Countries

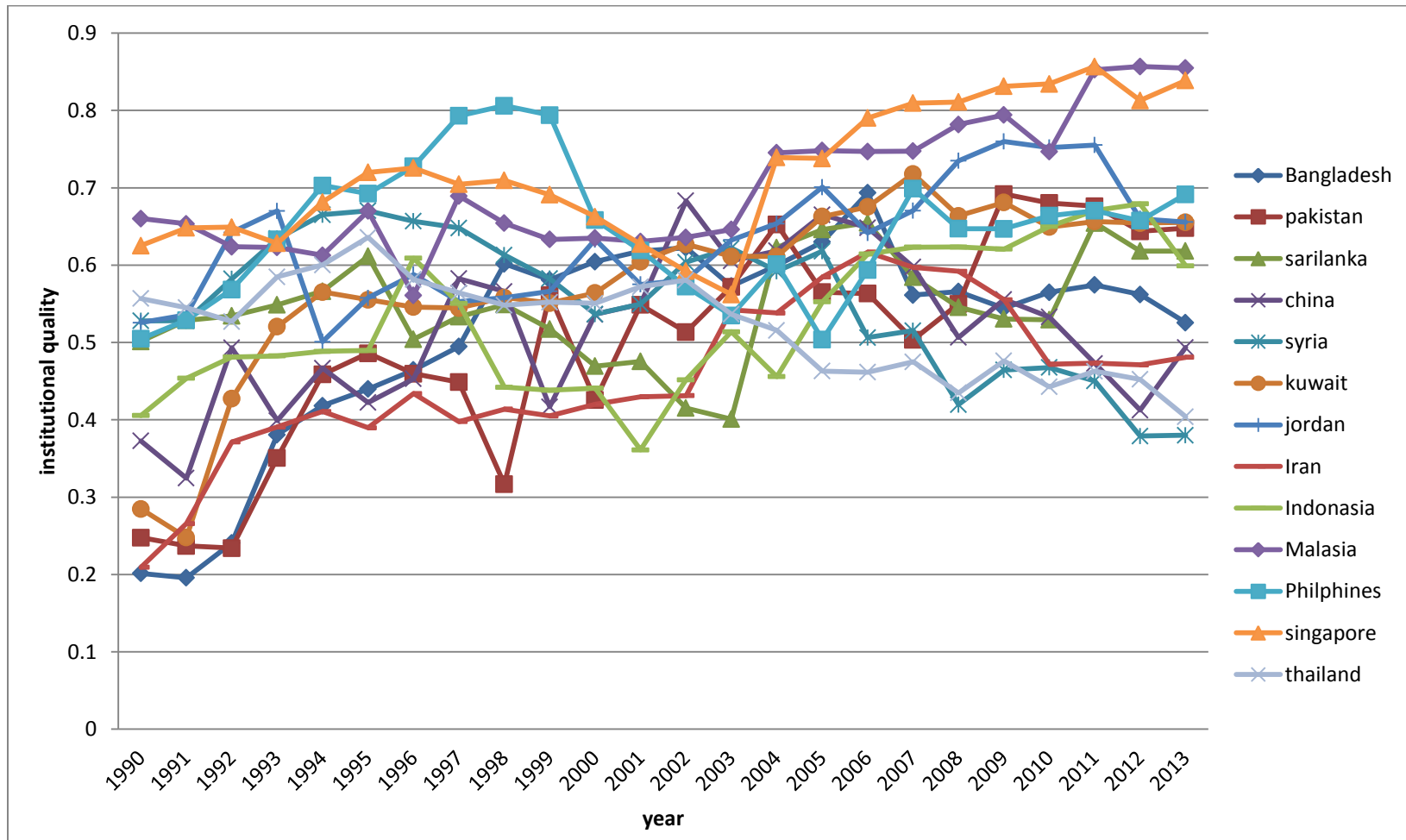


Figure 4. 14: Combined Graph of Political Institutional Quality Index of Asian Countries

