DOES TRADE OPENNESS AFFECT INSTITUTIONAL QUALITY?

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ABSTRACT

A rich literature in economics has identified Institutions as a key factor in explaining the disparity in growth across countries. It is thus essential to look at the determinants of institutional quality. This study tries to capture the affect of one of the possible determinants of institutional quality that is trade openness. Theory suggests that there is a positive relationship between trade openness and institutional quality. This study uses panel data estimation techniques to uncover the relationship between trade openness and institutional quality. The results suggest that there exists a positive relationship between trade openness and institutional quality, although it is not significant for the legal system and property right index available from 'Economic Freedom of the World' dataset. Furthermore, the results are quite robust to the changes in definitions of the variables as well as to the inclusion of additional control variables.

Keywords: Trade openness, Trade liberalization, Institutions, Institutional development, Institutional quality.

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1. INTRODUCTION

A. BACKGROUND

Many theories have been put forward to answer the most repeated and important question in economics: Why are some countries poorer than others? Economists have gone to great lengths in order to explain this phenomenon. Many determinants of economic growth and development were pointed out in literature like saving rate, accumulation of physical and human capital, technological progress, geographical factors as well as intuitional framework and quality. There has been growing literature on the nexus of economic growth and institutional quality.

One can find many studies in economic literature that try to address the role of institutional framework and quality in aiding growth process. The works of Scully (1988), Keefer & Knack (1995, 1997), Acemoglu, Johnson, & Robinson (2001), Rodrik, Subramanian, & Trebbi (2004) and many others present evidence that institutional framework is indeed an important factor in determining the growth process. For example Acemoglu & Johnson (2003) find that institutions that protect property rights have a direct effect on long-run economic growth, investment, and financial development.

Economic history evidently points out towards the fact that institutions are crucial for economic growth and development. Countries in the past have developed different types of institutional frameworks and as a result experienced different trajectories of economic development. The development of institutions in general and economic institutions in particular affects the political and economic outcomes in a society as they affect different groups differently (Acemoglu, Johnson & Robinson, 2004).

This leads us to the question *"how institutions (in general and economic institutions in particular) are determined?"* Answering this question might probably help us explain the broader question of difference in economic growth and development among countries. There is ample literature, which try to figure out the possible determinants of institutional quality. Almost all the previous studies tried to explain the differences in institutional quality by looking at the historical origins of a country, like its colonial past or the initial level of development etc.

Although, there has been lot of theoretical debate on how institutions develop over time and how they change and react to changes in economic and political environment, these theoretical ideas are not backed by any concrete empirical evidence. The lack of empirical evidence on the development of institutional framework over time and institutional changes brought about by changes in political and economic circumstances calls for extensive empirical studies on this issue. In this context, my study is an effort to add to the empirical literature related to the development of institutions overtime and its determinants. In this study, I will try to uncover the relationship between trade openness and institutional quality. That is I will ask the question, whether more trade openness leads to better institutional quality or not?

B. RESEARCH QUESTION

As noted earlier, most of the studies are concerned about the historical determinants of institutional framework. What I intend to do in my study is to see the relationship between trade openness and institutional quality. As suggested by the theoretical framework of Acemoglu et al. (2004) and by many others, one of the potential determinants of institutional framework can be trade openness and trade liberalization. Acemoglu et

al. (2004) argue that economic institutions and institutions in general are endogenous, that is they are determined by the choices of different groups within a society which represents their economic interests and the distribution of economic resources and political power. The redistribution of resources and political power in few hands will eventually lead to the development of such institutions, which only favors a few in the society. Thus, better institutions develop when political power is spread amongst a wide group of people.

This implies that, institutional changes arise when there are significant and discrete changes in the distribution of income and resources or distribution of political power in the economy. This kind of abrupt and significant transformation in the distribution of resources and political power can be brought about by trade liberalization and openness. This means that increased trade openness can improve institutional quality and this is the subject matter of my study. Therefore, my research question is as follows:

- *"Does increased trade openness lead to an improvement in the institutional framework and institutional quality?"*

My study adds to literature in at least two ways. Firstly, it tries to disentangle the relationship between trade openness and institutional quality by using a newer and expanded data set of institutional quality for more than 150 countries dating back till 1970's. Secondly, it exploits the multidimensional aspect of data in the analysis to test the hypothesis, which eventually results in unbiased and efficient estimates.

C. METHODOLOGY AND DATA

In order to test the hypothesis and to uncover the relationship between trade openness and institutional quality, I will employ a similar methodology used by Bhattacharyya (2008). I will use panel data for approximately 150 countries dating back till 1970's. I will use the log of the trade to GDP ratio, the mostly widely used measure of trade openness in literature and various institutional quality measures which include the political rights and the civil liberties index available from freedom house, the index of executive constraint from the polity IV dataset and the Legal system and property rights index (adjusted) available through Economic freedom of the World dataset.

The model used by Bhattacharyya (2008) also allows for the control variables, which in this case includes the log of GDP per capita as a measure of the development, the log of GDP as a measure of size of the economy, the percentage of the population having secondary schooling as a proxy for the human capital, the distance from the equator as a proxy for geography measured in latitudes (normalized), and lastly legal origin of the country. In addition to this I will construct an instrumental variable in order to tackle the potential problem of endogeneity bias by separating natural and residual openness[1]. Finally, I will perform sensitivity analysis to see if the results are robust to changes in the definitions of variables and addition of other control variables.

D. LIMITATIONS

The most apparent limitation of my study is on the data front. There is unanimous agreement amongst economist, on the importance of institutions for economic development, but there is no single agreed upon

[1] For detail discussion, see Frankel & Romer (1999) and Wei (2000).

measure of the quality of institutions. As suggested by Keefer & Knack (1997, p. 592) "ideally measures of institutional quality would consist of objective evaluations, comparable across countries and over time, of the institutions that protect property and contractual rights". But unfortunately, these kinds of ideal measures of institutional quality do not yet exist and I have to resort to proxy variables which mostly measure the outcomes of institutions rather than measuring institutional quality directly.

Another possible limitation of my study is the non-availability of complete measure of trade openness which captures trade restrictions imposed by countries. Lastly, there might be possibility of causality running in both ways, i.e. from trade openness to institutional quality and institutional quality to trade openness. This will introduce bias in the result and we need a proper instrumental variable (IV) to solve this problem. The IV most generally used is constructed using gravity model, which is complicated to construct and I have to resort to another variant of that IV, which might not capture the whole picture.

E. DISPOSITION

The remainder of the thesis proceeds as follows: section 2 provides theoretical framework on trade openness and institutional quality nexus. Section 3 gives an overview of the empirical literature on the trade openness and institutional quality nexus is provided. Section 4 describes in detail the methodology used to disentangle the relationship between trade openness and institutional quality. Section 5 discusses the description of data and variables use in the analysis. Section 6 presents the results and robustness checks, and Section 7 concludes the thesis.

2. THEORETICAL FRAMEWORK

Institutions are important in determining the level of growth in the economy, because they influence the structure of economic incentives in society. As mentioned by Acemoglu, et al. (2004, p. 1) "of primary importance to economic outcomes are the *economic institutions* in society such as the structure of property rights and the presence and perfection of markets. Economic institutions are important because they influence the structure of economic incentives in society".

For example, if property rights are not well defined in an economy then, individuals will not have the incentive to accumulate and invest in physical or human capital. Similarly, producers as well have no incentive to adopt more efficient technologies and production techniques. Furthermore, institutions also play a central role in resource allocation, as they help allocate resources where they are most efficiently used and they determine the distribution of rents, profits and revenues. Thus, "Societies with economic institutions that facilitate and encourage factor accumulation, innovation and the efficient allocation of resources will prosper" Acemoglu et al. (2004, p. 2).

Therefore, it is important to understand how institutions are determined? There is ample literature, on the possible determinants of institutional quality. La Porta et al. (1999) show that the countries that are poor, close to the equator, ethno-linguistically heterogeneous, use French civil law or socialist law, or have high proportions of Catholic or Muslim population in general have poor institutions.

Acemoglu et al. (2001) stress that, variation in the current institutional quality amongst countries is mainly due to their colonial past. They argue that colonial state and institutions persisted even after the independence

and are responsible for the current state of their institutions. Al-Marhubi (2005) points out that countries which were under Western European influence and those with British Common Law origin tend to have better governance. Another empirical research by Alonso & Garcimartín (2009) confirm that the key determinants of the institutional quality are per capita income, income distribution, the efficiency of its tax system and human capital it possess (i.e. the education level of its population). Surprisingly, they find that some other variables pointed out in previous researches like location, ethnolinguistic fragmentation, the origin of the legal system or colonial origin either do not have any significant impact on institutional quality or they affect institutional quality indirectly through the first set of variables.

