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The Composite Impact of Institutional Quality and Inequality on Economic Growth

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1. INTRODUCTION

The relationship between institutions and economic growth has attracted significant attention in recent years with the dominant view being that institutional quality positively influences economic performance of a country. However, the impact of similar kind of institutions on economic growth varies across regions and countries. Various reasons including, Income inequality and ethnic fragmentation have been put forth as proximate cause of the weaker relationship between institutions and economic growth [Easterly, *et. al* (2006); Ann-Sofie (2007)]. However not enough literature is available on why the impact of similar set of institutions on growth varies across countries and regions. Given that inequality may weaken the impact of institutional quality on growth, this study seeks to examine the composite impact of institutional quality and inequality on growth in selected Asian economies.

Highly unequal societies may adversely influence the quality of institutions. Literature suggests variety of mechanisms through which this may happen. These include concentration of political power and social and ethnic fragmentation etc. Studies argue that if the political power is concentrated in society, then the few elites will shape institutions and policies to their own advantage—in such societies the government will make the kind of investment and offer the kind of services which favour the elite. It is also argued that the skewdness of the distribution of wealth contributes to political inequality which produces institutions that favour a small segment of the society [Olson (1993), Sonin (2003), Acemoglu (2003, 2005), Gradstein (2008)]. Engerman and Sokoloff relate institutional quality to inequality observed in factor endowments while Acemoglu relate this to colonialism. They argue that inclusive institutions were established in places where the European colonisers could settle themselves while extractive institutions were developed in countries/regions where the colonisers were to rule through minimal presence of their own.

The primary objective of the study is to examine how institutional quality influences economic growth, given inequality. While seeking an answer to this question the independent impact of institutional quality and inequality on growth will be also be gauged.

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The rest of the paper is organised as follows. Section 2 discusses the relevant literature review while the empirical model, data sources and the model specification are presented in Section 3. Section 4 describes the estimation results Section 5 concludes the study.

2. REVIEW OF RELATED LITERATURE

The debate over the importance of institutions in the growth process has been the focus of attention for some decades now. A variety of literature examines the growth process across nations in relation to many concepts ranging from inequality, trade, geography to institutions. Some of these works are reviewed below:

2.1. Inequality and Growth

The relationship between inequality and growth has been repeatedly challenged making it difficult to capture the exact relationship between growth and inequality. While Kuznets' inverted U-curve hints that inequality will rise as the economy grows in the early stage of development and falls when GDP per capita surpasses a certain level. However, it is argued that high inequality may lead to reduced economic growth, suggesting a negative relationship between inequality and growth [Alesina and Rodrik (1994); Persson and Tabellini (1994) and Clarke (1994)]. Explaining the negative relationship between growth and inequality Birdsall, *et al.* (1995) and World Bank (1993) point towards the fact that growth had been high in relatively egalitarian East Asia as compared to Africa and Latin America—the regions with high inequality. Perotti (1996) finds no evidence for the role of higher tax rates causing inequality but links the negative relationship between inequality and growth to the political instability and low human capital development more unequal societies. The negative inequality-growth relation has been challenged by many researchers who found zero, or a positive relationship between inequality and growth. [Forbes (2000); Barro (2000); Banerjee and Duflo (2003)]. These studies implicitly support the long held belief in economics about the positive association between inequality and growth. The underlying argument being that the rich with higher propensity to save will provide more capital for investment thereby positively influencing growth. However, given data constraints, especially regarding the data on inequality, these studies did not test the relationship for poor countries.

A large strand of literature is focused on the mechanisms that characterise the inequality-growth relationship. Apart from the redistributive mechanism identified in the work of Alesina and Rodrik (1994) and Persson and Tabellini (1994), institutional mechanism is a strong determinant of the negative relationship between inequality and growth [Easterly (2002); Olson (1993); Acemoglu (2003, 2005) and Sokoloff and Engerman (2000)]. Easterly (2002) has examined the impact of inequality; on institutions, openness and schooling and he finds negative effect of inequality on all three. Olson (1993) and Acemoglu (2003) confirm the negative relationship between inequality and growth by identifying how inequality and political instability lowers the growth process. Sokoloff and Engerman (2000) emphasise the role of few powerful elites in delaying the implementation of growth enhancing policies and conclude the inequality adversely affects economic development.

