



Essays on the Economics of the Political Replacement Effects

By

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Declaration

Acknowledgements

Abstract

This study focused on two themes. The first examines how political competition impacts human capital accumulation over time for one hundred fourteen countries for the period 1980 to 2010. The second theme analyzed how the level of political competition determines the level of financial development over one hundred and thirty six countries from 1960 to 2010. The study attempts to provide empirical evidence that the impact of political competition on economic growth passes through its impact on human capital formation and financial development.

To address both themes, institutions as the main determinant of divergent paths of development, is employed. Institutions are human devised rules of the game that shape and govern economic, social and political interactions of the society (North, 1991). These institutions could be good or bad from the perspective of their impact on economic outcomes. Good institutions foster sustained economic growth and hence development, whereas bad institutions lock countries under stagnated economy and traps. Within the bigger institutions, there are political institutions that govern and shape political interactions of the society, which in turn determine society's economic institutions which govern and shape economic incentives and interactions of economic agents (Acemoglu and Robinson, 2006). The political elites who are in charge of the nation decide which form of economic institution to adopt by taking into account their benefits' calculus. It is therefore imperative to assume that there is interplay between economic institutions and political institutions which eventually predicts the variation in the level of economic outcomes of different measures across countries over time.

Results indicate that there is non-monotonic relationship between the level of political competition and our outcome variables: human capital formation and financial development. It gives evidence that implementation of reforms that promote better economic outcomes, such as human capital formation and financial development in this case, depend on the political calculus of the political elites. Political elites who faced either lower or higher level of competition are likely to implement reforms or adopt technologies that will foster better economic outcomes whereas political elites who are

in the intermediate level of political completion are likely to block those initiatives and thereby lower level of economic outcomes.

Key words: political competition, human capital formation, financial development, democracy

JEL classification: **I25, O17, O43**

Table of Contents

Declaration	i
Acknowledgements	ii
Abstract	iii
Table of Contents	v
List of Tables	vii
Chapter One	1
Introduction	1
1.1 Background and Problem Statement	1
1.2 Objectives of the study	4
1.3 Hypothesis of the study	4
1.4 Approaches and Methods of the Study	5
1.5 Organization of the Thesis	5
Chapter Two	7
Review of Related Literature	7
2.1 Introduction	7
2.2 The origin of legal system view	8
2.3 The endowment View	14
2.4 Regime characteristics and economic outcomes	20
2.5 What matters for financial development and human capital formation other than institutional determinants	23
2.6 Summary	27
Chapter Three	28
Political Competition and Human Capital Accumulation	28
3.1 Introduction	28
3.2 A Brief Overview of Related Literature	32
3.3 Data and Specification	35
3.4 Empirical Results	43
3.5 Summary	56
Chapter Four	58
Political Competition and Financial Development	58
4.1 Introduction	58

4.2	A Brief Overview of Related Literature	62
4.3	Data and Methodology	66
4.4	Result and Discussion	74
4.5	Summary	94
Chapter Five		96
Conclusion		96
References		99
Appendix		107
Appendix1		107
Appendix 2		108

List of Tables

Table 1 Summary statistics for human capital and other control variables.....	41
Table 2 Correlation matrix for human capital and control variables.....	42
Table 3 Regression result: basic model (no control variables).....	44
Table 4 Non-monotonicity test for the basic Model.....	45
Table 5- Regression result of the model (with control variables)	47
Table 6- Test for non-monotonicity with control variables	48
Table 7 Robusness Analysis.....	50
Table 8-Test for non-monotonicity for (robustness analysis)	51
Table 9-more robustness exercise (sub-sample analysis).....	53
Table 10- Non-monotonicity test (robustness check).....	54
Table 11-political competition human capital accumulation Granger causality	55
Table 12-Summary statistics for the banking sector	74
Table 13-pair-wise correlations on financial development (banking sector)	74
Table 14-regression result for banking sector	77
Table 15- Test for non-monotonicity political competition and financial development (banking)	78
Table 16-regresssion result by adding more control variables	79
Table 17- regression output with origin of legal system dummy	81
Table 18-Test for non-monotonicity with origin of legal system dummy	82
Table 19– robustness check (banking sector).....	84
Table 20-non-monotonocity (robustness check/banking sector).....	85
Table 21-summary statistics (stock markets)	85
Table 22- pair-wise correlation between variables (stock market)	86
Table 23-regression (total value of stock market traded as a percentage of GDP)	87
Table 24 -Non-monotonicity test (total value of stock market traded as a percentage of GDP). 88	
Table 25 - regression results with legal origin dummy(stock market).....	89
Table 26 - Robustness check (Stock market)	91
Table 27-U-test for robustness analysis (stock market).....	92
Table 28-granger causality: banking sector.....	93

Chapter One

Introduction

1.1 Background and Problem Statement

Different studies have different theoretical explanations for how cross-country heterogeneities in economic outcomes evolve over time. But there is a growing consensus and one thing is becoming pervasive in the different varieties of the literature: institutions (Acemoglu and Robinson, 2012). Institutions are human devised rules of the game that shape and govern economic, social and political interactions of the society (North, 1991).

This study adopts the framework that institutions are the main cause for the divergent paths of economic development. These institutions could be good or bad from the perspective of their impact on economic outcomes. Good institutions foster sustained economic growth and hence development, while bad institutions lock countries under traps and stagnated economy. Within institutions, there are political institutions that govern and shape political interactions of the different political actors of the society, which in turn determine society's economic institutions which govern and shape economic incentives and interactions of various economic agents (Acemoglu and Robinson, 2006). The political elites who are in charge of the nation decide which form of economic institution to adopt by taking into account their benefits' calculus. It is therefore imperative to assume that there is interplay between economic institutions and political institutions which eventually predicts the variation in the level of economic outcomes of different measures across countries over time.

Furthermore, the study period coincided with massive diffusion of political institutions, which is in the form of democracy has been observed (Papaioannou and Siourounis, 2008). Almost all of third wave of democratization happened in the thesis study period. Political participation and democratic scores across different countries have increased following the waves of democratization. There are countries that were able to consolidate democracy and the rest partially democratized following the third wave of democratization as documented by (Papaioannou and Siourounis, 2008).

There is also tremendous diffusion of economic institutions through globalization, and trade and financial liberalization throughout the world over the study period. The level of globalization from 1970 to 2010 has increased by over 50% according to the globalization

dataset by Dreher (2006). Similarly, massive episodes of financial liberalization across different countries happened in the study period: most of the financial reforms in most of Latin America occurred in the 1980s and 1990s; much of Sub-Saharan Africa has observed fastest financial liberalization in the 1990s; most of OECD countries undergone financial liberalization starting from early 1970s and have more or less fully liberalized financial sectors; countries in East Asia opened up their financial sector in the 1980s and undergone a continued liberalization for the following decade or so (Abiad, Detragiache and Tressel, 2010).

The political elites in charge of the country decide which form of economic institution to adopt taking into account their benefits' calculus. Because of this calculus depends on the characteristics of the political institutions, there is interplay between economic institutions and political institutions which eventually predicts the variation in the level of economic outcomes of different measure across countries over time. Political elites who are well entrenched or constrained by high level of political competition are more likely to opt for adopting policies or economic institutions which are favorable for economic growth and development. Inefficient government policies and institutions arises when there the political elites' fear political replacement effect. These inefficient policies and economic institutions result in underdevelopment. With this framework, this study tries to untangle the question why some countries remain economically underdeveloped or fail to develop.

In the third chapter, this study employed a dynamic panel data model to test Acemoglu and Robinson (2006) political replacement hypothesis on human capital accumulation. They argued the implementation of institutional changes and policies that promote human capital formation depend on the political calculation of political elites' probability of staying on power, which then results in non-monotonic relationship between the level of political competition and human capital. Moreover, higher level of human capital in the labor force is likely to increase output and productivity which is good for the political elites' as it increases the rent available for them. But it poses a risk for the political elites as well that highly educated mass may organize itself to overthrow the incumbent political elites. These likely impacts of higher human capital accumulation give incentive/disincentive to political elites' who are in charge of the government policies and thereby foster/block human capital investment to the mass. This chapter tests the hypothesis of political replacement effect that the implementation of institutional changes and policies that promote human capital formation depend on the political calculation of political elites' probability of staying on power. Incumbent political elites who faced high or low level of political competition more likely

implements policies or institutional change that promote human capital formation where as political elites who faced intermediate level of political competition more likely engaged in blocking the institutional changes and policies that promote human capital formation. Therefore, there is non-monotonic relationship between human capital accumulation and the level of political competition.

For the analysis in the third chapter, this study uses human capital which is measured by average years of secondary schooling of the male population above 25 years of age from Human Capital database by (Barro and Lee, 2013) and the political institution variable, level of political competition in the country is obtained from Polity IV data set (Marshall, Jaggers and Gurr, 2013). The dynamic panel data model of human capital accumulation is controlled for the level of political rent and external rent, corruption as a proxy for the former and country's involvement in international violence for the later, both obtained from PRS Group (2009). Dreher(2006) database of globalization is also used. Real interest rate, life expectancy at birth and annual economic growth (GDP growth) from the World Bank WDI database is used as well.

In the forth chapter the same political replacement effect is tested for financial development. Different measures of financial development are used for the banking sector and equity market. Dynamic panel data estimations are carried out to test the relationship between political competition and financial development. The same analogy used in human capital accumulation is applied. In countries where the political elites are well entrenched and the level of political competition is low, it is upon the interest of the political elites to adopt or implement policies favorable to financial development so that they themselves can harness its beneficial effect on the economy. In a similar fashion in countries where there is high level of political competition, the more the government becomes accountable to the public, the more difficult to the government to peruse policies which favor minor political elites. In countries where the level of political competition is medium, political elites tend to block reform.

For the fourth chapter, the different measures of financial development are obtained from Global Financial Development Database and a financial dataset by Beck, Demirgüç-Kunt, and Levine (2000). For different economic indicators, the World Bank development indicators are used. The political institution index is obtained from POLITY IV project database. Human capital data by Barro and Lee (2013) is used.

This study contributes to the literature by providing empirical evidence on political replacement effects of human capital accumulation and financial development across countries throughout the world. The study is relevant to the literature on political institutions and economic growth. It gives empirical evidence that the impact of political competition on economic growth passes through its impact on human capital formation and financial development.

1.2 Objectives of the study

The primary objective of this study is to examine the political replacement effect on economic outcomes. How the level of political competition in the country interplay with economic institutions to determine various economic outcomes.

The study specifically aims to peruse the following specific objectives:

1. Attempt to build a unified interpretation of the theoretical explanations of political replacement effects.
2. Empirically test the political replacement effects on human capital accumulation.
3. Empirically test the political replacement effects on financial development.

1.3 Hypothesis of the study

The hypothesis that this study is going to test is that political leaders choose whether to adopt/change/block new/better institutional arrangements or technology that will foster better economic outcomes but may cause political turbulence as well. This institutional arrangements or the technology determine the level of economic outcomes countries' achieve. Political elites' choice of reform or block turn depends on their political calculation of staying on power after introducing the change which is called political replacement effect.

In countries where the level of political competition is medium, fear of losing power appears to be high, pushes the political elite not to go for reform or opt for blockage of institutional arrangements that will result in better economic outcomes. Since the probability of staying on power is at stake, maintaining the status quo is going to be the highest priority of the incumbent political elites. On the other hand in countries where the political elites are well entrenched and the level of political competition is low, it is upon the interest of the political elites to adopt policies favorable to financial development so that they themselves can harness its beneficial effect on the economy. For these elites better economic outcomes delivers more

rent than the status quo does. In a similar fashion in countries where there is high level of political competition, it will not be the interest of the government to peruse policies which favor minor political elites as there will be more or less accountability to the public. Furthermore, the probability of winning the next election depends highly on the real delivery that accrues to the public in their term of office. To deliver better economic outcomes to the public, political elites in countries where there is high level of political competition implement policies and institutional arrangements that are intended to foster better economic outcomes. Therefore, it is plausible to expect non-monotonic relationship between the level of political competition and the economic outcomes of interest of this study such as human capital and financial development.