In this study, I am going to focus on another probable determinant of institutional quality which is trade openness or trade liberalization. In the remaining of this section, I will provide theoretical framework on the relationship between trade openness and institutional quality. In other words, I will try to answer the question why should more open economies have better institutions?

'Trade liberalization' or 'trade openness' in its conventional term refers to opening up of trade by a country with the world by partial or full elimination of trade barriers like tariffs and quotas on trade taking place within and across the borders of each country. So in simple words, it is the opening up of trade of a country with other countries without any trade barriers. To define Institutions we follow Douglas North definition of institutions. According to him: "Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction" (North, 1990, p. 3). Thus, institutions are the set of rules that govern the interaction between individuals in a society.

In order to answer our question on how trade liberalization affects institutional quality, we need to clearly identify causes and effects and take into account various channels through which openness and trade liberalization can affect the quality of institutions. Firstly, as Acemoglu et al. (2004) argue that, economic institutions are endogenous. They are determined by the collective actions and choices of the society which represent their economic interests. However, there can be a conflict of interest amongst various groups of the society because different economic institutions lead to different economic and resource distributions. Thus, the preference of that group prevails which has most political power. This political power is also endogenously determined in part by the distribution of resources in the society and also by the political institutions. Consequently, political institutions and resource distribution in the society determines economic institutions, but they change very slowly over time, resulting in persistence of economic institutions (Acemoglu et al., 2004).

Although their model suggest that economic institutions tend to be persistent and their change depends on the evolution of political and economic inequality amongst the different groups in the society, but they can also change mainly because of the '*exogenous shocks*', like changes in technology, international environment and distribution of resources, that can modify the balance of political power in society and can lead to changes in political institutions and hence changes economic institutions (Acemoglu et al., 2004). These kinds of abrupt changes in the technology and distribution of resources can be brought about as economies open up their trade and integrate into the world markets.

Many studies have pointed out that trade openness and liberalization leads to technological spillovers and bring technological change[2]. Coe & Helpman (1995) find out that foreign Research & Development (R&D) is beneficial for the domestic productivity and this effect is stronger the more economy is open to trade. This basic empirical model by Coe & Helpman (1995) is expanded and updated since then and many studies find a significant relationship between trade openness and technological spillovers. Similarly, there exists enough evidence suggesting that there is a negative relationship between trade openness and inequality as suggested by Stolper-Samuelson theorem[3]. Therefore, based on above arguments we can claim that trade liberalization and trade openness affects institutional quality by changing the resource distribution in the economy and bringing technological change.

Secondly, increased openness of the economy and trade liberalization of an economy may lead to policy choices such that it's economic and social institutions are in line with those of its trading partners and willingness to submit to rules and regulations imposed by membership of international institutions (Al-Marhubi, 2005). For example, if a country becomes a member of World Trade Organization, it will have to adopt certain institutional and governance norms and rules. These include "non-discrimination in trade, harmonization of regulatory standards, transparency, and patent and copyright protection". These policy and institutional harmonization also enhance the government credibility as its institutions are working according to certain guidelines. All these factors that are the outcome of openness will eventually lead to better institutions. Another indirect affect of openness on quality of institution comes from growth. As it is well established that increased openness leads

[2] See for example Grossman & Helpman (1991, 1994), Falvey & Reed (2000).

[3] See also Stolper & Samuelson (1941), Spilimbergo, Londono, & Szekely (1999), Litwin (1998).

to high growth[4], and there exist a positive relationship between growth and quality of institutions[5]. Therefore, increased trade openness will lead to good institutions by increasing growth in the economy.

Thirdly, as economy opens up, the number of trading partners of a country increases which requires management of unknown risk associated with new trading partners. This creates demand for better and efficient institutions (Islam & Montenegro, 2002). Thus, the incentive of benefiting from increased trade and to avoid the risk involved in working with an unknown trading partner can bring about positive change in institutional quality. Fourthly, trade openness affects the quality of the institutions involved by potentially increasing the costs associated with greater integration and openness (Al-Marhubi, 2005). As country opens up and liberalizes its trade, it provides international traders and investors with an exit option, which they can exercise in response to adverse policies. This means that economic agents can reduce risk arising due to adverse policies via international diversification, leading to the outflow of resources. Thus, as Skipton (2007) suggests:

> *"Governments must also adjust their portfolio of services (and the taxes used to fund them) or risk capital flight, commerce flight, a loss of competitiveness for its domestic suppliers, and ultimately shrinkage in their tax base. Trade openness begets greater importance for competitive institutions of governance, and so greater economic freedoms generally" (p. 1).*

Another channel through which, openness affects quality of institutions is via the increased risk of external shocks to the economy, since increased

[4] See for example Dollar & Kraay (2004), Frankel & Romer (1999).
[5] See for example La Porta et al. (1999), Alonso & Garcimartín (2009).

openness will make the economy prone to the shocks occurring in the world. Thus, good institutions will be effective in insulating the economy from the external shocks. This implies that increased openness increases the incentive for the country to invest heavily on the improvement of its institutions so that it can cope with the adverse effects of external shocks. Additionally, greater integration into the world economy will gradually lead to social and cultural changes. These changes will eventually lead to changes in institutional quality making them better and in line with the global standards (Al-Marhubi, 2005).

Increased integration in the world economy also enables the global flow of information which provides citizens alternative sources of information and ideas. These information spillovers help improve domestic institutions as citizens become more aware of their rights and hence more demanding Al-Marhubi (2005). Commenting on this Al-Marhubi (2005) writes "this helps to create a more confident, more demanding and independent minded citizenry that can form the backbone of more representative forms of government. Contact with the ideas and practices of other societies could also help nurture civil institutions that can offer ideas and influence outside government in the policy steering process" (p. 457). Thus, according to Rodrik (1999, p. 31), "Civil liberties and political freedoms are among the most imported concepts in the developing world; the demands for democracy to which these ideas give rise are a direct product of openness in this broad sense".

Rodrik (2000) also provides possible explanation on the link between trade reforms and institutional quality and governance structure. He argues that trade reforms results in institutional reforms and are not only a simple change in relative prices, and this is the primary criterion by which such reforms should be evaluated. According to him, trade policies go beyond

changes in the level of tariffs and quantities restrictions, which bring about changes in relative prices. These reforms set new rules and change expectations about the implementation and creation of these policies changes, provide new set of constraints and opportunities for economic policies and create new set of stake holders. In other words, trade reforms give rise to institutional reforms. These institutional reforms can be a result of increased financial integration and makes macroeconomic stability more desirable, which entails establishing better and efficient institutions. Similarly, increased integration in the world markets will also bring changes in the preferences of the domestic citizens, giving rise to civil liberties and political freedom and hence increase the demand for better government and democracy.

Differences in institutional quality across countries can be seen as a source of comparative advantage in the trade. Thus, countries having better institutions will specialize in the production of institutionally extensive goods. This means that, country with better institutions will specialize in the production of those goods which are characterized by rents (Levchenko, 2008). Levchenko (2008) presents a parsimonious model on the affect of trade openness on institutional change. According to him, if two countries have similar technologies, then in equilibrium both countries will strive to attain the best possible level of institutions, resulting in a "race to the top" in institutional quality. This happens because the rent associated with having better institutions vanish unless institutions improve to a level which is slightly better than the trading partners.

Increased trade openness can improve institutional quality but it depends on how much firms in a country rely on the institutions (Zhao et.al, 2006). According to them, the larger the firm the less it depends on an economy's institutions as compare to small firms, which heavily rely on

country's institutions. Similarly, multinational firms do not heavily rely on local institutions as they can use their global organizations. Therefore, according to Zhao et al. (2006, p. 2) "firm heterogeneity of this sort can thus contribute to markedly different institutional responses to liberalization". Their framework suggests that institutional development occur when the firms in a country rely more on institutions or with more potential entrants. This means that opening up of trade will eventually lead to the improvement of local institutions, as it increases the number of potential entrants in the market. Thus, firms will have greater incentive to invest in the improvement of institutions.

Furthermore, there are various strands of literature on trade and corruption that implicitly provide a variety of channels through which trade liberalization and openness can influence the quality of institutions. There exist enormous amount of literature that suggest that corruption and rent seeking decreases with increase in competition. For example Bardhan (1997) suggest that one way of reducing bureaucratic corruption is to reduce the monopoly power of a bureaucrat when serving a client. On the other hand we know that, openness and trade liberalization foster competition and provide economic agents with more options. This suggests that there exists a negative relationship between trade openness and institutional quality.

Protectionist trade policies are a source of rents and this leads to corruption. Bureaucrats and government officials use their power to change the definition of duties and exceptions applying to different goods and products in order to extract rents. In contrast to this, free trade leaves no or little room for the policy makers to use their power, hence lowering corruption (Larrain.B & Tavares, 2007). An increase in competition among agents due to openness will make it harder for the economic

agents to seek rent and involve in corrupt practices. For example Ades & Di Tella (1999) and Treisman (2000), suggest that more open economies tend to have a lower level of corruption because trade openness results in greater competition in product markets which in turn lowers rents and thereby reduces the rewards from engaging in corruption.