Yet another channel of inequality-growth relationship is of credit market imperfections. The credit market imperfections affect growth through influencing access to education. Galor-Zeira (1993) and Perotti (1996) argue that given credit market imperfections a borrower ends up paying more interest making it difficult for the poor to borrow. This constrains the access to education for the poor and the formation of human capital. Easterly (2007) also supports the view that inequality has an adverse effect on human capital formation and economic development. Easterly's cross country analysis suggests that inequality has been a barrier to schooling and economic prosperity.

2.2. Inequality and Institutions

While the importance of institutions for development has widely been accepted, a significant body of literature confirms that institutional quality varies across countries. Several studies examine the impact of economic conditions on institutional quality. In particular, studies like Hoff and Stiglitz (2004), Sonin (2003), and Chong and Gradstein (2004) suggest that an egalitarian distribution of income is very important for establishing good institutions. Hoff and Stiglitz (2004) present a framework for institutional subversion; Sonin (2003) presents a dynamic model suggesting that low quality institutions are responsible for the adverse effect of inequality on growth as low-quality institutions are associated with wasteful redistribution towards the rich which affects the growth process negatively. Chong and Gradstein (2004) propose a mechanism which identifies that the intensity of rent seeking derived from a public asset—such as technological knowledge or a natural resource—is a source of low institutional quality. Using a panel vector Autoregressive approach and Granger causality test they find a bi-directional causal relationship between income inequality and institutions. Sonin (2003), using a theoretical model, shows that in the absence of democracy (political inequality and wealth inequality) the rich and the politically influential make the institutions work for their benefit through rent seeking activities. Such activities retard the development process due to waste of resources in rent seeking, resulting into lower growth and high inequality.

Engerman and Sokolof (2002) and also Sokoloff and Engerman (2000) look at this relationship in historical perspective. They argue that initial (historical) factor endowments are the main determinants of inequality developed under colonial regimes. Given high inequality the colonial regimes were able to establish extractive institutions in Latin America whereas they failed to do so in North America, where relative egalitarianism prevailed. The authors argue that high inequality in these colonies provided unbalanced economic opportunities which benefited the elite. In line with study of Engerman and Sokolof (2002), many social scientists and economists have successfully tested inequality's hypothesis. Easterly (2001) using middle class share as a proxy for inequality and commodity endowments as an instrument for inequality confirms a negative relationship between inequality-democracy. Ericksonand Vollrath (2004) test the Engerman and Sokolof hypothesis using land inequality as a measure of inequality and they find no influence of land inequality on institutions. Quite contrary to the findings of Ericksonand Vollrath (2004), Keefer and Knack (2002) test the impact of land and income inequality on property rights controlling for political regimes (democracies versus autocracies). They show that inequalities negatively affect institutions (property rights).

Some studies, such as Bardhan (2001), Hoff and Stiglitz (2001), and Busch and Muthoo (2010) link the persistence of inefficient institutions with bargaining power. Bardhan (2001), using a simple Nash bargaining model, demonstrates that a growth-enhancing institutional change may create would-be winners and would-be losers and argues that it is the would-be losers who would resist the change. They further argue that the change being resisted is potentially Pareto improvement. Similarly, Busch and Muthoo (2010) study the issue in a two player's model in which the players have options to negotiate over an efficiency-enhancing institutional change. The model assumes that the players have perfect and complete information. They show that if this change is implemented then how the players' respective bargaining power would be altered, resulting into a change in the players' incentive to support or not to support the institutional change. Both the studies conclude that greater degree of inequality in the players' bargaining powers leads to the persistence of inefficient institutions. Similarly in one of his pioneering works Acemoglu (2002) argues that the conflict over redistribution policies is a key factor determining the persistence of inefficient institutions.