1.4 Approaches and Methods of the Study

This study employs dynamic panel data estimations to test the interplay between economic and political institutions in determining the economic outcome of interest. The following estimation techniques are employed: pooled OLS estimator fixed effect estimator, least square dummy variable estimator (LSDV) and generalized method of moments (GMM) estimator. The caveats and merits of each estimator are discussed in detail for each empirical study and the preferred estimation technique to interpret the results is also explained in detail. A formal test for non-monotonicity developed by Lind and Mehlum (2010) is employed rather than using the significance of the coefficient of the quadratic term which is proven to be misleading when the true relationship of the variable of interest is convex and monotonic.

1.5 Organization of the Thesis

The thesis is structured as follows. Chapter two provides review of literature on the fundamental determinates of economic outcomes and the political replacement effect. It attempts to provide a unified interpretation of the theoretical explanation of the economics of political replacement effects. It further discussed both theoretical and empirical studies which examine the determinants of financial development and human capital accumulation. How political replacement effect impacts human capital accumulation over time and the results from empirical analysis is discussed and presented in chapter three. Furthermore, it specifies a formal test of non-monotonicity between human capital accumulation and political competition and discusses the results from the empirical model. Chapter four presents empirical study on the impact of political replacement effects on financial development. The

non-monotonicity test of the empirical model employed for this chapter is also presented. Chapter five summaries and concludes the study.

Chapter Two

Review of Related Literature

2.1 Introduction

There are different theoretical explanations on how and why cross-country heterogeneities in economic outcomes evolve over time. This literature review presents the ‘deep institutional’ views in the economics literature that explain the reasons for the divergent paths of economic development. Institutions are considered as the fundamental determinants of economic growth and development. Institutions are humanly devised rules of the game that govern and shape behaviors and actions of economic, social and political actors in the society (North, 1990). There are economic institutions and political institutions. Economic institutions impact economic incentives in the society. These economic institutions are endogenous themselves and in general include market and how it efficiently works and the structure of property rights (Acemoglu, Johnson and Robinson, 2005).

The literature that considers institutions as the fundamental causes of long-run economic growth split into ‘endowment view’ and ‘the origin of legal system view’. One of the view emphasizes on the initial endowments of land, climate and the disease environment as the main determinant of the the type of institutions at the critical juncture, and these self-persisting institutions determine the different path of economic development (Acemoglu, Johnson and Robinson, 2001; Engerman and Sokoloff ,2000). This view is generally called the ‘endowment view’ in the economics literature. It is, however, important to mention that there is disparity with in this view mainly on the channel in which the initial endowments impact economic development. The other competing view stresses the origin of legal traditions which were initially coded in Europe and spread throughout the world colonization, conquest and adoption to explain the heterogeneity in economic development (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1997, 1998; LaPorta, Lopez-de-Silanes, and Shleifer, 2008; Beck, Demirgüç-Kunt, and Levine, 2001,2003).

The origin of legal system mainly emphasizes how legal system affects finance and then how finance impacts economic growth. There seems a strong consensus in the finance literature that origin of legal system strongly predicts financial institutions and financial development. Moreover, it is also widely accepted in the literature that well developed financial institutions

are taken as the precondition to spur economic growth. There are different channels in which the origin of legal system influences economic outcomes but the main one is through the security of property rights.

The endowment view, on other hand, highlights the importance of both economic and political institutions as the determinant of the divergent paths of economic development. In this view there is no clearly specified institution as the origin of legal system. Despite the fact that there is no clear cut agreement on which specific political or economic institution as the determinant, the interplay between these institutions and the role of government is stressed.

This chapter summarizes these two theoretical explanations on why the different paths of development with their corresponding empirical support provided in the literature. Furthermore, it specifically reviews the different regime characteristics and their impact on economic outcomes. The different arguments within the political economy literature about economic outcomes and the type of regime characteristics will be discussed in detail.

The chapter also reviews both theoretical and empirical literature on the determinants of human capital accumulation and financial development. How the different determinants that try to explain cross-country heterogeneities of these particular economic outcomes are going to be discussed in detail.

Finally, it attempts to build a unified interpretation on how the interplay between political and economic institutions determine economic outcomes and hence the different paths of economic development.

2.2 The origin of legal system view

This strand of literature stresses legal system origin as the fundamental determinant of economic development (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1997; La Porta *et al* 1998; LaPorta, Lopez-de-Silanes, and Shleifer, 2008; Beck, Demirgüç-Kunt, and Levine, 2001; Beck *et al*, 2003). Differences in legal system (traditions) result in differences in the security of property rights, quality of enforcement of private contracts and hence investor protection. Those countries who were able to form or adopt a legal system with better protection of property rights and enforcement of private contracts achieve higher level of financial development. The argument is some legal traditions are initially designed to favor state over protection of private property and some others are designed to buffer the private

property against government expropriation. When there is a government who expropriates, depositors will not be able to save their money in the bank which is subjected to expropriation, even bankers wouldn't feel comfortable in channeling fund to investors whom might make arrangement with the government and go away with the money, will eventually end up with a repressed financial sector.

The risk of government expropriation varies across the different legal traditions. Common law (English) performs better than civil law (German, Scandinavian and French) in investor protection. English common law tradition has a judicial buffer against expropriation risk by the state. However within civil law tradition, while the German and Scandinavian legal tradition countries performs better than French tradition as the former are more adaptable to changes compared to the later. The main theme of this theory is that in countries where the legal system enforce private property rights, protect the legal right of investors, savers are more willing to finance investors and hence a developed financial market.(Beck, Demirgüç-Kunt, and Levine, 2001; Beck *et al*, 2003)

The literature also explains the channels through which legal systems impacts financial outcome. LaPorta *et al.* (1997, 1998) argued the common law system come into effect to protect investors from the crown when it was designed. Civil law, on the other hand, puts the state above the judiciary. This channel is called 'political structure' by the law and finance literature as the difference lies on the relative importance given by the law to the state versus private investors. The other channel is called adoptability of the law to changing environment. Beck *et al.* (2001) argued common law systems are very quick to respond to the dynamics of finance and economy to the contrary to the civil law legal tradition. The former legal tradition gives discretion to the judge as opposed to in the French civil law. The more the legal system buffers itself from reform, makes the legal system static that private investors protection will stay lower with the dynamic financial innovation and hence lower financial development (Beck, Demirgüç-Kunt, and Levine (2003) Beck and Levine (2005)).

Initially this strand of literature was confined to show how the different legal traditions impact finance. In this category, researchers look how legal origin impact investors protection and how investor protects impacts financial development (La Porta *et al.*, 1997, 1998), or from legal origin to shareholder protection and from shareholder protection to financial development (La Porta *et al.*, 2006), or from creditor right to financial development (Dejankov *et al.*, 2008). The evidence in these studies is that higher shareholder and creditor

protection is highly linked with better developed financial markets and higher per capita income.

Subsequently, it further covers how the origin of legal traditions affects firms' entry (Djankov, LaPorta, Lopez-de-Silanes and Shleifer, 2002.), regulation on labor market (Botero, Djankov, La Porta, Lopez-de-Silanes and Shleifer, 2004), government ownership of the media (Djankov, McLiesh, , Nenova, and Shleifer, 2003), government ownership of banks (La Porta *et al.*, 2002) even the practices of military conscription (Mulligan and Shleifer , 2005a). The central argument this literature is that it emphasizes the impact of regulation vis-à-vis origin of legal system that the fixed and variable costs in introducing and enforcing new regulations differ significantly across different legal traditions, states proclivity to intervene in the economy varies across different legal traditions.

Djankov *et al.* (2004) examined the implication of entry regulation on the economy vis-à-vis the origin of legal system. They found entry regulation negatively related with better public goods delivery and better quality of private goods. They also empirically found that higher entry regulation, corruption and the size of the informal (unofficial) economy positively associated. In their findings, German and French civil law countries entry regulation is heavier than common and Scandinavian origin of the law countries. They argued the impact of legal origin in entry regulation reflects states tendency to intervene in the economy.

Ciccone and Papaioannou (2007) examined entry regulation and its impact across industries. They provide empirical evidence that where there is high level of entry regulation, growth of variety of industries and adjustment is slower and vice versa with expanding global demand and shift of technology.

Botero *et al.* (2002) studied the labor market regulation and its link with regime characteristics and legal origin. Furthermore, they also look at how these regulations relate to the level of unemployment across countries. Their findings can be summarized as follows: (1) when regulations appear to be heavier, lower level of labor force participation and unemployment tends to be high as well, the problem is severe for the youth; (2) heavier regulation appears to be the characteristics of civil law and Scandinavian legal tradition than common law countries; (3) left leaned and socialist governments tend to implement heavier labor regulations; (4) the impact of the origin of legal tradition is more significant than political factors.

This study inspired other researchers to look the implication of labour market regulation on the economy from different aspects. (Caballero, Cowan, Engel and Micco, 2013) heavier labor market regulation is associated with lower speed of adjustment to shocks and lower productivity growth in countries where the rules are enforced strongly.

Higher regulation impacts investment negatively that reduction of entry regulation reduces the monopoly mark up profit and hence spur competition and investment (Alesina, Ardagna, Nicoletti and Schiantarelli, 2005). A similar paper but not of legal origin category finds the same empirical evidence that pro-worker regulations lower investment and employment, and no link with improvement of welfare to the workers in India (Besley and Burgess, 2004).

Mulligan and Shleifer (2005a) examined the cost implications of regulations on military conscription. They stressed French civil law tradition has lower fixed and variable cost in administering new regulations and its enforcement as compared to common law tradition. In their theory, fixed cost of regulation predicts the extent of practice of conscription. They empirically showed French civil law tradition is more likely to conscript than common law countries.

The evidence in these studies can be summarized as: (1) lower entry regulation and lower ownership of the media is positively associated with higher income per capita; (2) higher ownership of the government is associated with less efficient debt enforcement; (3) French legal origin countries have higher entry regulation and state ownership of the media than English common law countries;

Higher government ownership of banks is associated with in countries where there is lower per capita income, insecure property right institutions, financially repressed and inefficient government (La Porta *et al.* 2002). They further showed government ownership of banks is consistent with the general view that proclivity of the state to intervene in the economy that French civil law countries have higher government ownership than common law countries.

2.2.1 Criticisms on the origin of legal system view

Despite the fact that there is a strong agreement in the literature that effective protection of investors facilitate financial development and economic growth, and the legal origin literature scored success in explaining cross country variation, many studies question the focal argument that the time invariant origin of legal system as the main determinant of investors'

protection and financial development. It is, however, challenged by the fact that it overlooked the change in financial development over time. Braun and Raddatz (2005) showed the movement of rank of countries deciles in financial development, using different proxies of financial development, varied especially in the recent past despite the fact that countries inherited bad legal institutions as deemed by the finance and law literature. Different measures of financial development showed variation in growth of financial development over time including reversal. As Rajan and Zingales (2003) showed some civil law countries (Argentinian, France, Germany and Russia) were better financially developed than other countries in the early 20th century but later reversal happen to these countries. It is also shown that positive correlation between higher financial development and common law legal system is the 20th century phenomenon.

