

# INSTITUTIONAL QUALITY AND ECONOMIC GROWTH IN SOUTH ASIA

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## Abstract

*This paper empirically investigates the relationship between institutional quality and economic growth in South Asia. It further aims to pinpoint specific aspects of institutional quality which are more important in determining economic growth in South Asia. To an extent, this study also empirically tests the mechanism through which institutions affect economic performance, which was propounded by Daron Acemoglu, Simon Johnson, and James Robinson in 2005. Panel data regression analysis has been used to undertake this study. The dataset used for this study has been compiled from larger datasets provided by the United Nations, World Development Indicators and World Governance Indicators. It is observed that institutional quality has a positive impact on economic growth in South Asia. More specifically government efficiency, regulatory quality, control of corruption, rule of law, voice and accountability, and political stability and absence of violence/terrorism have a positive effect (in descending order of magnitude) on economic growth in South Asia. Despite emphasising the role of institutional quality as an important determinant of economic growth, this study reaffirms the critical importance of factors such as capital stock, labor force, and international trade in determining economic growth. The results also show that economic institutions are fundamental determinants of economic growth in South Asia; and further indicate that political institutions also have a positive effect on economic growth in South Asia indirectly via economic institutions, though the evidence on the latter proposition is not very conclusive.*

JEL Classification: B52, C23, N15, O10, O43, P16

Keywords: Economic Growth, Economic Institutions, Institutional Quality, Panel Data Regression Analysis, Political Institutions, South Asia

## 1. INTRODUCTION

One of the most pressing questions in the literature of economics of growth and development is: *Why some countries are poorer than others?* The evolution of the answer(s) to this question corresponds to the historical trajectory of the evolution of the theories of economic growth. Classical economists like Adam Smith, Karl Marx, Thorstein Veblen, Joseph Schumpeter were much concerned with economic growth. But the modern revival of the topic of economic growth started in the mid-twentieth century with a remarkable paper by Roy Harrod in 1939. This also marked the beginning for much of the theoretic-

cal and empirical research aiming to explain the international differences in income levels and their growth rates.

The so-called Harrod-Domar model of economic growth, which is based on the Keynesian saving-investment analysis predicts that the cross-country differences in economic growth are primarily due to the differences in aggregate economic parameters such as savings rate, capital-output ratio, population growth rate and rate of depreciation. Neoclassical growth models, explains the differences in income per-capita in terms of the different paths of factor accumulation across countries. New growth theories have taken two major paths to explain the international differ-

ences in income levels and their growth rates. First, they have emphasised the role of human capital and its deliberate accumulation over time. Second, they have emphasized the linkages between economic growth, technological growth, factor productivity, and innovation.

Despite such a rigorous and vibrant theoretical and empirical tradition ‘it [economic growth theories] has for a long time seemed unable to provide a *fundamental* explanation for economic growth’ (Acemoglu, Johnson, and Robinson, 2005). Scholars belonging to the institutional school of economic thought believe that physical capital, human capital, and technological growth are only *proximate* causes of growth. In the sense that they raise additional questions regarding the reasons for the cross-country differences in physical capital, human capital and technological growth. ‘The factors we have listed (innovation, economies of scale, education, capital accumulation etc.) are not causes of growth; they *are* growth’ (North and Thomas, 1973)). In North and Thomas’s view, the fundamental explanation of comparative economic growth is the difference in *institutions*.

The broader emphasis on the role of institutions in determining economic behavior, in general, started with the works of Thorstein Veblen (see for example Veblen (1899)). The modern revival of this approach started with works of scholars like John Kenneth Galbraith, Gunnar Myrdal, Robert Fogel, Douglas North, and others (see for example Galbraith (1958), Myrdal (1968), North (1990)). They undertook cross-discipline analysis to establish the relevance of formal and informal institutions for the economy, and the society in general.

A more focused inquiry into the relationship between institutional quality and economic growth also has rich theoretical and empirical literature (see for example Easterly and Levin (2000), Acemoglu, Johnson, and Robinson (2002,2005), Rodrik (2008)). Many other studies have inquired into the relationship between economic growth and specific aspects of institutional quality such as corruption, form of government, property right enforcement, rule of law and others (see for example Barro (1991), Knack and Keefer (1995), Mauro (1995), Vijayaraghavan and Ward (2001), Ulubasoglu and Doucouliagos (2004), Asgar, Qureshi, and Nadeem (2015), Iheonu, Ihedimma, and Onwuanaku (2017)). There is also evidence of a bilateral causality between institutional quality and economic growth (see for example Chong and Calderon (2000)). One common conclusion of all these studies is that an improvement in institutional quality does not lead to a fall in economic growth (rather in most cases it leads to a rise

in economic growth).