2.3. Institutions and Growth

The link between institutions and growth has been widely debated to explain the cross country variation in the development path. Since the first studies that used institutions as explanatory variables of growth in cross-country regressions [e.g., Barro (1991)], large number of works have used variety of datasets that provide 'institutional variables' to be added to the usual explanatory variables in cross-sectional growth regressions. e.g. International Country Risk Guide (ICRG), Business Environment Risk Intelligence (BERI), the Polity database, the Freedom House index, etc. [Knack and Keefer (1995); Mauro (1995); Clague, *et al*. (1997) and Hall and Jones (1999)].

In a cross-country analysis, Knack and Keefer (1995) investigates the impact of property rights on economic growth using institutional indicators. These institutional indicators include quality of bureaucracy, property rights, and the political stability of a country compiled by country risk evaluators to potential foreign investors. They find a statistically significant positive relationship between institutions and economic growth. Similarly, Mauro (1995) and Easterly (1999) show that corruption affects the growth process negatively. The two popular studies which have examined the role of institutions on economic growth are Hall and Jones (1999) and Acemoglu, *et al.* (2001). The former focuses on social infrastructure and the later emphasises the risk of expropriation that current and potential investors face. Given the endogeniety between institutions and growth, both the studies use instrumental variables to examine the relationship between institutions and growth. Hall and Jones (1999) examine the hypothesis that the difference in cross-country economic performance is based on variations in inputs (physical capital and human capital). Their results show that the large amount of variation in the level of the Solow residual across countries cannot fully explain the differences in physical capital and educational attainment. They conclude that the differences in capital accumulation, productivity and therefore output per worker across countries are determined by differences in institutions and government policies, which they call social infrastructure. Acemoglu, *et al*. (2001) argue that European colonisers established good institutions in countries where the disease environment allowed them to settle, while they established extractive institutions in countries where they could not settle themselves.

Rodrik, *et al*. (2002) investigates the impact of institutions, geography and trade in affecting the variations in income levels around the world. Their results show that the quality of institutions succeed in explaining the variation—once institutions are controlled for, trade does not directly affect economic growth, while geography weakly affects it. Trade and other geographical indicators have negative relationship with growth. Rodrik, *et al*. (2002) finds a bi-directional relationship between institutional quality and trade. This suggests that trade can indirectly affect the growth process by improving institutional quality. They also examine the impact of geography on economic growth and their results confirm the findings of Easterly and Levine (2002) that geography has a significant effect on institutions, this could be, e.g. through the disease environment.

The literature, discussed in this study provides a one link phenomenon in which either inequality has been linked to growth or to institutions, or institutions have been linked to growth and vice versa.

Only a selected number of papers which study the determinants of institutions and the influence of these institutions on growth. Olson (1993), Acemoglu (2003), and (2005) discuss the political determinants of development in which they argue that political inequality affects economic institutions which in turn affect the growth process. In historical perspective Sokoloff and Engerman (2000) links the development pattern of the New World's colonies to the initial level of inequality which, they argue, has resulted into the subversion of institutional quality in Africa and Latin America. The authors conclude that economic inequality in the age of colonisation adversely affects suffrage, schooling, banking and other institutions and continues to affect growth to this very day. Social and cultural dynamics of a country also play an important role in establishing efficient and much effective institutions. In line with this argument Ann-SofieIsaksson (2007) and Easterly, *et al* (2006) find that measures of social cohesion (or social division) such as income inequality and ethnic fractionalisation endogenously determine institutional quality which in turn causally determines growth. Gradstein (2008) emphasises on the role of political and economic inequality over formal institutions in the growth process. However, Mark Gradstein does not empirically test this relationship argued. The present study seeks to fill this gap.