Ades & Tella (1999) argue that bureaucrats will involve in corrupt practices in an imperfect competition environment. In this situation, society will spend resources in order to monitor these bureaucrats and control them and a possible way to put check and balances on corrupt practices is to increase competition which then implies less corruption. According to the model presented by the authors, equilibrium level of corruption depends on three variables namely, the level of monitoring, wages paid to the bureaucrats and the level of profits, which is determined by the level of competition in the economy. Therefore, as economy opens up, level of competition increases, hence decreasing equilibrium level of corruption, establishing a negative relationship between trade openness and corruption.

Another argument links natural openness (as measured by country's geographical factors and its size) to corruptuion. If we assume that corruption, bad governance and weak institutions reduce international trade and investment more than domestic trade and investment, then a "naturally" more open economy, as determined by its size and geography would tend to allocate more resources for building good institutions and lower corruption (Wei, 2000). This means that high level of economic integration will drive the country to improve its institutional framework and helps deter corruption. As we know, fighting corruption, improving governance and setting up better institutions are costly. On the other hand, foreign traders and investors have more options than their domestic

counter parts (i.e. they have much better outside options). Thus, poor institutions reduce the level of international trade and investment more than domestic trade and investment. Hence a country that is naturally more open as determined by its size, geography and other factors will have the incentive to improve its intuitions. Therefore in equilibrium, such economies tend to have less corruption and better governance as compare to naturally less open economies.

In a study by Sandholtz & Gray (2003) another theoretical relationship between trade openness and corruption has been presented. They theorize that corruption influences the economic incentives of the various actors in the economy, altering their costs and benefits of engaging in corrupt practices. In addition to this, they also pointed out a normative channel through which trade openness affects institutional quality. According to them, increased integration not only leads to the imports of goods and capital, but also information, ideas and norms. *"Prevailing norms in international society delegitimate and stigmatize corruption. Countries that are more integrated into international society are more exposed to economic and normative pressures against corruption"* (Sandholtz & Gray 2003, p. 761).

They suggest that actors or agents are both 'utility rational' and 'normative rational', which means that they have the desire to increase their well being as well as to act in appropriate and justifiable ways which means that they will adhere to the norms and rules. These norms and rules in general and anticorruption norms in particular are transmitted through international organizations (IOs), which are mostly dominated by rich nations having explicit anticorruption laws, so these IOs have adopted explicit laws to fight corruption. Thus they propose that, *"the more a country is involved in international organizations, the more likely its elites*

are to have absorbed some of the anticorruption norms, and the lower the level of corruption should be" (Sandholtz & Gray, 2003, p. 767).

Finally, we know from neoclassical trade theory that there are significant welfare gains attached with trade. When countries open up, they specialize in the production of those products in which they have relative advantage and trade the extra production with other countries thus increasing the welfare of the society. But this is only true when the institutional framework in the country is working properly without any hiccups. In the real world, however, this is not always the case. This means that when economies open up and as their trade level increases, they then have the incentive to improve their institutional framework in order to completely benefit from the trade.

As an example, consider a country having a comparative advantage in producing a good that is capital intensive. When the country opens up then according to the neoclassical theory it will specialize in the production of capital intensive good and then trade it with the other good and increase the overall welfare level. However, if the institutional framework of the country is weak e.g. weak property rights, then this will result in imperfect capital markets and country will not been able to entirely capture the gains from trade. As a result this creates an incentive for the country to improve its institutional quality, so that it will gain more from the trade. This example shows one channel through which trade liberalization and openness can lead to a better institutional framework.

Concluding our discussion of the theoretical framework on trade openness and institutional quality nexus, we can quiet confidently say that opening up of trade by a country leads to an improvement in its institutional quality. It is evidently clear that increased trade openness

leads to an improvement in institutional quality and it can be in the form of decreased bureaucratic corruption, improved governance, improved property right structure or better enforcement of contractual rights etc. Now let us turn our attention towards the empirical literature and see how well this theoretical framework is supported by empirical studies.

3. EMPIRICAL EVIDENCE

There is not much empirical literature on the direct relationship between institutions and trade liberalization, although there are many studies on the relationship between governance, corruption and trade liberalization.

Bhattacharyya (2008) finds that, differences in economic institutions can be explained by trade liberalization. His basic model predicts that one standard deviation increase in trade liberalization would lead to a 2.1 points increase in the property rights institutions index which is also statistically significant. Similarly, trade liberalization has a positive and significant effect on contracting institutions, implying that trade liberalization positively affects institutions. In another study, Levchenko (2008) finds that institutional quality will improve in those countries, which specializes in the production of institutionally intensive goods, after opening up of their trade. He constructed predicted trade share of institutionally intensive exports for each country based solely on exogenous geographical factors. As for the measure of institutional quality he used rule of Law index available from the Governance Matters database of Kaufmann, Kraay, & Mastruzzi (2004).

Islam & Montenegro (2002) also argue that trade openness is positively and robustly associated with institutional quality. Their results show that openness to trade is a significant determinant of institutional quality.

In a recent case study, Dang (2010) focuses on the relationship between trade liberalization and institutional quality for Vietnam, which complements the usual cross country studies. He finds that differences in economic institutions across provinces in Vietnam can be explicated by trade liberalization. His basic results show that one percent increase in foreign investment per capita is associated with 0.72 point increase in institutional index. These results are robust to various alternative institutional measures, changes in the sample size and addition of control variables. Thus, this study reinforces the claims of cross country studies as it indicates a significant and robust positive relationship between trade liberalization and institutional quality.

Rigobon & Rodrik (2005) in a study on interrelationship of rule of law, democracy, openness and income find that openness as measured by trade to GDP ratio has a negative impact on democracy, but a positive effect on rule of law. In an another study, Al-Marhubi (2005) finds a significant and positive relationship between openness to trade and Governance, suggesting that increased openness to trade improves Governance in a country. In his study openness to trade accounts for 12% variation in governance across countries. His fundamental result suggests that a one standard deviation increase in openness would increase governance by 0.19 units.

Similarly, Larrain.B & Tavares (2007) find a significant negative relationship between openness and corruption. They use FDI as a share of GDP to measure openness, and find out that openness significantly decreases corruption. The results are robust to the addition of other determinants of openness such as trade intensity and average tariff level. Their basic findings are that FDI inflows are negatively and significantly related to corruption. A 5 percent increase in the share of FDI in GDP leads to a

decrease in the corruption index between 0.4 and 0.60. Other studies by Ades & Tella (1999) and Treisman (2000) also find that trade openness significantly lowers corruption.

A similar study by Neeman, Paserman, & Simhon (2004) reveals that the relationship between corruption and output depends on the economy's degree of openness. For economies which are open, corruption and GNP per capita are strongly negatively correlated whereas in closed economies, there is no relationship at all. This finding is robust to alternative measures of openness and changes in sample sizes based on time periods, geography, and income of the countries and level of corruption. They also find that the extent to which corruption affects output is mainly determined by the level of financial openness. Gokcekus & Knorich (2006) results indicate that the level of openness as well as the quality of openness has a negative significant affect on the level of corruption. They constructed a quality of openness index in order to see the impact on corruption.

Wei (2000) provides a somewhat different angle on the relationship between openness and corruption. He suggests that a "*naturally open economy*" as measured by country's size and geography, exhibit less corruption taking into account the level of development. His findings also suggest that a naturally more open economy pays more to its civil servants, which is an indication of preference of a society for better governance. In a recent study, Dutt (2009) finds that protectionist policies imposed by the government leads to increased bureaucratic corruption.

Torrez (2002) analyzes the link between corruption and trade liberalization, using measures of corruption and trade liberalization from multiple sources. He finds that there is a weak negative relationship

between trade liberalization and corruption. According to his study majority of empirical evidence points towards the fact that there is a weak negative relationship between trade liberalization and corruption, although this result doesn't hold for all dataset and it depends on the selection of the measure of corruption.

Bonaglia, Braga de Macedo, & Bussolo (2001) empirically investigate the link between globalization and governance or more precisely the relationship between openness and corruption. Their basic specification result suggests that there is a positive relationship between trade openness and quality of governance or a reduced level of corruption. The most basic specification predicts that a 10% increase in import openness leads to a change in corruption index by 0.03 points provided by ICRG and a change of 0.06 points in the corruption index provided by Transparency International, which suggest a significant affect of openness on corruption. Gatti (2004) analyses whether barriers to trade and capital flows is associated with higher corruption. His finding suggests that trade barriers lead to higher corruption mainly through "the incentive to collusive behaviors between individuals and customs officials, rather than from the decreased foreign competition pressure on the domestic sector induced by restrictive trade policy" Gatti (2004, p. 851).