In addition to this, this strand of literature fails to explain the within the same legal system variation of economic outcomes over time. Stulz and Williamson (2003) tried to explain this within variation by using yet another deep institutional feature such as culture and religion. They found Catholic and Islam not pro-finance where as to the contrary holds for protestant religion. The main theme of this culture as a determinant argument stresses that legal origins are proxy for other factors that influence legal rules and legal outcomes. There is an attempt to see the impact of culture on economic outcomes by Guiso, Sapienza and Zingales (2006). The time invariant nature of culture and origin of legal system rules them out from explaining the overtime variation of different economic outcomes.

The other argument in the literature takes legal origin as a proxy to political characteristics than reflecting legal rules and outcomes themselves. The legal origin literature further doesn't take into account the political systems within which the legal system operates. Among other things, government ownership of banks and controlling interest rate, control and restriction on the flow of finance, and regulation of financial institutions which are considered to impact financial development negatively cannot be seen separately by themselves sidelining political decisions. Quinn (2000) showed there is clear link between financial liberalization and regime characteristics.

In this context, Grima and Shorthand (2008) show the legal origin dummy appeared insignificant when they are introduced in the political economy model regression. Similar result is also obtained by Keefer (2007). In his empirical estimation, he finds political variable significant when he controlled for the origin of legal system. Legal origin appears

insignificant when he controlled for political endogeneity in his estimation. The argument put forward by his new evidence is that legal origin does not reflect the legal rules *per se* but a proxy for the characteristics of the government over its proclivity in serving broad or narrow groups.

The political economy literature of financial development traces the main source of heterogeneity of financial development from the distributional implication that financial institutions would bring as opposed to the time invariant origin of legal system. Due to this distributional implication, financial development will have both opponents (incumbent industrial elite tend to lose from financial development as it brings in new competitors by making access to finance easy who have innovative idea) and promoters. The group interest theory of financial development by (Rajan and Zingales, 2003) has put forward another argument in which the optimal level of financial development is going to be determined by the relative strength of opponents and backers of financial development. When there is a well functioning financial market, it attracts savings and channels them into productive investments. It will enhance competition in a sector which needs external finance to start up with innovative idea, Rajan and Zingales (2003) identified the industrial sector. It is the interest of incumbent firms to lobby the political elite to block/reverse financial reform as the pie of their rent is under threat from the new entrant.

In the same political economy context, there is a view that generally emphasizes initial endowments of land, climate and the disease environment for current institutions. These initial conditions when they appear to be favorable influenced colonialists to settle and establish institutions favorable for long-term development. On the other hand, in the case of unfavorable conditions, they set up institutions to extract resources without being settled there in case of unfavorable ones. In fact, western institutions dispersed throughout the world by colonization, conquest and adoption.

Acemoglu, Johnson and Robinson (2001) provides evidence to the view that European colonizers install extractive institutions in countries where they faced higher rates of mortality, while in favorable environments where they face lower level of mortality, they settled and set up institutions friendly to long run economic growth and development. Beck, Demirgüç-Kunt, and Levine (2003) applied the settler mortality hypothesis used by Acemoglu, Johnson and Robinson (2001) to financial development. They found empirical support that endowment does influence current financial institutions. Initial institutions persist as it gives advantage to

benefiters within the political process and can be used to explain current cross country disparities. Easterly and Levine (2003) also provide empirical support for the view that endowments influence today institutions.

2.3 The endowment View

The endowments view stresses factor endowments as the main determinant of early institutions and self sustaining institutions determine the different trajectories of economic development. The initial endowments of land, climate and the disease environment affect European colonizers what type of institutions to install. These initial conditions when they appear to be favorable influenced colonialists to settle and establish institutions favorable for long-term development. On the other hand, in the case of unfavorable conditions, they set up institutions to extract resources without being settled there in case of unfavorable ones. This different strategy employed by European colonizers explains the divergent paths countries end up (Acemoglu, Johnson and Robinson, 2001; Engerman and Sokoloff, 2000; Engerman and Sokoloff, 2005)

European colonizers established two variants of colonies: ‘setter colonies’ and ‘extractive colonies’. The disease environment (observed by mortality rate of early European migrants), population density (of the indigenous people) are instrumental in determining which strategy to employ. In countries such as United States, Canada, New Zealand and Australia, mortality rate of early European migrants and indigenous people population density were low that European colonizers settled and established institutions that are inclusive enforce private property rights and limit expropriation by the state on private properties. On the other hand in countries Brazil, Congo and much of the Caribbean islands where there are large indigenous population density and/or European migrants faced higher mortality rates, Europeans didn’t settle rather they extracted the resource these countries are endowed with in the form of minerals, sugarcane plantations and even slaves. They established the extractive institutions so that it protects and enriches the elite who come to extract the wealth. The presence of large indigenous population made the extraction more profitable by making more available labor to work in mines and plantations. (Acemoglu, Johnson and Robinson, 2001; Engerman and Sokoloff ,2000; Engerman and Sokoloff ,2005)

Within this endowment view, there are two verities of arguments on how endowment impacts the different paths of economic development. The one by Acemoglu, Johnson and Robinson

(2001) institutions set up initially persist after colonization is abolished. In settler colonies, the political and legal institutions that protect private property rights and facilitate private contracting endured after colonization. Similarly, in extractive colonies, post colonial leaders inherited and continue to use these extractive institutions. These new leaders to their advantage used the institutions to expropriate resources and enrich themselves. The causality channel is in the way that endowment (which they use settler mortality rates as an instrumental proxy) impacts early institutions, and early institutions persist and impact economic development.

They provide empirical evidence to this view that European colonizers install extractive institutions in countries where they faced higher rates of mortality, while in favorable environments where they face lower level of mortality, they settled and set up institutions friendly to long run economic growth and development. Beck, Demirguc-Kunt, and Levine (2003) applied the settler mortality hypothesis used by Acemoglu, Johnson and Robinson (2001) to test whether the theory holds for financial institutions. They found the empirical support consistent with the theory that endowment does influence current financial institutions. Initial institutions persist as it gives advantage to benefitters within the political process and can be used to explain current cross country disparities. Easterly and Levine (2003) also provide empirical support for this view that endowments of tropics, germs and crops affect income of the country via institutions. The result they provide is robust using four different instruments of endowment: settler mortality, latitude, crops/minerals dummy and landlocked dummy.

The endowment view discussed so far stresses the causality channel from endowment to early institutions, and early institutions persist and impact economic development. However, there is another strand of literature with a different path such as inequality instead of institutions. The causality path is endowments predict inequality and inequality predicts institutions and economic outcomes (Engerman and Sokoloff, 2000; Engerman and Sokoloff, 2005). They showed that Caribbean or South America enjoyed a relatively higher per capital than the New England (USA and Canada) at the time of European colonization but after the later were able to sustain higher level of economic growth. Their explanation for the divergent path between the two stresses the level of inequality that emanated from the initial endowments.

The extreme level of inequality in the Caribbean or South America but not in the new England is accounted from: (1) the suitability of the agro-ecology for the plantations of

sugarcane, then a high return cash crop, generated economies of scale with the use of slave labor; (2) the relatively high level of endowments of minerals also encourage the colonizers the use of slave labour; (3) the area is has a large indigenous population density, the level of inequality does correspond to indigenous population density after the end of colonization. These factors contributed for small number of elites of European origin to control large proportion of the wealth and political power. These powerful elites established institution that safeguard their privileges which perpetuates itself and result in lower level of economic development. Powerful elites block any reform that ensures equality before the law for the reason that to perpetuate their privileges (Bourguignon and Verdier ,2000). On the other hand in the New England, the land was suitable for corn and wheat production at the small scale, no economies of scale, and then no extreme inequality, which triggered them to establish more egalitarian institutions that encourage private investment and secure private property (Engerman and Sokoloff, 2000; Engerman and Sokoloff, 2005).

This view stresses the role of collective action problems such as inequality in shaping public policies or institutions. it gets empirical support from Galor, Moav and Vollrat (2009), Galor (2011) and Bourguignon and Verdier (2000). They argue that powerful economic groups of the society may block the implementation of institutional change or policies that are intended to promote better economic outcomes if they fear it might erode their economic power. The central theme of the argument is the higher the inequality the lower the economic outcome would be. While Acemoglu, Johnson and Robinson (2001) emphasized on disease and indigenous population size, Engerman and Sokoloff (2000, 2002) pointed to relative endowments between mining and crop in the American colonies in determining the divergent political and economic development paths. In colonies where the land is conducive to large cash crop plantations and/or countries endowed with minerals, the fortunate few elites enriched themselves using slave labor. This resulted in extreme inequality. These elites created institutions to perpetuate their privileged status. Leading examples of from this category include the Caribbean, Colombia, Brazil, Venezuela and southern part of North America. On the other hand, up in northern America, the land is conducive to wheat and corn which can be more efficiently produced in a smaller scale farm. This created more equal society and therefore established inclusive institutions.

Galor *et al.* (2009) provide empirical evidence that shows land inequality has a negative impact on human capital formation and economic growth. they argued: (1) from period of stagnation to economic growth, that is, from traditional sectors to industrialization, the

increase in the demand of human capital and its effect in human capital formation is very instrumental; (2) and as opposed to the Acemoglu, James and Robinson(2001, 2002) and Engerman and Sokoloff (2000,2002) the conflict of interest is between the new industrial class and the landlords class than the ruling elite and the; (3) it is the landlords elites incumbent upon their interest to block reform on education out of economic incentive than the effect on political reform on the distribution of political power; (4) the distribution of land in spite of the fact that the political power remained intact will trigger human capital formation and hence growth. he supported his argument with evidence from Japan, Taiwan, South Korea and Russia. To the contrary to this, Acemoglu and Robinson (2006) provided the opposite account on Germany landed aristocracy supporting economic growth technologies and economic institutions and the Japan entrenched political elite adopting different technology pro to investment and economic growth. Similarly, Easterly (2007) showed how income inequality hampers economic development.

2.3.1 Criticisms on the Endowment View

The basic argument of the endowment view is endowments shape institutions and then institutions impact economic growth. Institution is the channel through which economic and political outcomes are determined. The question raised on this line of argument is what if the direction of causality is reversed. That is endowment impacts economic outcomes directly and these economic outcomes determine institutions. This view is called the geography determinants of development. Sachs (2001) argued differences in health, agriculture, energy and transport as a result of geographic location are the fundamental factors sources of economic variation between the tropics and temperate agro ecologies. The tropics has lower soil fertility and higher crop pests and animal parasites, lower water availability and evaporation as a result of warm temperature, which make agricultural production with lower yields. On the health front, the burden of disease is considerably higher in the tropics than in temperate zones. He also observed difference in energy endowment such as coal deposit between the two agro ecology zones where the later has much higher deposit than the other. This main difference endowment then leads to tropical climate production technology lags behind the temperate climate in agriculture and health. Furthermore unsuitability of the tropics for different modes of transport makes technology diffusion harder and the diffusion of technology occurred only within an agro-ecology zone not across. (Sacks, 2001)

The geography hypothesis puts the causality from endowment to economic outcome and then to institutions as opposed to the endowment view which argue the casual chain from endowment to colonial strategy to institutions and then to economic outcomes. But Easterly and Levine (2003) tested the two views that whether endowments impact economic development directly or endowments affect economic growth via institutions. Their test is positive for the view that endowments influence economic growth via institutions. However, they found no evidence for the geography view that endowments affect economic development without the institutions channel. Beck, Demirguc-Kunt, and Levine (2003) applied the settler mortality hypothesis used by Acemoglu, Johnson and Robinson (2001) to financial development that they found empirical support that endowment does influence current financial institutions.