3. EMPIRICAL MODEL

Based on the literature reviewed above the behavioural relationship between income inequality, institutional quality and economic growth can be empirically formulated as follows

$$Y_{it} = \beta_0 + \beta_1 Inst_{it} + \beta_2 Ineq_{it} + \beta_3 Inst_{it} . Ineq_{it} + \beta_4 X_{it} + u_{i,t} \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Y_{it} is the annual per capita growth rate of GDP, $Inst_{it}$ is institutional quality, $Ineq_{it}$ is inequality, $Inst_{it} \times Ineq_{it}$ is the interaction term allowing the institutional parameter to vary along inequality, Xi is a vector of control variables including inflation, trade openness, change in capital taken as investment and population growth, whereas u_{it} is the random error term.

The main focus in Equation 1 is on β_3 which is the parameter for the interaction of institutional quality and inequality. Interaction models are generally used to capture the

effect of one variable over the other through the mediating mechanism. For example Ann-Sofie (2007) investigates the impact of institutional quality on economic performance in socially segmented countries. To account for the role of social division on economic performance, the author employs a nonlinear model that captures the interaction between institutional quality and social division by using the term 'Gini times social division'. The study finds that that though high institutional quality positively influences economic growth independently but this relationship is adversely affected in countries with high degree of social divisions. Similarly, Savoia and Easaw (2007) use the interaction of economic institutions and political equality (i.e. democracy) to gauge their combined influence on income inequality. They find that the impact of economic institutions on income inequality is influenced by the level of political equality.

3.1. Data Description and Sources

We use panel data for nine low and lower-middle income countries.[1] The selection of nine countries within the low and lower middle income countries is owed to data constraints—the data on income inequality (Gini coefficient) for sufficient period to allow econometric analysis (1984-2010) is available only for these 9 countries, within the category of low and middle income countries.

The studies on inequality often use the data on inequality developed by Dennigner and Squire (1996, 1998). The Denniger and Squire data set has been criticised on various counts by Atkinson and Brandolini (1999). They argue that the inequality measured by Denniger and Squire uses different variables for different countries, for example; individual versus household income, income vs. expenditure and pre-tax vs. post-tax income. They argue that the adjustment required to make the data comparable across countries has not been carried out.

An alternative global inequality dataset as been constructed by University of Texas Inequality project (UTIP) based on Industrial Statistics data base published annually by United Nations Industrial Development Organisation (UNIDO). This data does not measure household income inequality rather it is a set of measures of the dispersion of pay across industrial categories in the manufacturing sector. This source has been used most often in the literature for the study of inequality over time and across countries. Yet another source for inequality data is 'Standardising World Income Inequality Dataset (SWIID)' which provides data for more than 153 countries starting from 1960. It interpolates the missing data from the World Income Inequality Database (WIID). Recently, the updated version of 'Standardising World Income Inequality Data Set', SWIID, version 3.1 [Solt (2011)] has made it quite possible to study the issue of inequality for wide panel of countries.

We have used Gini coefficient to measure income inequality and the data on the variable is from SWIID version 3.1. For institutional quality we have constructed an index comprising six features institutional quality. The components of the index of institutional quality include: democratic accountability, government stability, corruption, bureaucratic quality rule of law and investment profile. The data on these features of

[1]The classification of low and lower middle income countries is based on WDI data set. The sample of countries include: Bangladesh, El-Salvador, Egypt, Honduras, India, Indonesia, Pakistan, Philippine, and Sri Lanka.

institutional quality is from International Country Risk Guide (ICRG) published by the PRS Group. The index has been generated using Principal Component Analysis.[2] Computation of the index is shown in Appendix Table 2 while the detailed description of data source is given in Appendix Table 1.

3.2. Summary Statistics

Appendix Table 3 presents summary statistics which includes mean, median, standard deviation and skewness for all the variables. Appendix Tables 4 and 5 present the correlation and covariance matrix. Institutional quality, trade openness and investment are positively correlated with per capita income growth while Gini index, population growth and the interactive term (Gini x institutional quality) are negatively correlated. The covariance matrix exhibits relationship similar to the ones observed in the correlation matrix. Gini index, population growth and the product of Gini and institutional quality covariate negatively with per capita income while all others covariate positively.