The empirical research presents considerable amount of evidence on the link between trade openness and institutional quality. Although, most of the empirical studies do not explicitly capture the relationship between trade openness and institutional quality, but there exists enough empirical literature on the relationship between trade openness and corruption as well as governance. Furthermore, nearly all the studies discussed above are cross sectional studies with an exception of few. This means that they ignored the variation over time and only relied on variation across

countries to see if there is any link between trade openness and institutional quality. In this context, my study is an effort to uncover the explicit relationship between trade openness and institutional quality using an expanded dataset which will exploit variation over time and across countries.

An important contribution of this study is that it uses a newer and larger dataset than those used in the studies discussed above to demonstrate the causal effect of trade openness on institutional quality. In addition to this, it provides a fairly parsimonious empirical strategy, taking into account variations between countries by controlling for country specific effects like legal origin, geographical factors, level of development, size of the economy and level of human capital.

This study also develops an Instrumental Variable (IV) by predicting trade shares based on purely geographical components like population, area and region. The Instrumental Variable (IV) approach will deal with the potential problem of endogeneity, in the quest to reveal the causal effect of trade openness on institutional quality. Exploiting the multidimensional aspect of dataset and broad cross-country coverage, the results show that the trade openness as measured by trade to GDP ratio positively and significantly affects the quality of institutions for some measures of institutional quality. This relationship is quite robust to the use of alternative definitions of human capital and inclusion of other control variables. Next section will present the model use to uncover the relationship between trade openness and institutional quality.

4. METHODOLOGY

In order to uncover the relationship between trade openness and institutional quality, I use panel data consisting of more than 150 countries from 1970's to 2009. Due to data limitations all of my specifications are unbalanced. To perform my analysis I will follow in general the methodology used by Bhattacharyya (2008) therefore I will estimate an equation of the following form.

$$inst_{it} = \alpha + \gamma\ ln\ (open_{it}) + \delta\ Z_{it} + \varepsilon_{it}$$

Where, $\boldsymbol{inst_{it}}$ is a measure of institutional quality for country i in period t, α is constant term common for all the countries, $\boldsymbol{ln\ (open_{it})}$ is the log of the measure of trade liberalization and openness for country i in period t, whereas, $\boldsymbol{Z_{it}}$ is the matrix of other control variables such as human capital, legal origin, geography, GDP and GDP per capita.

In this framework, the main variable of concern is $\boldsymbol{ln\ (open_{it})}$ and therefore, $\boldsymbol{\gamma}$ will be the focus coefficient. I expect $\boldsymbol{\gamma}$ to be positive or negative (depending on the measure of the institutional variable) and statistically significant. In addition to this, $\boldsymbol{\gamma}$ can be interpreted as the direct causal affect of trade liberalization and openness on institutional quality, but there are some problems attached to this interpretation, which will be discuss in the next sub-section.

A. POTENTIAL PROBLEMS

Since we are primarily interested in finding the causal effect of trade openness on institutional quality, we have to be careful in order to deduce such kind of effects. There are some major problems, which need to be addressed before we can interpret $\boldsymbol{\gamma}$ as the causal effect of trade

openness on institutional quality. There are three major problems that mar our interpretation and are as follows.

1. ***Omitted variable bias:*** Many of the time invariant variables that are not include as control variables in the analysis (for example religion, colonial origin etc.), can cause bias as they can be correlated with the measures of institutional quality and trade openness. This will cause the results to be biased upwards.[6]

2. ***Endogeneity:*** One of the most common problems that plague this kind of analysis is the presence of endogeneity or in other words two way causality. This means that it is not only the case that trade openness effects institutional quality, but institutional quality also effects trade openness. This issue will most probably leads to larger values of $\boldsymbol{\gamma}$ in absolute terms.

3. ***Measurement Error:*** Another source of bias is the presence of measurement errors in the variables. In our case the trade to GDP ratio and the measures of institutional quality are most likely to be noisy. Although, measurement error in the measures of institutional quality does not introduce any bias but measurement error in trade to GDP ratio can bias our results downwards.[7]

In the presence of these three problems, estimation results will be bias and the direction of the bias is unknown in this case. A standard response to tackle these three issues in the literature is to look for a valid instrumental variable for the endogenous variable, which in our case is trade openness in order to get a consistent estimate of $\boldsymbol{\gamma}$ so that it can be

[6] For further discussion see Greene (2003), page 148.
[7] For further discussion see Greene (2003), page 83.

interpreted as a causal effect of trade openness on institutional quality. An instrumental variable must satisfy the following two conditions, i.e. it must be correlated with the endogenous variable which in our case is the log of the trade to GDP ratio and it must also be uncorrelated with the error term in the levels regression.

The predicted share of the trade to GDP ratio using the gravity model[8] is one of the most commonly used instrumental variables for trade openness. For this case I am going to follow the procedure used by Wei (2000). This involves dividing trade openness into two parts, one is natural openness and the other is residual openness and using natural openness as an instrumental variable for trade openness. Natural openness is found by estimating the level of trade openness based on each country's size, geography and population[9]. In particular, I estimate the following equation:

$$\ln(open_{it}) = \beta_1 \ln(population_{it}) + \beta_2 \ln(area_{it}) + \beta_3 (land\ lock_{it}) + regional\ dummies + \varepsilon_{it}$$

This method to construct an IV is based on the same concept as that of the gravity model. The predicted value of the log of trade to GDP ratio from the above equation is used as an IV in order to deal with the biases. One possible disadvantage of constructing and using such an instrumental variable is that we might lose a significant number of observations in the process.

Using a fixed effects estimator is another alternative to tackle the problem of an omitted variable bias. The fixed effects estimator controls for the

[8] See for example Frankel & Romer (1999).
[9] Data on country's size and geography is available from CEPII dataset. Data on population is from PWT7.0.

country specific unobserved heterogeneity[10]. On the other hand, we cannot use a fixed effects estimator in our analysis, if we include control variables that capture country specific effects and do not vary over time. In this case we have to resort to a random effects estimator[11]. Therefore, in the analysis I will be using a fixed effects estimator for those specifications in which the control variables vary over time in order to remove the omitted variable bias. On the other hand, for those specifications in which I add control variables which do not vary over time I will use random effects estimator.

Two other problems that also need to be addressed are:

1. ***Heteroskedasticity:*** The most common problem in almost all panel data estimations is the existence of heteroskedasticity. Even if the error terms are homoskedastic within each panel, it is highly likely that error terms are not homoskedastic between panels[12]. The problem of heteroskedasticity will cause inference problem as the coefficient estimate will no longer be efficient.

2. ***Autocorrelation:*** Another problem that might arise in this kind of analysis is that of autocorrelation[13]. This means that error terms are correlated with each other. Presence of autocorrelation also makes the estimates inefficient and cause inference problems.

The two problems stated above, concerning heteroskedasticity and autocorrelation are not so easy to tackle in the panel data analysis. To deal with the issue of heteroskedasticity, I will use White's robust standard

[10] For detail discussion on fixed effects estimator see Greene (2003), page 287.
[11] For detail discussion on Random effects estimator see Greene (2003), page 293.
[12] For further discussion see Greene (2003), page 191.
[13] For further discussion see Greene (2003), page 191.

errors[14] instead of normal standard errors. On the other hand, dealing with autocorrelation is relatively difficult, as it requires estimating Feasible Generalized Least Square (FGLS) estimators. It becomes further complicated when the panel is unbalanced, therefore I will not correct for the autocorrelation in the analysis.

B. CONTROL VARIABLES

The model specified above to find the causal relationship between trade openness and institutional quality allows for the inclusion of control variables. In the analysis I will generally control for those variables which affect both the institutional quality and trade openness. I will briefly discuss and justify the inclusion of certain control variable in my analysis:

1. *Level of Development:* In an analysis of such a nature, controlling for the level of development is the most common thing to do. Level of development tends to affect the institutional quality as well as trade openness[15]. A country which is more developed tends to have better institutions as well as it is likely to be more open. Therefore, I add the log of per capita real GDP (which is widely used as an indicator of development) in my analysis to control for the level of development.

2. *Size of an Economy:* Size of an Economy is also an important factor in determining both the quality of institutions as well as trade openness of an economy. Thus, it is necessary to control for the size of the economy. Therefore I add the log of GDP of a country as a measure of the size of an economy (as a control variable in the analysis).

[14] For further discussion see Greene (2003), page 314.
[15] See for example La Porta, et al. (1999), Durkin Jr & Krygier (2000).

3. *Human Capital:* Theoretical and empirical literature suggests that there is a strong relationship between human capital and institutional quality[16]. In the analysis I add the percentage of the population having secondary schooling (a measure of human capital) as a control variable for human capital.

4. *Legal Origin:* La Porta, et al. (1999) found that legal origin is one of the most important determinants of institutional quality, and it is therefore essential to control for legal origin.