Acemoglu, Johnson and Robinson (2002) present evidence reversal of fortune as a result of European extractive institutions which they argued caused institutions reversal in countries where reversal of fortune is observed to rebuke the time invariant geography hypothesis determinants of economic development. They observed and argued: (1) relatively poorer regions at the time of colonization were sparsely populated with indigenous population that gives an incentive for European colonizers to settle in and install investment conducive institutions; (2) in relatively richer and largely populated regions, they installed more extractive institutions since they are more profitable to the elites that they force the native population to work in large plantations and mines , which then results in reversal of fortune; (3) the role of institutions in the reversal becomes more intense or crucial when the new mode of production namely industrialization appeared; (4) when a new technology appeared, the institutions installed there blocked the new opportunity mainly because the new technology may benefit groups outside the elites who are in control or it may result in political turbulence so that they lose their privilege or political power.

The empirical result provided by Acemoglu, Johnson and Robinson (2002) is not free from challenge. Przeworski (2004) doesn't find the reversal of fortune using the income data by Angus (2003) the World Economy. He questions the fundamental argument of the endowment hypothesis that the institutions installed by Europeans as a main cause for the international differences in economic development. He further cannot find conclusive evidence that past political systems such as autocracy or democracy predicting the current institutions. However, He admitted that he is not in a position to assert that the World Economy income data which dates back to 1500 involves conjecture and guess is more reliable than the one by Acemoglu,

Johnson and Robinson (2002) who used the previously available urbanization and population density for their analysis of fortune reversal. But the data has more time and country coverage than the previously available ones.

Yet another criticism of the endowment view by Glaeser, La Porta, Lopez-de-Silanes and Shleifer (2004): (1) European colonizers didn't merely bring institutions alone but themselves (human capital), their culture, education and schools; (2) the casual channel of the endowment view is challenged that these are the main factors that endured after colonization not the institutions they brought; (3) using settler mortality as an instrument will not be valid since settlers brought with them many aspects that matter for economic development. They further provide empirical evidence that it is human capital not institutions that predicts economic growth. According to their line of argument institutions are outcome of human capital and economic growth. However, Acemoglu *et al.* (2005) raised a question on the econometric specification employed by Glaeser *et al.* (2004) that after introducing fixed effect and the within country variation, they found out that the causality from human capital to growth to institution doesn't appear to be robust.

It is not using settler mortality as a valid instrument invites criticism but also the measurement of the data as well by Albouy (2012). He further argues much of the variation in mortality rates for a considerable sample covered in the study doesn't reflect actual living conditions rather living conditions of transitory nature. After dropping the countries in the sample that their mortality rate is taken from the neighboring countries (which account 60% of the total sample) and capping the mortality rates to account outliers, the Acemoglu, Johnson and Robinson (2001) causality of institutions doesn't appear to be robust. However, Acemoglu, Johnson and Robinson (2012), rebutted all the claims raised by him. The endowment view does not depend solely on mortality rates data as an instrument. There are other instruments used to proxy endowments by Beck, Demirgic-Kunt and Levine (2003), Easterly and Levine, 2003) and Easterly (2006) that give the same result with the endowment view. The first two researches used latitude as a proxy for endowment while the later used availability of land suitable for sugarcane plantation as opposed to used for wheat. Banerjee and Irvin (2005) provide empirical evidence that agricultural productivity and human capital is lower in landlords dominated areas than small holder dominated areas.

2.4 Regime characteristics and economic outcomes

There are different views of the characteristics of the state vis-à-vis service delivery. It extends from views that find no relationship between regime characteristics and economic policy to democratic institutions as a positive determinant of different economic outcomes. The literature in this subject is very far from consensus. These views are summarized below.

The View that sees state from the lens of monopolistic theory of the firm predicts autocratic governments provide fewer public services than democracy. The argument of this model is as follows: (1) state is considered as monopoly because of its monopoly of violence within its territory; (2) since the cost of entry to politics or participation and barriers to exists are low in democracy, the state faces higher competition and it is incumbent upon its interest to provide more services to the public so that the way it behave is like regulated monopoly; (3) in autocracy, barriers to exit and cost of entry or participation are higher, the state will provide lower public services but collects higher economic rents by exercising its monopoly of violence (Lake & Baum, 2001).

Another theory with puts forth stability of succession in the regime characteristics as the main predictor of long-run economic growth. According to this theory, both democracy and economic growth in the long-run could be achieved when there is security of property rights. According to this theory, the long-run economic performance of the dictatorial regimes is a seldom phenomenon for mainly because naturally autocracies have very uncertain future in succession, they have an incentive of imposing higher tax or expropriating private property. This theory predicts different result from the one which views the state as a monopolistic firm that, in this theory it is the interest of a secure autocrat to provide policies that increase productivity so that it gets the higher rent. (Olson, 1993)

This view has the merit of explaining the success monarchies. However, there are a bunch of secure autocrats who has been performing well in the economic front. In economic success South Eastern Asian countries, one party dictatorial regime has been able to craft different arrangement to spur economic growth. There are studies in the literature which considers democratic institutions bad for economic outcomes.

For example, Shleifer and Vishny (1994) argue democratic system leads to inefficient economic outcomes in the two models of democratic decision making such as majority voting and interest group. In the case of majority voting decision-making, democratic economic

policies will redistribute resources from the minority to themselves which will not result in efficient economic outcomes. They argued, when the democratic decision is made by interest group, organized minority interest groups will have much of the influence which in the end results in inefficient economic outcomes. they mentioned two reasons for this: (1) due to the cost and problem of free rider in organizing interest groups, groups that could represent the majority fails to form strong organized group; and (2) payments due to lobbying encourage rent seeking behavior and waste resource otherwise spent in productive activities.

Yet with the same context, there are studies that associate democratic institutions as bad for economic growth for particularly middle income countries because it increases redistributive pressure (Aghion, Alesina and Trebbi, 2004). The argument here is the redistributive tendency of electoral democracy from the mean to median voter is distortionary that it will discourage economic growth (Alesina and Rodrik, 1994; Persson and Tabellini, 1994).

Acemoglu (2008) cannot rule out the redistributive impacts of the democratic institutions and better performance of economic growth under non-democracies, but they argued when it comes to long-run economic growth democratic countries perform better as democratic institutions foster competition than the oligarchic regimes craft a system based on selection and favoring.

This strand of literature emphasizes the role of political institutions in the implementation of policies that promote economic growth (Acemoglu and Robinson, 2006; Gallego, 2010). The main argument in this category of literature is the higher the enfranchisement, the higher the economic outcomes through different channels. Gallego (2010) argued the political institutions in the past which are determined by historical factors shows persistence and affect economic institutions and outcomes. He empirically demonstrated democracy and decentralization are the crucial factors in determining economic institutions and outcomes. Lake and Baum, (2001) demonstrated empirically that democracy increase provision of public services in general and educational attainment in particular across the developing world. Avelin, Brown and Hunter (2005) showed total education expenditure per capita increase with democracy for Latin American countries for the period of 1980-1997. Similar result has been obtained by Harding and Stasavage (2014) for sub-Saharan Africa. They found that democratically elected governments abolish primary school fees and get a chance of re-election with a very high probability.

However, there is a stand of literature which rather argues the reverse causation from education to democracy. Lipset (1959) argued education promotes democratization. He wrote on page 79 “education presumably broadens men’s outlooks, enables them to understand the need for norms of tolerance, restrain them from adhering to extremist and monistic doctrines and increase their capacity to make rational electoral choice.” This modernization hypothesis got empirical support from Barro (1999), Glaeser, La Porta, Lopez-de-Silanes, and Shleifer (2004), Bobba, and Coviello (2007) and recently by Martin and Wacziarg (2014) from the macro studies, and Milligan, Moretti and Oreopoulos (2004) a micro study, showed that education increases participation in public affairs and following politics. Similarly, Dee (2004) assessed the causal effect of educational attainment on civic outcomes. He found positive relationship for both secondary and college education.

These empirical supports of modernization hypothesis are not far from challenge. Acemoglu Johnson, Robinson, Yared (2005) questioned the empirical strategy employed in cross sectional regression and after introducing fixed effect and the within country variation, they found out modernization theory evidence not robust. Tenn (2007) found additional education with a very little impact on voter turnout. Friedman *et al.* (2011) using a randomized trial (randomly assigned scholarship program for girls) in Kenya that despite the fact that girls have higher political knowledge and less likely to accept the legitimacy of political authorities, empowerment through education doesn’t translate into more participation in politics. Solis (2013) found no causal effect of higher education on political participation (voter registration and affiliation with political party). Acemoglu, Johnson, Robinson and Yared (2008, 2009) argued the other way round of the modernization hypothesis. They found out no casual effect from income on democracy. Acemoglu, Naidu, Restrepo, and Robinson (2014) show democracy indeed causes growth. They observed a 20% increase in GDP per capita as a result of democratization in the long run. Democratization impacts economic outcomes through creating favorable environment for investment, increasing schooling and provision of public goods, and reducing social unrest and instability.

On the other hand, Mulligan, Gil, and Sala-i-Martin (2004) argued there is no link between the quality of political institutions and any policy outcome since they could not find as such a difference in public policies between democracies and non-democracies. Their economic explanation for their finding is “Economic and social policies in all kinds of countries are to a first approximation the outcome of tradeoffs-like efficiency, or conflicts among generations, or among industries that are basic to human nature and not specific to particular political

institutions” (page 71-72). The difference they found out between authoritarian and democratic countries is the degree of competition on how to hold and maintain public office but not any significant difference on economic and social policies. Autocratic countries are more likely to violate very basic human rights, control or monitor the flow of information, and spend much more on the military as compared to democratic countries.

Acemoglu and Robinson (2006) theoretical model has the answer for these opposing views. They highlighted how the ruling elite’s calculation of staying on power plays a crucial role in blocking/allowing institutional change or technology that leads to better economic outcomes. their argument focus on the political replacement effect: (1) economic institutions for economic development are not mainly decided by interest groups or economic elites but political elites; (2) elites blocked new productive technologies or institutions that spur investment and growth when they calculate the implication of these changes going after their interest; (3) the greater the rent available for political elites the higher the incentive for them to block this institutions and economic change; (4) when the elites are well enriched who do not face replacement risk, prospect of future rent as a result of growth after the adoption of technology will likely allow the adoption of the new technology and economic institutions. Based on their argument there is non-monotonicity in political competition and economic reform. In other words, autocracies with low level of political competition and very unlikely to be removed from power and lose future rents, and competitive democracies where there is high level of political competition and the chance of retaining political power is improved when offering better policy outcomes will not block institutional change or technology that promotes human capital of the masses. They provided empirical evidence with a comparative study on Germany, Britain, Japan, Hungary and Russia. Recently their hypothesis got empirical support from 119 countries with a sophisticated econometric approach by Leonida, Patti, Marini, and Navarra (2015).

2.5 What matters for financial development and human capital formation other than institutional determinants

There is a considerable body of literature which untangles the determinants of financial development other than institutional variables. As clearly discussed in the previous sections of this chapter, institutions, regime characteristics and legal and regulatory traditions are the most studied determinants. La Porta *et al.* (1997, 98), Levine (2003, 2005), La Porta *et al.* (2008) find that financial development is impacted by the origin of legal system the country

adopted or inherited. They stressed that the impact of the origin of legal system pass through protection and enforcement of property rights, and the reinforcement of creditors and shareholders' rights. Becerra, Cavallo and Scartascini (2012) find government institutional capability impacting financial development. They provide evidence that in countries where government capability is high, expansion of credit markets. Keefer (2008) also finds the presence of political checks and balances influence financial development significantly.