In this context, there are three main objectives of this study. First, to investigate the relationship between institutional quality and economic growth in South Asia. Second, to pinpoint *specific* aspects of institutional quality which are more important in determining economic growth in South Asia. Third, to an extent, empirically test the mechanism through which institutions affect economic performance, which was propounded by Daron Acemoglu, Simon Johnson, and James Robinson in 2005.

It is observed that institutional quality has a positive impact on economic growth in South Asia. More specifically government efficiency, regulatory quality, control of corruption, rule of law, voice and accountability, and political stability and absence of violence/terrorism have a positive effect (in descending order of magnitude) on economic growth in South Asia. Despite emphasising the role of institutional quality as an important determinant of economic growth, this study reaffirms the critical importance of factors such as capital stock, labor force, and international trade in determining economic growth. The results also show that economic institutions are fundamental determinants of economic growth in South Asia; and further indicate that political institutions also have a positive effect on economic growth in South Asia indirectly via economic institutions, though the evidence on the latter proposition is not very conclusive.

This study contributes to the existing literature in the following ways. First, it uses a more reliable, more transparent and all-encompassing dataset on different aspects of institutional quality provided by World Governance Indicators<sup>1</sup>. Second, there has been limited empirical research to identify specific aspects of institutional quality which are more important in determining economic growth, especially in the context of South Asia; this study attempts to identify such specific aspects of institutional quality. Third, it reaffirms the importance of factors such as capital stock, labor force, and international trade as fundamental determinants of economic growth. Fourth, to an extent, this study presents empirical evidence in favor of the mechanism through which institutions affect economic performance, which was propounded by Daron Acemoglu, Simon Johnson, and James Robinson in 2005.

The next section discusses the underlying theoretical framework for this study. Section 3 outlines the econometric model and estimation methods used in this study. Section 4 presents a detailed description of the dataset which has been compiled from various data sources for

<sup>1</sup>The methodology through which World Governance Indicators are constructed can be viewed at <https://info.worldbank.org/governance/wgi/Home/Documents> (last viewed on 22nd December 2019).

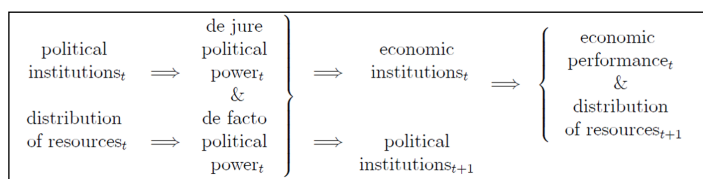
econometric estimation. Section 5 presents estimation results based on various estimation methods and their relevant interpretations. Section 6 concludes the study and links some of the findings to the theoretical issues discussed in Section 2. Appendix and Notes can be found at the end of the paper.

## 2. THEORETICAL FRAMEWORK

What are institutions? This study uses the following definition, propounded by Douglass North: ‘Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction. In consequence, they structure incentives in human exchange, whether political, social, or economic’ (North, 1990). This definition brings out three important characteristics of institutions. First, they are humanly devised constraints. Second, they shape human interaction. Third, they *structure incentives* in human exchange.

To understand the relevance of institutional quality as an important determinant for economic growth, it is important first, to understand the distinction between economic institutions and political institutions. Both economic institutions and political institutions influence the structure of incentives in society, but in different aspects. *Economic institutions* are concerned with aspects like - credibility of government’s economic policies, judicial and civil services efficiency, property rights, quality of contract enforcement, and others. *Political institutions* are concerned with aspects like the extent of elite control of the state, people’s participation in government selection, freedom of expression, free media, political stability, and others.

**Figure 1:** Mechanism through which institutions affect economic performance.



Source: Acemoglu, Johnson and Robinson (2005).