5. *Geography:* It has been well established in the literature that geography has a significant impact on institutional quality and trade. Thus it seems plausible to add a measure of geography which in our case is the absolute value of country's latitude (scaled between 0 and 1) as a control variable.

I will estimate various specifications of the model using a different set of control variables for each specification. For the specification including the measure of human capital, the number of observations decreases significantly, because of the data availability. According to Econometric theory, such a significant decrease in the number of observations or sample size will cause inference problems by increasing the standard errors of the estimates and making them statistically insignificant. The next section will discuss data and its limitations in further detail.

[16] See for example Alonso & Garcimartín (2009)

5. DATA

The two main variables that I will use in my analysis are institution quality and trade openness. Since the main task is to find the effect of trade openness on institutional quality, the data must consist of observations across countries and across time. Also the data must sufficiently go back to at least the 1970's in order to correctly measure the impact of trade openness on institutional quality.

The most difficult task is to find a correct measure of institutional quality. As pointed out by Keefer & Knack (1997, p. 592) "ideally measures of institutional quality would consist of objective evaluations, comparable across countries and over time, of the institutions that protect property and contractual rights". But these kinds of ideal measures of institutional quality do not yet exist therefore I have to resort to proxy variables. I will employ four measures of institutional quality from three sources, in my analysis.

First two measures of institutional quality are the most common proxy variables used in literature. These are Gastil (1987) indices of *Political Rights* and *Civil Liberties,* which are available through freedom house from 1972 to 2009 for over 200 countries[17]. Another measure I will use is the indicator of executive constraints on executive branch decision making available from the Polity IV dataset labeled as *Executive Constraints* for 169 countries (in 2009) dating as far as 1800 for some countries (but I will use the data from 1950 onwards in our analysis). The last measure of institutional quality I am going to use is the Legal System & Property Rights index available from Economic Freedom Dataset for 141 countries from

[17] Since data for year 1982 is not explicitly available, therefore I use the data for 1983 as a proxy for year 1982.

1970 to 2008 (on a five yearly basis until 2000). I will describe these four measures of institutional quality in more detail below.

1. *Political Rights Index:* "The Political Rights index measures the degree of freedom in the electoral process, political pluralism and participation, and functioning of government. Numerically, Freedom House rates political rights on a scale of 1 to 7, with 1 representing the most free and 7 representing the least free" (Adapted from *Freedom in the World 2010: Survey Methodology*).

   As mentioned in the *Freedom in the World 2010 report,* citizens of the country with a score of 1 enjoy complete political freedom. A score of 1 represents a country having free and fair elections, political competition and autonomy for all citizens. On the other hand, in countries that have a political rights rating of 7, political rights are essentially missing, mainly due to extremely oppressive regimes, civil war, extreme violence or warlord rule.

2. *Civil Liberties Index:* "The Civil Liberties index measures freedom of expression, assembly, association, and religion. Freedom House rates civil liberties on a scale of 1 to 7, with 1 representing the most free and 7 representing the least free" (Adapted from Freedom In the World 2010: Survey Methodology).

   According to *Freedom in the World 2010 report,* a rating of 1 indicates that in general a country has a well established and equitable rule of law with free economic activity implying that citizens benefit from a full range of civil liberties. Whereas,

individuals from countries having a score of 7 have almost no freedom. According to Freedom House poor country ratings are "not necessarily a comment on the intentions of the government, but may indicate real restrictions on liberty caused by non-governmental terror."

3. *Executive constraint (Decision Rules):* According to Eckstein & Gurr (1975) executive constraints or decision rules are defined as: "Super ordinate structures in action make decisions concerning the direction of social units. Making such decisions requires that supers and subs be able to recognize when decision-processes have been concluded, especially "properly" concluded. An indispensable ingredient of the processes, therefore, is the existence of Decision Rules that provide basic criteria under which decisions are considered to have been taken" Eckstein & Gurr (1975, p. 121).

   In other words, this measure captures institutional constraint on the decision making power of chief executive. It is measured on a scale of 1 to 7, where a score of 1 represents unlimited authority. This means there is no limitation on the executive's action or constitutional restrictions or these actions are continuously ignored. It also means that the chief executive uses rule by decree and appoints and removes members of executive at his will without any restrictions. On the other extreme, a score of 7 indicates that there exists executive equivalence. This means that accountability groups (like a legislature or a parliament) have equivalent or greater power and authority than the chief executive in most of the decision

making. It also means that the choice of executive also depends on the legislature.

4. *Legal System & Property Rights Index:* This index of protection of property rights is available from Economic Freedom Dataset. It provides information on the protection of property rights in a country. It measures the extent to which an individual's property is protected from physical invasion by others. This index varies from 0 to 10, where a score of 0 represents non existence of property rights in a country whereas a score of 10 indicates that the country has a perfect property right structure.

For the trade openness I will use the trade to GDP ratio ($\frac{Imports+Exports}{GDP}$) available from Penn World Table 7.0 (PWT 7.0) for 1950 until 2009. This is one of the most widely used measures of trade openness in the literature[18], primarily because of the lack of other accurate measures of trade openness. Other measures of openness such as Sachs-Warner index are also available but only until year 2000, which will considerably restrict our analysis.

Data on control variables which include real GDP (in current prices) and real GDP per capita (in current prices) comes from PWT 7. Data on the percentage of population having secondary schooling which is a proxy for human capital is available via the Barro & Lee (2010) dataset of educational attainments. This dataset is available on 146 countries from 1950 to 2010 in 5 years interval. This means that when we control for human capital we lose a considerable number of observations, which can make our estimates more volatile. Data on legal origin and latitude is available from La Porta et al. (1999) dataset originally collected from CIA

[18] See for Example (Al-Marhubi, 2004), (Islam & Montenegro, 2002), (Zhao, et al., 2006).

world fact book. Lastly, data for IV estimation comes from two sources. Information on the area of the country and its geographical features is available from the CEPII dataset and data on country's population is available from PWT 7.0.

Table 2 shows the summary statistics of the variables I will use in my analysis. In addition to this, table 3 shows the correlation between the main variables used in the analysis. As expected, there seems to be a strong positive correlation between the institutional variables I am going to use. Similarly, the log of openness is also positively related with all the four measures of institutional quality, though the correlation is not very strong. Other control variables like the log of GDP and the log of GDP per capita are also positively associated with the institutional quality measures. Lastly, the absolute value of latitude seems to be strongly and positively correlated with the dependent variables.

6. RESULTS

The baseline result presented below suggests that there is positive and significant affect of trade openness on institutional quality. Although, we cannot interpret this result as a direct causal effect of trade openness on institutional quality, but still it gives us some sense on the direction or sign of the effect. The estimation results are in line with the explanation provided by theory as well as with the findings of empirical literature.

Table 4 depicts the estimation results of all the specification for the political rights index. The results are as expected; in all the specifications openness enters with the correct sign and it is highly significant for all the specifications except for the last one, in which human capital is controlled for. Panel 1 shows the impact of trade openness on institutional

quality when there are no control variables apart from country specific fixed effects. It shows that a 10 percentage point increase in trade to GDP ratio will decrease the political right index by 0.0609 points which shows an improvement in political rights index. Similarly, when we control for the level of development and size of the economy, even then this positive relationship tends to hold significantly as shown in panel 2 and 3. Also, the signs of both the log of GDP and GDP per capita are as suggested by the theory and they are statistically significant.

Even when we control for variables that are country specific and do not change over time, like legal origin and the absolute value of latitude, the impact of trade openness on political rights remains positive and statistically significant with a marginal change in the magnitude as evident from the results presented in panel 4 and 5 of table 4. Furthermore, the coefficients of control variables are also meaningful and in line with the theory. The Level of development of the economy as measured by the log of per capita GDP, its geographical location measured by the absolute value of latitude and the size of the economy as measured by the log of GDP all affect political rights positively, although the log of GDP is not significant. The absolute value of latitude has a much larger impact, suggesting that citizens of countries farther away from the equator are more likely to have better political rights. These results are similar to the findings of La Porta et al. (1999).

Similarly, legal origin dummies also have the expected sign. According to the results British, French and Socialist law fare worse as compared to Scandinavian law (which is the benchmark) in improving institutional quality, and German law seems to do even better than the Scandinavian law (though its coefficient is insignificant). The last panel of table 4 shows the estimate when we also control for human capital. As mentioned

earlier, adding human capital as a control variable leads to significant decrease in the number of observations and number of countries in the panel decreases from 180 to 137. The result indicates that trade openness still affects property rights positively, but now it has become insignificant. This is most probably because of the decrease sample size. Moreover the coefficient of human capital has the expected sign, but it is insignificant.