As discussed in the previous sections of this chapter, another stand of literature focuses on the political economy of financial development. The central theme in this literature is financial development is repressed in countries where interest groups have a significant stake on shaping policies and reforms. Rajan and Zingales (2003) are the forefront in hypothesizing the interest group theory of financial development. They argued opening up financial market may threaten incumbent firms, particularly manufacturing which require a relatively higher level of credit capital to start up, so that they lobby for the blockage of financial reform. Their argument extends to opening up the country to international trade and finance to spur financial development. Their hypothesis has obtained empirical support from Becerra, Cavallo and Scartascini (2012) on 97 both developing and developed countries (70 for the former and 27 for the latter to be specific) for the period 1965 to 2003. They find that interest group theory holds but conditioned on government capability in the sense that in countries where there is lower opposition to financial reform, financial development is observed only in countries where there is higher government capability. Likewise, their findings show that government capability impacts financial development positively only in countries where there is higher level of credit dependency and lower level of opposition to financial reform.

Girma and Shorthand (2008) investigate the impact of regime characteristics on financial development in line with interest group theory. Here the line of argument is that there will be financial underdevelopment if the country is led by narrow political elites and the reverse is true if the country has more inclusive political institutions. They provide empirical evidence that regime stability and democracy impacting financial development positively. Furthermore they documented evidence that financial market is less likely to be established in countries where they are run by autocratic rulers, and if found established, there is low probability of success of thriving. They stressed democracy consolidation is more beneficial in the speed of financial development. They also find stability of the regime as a positive determinant of financial development.

For interest groups to concede to financial reform, Rajan and Zingales (2003) hypothesize that trade openness and financial openness together are imperative to financial development. They further stressed trade openness without financial openness may not deliver financial development. Baltagi, Demetriades and Law (2009) tested empirically this hypothesis over a range of countries using panel data and provide evidence that both financial openness and trade openness as significant determinants of financial development. they show the impact of openness to financial development is not linear meaning higher benefit of financial development accrue when very closed countries open their country and a disproportionately lower increase in the level of financial development for a relatively very open countries open more their trade and finance. Chinn and Ito (2006) provided empirical evidence that financial openness with a proxy of capital account liberalization impact financial development positively conditional on the required institutional and legal capacities threshold.

The level and sophistication of financial institutions is highly conditioned on the structure of the economy. The classic supply and demand of financial services have a role in this aspect. Non industrial Economies or those at the early stage of industrialization may not necessarily need well developed financial institutions as the forces of demand and supply of the financial market have a significant impact in spite of actions by the government. Empirical studies used a range of proxies to capture the demand of financial services by the market, for instance Becerra, Cavallo and Scartascini (2012) used GDP per capita, Girma and Shorthand (2008) used GDP growth.

Studies also give focus on microeconomic stability for the smooth functioning and development of financial sectors. Frequent occurrences of banking crisis might contribute to the erosion of public trust on financial institutions and impact financial development negatively (Loayza and Ranciere, 2006). They provide empirical evidence that banking crisis impacts financial development negatively and its impact goes to the extent of long-run economic growth. Reinhart and Rogoff (2011) examine the link between external debt and banking crisis, sovereign debt and banking crisis, and public borrowing debts and banking crisis.

Boyd, Levine and Smith (2001) study the performance of financial sector vis-à-vis inflation. The presence of higher inflation makes the return on future investment uncertain or reduce real returns and thereby it affects saving and investment in unfavorable manner. Boyd, Levine and Smith (2001) provide evidence that shows negative relationship between both banking

sector and equity market development and higher level of inflation after inflation reaches a certain threshold. They also find that at a very lower level of inflation, a slight increase in inflation is good for financial development.

The schooling models that exist in the literature so far try to assess the causes of schooling difference at the individual level. For instance, Becker and Tomes (1986) study human capital and credit frictions to human capital investment; Boucekkine, Croix and Licandro (2002) examines human capital and demography; Bils and Klenow (2000) study human capital and economic growth; Glomm and Ravikumar (2001) study human capital and public expenditure. all the studies share one thing in common that they look the variation in either schooling or earning across individuals. They focus on the elasticity of schooling to wages and income, impact of friction in credit market on human capital investment, the impact of public educational variables on schooling.

Another stand of literature study the role of human capital to explain cross-country growth or income differences (Bils and Klenow, 2000; Mankiw, Romer and Weil, 1992; Manuelli and Seshadri, 2014). Recent studies, however, tries to look at the determinants of schooling variation across countries and over time. Córdoba and Ripoll (2013) find demographic factors such as fertility and mortality as the main determinants of schooling variation across countries. Restuccia and Vandenbroucke (2014) find productivity and life expectancy as the main determinates of the variation in schooling across countries and over time. Schooling decision by the individual depends on how much the individual expects to work in the labor market. So life expectancy at birth is used to proxy how much an individual expected to work. It further proxy the impact of other demographic variables expected to impact schooling decision like health.

Bils and Klenow (2000) show that the growth influences the optimal years of schooling. Madsen and Mamun (2016) provide empirical evidence for Asian growth miracles. They show the impact of growth on human capital accumulation via growth induced saving and then to investment to human capital. Another channels through which growth affects schooling is the presence of credit that increase in income will in turn affect the affordability of schools.

2.6 Summary

This chapter reviews the literature on the institutional determinants of economic development and builds a unified interpretation how economic institutions and political institutions interplay in determining various economic outcomes. It can be summarized as follows. The different economic institutions for economic development are not mainly solely decided by interest groups or various economic actors. There is a heavy involvement by the political elites to determine the economic institutions. These political elites have their own interest either to peruse policies to adopt new productive technologies or institutions that spur investment and growth or block them. Rent to be collected and the probability of staying on power are the incentives that shape their decision. This rent and the probability of staying on power are expected to change with the adoption of new technology or institutional arrangement. They calculate the implications of these changes to their interest.

The probability of staying on power captures the different type of regime variety. Well entrenched political elites in autocratic government have the higher probability of staying on power. The replacement risk in this kind of regime appears to be low. The prospect for future rent as a result of growth after the adoption of technology or institutional arrangement will likely make these elites to opt for the adoption of the new technology and/or institutional arrangements.

In democracy, the probability is highly dependent upon the political elites' delivery of outcomes to the public. The higher the delivery the higher will be the probability of getting reelection. The risk of replacement tends to be higher in regimes where the democracy score appears intermediate level. To sum up, the different regime characteristics can be captured with the level of political competition they are facing. These political calculus by the political elites determine the optimal economic institutions that in turn decide economic outcomes.

Chapter Three

Political Competition and Human Capital Accumulation

3.1 Introduction

Educational attainment varies across countries. Over the past half a century, a massive increase in both democracy and education has been observed in less developed region (Friedman, Kremer, Miguel, and Thornton 2011). South Korea achieved universal primary enrollment and expanded secondary enrolment from 35 percent in 1965 to 88 percent in 1987 under military dictatorship, whereas in democracies, the likes of India were seen struggling to educate half of their population on the same period (Ansell, 2010). In sharp contrast, following democratization in 1993, Lesotho managed to increase spending on education to over 10 percent of the national income from 6 percent over the next decade while a rather decreasing trend observed in a similar Swaziland under dictatorship for the same period. There is also faster increase in schooling attainment in relatively poor countries from relatively rich countries (Restuccia and Vandenbroucke, 2014).

Why schooling attainment vary across countries? Why does countries are converging over schooling attainment? Different studies have their own theoretical explanation to these questions. But all do emphasize the role of government actions and institutions (Galor, Moav and Vollrath, 2009; Acemoglu and Robinson, 2006; Gallego, 2010; Ansell, 2010). Historical factors determine the distribution of political power among different groups and hence the quality of political institutions (Acemoglu, Johnson and Robinson, 2001). They further argued the country's economic institutions that shape the incentives to do economic activities are determined by the political institutions.

Despite the fact that there is agreement in the role of government and institutions, there is difference when it comes to the detail. One group argues that due to the presence of credit market imperfections and fixed cost in human capital investment, factor endowments and the role of collective action problems such as inequality shapes public policies that determines human capital accumulation (Galor *et al.*, 2009; Galor, 2011; Bourguignon and Verdier, 2000; Sokoloff and Engerman, 2000; Engerman and Sokoloff, 2005). Powerful economic groups of the society may block the implementation of institutional change or policies that are intended

to promote human capital formation if they fear it might erode their economic power. In other words, the higher the inequality the lower the human capital outcome would be. This theory gets empirical support from Galor *et al.* (2009) with land inequality, and Easterly (2007) on income inequality.

On the other hand, others give emphasis to the role of political institutions in the implementation of policies that promote human capital formation. The main theme of this argument is that the higher the enfranchisement of the population, the better will be education outcomes. This theory gets empirical support from Lake and Baum (2001) for the developing world, Avelin, Brown and Hunter (2005) for Latin American countries for the period of 1980-1997, and from Harding and Stasavage (2014) for sub-Saharan Africa. According to the evidence provided by this strand of literature, the impact of enfranchisement on human capital goes through public spending on education.

However, there are studies which couldn't find any difference in public policies between democracies and non-democracies (Mulligan, Gil, and Sala-i-Martin, 2004). Based on the evidence they provide, they concluded that there is no link between the quality of political institutions and any policy outcome. There is also a study that finds that democracy performs badly in economic outcomes for particularly middle income countries because it increases redistributive pressure (Aghion, Alesina and Trebbi, 2004).

A theory which attempts to answer to the contradicting evidences is developed by Acemoglu and Robinson (2006). It stresses how political competition affects institutions which shape the incentives to undertake economic activities. They argued that the implementation of institutional changes and policies that promote human capital formation and economic growth depend on the political calculation of political elites' probability of staying on power if they don't block innovation or change. They called it political replacement effect. The theory highlighted the conditions under which political elites will not block institutional change or technology that promotes human capital of the masses: (1) under autocracies where there is very low level of political competition and low probability of losing power and future rents of political elites, or (2) under competitive democracies where there is high level of political competition and the chance of retaining political power is conditioned on offering better policy outcomes.

A massive level of economic globalization has been observed over the last few decades as well. With globalization, as Acemoglu and Autor (2011) showed there is rapid diffusion of the latest technology and expansion of job offshoring opportunities. It is plausible to argue that diffusion of technology, mobility of capital and job offshoring will impact human capital through the supply and demand of human capital. On one hand, new technologies are skill complementary (Goldin and Katz, 1998). Hence adaptation of new technology necessarily requires trained workers. And the other is as Rodrik (1998) observed there is positive correlation between openness to international market and the size of government (one of the measure of size is public spending on education). For instance, Avenilo, Brown and Hunter (2005) found positive relationship between openness and public spending on education.

Acemoglu and Robinson (2006) argued the implementation of institutional changes and policies that promote human capital formation depend on the political calculation of political elites' probability of staying on power, which then results in non-monotonic relationship between the level of political competition and human capital. Moreover, higher level of human capital in the labor force is likely to increase output and productivity which is good for the political elites' as it increases the rent available for them. But it poses a risk for the political elites as well that highly educated mass may organize itself to overthrow the incumbent political elites. These likely impacts of higher human capital accumulation give incentive/disincentive to political elites' who are in charge of the government policies and thereby foster/block human capital investment to the mass. This chapter tests the hypothesis of political replacement effect that the implementation of institutional changes and policies that promote human capital formation depend on the political calculation of political elites' probability of staying on power. Incumbent political elites who faced high or low level of political competition more likely implements policies or institutional change that promote human capital formation where as political elites who faced intermediate level of political competition more likely engaged in blocking the institutional changes and policies that promote human capital formation. Therefore, there is non-monotonic relationship between human capital accumulation and the level of political competition.