4. EMPIRICAL FINDINGS

This section explains the empirical model in detail along with its interpretation and robustness check in a subsequent manner.

4.1. Results

Two methods available for estimating panel data are the fixed effect and random effect model. The results from Hausmann test, reported in Appendix Table 6 reveal that fixed effect model is more suitable for estimation of the empirical model given by Equation 1. Given that Hausman test favours fixed effects method, the model has been estimated using this method and to tackle endogeniety robustness of the results has been checked using two stage least square (2SLS). Per capita income growth the dependent variable: institutional quality, Gini index and the interactive term, Gini x institutional quality are main variables of our interest variables while we control for inflation, investment, trade openness and population growth. The Results are reported in Appendix Table 7.

Institutional quality, positively influences growth, is highly significant and conforms to literature [Acemoglu, *et al.* (2004); Hall and Jones (1999); Knack and Keefer (1995); and Rodrik, *et al.* (2004)]. Income inequality, measured by Gini Index, is negatively correlated growth. The results indicated in the fixed effects model show that the coefficient of this variable is negative and highly significant at 1 percent. The coefficient suggests that a 1 percent increase in Gini Index leads to 0.38 percent decrease in economic growth. The result is consistent with the findings of Alesina and Rodrik (1994), Persson and Tabellini (1994), and Clarke (1994). In low income countries this negative inequality-growth relationship is consistent with the findings of Perotti (1996) who links the negative relationship to the political instability and low human capital development in these countries.

The third variable which is the main focus of this study is the interactive term of income inequality and institutional quality. This is included to capture the effects of institutions on economic growth given high inequality in a society. The results show that

[2]Principal component analysis is based on the frame work used by Bishoi, *et al.* (2009).

the interactive term, which is significant at 1 percent, affects economic growth negatively. A 1 percent increases in the coefficient of the interactive term (Gini x institutional quality) decreases growth by 0.49 percent. Thus despite there being positive relation between institutional quality and growth the composite impact of income inequality and institutional quality on growth is negative. This implies that for institutions to play a positive role in economic growth a certain minimum level of egalitarianism in a society is essential, this being absent the composite impact is negative.

Inflation, investment, trade openness and population growth are the control variables. Investment/GDP is highly significant at 5 percent level of significance and is positively related to growth; while inflation (CPI), significant at 1 percent, is negatively associated with GDP. Trade openness and population growth influence growth positively. All the results are as expected.

The results obtained from the 2SLS are similar to the results obtained from estimation of equation 1 using the fixed effects model. In 2SLS estimation, the validity of the results depends on the value of J-statistics which tests the null hypothesis of correct model specifications and over identification restriction i.e. the validity of the instruments. The results reported in Appendix Table 6 show that the null hypothesis is not rejected at any conventional level of significance ($p = 0.129$). This confirms the validity of the model and of the instruments used.

4.2. Sensitivity Analysis and Robustness Check

We have estimated a whole range of regressions using both the fixed effects model and the 2SLS, by including or excluding certain variables. In all the specifications the sign and significance of coefficients of institutional quality, inequality and their interactive term remain consistent. These results are presented in Appendix Table 8.

5. SUMMARY AND CONCLUSION

Institutions are known to influence growth positively. While inequality that was once considered good for growth is now considered harmful. We argued that it is not appropriate to consider the effect of either institutions or inequality on growth in isolation because both may interact to influence growth. For example, given high inequality, otherwise brilliant individuals may not make it to the labour market due to market frictions. Similarly despite equality of opportunity, organisations may not overcome the problem of adverse selection if the institutions meant for identifying the right individual are of poor quality. Therefore the composite impact of institutional quality and inequality is an important determinant of growth. We find that the impact of the interactive term, 'institutional quality times inequality' on economic growth is negative. This is despite the fact that the independent impact of institutions on growth is positive. The implication is that for a sustained and decent growth, improvements in institutional quality as well as alleviation of inequality are important.