Trade openness also affects civil liberties positively and significantly as depicted in table 5. If we look at panel 7, we can see that a 10 percent increase in trade openness will lead to a decrease in the civil liberties index by 0.0330 points controlling for the level of development, human capital, legal origin and geography. This result is also significant at the 5 % significance level. If we look at the results illustrated in the other panels in table 5 we can see that the magnitude of impact of trade openness on civil liberties index does not change markedly from one specification to another. The results shown in table 5 below signifies the fact that citizens of a country that is more open in terms of its trade will in general enjoy more civil liberties.

The coefficients of the control variables in this case also have the expected signs and meaningful interpretations. The level of development, stock of human capital, size of the economy, and distance from equator all affect civil liberties positively and significantly with the exception of the size of the economy which is insignificant in more complete specifications. Furthermore, the magnitude of the impact of a country's geographical location on the civil liberties index is quite high which is in line with the findings of many studies. Legal origin seems to matter also. Countries with civil law and its variants provide more civil liberties to their citizens as compared to French and Socialist law. Interestingly, countries with

Scandinavian law provide much better civil liberties to their citizens as compared to countries with any other legal system.

Likewise, the impact of trade openness on institutional quality as measured by executive constraints is also significantly positive. This is reflected in the results presented in table 6. For all the specifications presented in table 6, the coefficient of trade openness is positive and significant. If we look at the results provided in panel 7 of table 6, we see that a 10 percent increase in the trade to GDP ratio will lead to an improvement in the score of the executive constraint index by 0.0317. In addition to this, the coefficients of the control variables have expected signs are in line with the theory and previous research.

Turning towards the last measure of institutional quality that is the Legal System & Property Rights Index, we can see that trade openness affects legal system & property right index positively as expected but this effect is not statistically significant except for the specification presented in panel 1 and panel 4 of table 7. This suggest that, increased trade openness will lead to the improved structure of property rights as captured by the legal system & property right index (provided by 'Economic freedom of the World' dataset) if we control for the level of development, the size of the economy, geography and legal origin. On the contrary, results are not robust to inclusion and exclusion of control variables as provided in table 7. One possible reason for the insignificant result in this scenario might be due to the fact that changing the property rights structure is costly. Therefore, countries with high per capital income have better institutions than the low income countries. So it is highly likely that, increased trade openness increases per capita income and as a result the structure of property rights improves. This can be a possible explanation for why we

are not able to capture the direct effect of trade openness significantly in our analysis.

In this case also, control variables like the level of development and geography have a positive significant effect on the Legal System & Property Rights Index. Similarly, legal origin also has an impact on the Legal System & Property Rights index. As expected, countries with French and Socialist law have poor property rights as compare to the countries with common law. Finally, the measure of human capital also has the expected sign but it is insignificant.

The above discussion suggests that there exist a positive relationship between trade openness and institutional quality. This relationship holds for all four measures of institutional quality used in the analysis, although the relationship is not significant for the Legal System & Property Rights Index. In addition to this, level of development, geography and human capital affect institutional quality positively and significantly. Also, countries with French or Socialist law have comparatively worse institutions as compared to Common law and its variants.

A. INSTRUMENTAL VARIABLE (IV) ESTIMATION

As mentioned in section 4, there might be a possible problem of endogeneity in the model, due to which our estimates can be biased. This means that we need to use an Instrumental Variable (IV) to tackle the issue of endogeneity. We constructed an IV by first regressing the log of trade to GDP ratio on purely geographical factors and then getting predicted value of log of trade to GDP ratio from that regression[19]. This gives us natural openness as mentioned by Wei (2000). We then used two stage least square method for panel data in order to get our estimates.

[19] For further discussion see section 4.

We find that the estimation results using IV are not significantly different from the ones we obtained earlier without an IV. Therefore, we performed the Hausman Specification Test[20] to evaluate whether our IV estimates are efficient or not. The test implies that our IV estimates are consistent but not efficient as compared to the estimates without IV (as we fail to reject the Null Hypothesis). This means that we are not better off using instrumental variable techniques to get our estimates as they will not be efficient. The IV estimates are not significantly different from our primary estimates; therefore we will not discuss it in detail. The IV estimates for all the four indicators of institutional quality, with different specifications are presented in tables 8 to 11.

B. SENSITIVITY ANALYSIS

Another important factor in the analysis is to establish the robustness of the results, as any result can be challenged by changing the specification or the definition of the variables. In this section, I have performed various robustness checks on several different model specifications to establish the robustness of the results. In order to ensure that the results are robust, first I will use two different definitions of Human Capital provided by Barro & Lee (2010) to see if the estimation results are robust to changes in the definition of variables. Afterwards, I will include regional dummies as an additional control in the analysis to see if the results are robust to inclusion of other control variables.

Table 12 below shows that the results are quite robust to changes in the definition of measures of human capital. When we use the percentage of the population having primary education as a measure of human capital, we see that a positive relationship holds for both the political rights and

[20] For more detail discussion see Greene (2003), page 80.

the civil liberties index. Furthermore, the signs of the control variables are also correct. Even if we use the average years of schooling as a measure of human capital, the relationship tends to hold but it is not significant for the political rights index. The relationship between trade openness and institutional quality is also robust to the addition of other control variables, in our case regional dummies.

A quick look at table 13, reveals that a positive relationship between trade openness and institutional quality (as measured by executive constraint and legal system and property right index) is robust to the selection of control variables and to different measures of human capital. Although, the coefficients of trade openness are not significant for legal system and property right index, because of the reasons discussed earlier. In addition to this, all the control variables have the expected signs, suggesting robustness to our model and results.

7. CONCLUSION

In this study I have tried to look at the relationship between trade openness and institutional quality. It has been well established in the literature that institutions matter for economic growth and development. Differences in economic growth and development across countries are mainly due to differences in institutional framework of the countries. Countries have developed different sets of institutions and therefore went on different trajectories of economic development. Another important fact is that institutions also effect the decision making process of the agents in the economy. As Acemoglu et al. (2004) point out that institutions influence the incentive system in the society and decide resuorce distribution in the society. Therefore societies with better

institutional framework will follow a trajectory that will lead towards economic growth and prosperity.

Considering the importance of institutions in growth process, it is vital that we must understand the development of institutions and how they evlove and what factors affect them. In this study I have tried to see the impact of one of the determinant of insitutional quality which is trade openness. I have tried to answer the question "does increased trade openness leads to better institutional quality ?" Theory suggests that there exists a positive relationship between trade openness and institutional quality. Trade openness affects the quality of institutions through various channels as discussed earlier in section 2. My results are concurrent with the theory, as the estimates reveal a positive relationship between trade openness and institutional quality. The results are quite robust to changes in the definition of variables and inclussion of additional control variables.

In addition to this, the coefficients of control variables also have correct interpretations. For example, the level of development, the size of the economy and human capital all affect institutional quality positively. Geography and legal origin of a country also affects its institutions. Countries which are farther away from the equator tend to have better institutions. Similarly, countries having Common law (and its variants) have better institutions as compare to French or socialist law, which are associated with poor institutions. This study also addresses the problem of endogeneity in the model by constructing an IV by predicting trade openness based on purely geographical factors. Interestingly, the IV estimates are not very different from our primary estimates.

Lastly, I performed some robustness checks to see if the results are robust. Firstly, I estimated my model using different measures of human capital

and found that the results are quite robust to changes in the definition of human capital. Secondly, I added regional dummies as control variables in the analysis. The inclusion of additional control variables does not affect the results, suggesting that the estimates are robust to inclusion of other control variables.

As we saw that there exists a direct, causal, positive and significant relationship between trade openness and institutional quality. For example a one standard deviation increase in the log of trade to GDP ratio will improve the civil liberties index by 0.21 points which is quite substantial. This means that countries that open up their trade by removing trade barriers will eventually have better institutions as compare to the countries which are less open. Therefore, countries especially those which are at low level of development must adopt such policies that are more pro trade, like reducing tariffs and removing quotas to name a few. These policies will eventually lead to the improvement in their institutional quality and as result enhance the growth process.

This study is an effort to contribute to the literature on trade openness and institutional quality nexus, but still there are lots of unresolved questions that need to be answered. One possible question is that whether this relationship will hold for other measures of institutional quality, which due to data limitations are not included in this study. Another important aspect that needs further attention is how well these results will hold if we also control for the historical aspects like colonial rule and initial level of development. Thus, further research is needed to firmly establish that there exists a positive causal relationship between trade openness and institutional quality.