Now, it is useful to consider the mechanism through which institutions affect economic performance as described in Acemoglu, Johnson, and Robinson (2005) and presented by the schematic diagram in Figure 1. Political institutions and the distribution of resources amongst different social groups in period *t* determine *de jure* and *de facto* political power in period *t*. The *de jure* and *de facto* political power in period *t* determines the state of economic

institutions in period *t* and political institutions in period *t+1*. Economic institutions in period *t* determine economic performance<sup>2</sup> in period *t* and the distribution of resources amongst different social groups in period *t+1*. Thus, economic institutions have a direct impact on economic performance, while political institutions affect economic performance indirectly via economic institutions.

This study adopts the following theoretical strategy to address its objectives. The neoclassical production function (see for example Solow (1956)), postulates that total output is equal to technical change factor times a function of capital stock and labor force. This production function has been expressed in Equation 1.

$$Y = A\varphi(K, L) \tag{1}$$

Here Y stands for total output/total income, A stands for the technical change factor, K stands for capital stock and L stands for the labor force. There are strong theoretical and empirical justifications of the hypothesis that the economic interaction of an economy with the rest of the world, i.e. international trade has a significant effect on income (total output). This can be justified based on almost every theory of international trade either based on comparative advantages (Ricardian Model, Specific Factors Model, Heckscher-Ohlin Model, and Standard Trade Model) or economies of scale. Many empirical studies have shown that international trade has a quantitatively large and robust positive effect on income (see for example Frankel and Romer (1999)). Thus, the extended functional relationship has been expressed in Equation 2.

$$Y = A\varphi(K, L, T) \tag{2}$$

Here T stands for international trade. Every independent variable in Equation 2 is directly observable except the technical change factor. The technical change factor represents the composite effect of all factors which effect total output for a given amount of capital stock and labor force. The popular components of technical change factor are technological growth, innovation, human capital, institutional quality, and others. Based on the discussion in this paper so far, it is reasonable to postulate that technological growth, innovation, human capital and other such factors are *proximate* determinants of technical change factor while institutional quality is the *fundamental* determinant of technical change factor. Hence, the technical change factor can be exhaustively measured through the data on institutional quality. Finally, the functional relationship which act as the basis of the econometric model, specified in the next section has been expressed in Equation 3.

$$Y = \varphi(K, L, T, IQ) \tag{3}$$

<sup>2</sup>Economic performance can mean many things. This study concentrates solely on economic growth as an exhaustive measure of economic performance.

Here IQ stands for institutional quality. It is reasonable to expect that all the independent variables, i.e. capital stock, labor force, international trade, and institutional quality, in Equation 3 have a positive effect on total output/total income. The functional relationship in Equation 3 suggests that in addition of institutional quality, factors such as capital stock, labor force, and international trade are also fundamental determinants of total output/total income. This view is divergent from the arguments put forth by *pure institutionalists*, according to whom institutions and institutional quality is the only fundamental determinant of income level and its growth rate.

### 3. ECONOMETRIC MODEL AND ESTIMATION METHODS

Based on the discussion in this paper so far, the econometric model used in this study has been expressed in Equation 4. Here,  $i$  refers to the number of cross-sectional

$$\ln Y_{it} = \beta_0 + \beta_1 \ln K_{it} + \beta_2 \ln L_{it} + \beta_3 \ln T_{it} + \beta_4 IQ_{jit} + u_{it} \quad (4)$$

$$i = 1, 2, \dots, 8$$

$$t = 1, 2, \dots, 19$$

$$j = 1, 2, \dots, 6$$

subjects in the panel dataset,  $t$  refers to the time dimension of the panel dataset and  $j$  refers to the different aspects of institutional quality which have been considered in this study.

It is observed based on the analysis of the compiled dataset, that the natural log of the observable variables for the explanatory variables, i.e. capital stock, labor force, and international trade, have a strong uncontrolled positive correlation with the natural log of the observable variable for total output/ total income (see Appendix A.1.). This observation is as per the priori expectation.

It is also observed that there is a weak uncontrolled negative correlation between different aspects of institutional quality which have been considered in this study and the natural log of the observable variable for total output/total income (see Appendix A.1.). This observation is not as per the priori expectation because it is unreasonable to expect that an improvement in institutional quality would lead to a decrease in the natural log of total output/total income. This suggests that in order to understand the relationship between institutional quality and the natural log of total output/total income there is a need to control for other variable(s). As discussed in the previous section,

theory suggests that capital stock, labor force and volume of international trade needs to be controlled. This is the justification of the model specified in Equation 4.