APPENDIX

Table 1

Description of Variables

S. No.	Variable	Description / Source
1.	*Economic Growth (Y)*	GDP per capita growth (% annual). / WDI
2.	*Income Inequality (Gini)*	Gini Coefficients. / SWIID Version 3.1
3.	*Institutional Quality Index(Q)*	ICRG Components/PCA Index
4.	*Investment (Inv)*	Gross fixed capital formation as percentage of GDP. /WDI
5.	*Population Growth (PG)*	Population Growth(% Annual)./WDI
6.	*Inflation (Inf)*	Consumer Prices (Annual %)./WDI
7.	*Trade Openness (TO)*	Sum of Imports and Exports as a ratio of GDP. / WDI

Table 2

Eigen Values of Correlation Matrix

	PC1	PC2	PC3	PC4	PC5	PC6
Eigen values	2.93	1.01	0.78	0.51	0.44	0.33
Variance %	192.13	22.59	26.92	7.18	10.92	-
Cumulative %	48.81	65.6	78.62	87.15	94.49	100
Eigen Vectors						
Variables	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6
Bureaucratic Quality	0.43	0.03	-0.43	0.65	-0.44	-0.SS12
Corruption	0.33	0.47	0.69	-0.01	-0.38	0.20
D. Accountability	0.35	0.63	-0.32	-0.04	0.59	0.18
Government Stability	0.43	-0.52	-0.03	-0.11	0.06	0.72
Investment Profile	0.46	-0.05	-0.23	-0.71	-0.27	-0.40
Law and Order	0.43	-0.32	0.43	0.25	0.49	-0.48

Table 3

Summary Statistics

	Mean	Median	Maximum	Minimum	Std. deviation
Economic Growth	2.81	2.86	17.15	-15.70	3.10
Institutional Quality	0.49	0.51	0.78	0.19	0.12
GINI	38.61	35.79	53.23	26.92	6.74
GINI x Inst. Quality	19.15	18.56	34.77	5.41	5.78
Inflation	9.58	8.35	58.39	0.52	7.04
Trade Openness	56.46	53.62	136.75	12.36	26.16
Investment	21.93	21.54	38.11	11.46	5.36
Population Growth	1.80	1.80	3.42	-1.61	0.68

Table 4

Correlation Matrix

	Y	Q	GINI	GINI*Q	INF	TO	INV	PG
Economic Growth (Y)	1							
Institutional Quality (Q)	0.29	1						
GINI	-0.18	0.02	1					
GINI x Inst.Q	-0.12	0.83	0.55	1				
Inflation (INF)	-0.41	-0.34	0.05	-0.27	1			
Trade Openness (TO)	0.10	0.25	0.68	0.62	0.01	1		
Investment (INV)	0.30	0.38	0.05	0.33	0.12	0.31	1	
Population growth (PG)	-0.24	-0.42	-0.11	-0.42	0.08	-0.19	-0.05	1

Table 5

Covariance Matrix

	Y	Q	GINI	GINI*Q	INF	TO	INV	PG
Economic Growth (Y)	9.591							
Institutional Quality (Q)	0.110	0.015						
GINI	-3.870	0.016	45.303					
GINI x Inst. Quality	-2.234	0.586	21.356	33.237				
Inflation (INF)	-9.091	-0.294	2.515	-11.147	49.433			
Trade Openness (TO)	8.058	0.823	121.008	92.792	17.752	681.432		
Investment (INV)	5.067	0.253	1.709	10.201	4.657	42.953	28.667	
Population Growth (PG)	-0.512	-0.035	-0.501	-1.635	0.378	-3.368	-0.188	0.463