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APPENDIX

Table 1

Description of Variables Used

Variables	Description	Source
pr	Political Rights.	Freedom House
cl	Civil Liberties.	Freedom House
xconst	Executive Constraint.	Polity IV Data set
pra	Legal System & Property Rights-Adjusted.	Economic Freedom of the World, 2010.
lnopen	Log of openness in current prices.	PWT 7.0
lngdpc	Log of per capita real GDP in current prices.	PWT 7.0
lngdp	Log of real GDP in current prices.	PWT 7.0
ls	% of population having secondary education.	(Barro & Lee, 2010).
lp	% of population having primary education.	(Barro & Lee, 2010).
yr_sch	Average years of schooling of the population of the country.	(Barro & Lee, 2010).
lat_abst	Absolute value of country's latitude normalized to take value between 0 and 1.	(La Porta, et al., 1999). Original Source CIA world fact book.
legor_uk	Dummy for legal origin: 1 if country has UK common law.	(La Porta, et al., 1999).
legor_fr	Dummy for legal origin: 1 if country has French Civil law.	(La Porta, et al., 1999).
legor_so	Dummy for legal origin: 1 if country has Socialist law.	(La Porta, et al., 1999).
legor_ge	Dummy for legal origin: 1 if country has German common law.	(La Porta, et al., 1999).

Table 2

Descriptive Statistics

Variable	Mean	Standard Deviation
Political Rights	3.801	2.229
Civil Liberties	3.785	1.922
Executive Constraints	4.232	2.365
Legal System & Property Rights - Adjusted	5.513	1.851
Trade Openness (in %)	79.763	48.066
Real GDP in Current Prices (Millions of US $)	180518.6	763381.8
Real Per Capita GDP in Current Prices (US $)	6824.5	9974.8
% of population having secondary education	34.707	20.057
% of population having primary education.	33.103	17.077
Average years of schooling	6.585	2.921
log of Openness	4.202	0.634
log of GDP	9.592	2.375
log of Per capita GDP	7.942	1.444
Latitude (Normalized)	0.264	0.184

Table 3

Correlation Matrix

	pr	cl	xconst	pra	lngdp	lngdpc	ls	lnopen	lat_abst
pr	1.00								
cl	0.91	1.00							
xconst	-0.87	-0.82	1.00						
pra	-0.48	-0.53	0.44	1.00					
lngdp	-0.36	-0.35	0.39	0.41	1.00				
lngdpc	-0.57	-0.63	0.56	0.63	0.64	1.00			
ls	-0.43	-0.49	0.48	0.48	0.42	0.68	1.00		
lnopen	-0.06	-0.13	0.06	0.21	-0.24	0.30	0.32	1.00	
lat_abst	-0.46	-0.50	0.44	0.51	0.45	0.61	0.54	0.08	1.00

Table 4

	Dependant Variable: Political Right Index					
VARIABLES	(Panel 1)	(Panel 2)	(Panel 3)	(Panel 4)	(Panel 5)	(Panel 6)
lnopen	-0.609***	-0.278*	-0.295*	-0.298**	-0.288**	-0.202
	(0.000)	(0.059)	(0.051)	(0.037)	(0.043)	(0.221)
lngdpc			-0.479***	-0.351**	-0.486***	-0.456***
			(0.000)	(0.024)	(0.000)	(0.000)
lngdp		-0.391***		-0.109		
		(0.000)		(0.323)		
ls[21]						-0.00971
						(0.284)
lat_abst				-2.884***	-3.002***	-3.209***
				(0.001)	(0.000)	(0.000)
legor_uk				0.0119	-0.0750	0.0806
				(0.977)	(0.848)	(0.849)
legor_fr				0.941**	0.757*	0.412
				(0.032)	(0.054)	(0.294)
legor_so				2.032***	1.844***	1.733***
				(0.000)	(0.000)	(0.000)
legor_ge				-0.0796	-0.353	-0.389
				(0.847)	(0.250)	(0.219)
Constant	6.360***	8.717***	8.842***	8.945***	9.124***	9.090***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	6,092	6,092	6,092	6,092	6,092	1,017
R-squared	0.027	0.087	0.080	0.342	0.362	0.371
No. of Countries	180	180	180	180	180	137

Robust p-value in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

[21] Data for Year 2010 is used as a proxy for 2009.

Table 5

	Dependent Variable: Civil Liberties Index					
VARIABLES	(Panel 1)	(Panel 2)	(Panel 3)	(Panel 4)	(Panel 5)	(Panel 6)
lnopen	-0.642***	-0.332***	-0.342***	-0.343***	-0.338***	-0.330**
	(0.000)	(0.003)	(0.003)	(0.001)	(0.002)	(0.012)
lngdpc			-0.458***	-0.388***	-0.462***	-0.378***
			(0.000)	(0.003)	(0.000)	(0.000)
lngdp		-0.367***		-0.0597		
		(0.000)		(0.521)		
ls[22]						-0.0146**
						(0.028)
lat_abst				-2.367***	-2.432***	-2.516***
				(0.001)	(0.000)	(0.000)
legor_uk				0.327	0.279	0.505
				(0.354)	(0.414)	(0.166)
legor_fr				1.116***	1.015***	0.795**
				(0.004)	(0.004)	(0.026)
legor_so				2.007***	1.904***	1.975***
				(0.000)	(0.000)	(0.000)
legor_ge				0.190	0.0404	0.109
				(0.667)	(0.918)	(0.773)
Constant	6.484***	8.698***	8.860***	8.619***	8.718***	8.579***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	6,092	6,092	6,092	6,092	6,092	1,017
R-squared	0.045	0.122	0.117	0.413	0.400	0.436
No. of Countries	180	180	180	180	180	137

Robust p-values in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

[22] Data for Year 2010 is used as a proxy for 2009.

Table 6[23]

	Dependent Variable: Executive Constraint					
VARIABLES	(Panel 1)	(Panel 2)	(Panel 3)	(Panel 4)	(Panel 5)	(Panel 6)
lnopen	1.049***	0.387**	0.443***	0.482***	0.413***	0.317*
	(0.000)	(0.021)	(0.008)	(0.002)	(0.009)	(0.096)
lngdpc			0.405***	-0.447	0.411***	0.175*
			(0.000)	(0.103)	(0.000)	(0.097)
lngdp		0.351***		0.669***		
		(0.000)		(0.001)		
ls[24]						0.0248***
						(0.003)
lat_abst				3.159***	3.165***	2.905***
				(0.001)	(0.000)	(0.001)
legor_uk				-0.881*	-0.395	-0.692
				(0.092)	(0.407)	(0.166)
legor_fr				-1.893***	-1.388***	-1.344***
				(0.000)	(0.001)	(0.002)
legor_so				-2.284***	-1.725***	-2.097***
				(0.000)	(0.000)	(0.000)
legor_ge				-1.012	0.0667	-0.115
				(0.145)	(0.899)	(0.821)
Constant	0.0263	-0.738	-0.602	-0.249	-0.562	1.235
	(0.968)	(0.283)	(0.380)	(0.774)	(0.478)	(0.204)
Observations	6,524	6,524	6,524	6,524	6,524	1,222
R-squared	0.073	0.134	0.121	0.235	0.298	0.312
No. of Countries	152	152	152	152	152	125

Robust p-value in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

[23] Data is for the period 1950 to 2009.
[24] Data for Year 2010 is used as a proxy for 2009.

Table 7[25]

	Dependent Variable: Legal System & Property Rights-Adjusted					
VARIABLES	(Panel 1)	(Panel 2)	(Panel 3)	(Panel 4)	(Panel 5)	(Panel 6)
lnopen	0.822***	0.0793	0.172	0.263*	0.180	0.152
	(0.000)	(0.686)	(0.378)	(0.068)	(0.202)	(0.295)
lngdpc			0.455***	0.417***	0.496***	0.470***
			(0.000)	(0.000)	(0.000)	(0.000)
lngdp		0.411***		0.0676		
		(0.000)		(0.112)		
ls[26]						0.00469
						(0.290)
lat_abst				2.550***	2.522***	2.476***
				(0.000)	(0.000)	(0.000)
legor_uk				-0.117	-0.0414	-0.0631
				(0.656)	(0.878)	(0.819)
legor_fr				-0.938***	-0.860***	-0.882***
				(0.000)	(0.001)	(0.001)
legor_so				-1.001***	-0.896***	-1.017***
				(0.000)	(0.000)	(0.000)
legor_ge				0.240	0.369	0.322
				(0.413)	(0.186)	(0.253)
Constant	2.075***	0.790	1.006	0.0233	0.365	0.574
	(0.002)	(0.331)	(0.215)	(0.972)	(0.559)	(0.372)
Observations	908	908	908	908	908	850
R-squared	0.033	0.080	0.070	0.477	0.479	0.484
No. of Countries	137	137	137	137	137	122

Robust p-values in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

[25] Data from 1970 to 2005 on 5 yearly basis. Last data point used is for year 2008.
[26] Data for Year 2010 is used as a proxy for 2008.