This study will try to analyze how cross-country heterogeneity in human capital accumulation evolved over time using panel data from 98 countries for the period of 1980 to 2010. It integrate the Acemoglu and Robinson's hypothesis of political replacement effect with labor

market institutions, and analyze how political competition interact with labor market institutions in determining human capital accumulation.

The chapter is organized as follows. The next section provides a brief overview of related literature. In section 3 we will discuss data and sources, specification, estimation issues and test for non-monotonicity. Section four presents the findings and then section five concludes.

3.2 A Brief Overview of Related Literature

Different studies have different theoretical explanation how cross-country heterogeneities in human capital accumulation evolve over time. One strand of literature emphasizes factor endowments and the role of collective action problems such as inequality in shaping public policies which they argue very crucial in the provision of education because of the presence of credit market imperfection and fixed cost associated with human capital investment (Galor *et al.*, 2009; Galor, 2011; Bourguignon and Verdier, 2000; Sokoloff and Engerman, 2000; Engerman and Sokoloff, 2005). They argue that powerful economic groups of the society may block the implementation of institutional change or policies that are intended to promote human capital formation if they fear it might erode their economic power. The central theme of the argument is the higher the inequality the lower the human capital outcome. Galor *et al.* (2009) provide empirical evidence that shows land inequality has a negative impact on human capital formation. Similarly, Easterly (2007) showed how income inequality affect schooling negatively.

Another strand of literature emphasizes the role of political institutions in the implementation of policies that promote human capital formation [Acemoglu and Robinson, 2006; Gallego, 2010]. One group from this stand of literature argues the higher the enfranchisement, the higher will be the government spending on education and thereby better education outcomes. Gallego (2010) argued the political institutions in the past which are determined by historical factors shows persistence and affect educational institutions and outcomes. He empirically demonstrated democracy and decentralization are the crucial factors in determining educational institutions and outcome. Lake and Baum, (2001) demonstrated empirically that democracy increase provision of public services in general and educational attainment in particular across the developing world. Avelin, Brown and Hunter (2005) showed total education expenditure per capita increase with democracy for Latin American countries for the period of 1980-1997. Similar result has been obtained by Harding and Stasavage (2014) for sub-Saharan Africa. They found that democratically elected governments abolish primary school fees and get a chance of re-election with a very high probability.

However, there is a stand of literature which rather argues the reverse causation from education to democracy. Lipset (1959) argued education promotes democratization. He wrote on page 79 “education presumably broadens men’s outlooks, enables them to understand the need for norms of tolerance, restrain them from adhering to extremist and monistic doctrines

and increase their capacity to make rational electoral choice.” This modernization hypothesis got empirical support from Barro(1999), Glaeser, La Porta, Lopez-de-Silanes, and Shleifer (2004), Bobba, and Coviello (2007) and recently by Martin and Wacziarg (2014) from the macro studies, and Milligan, Moretti and Oreopoulos (2004) a micro study, showed that education increases participation in public affairs and following politics. Similarly, Dee (2004) assessed the causal effect of educational attainment on civic outcomes. He found positive relationship for both secondary and college education.

These empirical supports of modernization hypothesis are not far from challenge. Acemoglu Johnson, Robinson, Yared (2005) questioned the empirical strategy employed in cross sectional regression and after introducing fixed effect and the within country variation, they found out modernization theory evidence not robust. Tenn (2007) found additional education with a very little impact on voter turnout. Friedman *et al.* (2011) using a randomized trial (randomly assigned scholarship program for girls) in Kenya that despite the fact that girls have higher political knowledge and less likely to accept the legitimacy of political authorities, empowerment through education doesn’t translate into more participation in politics. Solis (2013) found no causal effect of higher education on political participation (voter registration and affiliation with political party)

On the other hand, Mulligan, Gil, and Sala-i-Martin (2004) argued there is no link between the quality of political institutions and any policy outcome since they could not find as such a difference in public policies between democracies and non-democracies. Their economic explanation for their finding is “Economic and social policies in all kinds of countries are to a first approximation the outcome of tradeoffs-like efficiency, or conflicts among generations, or among industries that are basic to human nature and not specific to particular political institutions” (page 71-72).

Yet there is another strand of literature which argues that democracy is bad for economic growth for particularly middle income countries because it increases redistributive pressure (Aghion, Alesina and Trebbi, 2004).

Acemoglu and Robinson (2006) theoretical model has the answer for these opposing views. They highlighted how the ruling elite’s calculation of staying on power plays a crucial role in blocking/allowing institutional change or technology that leads to better economic outcomes. Based on their argument there is non-monotonicity in political competition and economic reform. In other words, autocracies with low level of political competition and very unlikely

to be removed from power and lose future rents, and competitive democracies where there is high level of political competition and the chance of retaining political power is improved when offering better policy outcomes will not block institutional change or technology that promotes human capital of the masses.

3.3 Data and Specification

3.3.1 Sources and Variable Definitions

Human Capital

Our main measure of human capital [educational attainment] is average years of secondary schooling attained by the male population above 25 years of age from Barro and Lee (2013). The data covers 146 countries in five year intervals for the period 1950 to 2010. Further it disaggregates average years of schooling of the population by level (primary, secondary and tertiary), by sex (male and female) for age levels (over age 15 and over age 25). According to World Bank (2012) the likelihood of women participation in the labor market is lower than men in many countries and it follows U shaped relationship with the level of development. This may in turn result in certain systematic relationship of women investment in human capital across countries. This study is interested to analyze how the level of political completion interacts with the labor market institution in determining human capital formation. Therefore we used average years of secondary schooling of the male population with the age of 25 and above.

Political Competition

Our main indicator of political competition in the country is from Polity IV data set (Marshall, Jaggers and Gurr, 2013). It has a composite index from two dimensions of political competition: the first one measure how free is the political participation is free from the government control and the other measures how political participation is institutionalized. The resulting composite index ranges between 1 and 10 with 1 representing ‘suppressed’ (lowest degree of political competition) and 10 ‘institutionalized electoral’ (highest degree of political competition).

Control variables: our control variables are based on Acemoglu and Robinson (2006) and literature on labor market structure.

Political rents: Acemoglu and Robinson (2006) argue that the presence of greater rents to political elites from staying on power most likely discourage rules from investing on human capital or block initiatives intended to increase the human capital of the masses. They further showed there is an interesting relationship between rents and human capital levels, those with higher levels of human capital makes rent smaller than future gain from industrialization and hence discourage blocking of change. The study uses the index of corruption developed by

PRS Group (2009) as a proxy to political rent. The index ranges from 0 to 6 which show the scale of corruption in ascending order.

External threat: Acemoglu and Robinson (2006) also argued the presence of external threats such as foreign invasion makes ruling elites to encourage innovation. In this study, the extent of external threat measured in two alternative ways. Recent experience of war with other states is more likely to increase policy makers' perception of the likelihood of a new interstate conflict (Aghion, Persson and Rouzet, 2012). The study uses war risk, a dummy indicator 1 if the country is engaged in interstate war in the previous 10 years and 0 otherwise by using Correlates of War (COW) database. The database lists all interstate wars from the year 1816 to 2007 all over the world with outcome (victory or defeat), casualties (death as a percentage of prewar population), and who initiated it among others (Sarkees and Wayman, 2010).

One of the constraints of this measure of external threat is miss external threats even in the absence of history of war as the indicator is completely backward looking. We therefore use an alternative measure of external threat from PRS Group (2009) with an index that ranges between 0 to 12, the higher the index the higher the risk that the country is involved in international violence and vice versa.

Globalization/Openness to the Global Market: globalization might affect human capital through diffusion of technology, mobility of capital and off-shoring via affecting supply and demand of human capital. Different indices of globalization are collected from KOF index of globalization developed first by Dreher (2006) and later extended in Dreher, Gaston and Martens(2008) . The index covers 207 countries over the period 1970 to 2012 on yearly basis. It has three main components: economic, social and political globalization. The study constructed the change of globalization using this dataset.

Economic growth: Bils and Klenow (2000) show that the growth influences the optimal years of schooling. Madsen and Mamun (2016) provide empirical evidence for Asian growth miracles. They show the impact of growth on human capital accumulation via growth induced saving and then to investment to human capital. Another channels through which growth affects schooling is the presence of credit that increase in income will in turn affect the affordability of schools. Annual growth rate of GDP is obtained from the Penn World Table (PWT 9.0) and World Bank development indicators (WDI).

Real interest rate: micro economic models that study schooling decision enter the real interest rate in their model. It affects schooling negatively, Bils and Klenow (2000) Restuccia and Vandenbroucke (2014). The data for the real interest rate is obtained from the World Bank development indicators database (WDI).

Life expectancy at birth: schooling decision by the individual depends on how much he/she expects to work in the labor market. So life expectancy at birth is used to proxy how much an individual expected to work. It further proxy the impact of other demographic variables expected to impact schooling decision like health. Again World Bank development indicators database (WDI) is the source of this proxy.

3.3.4 Specifications

The approach this study follows is to estimate the panel data model with country fixed effect and time effect by including the polynomial of the degree of political competition (this is to capture the non-monotonic relationship). The main interest of this study is to test whether there exists a non-monotonic relationship between the level of human capital and the degree of political competition.

Bils and Klenow (2000) show how expected growth impact schooling. They derive the optimal years of schooling decision by the individual (S^*) as follows:

$$S^* = T - \left[\frac{1}{r-g} \right] * \ln \left[\frac{\phi}{\phi - \mu(r-g)} \right] \dots \dots \dots (1)$$

Where T represents the number of years the individual is expected to live, r is the interest rate, and ϕ the Mincerian return to schooling, μ the ratio of schooling tuition fees and opportunity cost of student time, and g is the productivity growth. From this equation, it can be seen that the schooling is positively related with the expected growth rate and negatively related with interest rate.

The baseline regression equation employed for the analysis is:

$$Y_{i,t} = \gamma Y_{i,t-1} + \sum_{j=1}^J \beta_j X_{ji,t} + \sum_{m=1}^M \rho_m PC_{i,t}^m + \mu_i + \mu_t + \varepsilon_{i,t} \dots \dots \dots (2)$$

Where $Y_{i,t}$ is the dependent variable (which refers to human capital in country i at time t), Y_{t-1} is one period lag of the dependent variable(it is included to capture persistence of the

dependent variable), PC the key independent variable of interest (political competition), X is a vector of control variables by Acemoglu and Robinson(2006) (political rent, external threat, and globalization) and control variables by Bils and Klenow (2000) (life expectancy at birth, GDP growth rate and real interest rate) .

The main coefficient of interest is ρ_m , which captures the effect of political competition in country i at period t on the level of human capital. The variable political competition entered into the model as a polynomial function which allows us to capture its effect non-monotonically on the dependent variable as explained in Acemoglu and Robinson (2006) political replacement effect theory. It means more level of education is attained at either low or high political competition, whereas no significant impact when political competition takes intermediate levels. The model incorporates country fixed effect μ_i and year fixed effect μ_t that capture shocks and trends for all countries. And finally, $\varepsilon_{i,t}$ is an error term which captures all others omitted factors with $E[\varepsilon_{i,t} | Y_{i,t-1}, X_{i,t}, PC_{i,t}^m, \mu_i, \mu_t] = 0$ for all i and t .

3.3.5 Estimation Issues

Estimating equation (2) by pooled OLS (henceforth denoted POLS) leads to inconsistent estimates as a result of the presence of lagged dependent variable $Y_{i,t-1}$. This is because the lagged dependent variable $Y_{i,t-1}$ and country fixed effect μ_i are necessarily correlated.