As described in the next section, six aspects of institutional quality have been considered in this study. Data on different aspects of institutional quality has been used *turn by turn*, to estimate the econometric model given in Equation 4. This ensures two things. First, the problems related to imperfect multicollinearity are avoided, since it is only reasonable to expect that the data on different aspects of institutional quality are correlated amongst themselves. This expectation is borne out in reality (see Appendix A.2.). Second, *specific* aspects of institutional quality that are more important in determining economic growth in South Asia can be identified conveniently and accurately.

The econometric model given in Equation 4 ensures that the estimates of  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  are the partial elasticities of total output/total income with respect to the capital stock, labor force, and international trade respectively. The estimates of  $\beta_4$  are the semi-elasticities of total output/total income with respect to the different aspects of institutional quality.

The estimation methods which have been used in this study are pooled OLS estimation, fixed effects estimation and random effects (Swamy-Arora)<sup>3</sup> estimation. Intuitively speaking, it does *not* appear that the pooled OLS estimation method will be the appropriate estimation method since it is reasonable to expect heterogeneity amongst different countries of South Asia. Similarly, it does *not* appear that the random effects estimation method is the appropriate estimation method since it assumes that the sample of countries is drawn from a much larger universe of such countries, which is not the case here as all the countries of South Asia<sup>4</sup> are part of the sample.

Moreover, “even if it is assumed that the underlying model is pooled or random, the fixed effects estimators are always consistent” (Gujarati, Porter, Gunasekar (2017)). Hence, in the context of the objectives of this study, it appears that the fixed effects estimation method is the most appropriate estimation method for this study.

For the sake of *completeness*, the econometric model given in Equation 4 has been estimated by all three estimation methods. The decision regarding the most appropriate

<sup>3</sup>Swamy-Arora estimation method is the most widely used random-effects estimation methods in situations concerning balanced panel data.

<sup>4</sup>South Asia for this study has been defined as a group of countries that are members of the South Asian Association for Regional Cooperation (SAARC).

estimation method(s) has been made based on F-test, Hausman test, and Breusch-Pagan Lagrange Multiplier test. Robust standard errors have been used for the purpose of statistical inference<sup>5</sup>.

#### 4. THE DATA

This study uses a panel dataset which has been compiled from larger datasets provided by the United Nations, World Development Indicators, and World Governance Indicators. The compiled dataset includes data on eight countries that are members of the South Asian Association for Regional Cooperation (SAARC), i.e. Afghanistan, Bangladesh, Bhutan, Nepal, Maldives, India, Pakistan, and Sri Lanka, for the period 1996-2017<sup>6</sup>.

The description of data on the dependent variable and controlled variables, i.e. total output/total income, capital stock, labor force, and international trade is given in Table 1.

**Table 1:** Description of data on dependent variable and controlled variables.

Conceptual Variables	Observable Variable (unit)	Source
Total Output/Total Income (Y) [Dependent Variable]	GDP at constant 2010 prices (US Dollar)	United Nations
Capital Stock (K)	Gross Capital Formation at constant 2010 prices (US Dollar) <sup>7</sup>	United Nations
Labor Force (L)	Labor Force (Absolute Number)	World Development Indicators
International Trade (T)	Exports of Goods and Services at constant 2010 prices + Import of Goods and Services at constant 2010 prices (US Dollar)	United Nations

Source: Author's compilation based on data provided by the United Nations and World Development Indicators.

In this study, data on all the six aspects of institutional quality provided by World Governance Indicators has been considered. The data on different aspects of institutional quality provided by World Governance Indicators has certain characteristics, which makes it superior to any other dataset on institutional quality. These character-

istics have already been discussed in Section 1. The description of data on different aspects of institutional quality provided by World Governance Indicators is given in Table 2.

**Table 2:** Description of data on different aspects of institutional quality.

Aspects of Institutional Quality	Description
Control of Corruption (CC)	Control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.
Government Effectiveness (GE)	Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
Political Stability and Absence of Violence/Terrorism (PV)	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism.
Regulatory Quality (RQ)	Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
Rule of Law (RL)	Rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
Voice and Accountability (VA)	Voice and accountability capture perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.

Source: Author's compilation based on information provided by World Governance Indicators.

<sup>5</sup>Since the number of cross-sectional subjects is less than the time dimension, Panel Consistent Standard Errors (PCSE) suggested by Beck and Katz have been used.