Table 8 : IV Estimates

	Dependant Variable: Political Right Index					
VARIABLES	(Panel 1)	(Panel 2)	(Panel 3)	(Panel 4)	(Panel 5)	(Panel 6)
lnopen	-0.734***	-0.303**	-0.327**	-0.318**	-0.224*	-0.191
	(0.000)	(0.026)	(0.017)	(0.020)	(0.073)	(0.115)
lngdpc			-0.528***	-0.427***	-0.372***	-0.458***
			(0.000)	(0.000)	(0.001)	(0.000)
lngdp		-0.422***			-0.0742	
		(0.000)			(0.307)	
ls				-0.00951*	-0.00930*	-0.00975**
				(0.090)	(0.063)	(0.050)
lat_abst					-3.213***	-3.200***
					(0.000)	(0.000)
legor_uk					0.144	0.0792
					(0.856)	(0.919)
legor_fr					0.516	0.412
					(0.504)	(0.589)
legor_so					1.839**	1.733**
					(0.015)	(0.021)
legor_ge					-0.228	-0.384
					(0.809)	(0.679)
Constant	6.733***	9.269***	9.342***	8.804***	9.160***	9.063***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	1,017	1,017	1,017	1,017	1,017	1,017
No. of Countries	137	137	137	137	137	137

p-value in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 9 : IV Estimates

	Dependant Variable: Civil Liberties Index					
VARIABLES	(Panel 1)	(Panel 2)	(Panel 3)	(Panel 4)	(Panel 5)	(Panel 6)
lnopen	-0.817***	-0.407***	-0.421***	-0.407***	-0.324***	-0.323***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
lngdpc			-0.515***	-0.362***	-0.376***	-0.379***
			(0.000)	(0.000)	(0.000)	(0.000)
lngdp		-0.402***			-0.00329	
		(0.000)			(0.956)	
ls				-0.0143***	-0.0146***	-0.0146***
				(0.001)	(0.000)	(0.000)
lat_abst					-2.511***	-2.510***
					(0.000)	(0.000)
legor_uk					0.507	0.504
					(0.440)	(0.442)
legor_fr					0.799	0.795
					(0.214)	(0.214)
legor_so					1.980***	1.976***
					(0.002)	(0.002)
legor_ge					0.119	0.112
					(0.880)	(0.886)
Constant	7.070***	9.488***	9.612***	8.803***	8.562***	8.561***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	1,017	1,017	1,017	1,017	1,017	1,017
No. of Countries	137	137	137	137	137	137

p-value in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 10: IV Estimates

	Dependant Variable: Executive Constraint					
VARIABLES	(Panel 1)	(Panel 2)	(Panel 3)	(Panel 4)	(Panel 5)	(Panel 6)
lnopen	1.184***	0.454***	0.529***	0.528***	0.427***	0.294**
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.020)
lngdpc			0.380***	0.138*	-0.196	0.178***
			(0.000)	(0.064)	(0.117)	(0.008)
lngdp		0.334***			0.294***	
		(0.000)			(0.000)	
ls				0.0243***	0.0236***	0.0249***
				(0.000)	(0.000)	(0.000)
lat_abst					3.004***	2.891***
					(0.001)	(0.001)
legor_uk					-0.885	-0.689
					(0.300)	(0.414)
legor_fr					-1.563*	-1.344
					(0.063)	(0.105)
legor_so					-2.341***	-2.097***
					(0.005)	(0.010)
legor_ge					-0.532	-0.124
					(0.593)	(0.899)
Constant	-0.263	-0.673	-0.559	0.596	0.954	1.303
	(0.580)	(0.147)	(0.230)	(0.260)	(0.375)	(0.220)
Observations	1,222	1,222	1,222	1,222	1,222	1,222
No. of Countries	125	125	125	125	125	125

p-value in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 11: IV Estimates

	Dependant Variable: Legal System & Property Rights-Adjusted					
VARIABLES	(Panel 1)	(Panel 2)	(Panel 3)	(Panel 4)	(Panel 5)	(Panel 6)
lnopen	0.833***	0.0284	0.111	0.0389	0.219	0.146
	(0.000)	(0.891)	(0.596)	(0.854)	(0.108)	(0.221)
lngdpc			0.479***	0.352***	0.396***	0.464***
			(0.000)	(0.001)	(0.000)	(0.000)
lngdp		0.428***			0.0573	
		(0.000)			(0.266)	
ls				0.0148**	0.00509	0.00527
				(0.032)	(0.291)	(0.274)
lat_abst					2.423***	2.401***
					(0.000)	(0.000)
legor_uk					-0.173	-0.105
					(0.684)	(0.801)
legor_fr					-0.974**	-0.904**
					(0.018)	(0.026)
legor_so					-1.113***	-1.016**
					(0.009)	(0.015)
legor_ge					0.193	0.301
					(0.697)	(0.535)
Constant	2.107***	0.855	1.110	1.941**	0.404	0.686
	(0.003)	(0.230)	(0.118)	(0.016)	(0.594)	(0.337)
Observations	830	830	830	830	830	830
No. of Countries	119	119	119	119	119	119

p-value in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 12: Robustness Checks

	Political Rights Index			Civil Liberties Index		
VARIABLES	(Panel 1)	(Panel 2)	(Panel 3)	(Panel 4)	(Panel 5)	(Panel 6)
lnopen	-0.213*	-0.181	-0.257**	-0.352***	-0.321***	-0.370***
	(0.078)	(0.131)	(0.029)	(0.000)	(0.001)	(0.000)
lngdpc	-0.579***	-0.252***	-0.461***	-0.527***	-0.247***	-0.378***
	(0.000)	(0.006)	(0.000)	(0.000)	(0.001)	(0.000)
ls			-0.00617			-0.0121***
			(0.199)			(0.001)
lat_abst	-3.333***	-2.996***	-2.984***	-2.640***	-2.375***	-2.137**
	(0.000)	(0.000)	(0.010)	(0.000)	(0.001)	(0.022)
legor_uk	-0.180	0.0246	-0.765	0.272	0.368	-0.296
	(0.822)	(0.974)	(0.261)	(0.691)	(0.556)	(0.592)
legor_fr	0.258	0.221	-0.361	0.693	0.585	0.0639
	(0.741)	(0.766)	(0.587)	(0.299)	(0.339)	(0.906)
legor_so	1.347*	1.811**	2.006**	1.547**	1.885***	2.096***
	(0.075)	(0.012)	(0.023)	(0.016)	(0.002)	(0.003)
legor_ge	-0.571	-0.398	-0.614	-0.0573	0.0380	-0.0735
	(0.547)	(0.661)	(0.434)	(0.944)	(0.959)	(0.908)
lp	-0.00560			-0.000732		
	(0.168)			(0.818)		
yr_sch		-0.198***			-0.180***	
		(0.000)			(0.000)	
Constant	10.24***	8.331***	10.09***	9.624***	8.266***	9.346***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Regional Dummies	No	No	Yes	No	No	Yes
R-Squared	0.376	0.412	0.526	0.425	0.479	0.598
Observations	1,017	1,017	1,017	1,017	1,017	1,017
No. of Countries	137	137	137	137	137	137

p-value in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 13: Robustness Checks

	Executive Constraints			Property Rights Index		
VARIABLES	(Panel 1)	(Panel 2)	(Panel 3)	(Panel 4)	(Panel 5)	(Panel 6)
lnopen	0.313**	0.278**	0.342***	0.172	0.142	0.165
	(0.011)	(0.019)	(0.004)	(0.132)	(0.215)	(0.120)
lngdpc	0.483***	-0.232***	0.208***	0.521***	0.337***	0.515***
	(0.000)	(0.005)	(0.002)	(0.000)	(0.000)	(0.000)
ls			0.0223***			0.00449
			(0.000)			(0.280)
lat_abst	3.143***	2.158**	1.824	2.543***	2.390***	1.086*
	(0.000)	(0.011)	(0.144)	(0.000)	(0.000)	(0.087)
legor_uk	-0.0893	-0.462	0.258	0.0672	-0.0536	0.240
	(0.917)	(0.563)	(0.733)	(0.868)	(0.893)	(0.455)
legor_fr	-0.967	-0.725	-0.368	-0.811**	-0.770**	-0.438
	(0.251)	(0.358)	(0.622)	(0.039)	(0.050)	(0.160)
legor_so	-1.200	-2.079***	-1.893*	-0.820**	-1.061***	0.0628
	(0.140)	(0.006)	(0.050)	(0.035)	(0.006)	(0.919)
legor_ge	0.254	-0.0238	-0.0826	0.408	0.346	0.198
	(0.798)	(0.980)	(0.923)	(0.383)	(0.457)	(0.586)
lp	0.0111***			0.00352		
	(0.001)			(0.320)		
yr_sch		0.458***			0.116***	
		(0.000)			(0.004)	
Constant	-1.347	2.428**	-0.0673	-0.00508	1.062	0.366
	(0.208)	(0.016)	(0.946)	(0.994)	(0.121)	(0.547)
Regional Dummies	No	No	Yes	No	No	Yes
Observations	1,244	1,244	1,244	850	850	850
R-Squared	0.318	0.383	0.442	0.486	0.488	0.549
No. of Countries	127	127	127	122	122	122

p-value in parentheses (*** p<0.01, ** p<0.05, * p<0.1)