Table 6

Hausman Test

Correlated Random Effects—Hausman Test				
Test Cross-section Random Effects				
Test Summary (Panel 1)	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	
Cross-section Random	24.8906	6.0000	0.0004	
(Panel 2) Cross-section Random Effects Test Comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob
Institutional Quality	-4.63	3.88	32.19	0.03
GINI x Inst. Quality	0.06	-0.15	0.02	0.18
Inflation	-0.18	-0.16	0.00	0.01
Trade Openness	-0.01	-0.01	0.00	0.01
Investment	0.20	0.15	0.01	0.11
Population Growth	0.07	-1.29	0.15	0.03
Panel (3) Cross-section Random Effects Test Equation:				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.90	1.14	0.79	0.42
Institutional Quality	-4.69	6.41	-0.72	0.47
GINI x Inst. Quality	0.06	0.14	0.42	0.67
Inflation	-0.18	0.02	-6.84	0.00
Trade Openness	-0.001	0.01	-0.13	0.89
Investment	0.20	0.05	4.06	0.00
Population Growth	0.38	0.16	0.02	0.002
Effects Specification				
Cross-section Fixed (dummy variables)				
R-squared	0.45	F-statistic		12.77
Adjusted R-squared	0.41	Prob(F-statistic)		0.00

Table 7

Empirical Findings

	Fixed Effect	2SLS	Random Effect
Institutional Quality	14.58	29.17	17.710
	(8.86)***	(11.44) **	(7.67) **
GINI	-.38	-0.53	-.16
	(0.11)*	(0.14)*	(0.08) ***
Inflation	-0.22	-0.26	-0.22
	(0.02)*	(0.03)*	(0.02)*
Trade Openness	0.23	0.53	-0.002
	(0.02)	(0.009)	(0.02)
Investment	0.23	0.15	0.24
	(0.04)*	(0.07) **	(0.03)*
Population Growth	0.07	0.28	-1.28
	(0.45)	(0.75)*	(0.2)
GINI x Inst. Quality	-0.49	-0.87	-0.56
	(0.22)**	(0.28)*	(0.19)*
C	-14.06	-18.48	-2.42
	(4.76)*	(6.26)*	(3.42)
R-square	0.48	0.46	0.417
Adjusted R-squared	0.45	0.41	0.39
F-statistics	14.44	–	23.96
Prob(F-statistic)	0.00	–	0.00
J-statistic	–	9.89	–
Prob(J-statistic)	–	0.13	–

Note: All the values in the parenthesis denote standard errors. The ***, **and * indicate the significance at 10 percent, 5 percent and 1 percent respectively.

Table 8

Robustness Check and Sensitivity Analysis

	Fixed Effects			2SLS		
Variables	1	2	3	4	5	6
Institutional Quality	6.51	-4.31	14.58	26.25	5.95	29.18
	(1.62)*	(2.24)***	(8.86)***	(13.97)**	(2.62)	(11.44)**
GINI	–	–0.19	-0.39	–	-0.26	-0.54
		(0.07)*	(0.11)*		(0.09)*	(0.14) *
Inflation	–	-0.22	-0.23	–	-0.2	-0.26
		(0.025)*	(0.03)*		(0.03)*	(0.04)*
Trade Openness	–	0.01	0.02	–	0.01	0.03
		(0.02)	(0.02)		(0.02)	(0.02)
Investment	–	-0.24	0.24	–	0.27	0.15
		(0.05)*	(0.05)*		(0.06)**	(0.07)**
Population Growth	–	0.02	0.06	–	-0.07	0.28
		(0.46)	(0.46)		(0.54)	(0.76)
GINI x Inst. Quality	–	–	-0.49	–	–	-0.87
			(0.22)**			(0.28)*
C	-0.41	-6.25	-14.06	-19.54	-7.84	18.48
	(0.82)*	(3.20)	(4.76)*	(6.57)	(3.79)*	(6.26)
R-squared	0.25	0.48	0.49	0.16	0.38	0.47
Ad. R-squared	0.22	0.44	0.45	0.11	0.33	0.41
F-statistic	8.80	14.87	14.44	–	–	–
Prob(F-statistic)	0.00	0.00	0.00	–	–	–
J-statistic	–	–	–	3.85	6.93	9.89
Prob(J-statistic)	–	–	–	0.28	0.22	0.12

Note: All the values in the parenthesis denote standard errors. The ***, **and * indicate the significance at 10 percent, 5 percent and 1 percent respectively.

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