<sup>6</sup>The sample size is 152. This is because the data on different aspects of institutional quality for the years 1997, 1999 and 2001 is not available.

<sup>7</sup>Gross Capital Formation at constant 2010 prices, has been used as a proxy variable for capital stock.

It should be noted, that the “estimate” of different aspects of institutional quality used in the analyses are not in absolute units but standardised units. “Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5” (World Governance Indicators).

## 5. ESTIMATION RESULTS AND INTERPRETATION

In this section, the estimation results based on pooled OLS, fixed effects and random effects (Swamy-Arora) estimation methods have been presented. Based on the

results of the F-test, Hausman test, and Breusch-Pagan Lagrange Multiplier test the correct estimation method(s) has been determined. This section ends, with the interpretation of the main results, based on the appropriate estimation method(s).

The descriptive statistics of the compiled dataset and the results of the F-test, Hausman test, and Breusch-Pagan Lagrange Multiplier test can be found in the Appendix (see Appendix A.3. and Appendix A.4.). The estimation results of Equation 4, based on the different estimation methods are given in Tables 3 to Table 5 <sup>8</sup>.

*Table 3: Pooled OLS estimation results*

Regressor/Statistic	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.891167 (0.0159)**	0.877832 (0.0272)**	0.823041 (0.0287)**	1.44627 (0.0026)***	0.766667 (0.0518)*	-0.121041 (0.7768)
lnK	0.152413 (0.0132)**	0.0181655 (0.6775)	0.156514 (0.0401)**	0.0255251 (0.5820)	0.0633594 (0.2042)	0.159862 (0.0141)**
lnL	0.255545 (0.0000)***	0.310928 (0.0000)***	0.232743 (0.0001)***	0.339389 (0.000)***	0.285848 (0.000)***	0.246587 (0.000)***
lnT	0.665068 (0.0000)***	0.760779 (0.0000)***	0.678479 (0.0000)***	0.713339 (0.0000)***	0.737782 (0.0000)***	0.704840 (0.0000)***
CC	-0.0707309 (0.0386)**	-	-	-	-	-
GE	-	0.0604824 (0.1108)	-	-	-	-
PV	-	-	-0.0643744 (0.0929)*	-	-	-
RQ	-	-	-	0.173382 (0.0002)***	-	-
RL	-	-	-	-	0.00319239 (0.9205)	-
VA	-	-	-	-	-	-0.168439 (0.0127)**
Adjusted R <sup>2</sup>	0.992028	0.991944	0.992138	0.992993	0.991825	0.992588

*Source: Author's calculation based on the compiled dataset*

<sup>8</sup>Values in the parentheses in Tables 3 to Table 5 represents p-value; \*\*\* represents significance at 1 percent level of significance, \*\* represents significance at 5 percent level of significance and \* represents significance at 10 percent level of significance.

Based on the results of statistical tests (see Appendix A.4.), it can be inferred that the fixed effects estimation method is the most appropriate estimation method for this study. This finding supports the intuitive discussion of these matters presented in Section 3. Thus, the estimation results presented in Table 4 is all that is required for the purpose of statistical inference and interpretation.

As per the results shown in Table 4, in South Asia, a 1 percent increase in capital stock leads to an increase ranging from 0.18-0.30 percent in total output/total income on an average. Similarly, in South Asia, a 1 percent increase in the labor force and international trade leads to an increase ranging from 0.23-0.44 percent and 0.33-0.44

percent respectively, in total output/total income on an average. The partial slope coefficients associated with the natural log of capital stock, labor force, and international trade are highly statistically significant in all six regression equations.

Partial slope coefficients associated with the different aspects of institutional quality has a different interpretation. A one standard deviation unit increase in government efficiency, regulatory quality, control of corruption, rule of law, voice and accountability and political stability and absence of violence/terrorism leads to a 22, 20, 18, 18, 3.5 and 3 percent increase in total output/total income on an average respectively, in South Asia. All aspects of institu-