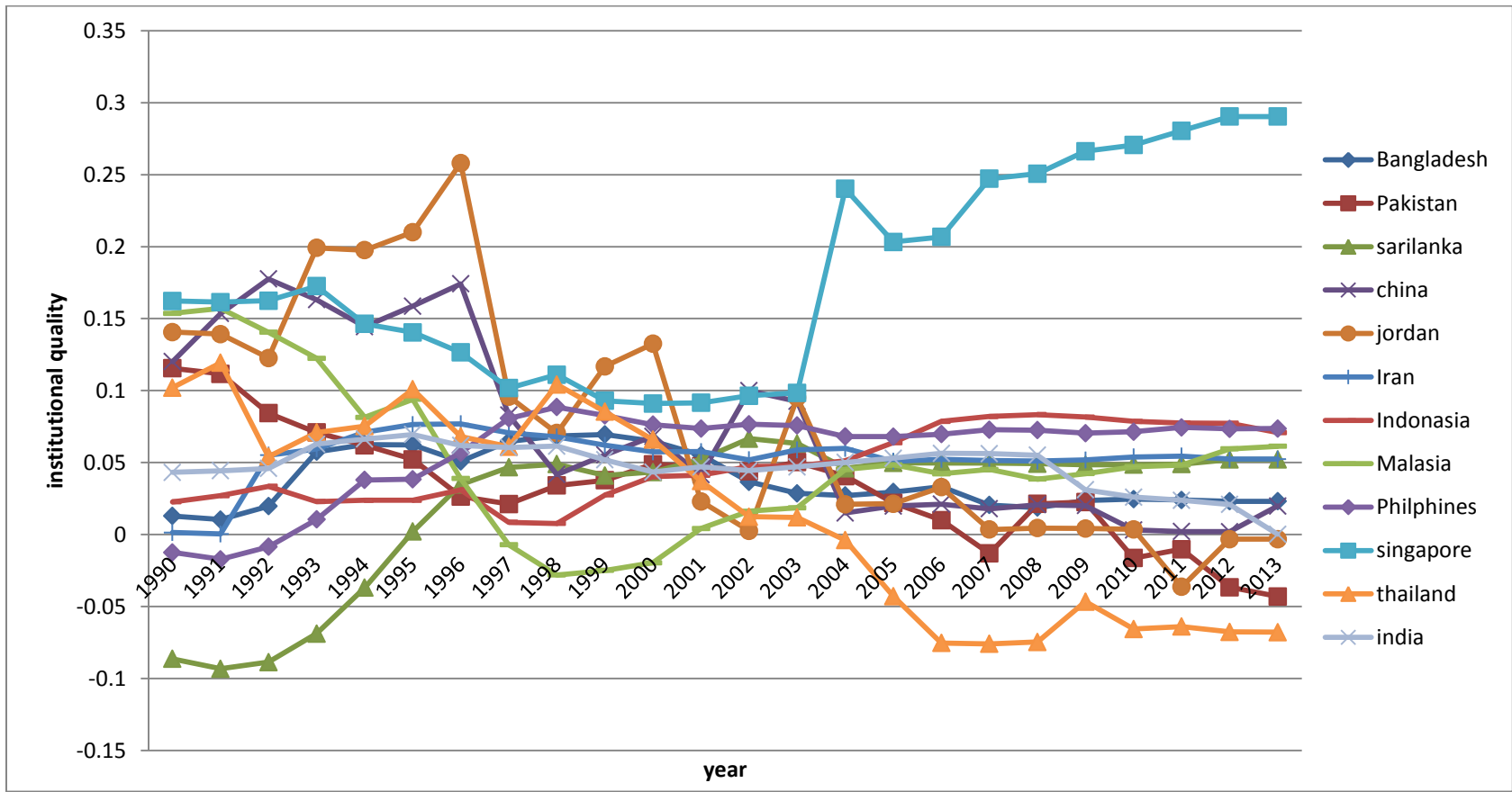


Figure 4. 15: Combined Graph of Legal Institutional Quality Index of Asian Countries