An alternative method is to estimate to this equation by within group estimator (hereafter WG), removing the fixed effect by taking first differences which will also give inconsistent estimate because the dependent variable $Y_{i,t-1}$ is correlated with $\varepsilon_{i,t}$ which will induce a downward biased estimate for γ despite the fact that with low γ or large enough T reduces the severity of the bias (Nickell 1981).

Yet another approach is to use generalized method of moments (GMM). It can be done by differencing equation (3) with respect to time. The country fixed effect term doesn't appear here because it vanishes with time differencing.

$$\Delta Y_{i,t} = \gamma \Delta Y_{i,t-1} + \sum_{j=1}^j \beta_j \Delta X_{ji,t} + \sum_{m=1}^m \rho_m \Delta PC_{i,t}^m + \Delta \mu_t + \Delta \varepsilon_{i,t} \dots\dots\dots(3)$$

The GMM estimator solves the bias resulting from lagged dependent variable and fixed effects , the estimate is still biased if political competition is correlated with other changes

that affects the level of human capital. Arellano and Bond (1991) developed a Difference Generalized Method of Moments (henceforth denoted DIF-GMM) estimator that uses lagged level of independent variable as instruments for differenced variables which are not strictly exogenous. This estimator may also suffer from weak instruments if the variables are close to a random walk. The presence of weak instruments underestimates the degree of autocorrelation in the dependent variable.

Blundell and Bond (1998) developed another estimator system GMM (henceforth denoted SYS-GMM), compared to DIF-GMM, it uses lagged differences as instruments assuming they are uncorrelated with fixed effects despite the fact that it is very difficult to validate with a priori theoretical arguments. Another problem with DIF-GMM and particularly to SYS-GMM estimators is the as Roodman (2009) pointed out instrument proliferation which in turn generate low values of Hansen tests of instruments exogeneity.

There are still concerns for applying the GMM estimator for our model. Since the time horizon we are dealing with is too short for the influence of initial condition to disappear soon for the case of the level of human capital. That is to say the lagged difference in human capital level could be correlated with country fixed effects.

Given all these limitations of GMM estimators we also use an alternative estimation method bias corrected LSDV dynamic panel data estimator as suggested by Kiviet (1995). This method calculates the exact bias and proposes a method to remove the bias. We report and compare the results obtained from the estimators discussed above.

3.3.4 Hypothesis Test for non-monotonicity

Our main interest is to test whether there exists non-monotonic relationship between the level of human capital and the degree of political competition. Hence, we set $m = 2$ in the degree of political competition polynomial $\sum_{m=1}^m \rho_m \Delta PC_{i,t}^m$.

$$H_0 : \rho_1 < 0 \text{ and } \rho_2 > 0$$

Vs.

$$H_1 : \rho_1 \leq 0 \text{ and/or } \rho_2 \geq 0 \dots\dots\dots(4)$$

Many empirical works that tried to test the presence of U shaped relationship uses the significance of a quadratic term in the regression with the expected sign and the estimated extreme point is within the data range. However, this criterion is happens to be weak and misleading when the true relationship is convex but monotonic. (Lind and Mehlum, 2010)

They suggest the appropriate test for the presence of U shaped relationship is to test the combined null hypothesis H_0 against H_1 as follows:

$$H_0 : \rho_1 + 2\rho_2 PC_{\min} \geq 0 \text{ and/or } \rho_1 + 2\rho_2 PC_{\max} \leq 0$$

Vs.

$$H_1 : \rho_1 + 2\rho_2 PC_{\min} < 0 \text{ and } \rho_1 + 2\rho_2 PC_{\max} > 0 \dots\dots\dots(5)$$

Where PC_{\min} and PC_{\max} are the minimum and maximum level of political competition observed in the data range respectively. The idea behind this test is assuming that there exists only one extreme point, a relationship is U shaped when the slope of the curve is negative at the start and positive at the end of observed range of the dataset $[PC_{\min}, PC_{\max}]$. Rejecting the null hypothesis H_0 means there is enough evidence for the existence of a non-monotonic relationship between the degree of political competition and the level of human capital.

3.3.5 Descriptive Statistics

Summary statistics and the correlation matrix of all the variables used are presented in table (1) and (2) respectively. In each of the variable, the mean, standard deviation and total number of observation (note that we have unbalanced panel data) are reported.

Table-1- below presents the summary statistics of the variables used for the analysis. The mean, standard deviation (overall, within and between the panels), minimum and maximum are presented.

Table -2- below presents the correlation matrix of the variables used in the analysis. As can be seen in the table, most of the regressors are strongly correlated with human capital accumulation variable. Furthermore the signs of the correlations are consistent with the Acemoglu and Robinson (2006) theoretical hypothesis. The other control variables included from the literature appear to have the same expected sign in the correlation matrix as well.

Table 1 Summary statistics for human capital and other control variables

Variable	Mean	Min	Max	Std. Dev. (overall)	Std. Dev. (within)	Std. Dev. (between)
						1.35
Human capital	2.39	.05	7.24	1.42	.57	
PC	6.52	1	10	3.51	2.02	2.86
PC2	54.90	1	100	39.53	20.94	33.49
Growth	1.75	-21.62	30.73	3.52	3.00	1.87
Interest rate	7.69	-71.76	540.83	26.95	23.07	13.25
Life expectancy	66.65	36.06	82.63	10.06	3.30	9.42
Rent	1.04	-2.48	1.79	.47	0.28	.38
Threat	2.22	.77	2.48	.28	.22	0.17
Globalization	.71	-6.77	6.87	1.59	1.48	.64

Table 2 Correlation matrix for human capital and control variables

	Human capital	PC	PC2	Growth	interest rate	life expectancy	Threat	Corruption	Globalization
Human capital	1								
PC	0.4714***	1							
PC2	0.4953***	0.9824***	1						
Growth	0.1125	0.0792	0.0803	1					
Interest rate	-0.0045	0.0345	0.0042	-0.0719	1				
Life expectancy	0.6815***	0.4583***	0.4949***	0.2231***	-0.1028	1			
Threat	0.3056***	0.4075***	0.4094***	0.1571***	0.0113	0.3075***	1		
Rent	0.3886***	0.3701***	0.4190***	0.0087	-0.1450***	0.4502***	0.2350***	1	
Globalization	0.1207***	0.1301***	0.1432***	0.0271	0.0599	0.0943	0.0618	0.0654	1

3.4 Empirical Results

The regression result of equation (2) with no control variables using different estimators such as POLS, WG, KWG, DIF-GMM and SYS-GMM is reported on table (3) below. In all the estimators, hetroskedasticity and autocorrelation consistent standard errors are clustered by country. The POLS estimator will end up biasing upward the lag coefficient due to the presence of country fixed effect, whereas the WG estimator biases it downward as a result of Nickell bias (Nickell, 1981). However, the result is very helpful to detect problems with GMM estimators if there exist, and moreover it can be used to approximate the upper and lower bounds of the autoregressive coefficient. For instance, if the autoregressive coefficient is biased towards the WG counterpart, it is plausible to suspect the presence of weak instruments which is one of the serious drawback associated with the estimator. The SYS-GMM estimator has the advantage of addressing the small sample bias inherent on DIF-GMM estimator. But this method has a drawback of instruments proliferation in which too many instruments results in low values of Hansen tests of instruments of exogeneity. Therefore care has to be given in setting the lag limits while applying these estimators. As Roodman (2009) suggests the number of instruments should not be greater than the number of countries in the sample.

Finally we estimate the model using the bias corrected LSDV (KWG) estimator which has many advantages for dynamic panel models with small T and large N like ours. It is based on calculating the exact bias of WG estimator and then corrects the estimate by removing the bias. Among other advantages, it reduces the fixed effect bias; it doesn't require instruments or differencing unlike other methods. However, it is not free from drawback as it assumes additional regressors as exogenous which is not the case practically and the case of our model.

As can be seen in the table below the autoregressive coefficient is statistically highly significant for all estimation techniques. It is expected that the autoregressive coefficients to lie between the one obtained by POLS which can be used as upper bound and the one by WG as the lower bound for the other two estimators such as KIVET and SYS-GMM. If the coefficient of autoregressive variable lies outside the interval, then it implies there is a suspect of a problem with that estimator. The autoregressive coefficient by DIF-GMM estimator lies outside this interval that the autoregressive coefficient in DIF-GMM estimator is lower than WG whereas the one by SYS-GMM is lies within the interval and close with the one that of KWG. This, therefore, makes the SYS-GMM the preferred method for the analysis.

Table 3 Regression result: basic model (no control variables)

$HC_{i,t}$	POLS	WG	KIVET	DIFF-GMM	SYS-GMM
$HC_{i,t-1}$	1.015*** (0.012)	0.744*** (0.030)	1.000*** (0.026)	0.609*** (0.172)	0.900*** (0.131)
$PC_{i,t}$	-0.025 (0.018)	-0.071*** (0.023)	-0.053* (0.027)	-0.232* (0.114)	-0.475*** (0.161)
$PC^2_{i,t}$	0.003 (0.002)	0.006*** (0.002)	0.004* (0.003)	0.022* (0.012)	0.046*** (0.016)
AR(1)				-1.69 (0.091)	-2.45 (0.014)
AR(2)				-1.51 (0.132)	-1.54 (0.124)
Hansen test				14.39 (0.212)	7.17 (0.846)
Hansen-in-diff test				6.61 (0.471)	3.80 (0.704)
Number of observations	630	630	630	630	630
Number of countries	114	114	114	114	114
Adjusted R2	0.970	0.861			

Note: Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The sample includes 114 countries. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country. Hansen test: test for validity of the set of instruments; Hansen in difference test: Test for validity of additional moment conditions. AR (1): test for the presence of 1st order autocorrelation of residuals; AR (2): test for the presence of 2nd order autocorrelation in residuals.

The coefficients for the level of political competition and its square term are also significant showing the expected sign in POLS, WG and KWG estimators. Arellano-Bond test for AR (1) test is statistically significant which is expected. There is no autocorrelation of order two as Arellano-Bond test AR (2) test is statistically insignificant for both DIFF-GMM and SYS-GMM. It indicates the second lag of variables can be used as a valid instrument any more. So lag of two or more has to be used to have a valid instrument. Both the Hansen test of over identifying restriction and exogeneity of instruments are not statistically significant.

As the main interest of the study is to test for the presence of non-monotonicity between human capital variable and the degree of political competition, following the estimation of the model with no control variable in the equation (2), U-test is undertaken for all estimators using the approach developed by Lind and Mehlum (2010) as explained in the previous section. Based on Acemoglu and Robinson (2006) hypothesis, the degree of political competition affects the level of human capital non-monotonically where governments introduce different reforms intended to increase human capital level when the degree of political competition is either high or low. Table 4 below shows the test outcome for all the regression models used. As shown below in all models used the null hypothesis (which is monotonic or inverse relationship) is rejected, hence there is enough evidence to support the existence of non-monotonic relationship between the degree of political competition and human capital level. The full test of the result such as the extreme point, the slopes at the lower bound and higher bound, the respective tests of non-monotonicity at each bound, and the overall test, is presented in detail in table (4) below.

Table 4 Non-monotonicity test for the basic Model

Basic Model	POLS	WG	KWG	DIF-GMM	SYS- GMM
extreme point	4.891	5.826	6.085	5.344	5.145
Slope at:					
Lower bound	-0.020 (0.089)	-0.059 (0.000)	-0.044 (0.022)	-0.1885 (0.018)	-0.382 (0.001)
Upper bound	0.026 (0.057)	.0510 (0.015)	.034 (0.096)	0.202 (0.050)	.4478048 (0.001)
t-value(overall)	1.35 (0.09)	2.17 (0.016)	1.30 (0.097)	1.64 (.0050)	2.90 (0.001)

Note: The values in the brackets refer to p-values.