**Table 4:** Fixed effects estimation results.

Regressor/Statistic	(1)	(2)	(3)	(4)	(5)	(6)
Constant	5.03056 (0.0000)***	3.39087 (0.0035)***	4.83356 (0.0001)***	3.60863 (0.0011)***	4.86633 (0.0000)***	5.62652 (0.0000)***
lnK	0.205438 (0.0011)***	0.244203 (0.0015)***	0.184654 (0.0045)***	0.290403 (0.0009)***	0.240132 (0.0008)***	0.201821 (0.0020)***
lnL	0.271265 (0.0022)***	0.438814 (0.0005)***	0.305596 (0.0027)***	0.380118 (0.0005)***	0.274460 (0.0022)***	0.238855 (0.0070)***
lnT	0.432408 (0.0001)***	0.349864 (0.0007)***	0.434543 (0.0003)***	0.337005 (0.0011)***	0.403014 (0.0002)***	0.429329 (0.0002)***
CC	0.181944 (0.0060)***	-	-	-	-	-
GE	-	0.223544 (0.0048)***	-	-	-	-
PV	-	-	0.0292172 (0.1491)	-	-	-
RQ	-	-	-	0.199504 (0.0016)***	-	-
RL	-	-	-	-	0.177589 (0.0279)**	-
VA	-	-	-	-	-	0.0361702 (0.3587)
LSDV R <sup>2</sup>	0.997514	0.997746	0.997368	0.997776	0.997509	0.997360
Within R <sup>2</sup>	0.905189	0.914043	0.899617	0.915163	0.904990	0.899315

Source: Author's calculation based on the compiled dataset

tional quality except voice and accountability, and political stability and absence of violence/terrorism are highly statistically significant.

It should be noted, that achieving a one standard deviation unit increase in any and every aspect of institutional quality considered in this study is not at all trivial; it might take a couple of decades altogether. This explains why a unit change in any aspect of institutional quality has a larger effect on total output/total income than a unit change in any of the controlled variables, i.e. capital stock, labor force, and international trade.

## 6. CONCLUSION

In conclusion, there are four major findings of this study. First, there exists a positive relationship between institutional quality and economic growth in South Asia, i.e. an improvement in institutional quality leads an increase in economic growth in South Asia. This conclusion follows straight from the estimation results presented in Table 4, where the estimated coefficients associated with all aspects of institutional quality are positive.

Second, it is observed that all the different aspects of institutional quality considered in this study, i.e. government

**Table 5<sup>9</sup>**: Random effects estimation results.

Regressor	(1)	(2)	(3)	(4)	(5)	(6)
Constant	3.64111 (0.0000)***	3.47532 (0.0000)***	3.32608 (0.0000)***	3.47112 (0.0000)***	3.64141 (0.0000)***	2.96065 (0.0000)***
lnK	0.190992 (0.0000)***	0.227017 (0.0000)***	0.167764 (0.0005)***	0.280930 (0.0000)***	0.217600 (0.0000)***	0.179418 (0.0000)***
lnL	0.387323 (0.0000)***	0.408249 (0.0000)***	0.389098 (0.0000)***	0.375537 (0.0000)***	0.376527 (0.0000)***	0.352805 (0.0000)***
lnT	0.425149 (0.0000)***	0.383578 (0.0000)***	0.458378 (0.0000)***	0.355273 (0.0000)***	0.406873 (0.0000)***	0.485848 (0.0000)***
CC	0.133831 (0.0031)***	-	-	-	-	-
GE	-	0.208716 (0.0000)***	-	-	-	-
PV	-	-	0.0370092 (0.0545)*	-	-	-
RQ	-	-	-	0.202916 (0.0000)***	-	-
RL	-	-	-	-	0.158353 (0.0013)***	-
VA	-	-	-	-	-	-0.000967117 (0.9804)

Source: Author's calculation based on the compiled dataset

<sup>9</sup>Gretl, the econometric software used for this study, does not report  $R^2$  statistics associated with random effects estimation methods.



efficiency, regulatory quality, control of corruption, rule of law, voice and accountability, and political stability and absence of violence/terrorism have a positive effect (in descending order of magnitude) on economic growth in South Asia. Thus, government efficiency is the most important aspect of institutional quality, and political stability and absence of violence/terrorism is the least important aspect of institutional quality in determining economic growth in South Asia. This conclusion follows straight from the estimation results presented in Table 4.

Third, despite emphasising the role of institutional quality in determining economic growth; this study reaffirms the critical importance of factors such as capital stock, labor force, and international trade in determining economic growth. It is observed that different aspects of institutional quality positively affect economic growth in South Asia, only when the differences in capital stock, labor force, and international trade are controlled for. Thus, capital stock, labor force, international trade, and institutions are *fundamental* determinants of economic growth. This conclusion follows straight from the analysis presented in Figure A.1. and Table 4.