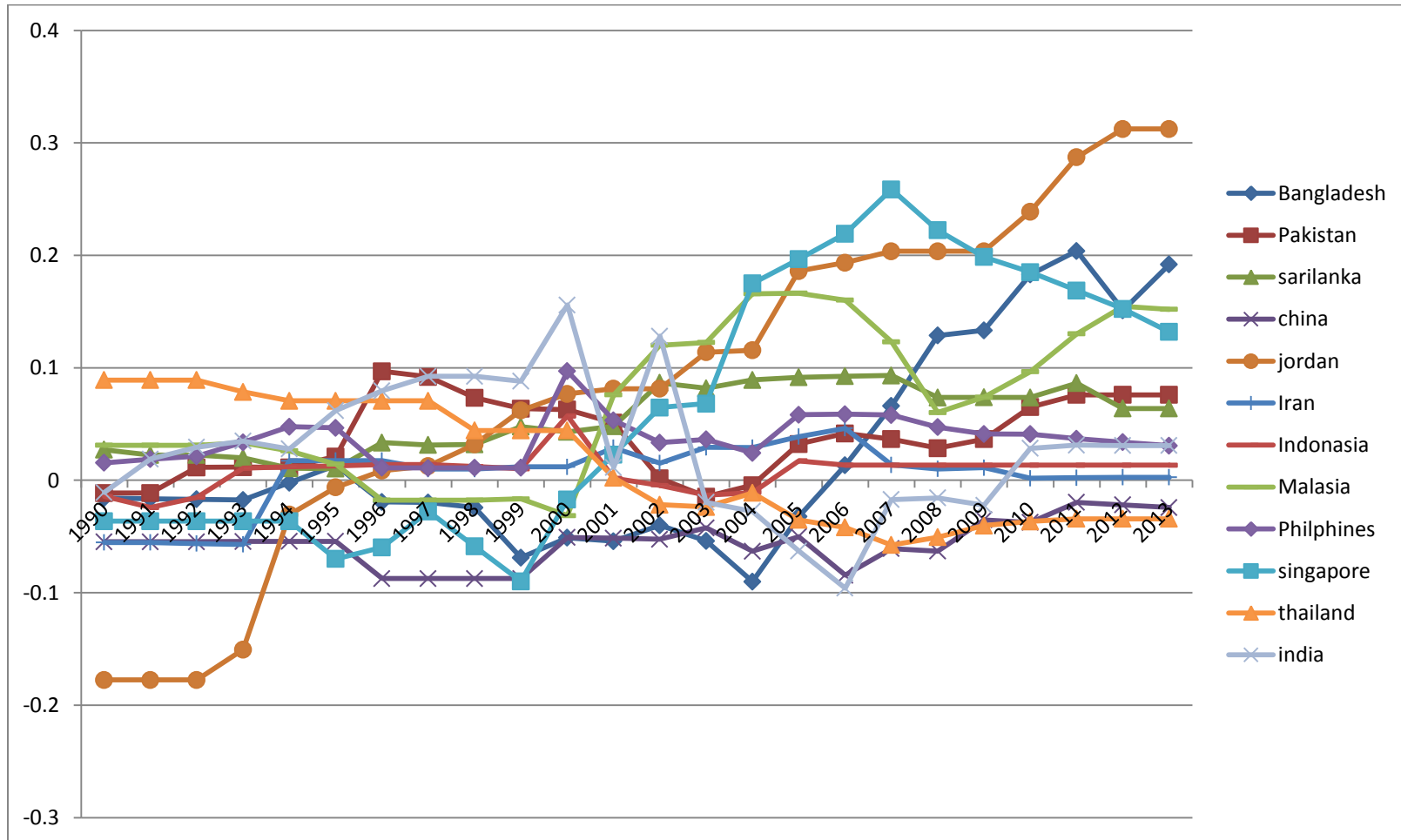


Figure 4. 16: Combined Graph of Economic Institutional Quality Index of Asian Countries