Fourth, there is strong evidence that economic institutions are *fundamental* in determining economic growth in South Asia. Political institutions also have a positive effect on economic growth in South Asia indirectly *via* economic institutions; though the evidence in this regard is not very conclusive. This becomes evident when the theoretical and conceptual issues discussed in Section 2 and the estimation results presented in the previous section are viewed together.

The distinction between economic institutions and political institutions discussed in Section 2, and the description of the different aspect of institutional quality presented in Table 2, ensures that the different aspects of institutional quality considered in this study can be categorised into indicators of economic institutions and political institu-

tions. Government efficiency, regulatory quality, control of corruption and rule of law can be thought of as indicators of economic institutions. Whereas voice and accountability, and political stability and absence of violence/terrorism can be thought of as indicators of political institutions.

Based on the estimation results presented in Table 4, it can be observed that the estimated coefficients associated with indicators of economic institutions are much larger in magnitude and are also statistically significant even at 1 percent level of significance. On the other hand, estimated coefficients associated with indicators of political institutions are much smaller in magnitude and are statistically significant only at 15 and 36 percent<sup>10</sup> level of significance respectively.

This finding corresponds to a large extent with the mechanism through which institutions affect economic performance, which has been presented by a schematic diagram in Figure 1. This study presents strong evidence to establish at least one of the many relationships of that mechanism in the context of South Asia, which has been expressed in Equation 5.

$$economic\ institutions \longrightarrow economic\ performance \quad (5)$$

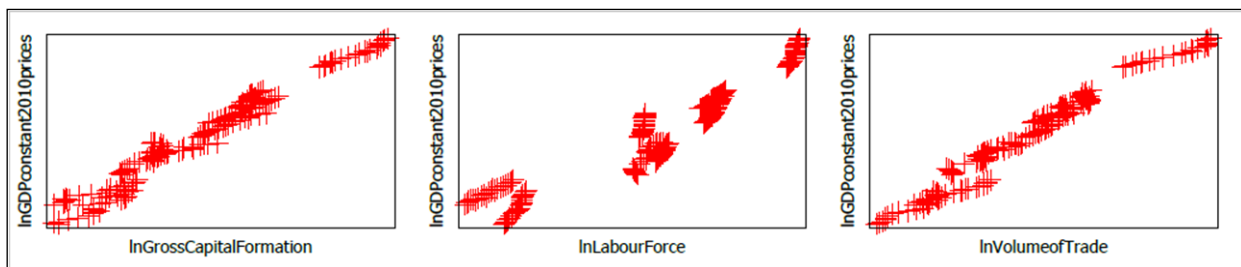
Another relationship of that mechanism, for which this study provides non-conclusive evidence in the context of South Asia has been expressed in Equation 6.

$$political\ institutions \xrightarrow{economic\ institutions} economic\ performance \quad (6)$$

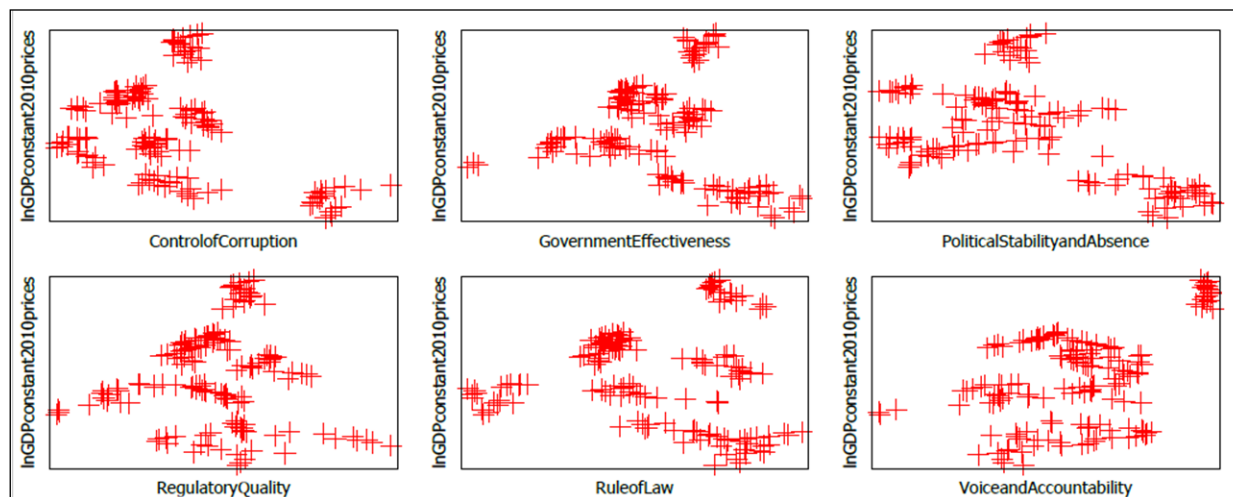
The fact that political institutions have a positive but statistically insignificant effect on economic growth in South Asia indicates that *maybe* political institutions affect economic growth indirectly, through a catalyst. Based on the mechanism presented in Figure 1, it can be concluded that maybe the catalyst is economic institutions.

## APPENDIX

### A.1. Scatter plot of lnGDP and the different explanatory variables given in Equation 4.



<sup>10</sup>It implies by definition that the indicators of political institutions are statistically insignificant with respect to conventional level of significance, i.e. 1,5 and 10 percent.



Source: Author's calculation based on the compiled dataset

**A.2. Correlation matrix for different aspects of institutional quality.**

	CC	GE	PV	RQ	RL	VA
CC	1					
GE	0.8235	1				
PV	0.7604	0.7895	1			
RQ	0.4018	0.7075	0.4979	1		
RL	0.8258	0.8844	0.6990	0.7095	1	
VA	0.2746	0.4474	0.2231	0.3984	0.6121	1

Source: Author's calculation based on the compiled dataset

**A.3. Descriptive statistics of the compiled dataset**

	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
lnY	24.052	20.074	28.593	2.2008	20.654	28.074
lnK	22.697	18.992	27.509	2.1595	19.323	27.066
lnL	16.019	11.193	20.041	2.5333	11.676	19.947
lnT	23.391	19.870	27.738	1.8774	20.587	27.327
CC	-0.54156	-1.6383	1.5683	0.70005	-1.5038	0.99208
GE	0.41907	-2.2317	0.90129	0.60717	-1.4507	0.59267
PV	-0.99564	-2.8100	1.2834	1.1549	-2.6540	1.0888
RQ	-0.60222	-2.1096	1.0267	0.54307	-1.6481	0.31806
RL	-0.48450	-1.8966	0.62753	0.63250	-1.7818	0.33952
VA	-0.53805	-2.0393	0.47656	0.54061	-1.3063	0.43824

Source: Author's calculation based on the compiled dataset

**A.4. Statistical tests to determine the appropriate estimation method(s)**

F-Test (Pooled OLS v/s Fixed Effects (LSDV))

$H_0$ : Both Pooled OLS method and Fixed Effects method give consistent estimators.

$H_1$ : Fixed Effects method give consistent estimators.

## Hausman Test (Fixed Effects v/s Random Effects)

$H_0$ : Both Fixed Effects method and Random Effects method give consistent estimators.

$H_1$ : Fixed Effects method give consistent estimators

## Breusch- Pagan Lagrange Multiplier test (Pooled OLS v/s Random Effects)

$H_0$ : Both the Pooled OLS method and Random Effects method give consistent estimators.

$H_1$ : Random Effects method give consistent estimators.

**Table A.4.** Results of F-tests, Hausman tests, and Breusch-Pagan Lagrange Multiplier tests.

Aspect of Institutional Quality in the Regression Equation	Welch F-Tests Statistics	Hausman Test Statistics	Breusch-Pagan (LM) Test Statistics	Appropriate Estimation Method
CC	33.7388 (0.0000)***	27.8143 (0.0018)***	210.789 (0.0000)***	Fixed Effects
GE	33.2382 (0.0000)***	9.61443 (0.0474)**	284.597 (0.0000)***	Fixed Effects
PV	30.2424 (0.0000)***	108.194 (0.0000)***	153.973 (0.0000)***	Fixed Effects
RQ	33.0102 (0.000)***	3.62995 (0.45839)	311.995 (0.0000)***	Fixed Effects and Random Effects
RL	34.5953 (0.0000)***	38.5852 (0.0000)***	247.416 (0.0000)***	Fixed Effects
VA	24.3293 (0.0000)***	101.536 (0.0000)***	110.632 (0.0000)***	Fixed Effects

Source: Author's calculation based on the compiled dataset

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