We also run regressions for equation (2) with control variables using different estimators: POLS, WG, KWG, DIF-GMM and SYS-GMM (the result is reported below in table 5). In all the models, heteroskedasticity and autocorrelation consistent standard errors are clustered by country. The autoregressive coefficient, the coefficient for political competition and its square term are statistically significant for all the models. The coefficient for autoregressive coefficient is high for POLS as expected whereas the DIF-GMM gives lower autoregressive coefficient than that of WG estimator which signals there is some problem with DIF-GMM estimator. The autoregressive coefficient for KWG and SYS-GMM estimator are between the upper bound POLS estimator estimate and the upper bound estimate WG estimator. The coefficient of real interest rate is negative as expected and statistically significant for all the estimators. The AR (1) is statistically significant as expected whereas AR(2) is statistically insignificant which means instruments with starting from lag two are used as valid instruments. Both the Hansen test of overriding restrictions and exogeneity of instruments are statistically insignificant.

Table 5- Regression result of the model (with control variables)

$HC_{i,t}$	POLS	WG	KWG	DIFF-GMM	SYS-GMM
$HC_{i,t-1}$	0.982*** (0.017)	0.716*** (0.046)	0.950*** (0.030)	0.694*** (0.079)	0.970*** (0.050)
$PC_{i,t}$	-0.043* (0.025)	-0.074** (0.032)	-0.060* (0.035)	-0.097** (0.048)	-0.253*** (0.062)
$PC^2_{i,t}$	0.004* (0.002)	0.007** (0.003)	0.006* (0.003)	0.009* (0.005)	0.024*** (0.005)
$Growth_{i,t}$	0.005 (0.004)	-0.005 (0.003)	-0.001 (0.007)	-0.012 (0.009)	-0.012 (0.009)
$r_{i,t}$	-0.001* (0.000)	-0.001*** (0.000)	-0.001 (0.001)	-0.002* (0.001)	0.001* (0.001)
$Life\ Exp_{i,t}$	0.006*** (0.002)	-0.004 (0.006)	-0.003 (0.007)	-0.012 (0.013)	-0.002 (0.006)
$Threat_{i,t}$	-0.115* (0.064)	-0.257*** (0.072)	-0.219*** (0.080)	-0.192** (0.086)	-0.001 (0.224)
$Rent_{i,t}$	-0.001 (0.029)	-0.031 (0.039)	-0.055 (0.047)	-0.003 (0.070)	0.220*** (0.078)
$Globalization_{i,t}$	0.002 (0.007)	-0.003 (0.005)	-0.003 (0.009)	-0.003 (0.008)	-0.013 (0.019)
AR(1)				-2.04 (0.041)	-2.39 (0.017)
AR(2)				-1.60 (0.110)	-1.48 (0.140)
Hansen test				68.82 (0.551)	19.47 (0.555)
Hansen-in-difference test				48.06 (0.794)	13.21 (0.354)
Adjusted R2	0.966	0.849			

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The sample includes 104 countries. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country. Hansen test: test for validity of the set of instruments; Hansen in difference test: Test for validity of additional moment conditions. AR (1): test for the presence of 1st order autocorrelation of residuals; AR (2): test for the presence of 2nd order autocorrelation in residuals.

When the control variables are added on equation (2), still the coefficients for the level of political competition and its square term are significant showing the expected sign in all estimators. Furthermore, the non-monotonicity test holds for all estimators. Therefore, there is evidence in support of the AR theory of non-monotonic relationship between the level of political competition and human capital level. The test result for non-monotonicity is reported below on table (6).

Table 6- Test for non-monotonicity with control variables

Basic Model	POLS	WG	KWG	DIF-GMM	SYS- GMM
extreme point	5.267	5.252	5.418	5.457	5.314
Slope at:					
Lower bound	-0.035 (0.048)	-0.059 (0.012)	-0.049 (0.043)	-0.079 (0.017)	-0.205 (0.000)
Upper bound	0.038 (0.038)	0.066 (0.020)	0.051 (0.047)	0.080 (0.085)	0.223 (0.000)
t-value(overall)	1.67 (0.048)	2.06 (0.020)	1.68 (0.047)	1.37 (.0857)	4.02 (0.000)

Note: The value in the brackets refers to p-values.

Robustness Analysis

Robustness check of the main result is done in three different ways: using alternative proxy for the level of political competition by constructing a similar index, using alternative measure of human capital accumulation, and subsample analysis. POLITY score from the Polity IV data is used to proxy the level of political competition. It is a combined score of AUTOC (a score that measure the level of autocracy) and DEMOC (it measures the level of democracy). It ranges from -10 (strongly autocratic) to +10 (strongly democratic). Due to the presence of square term in our political competition variable, we recode the POLITY score from 1 to 7 in ascending order. It is plausible that the level of democracy and political competition are highly correlated despite the fact that the two are distinct. The result of the regression output is reported in column (2) of table (7). The alternative index is $Polity_{i,t}$ in place of $PC_{i,t}$.

The other robustness check is by using alternative measure of human capital accumulation. Percentage of the population who completed tertiary education is adopted from Barro and Lee (2013) human capital database. The result for this robustness check is presented in column (3) of table (7) below.

Excluding the 1980, 2005, and 2010 is another robustness exercise undertaken. This one helps to detect if the result is driven by specific periods. In this robustness check, the main result holds. Column (1) of table (7) reports the result of this sub sample regression.

Table 7 Robusness Analysis

$HC_{i,t}$	(1)	(2)	(3)
$HC_{i,t-1}$	0.805*** (0.124)	0.886*** (0.015)	0.967*** (0.040)
$PC_{i,t}$	-0.156* (0.087)		-0.254** (0.127)
$PC^2_{i,t}$	0.014* (0.009)		0.033** (0.013)
$Polity_{i,t}$		-0.139*** (0.019)	
$Polity^2_{i,t}$		0.015*** (0.003)	
$Growth_{i,t}$	-0.007 (0.007)	-0.005** (0.002)	0.003 (0.024)
$r_{i,t}$	0.001 (0.002)	0.000 (0.000)	0.000 (0.004)
$Life\ Exp_{i,t}$	-0.007 (0.013)	0.026*** (0.002)	0.012 (0.031)
$Threat_{i,t}$	-0.082 (0.077)	-0.128*** (0.032)	-0.445 (0.312)
$Rent_{i,t}$	-0.059 (0.047)	-0.112*** (0.022)	-0.201 (0.181)
$Globalization_{i,t}$	0.005 (0.006)	-0.008*** (0.002)	-0.070** (0.035)
$AR(1)$	-0.44 (0.662)	-2.21 (0.027)	-3.17 (0.002)
$AR(2)$	-1.06 (0.288)	-1.55 (0.122)	-0.85 (0.398)
$Hansen\ test$	11.48 (0.488)	72.86 0.483	48.26 (0.269)
$Hansen\ in\ -\ difference\ test$		3.40 (0.493)	0.05 (1.000)

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country. Hansen test: test for validity of the set of instruments; Hansen in difference test: Test for validity of additional moment conditions. AR (1): test for the presence of 1st order autocorrelation of residuals; AR (2): test for the presence of 2nd order autocorrelation in residuals.

Column-1- excluding the year 1980, 1985 and 1990 from the study period

Column -2- using alternative proxy for the level of political competition

Column -3- using alternative measure of human capital accumulation

The presence of non-monotonicity for each robustness check is undertaken as it is done in the main analysis of the study. In all the robustness check done in this section, there is enough evidence for the Acemoglu and Robinson (2006) theory that there is U shape relationship between the level of political competition and democracy. The detailed test result is reported below on table (8).

Table 8-Test for non-monotonicity for (robustness analysis)

Basic Model	1	2	3
extreme point	5.441	4.649	3.8081
Slope at:			
Lower bound	-0.127 (0.035)	-0.109 (0.000)	-0.187 (0.032)
Upper bound	0.130 (0.067)	3.938 (0.000)	0.413 (0.002)
t-value(overall)	1.50 (0.067)	3.94 (0.000)	1.85 (0.032)

Note: The value in the brackets refers to p-values.

Further robustness check is also done, mainly sub-sample analysis. Six different sub-samples analysis are done. One of the sub-samples is obtained by excluding countries which democratize fully in the study period in the third wave of democratization. The idea is

following democratization, a surge in the level of political competition is likely to be observed. This brisk surge in political competition might not immediately translate to policy outcomes as the period is too short for that. The list of countries is taken from Papaioannou and Siourounis (2008). From the whole sample, the following countries democratize fully in the study period: Greece (which democratize fully in 1975), Portugal (1976), Dominican Rep. (1978), Spain (1978), Peru (1980), Bolivia (1982), Honduras (1982), Argentina (1983), Brazil (1985), Uruguay (1985), Philippines (1987), Republic of Korea (1988), Poland (1990), Chile (1990), Romania (1990), Hungary (1990), Bulgaria (1991), Mali (1992), Guyana (1992), Thailand (1992), Mongolia (1993), Panama (1994), South Africa (1994), Malawi (1994), El Salvador (1994), Ghana (1996), Mexico (1997) and Senegal (2000). The result for this sub-sample analysis is reported in table (9) column (1).

By the same reasoning, column (2) of table (9) excludes countries which were able to go partial democratization in the ‘third wave of democratization’. The following countries are excluded from the sample: Albania, Bangladesh, Guatemala, Haiti, Indonesia, Malawi, Mozambique, Nicaragua, Niger, Paraguay, United Republic of Tanzania, Turkey and Zambia. The result for this sample is presented in column (2) of table (9).

The next sample is obtained by excluding countries which seceded from former USSR and secession led to a new democratic independent states. The secession occurred within the study period. From the whole sample Armenia, Croatia, Czech Republic, Estonia, Kazakhstan, Latvia, Lithuania, Ukraine, Slovenia and Slovakia who managed to democratize immediately following independence. The transition to democracy happened within our study period swiftly following independence. That swift transition might most likely surge the level of political competition which in turn might not reflect the exact relationship of the variable this study is untangling. The regression output is reported in column (3) of table (9).

The last sub sample analysis of study is to check whether different income group countries behave differently or not. The income group classification is adopted from the World Bank. Three sub-sample studies are undertaken: excluding OECD countries from the sample (column (4) of table (9)), taking only high income countries (column (5) of table (9)), and taking only middle income and low income countries ((column (6) of table (9))). The main results with the presence of non-monotonicity hold for all these sub samples. It holds as well if the sample is only middle income countries. However, the result doesn’t hold if the sample is only members of OECD countries or only low income countries.

Table 9-more robustness exercise (sub-sample analysis)

$HC_{i,t}$	(1)	(2)	(3)	(4)	(5)	(6)
$HC_{i,t-1}$	0.887*** (0.074)	0.748*** (0.095)	0.744*** (0.121)	0.916*** (0.083)	0.854*** (0.066)	0.979*** (0.013)
$PC_{i,t}$	-0.234*** (0.063)	-0.230** (0.094)	-0.251** (0.105)	-0.201*** (0.066)	-0.286** (0.118)	-0.045*** (0.014)
$PC^2_{i,t}$	0.022*** (0.006)	0.020** (0.008)	0.023** (0.009)	0.018*** (0.006)	0.025** (0.010)	0.004*** (0.001)
$Growth_{i,t}$	-0.006 (0.013)	-0.005 (0.012)	-0.029 (0.019)	-0.008 (0.015)	0.021 (0.013)	0.003 (0.002)
$r_{i,t}$	0.000 (0.001)	0.002 (0.003)	-0.000 (0.003)	0.001 (0.001)	-0.020*** (0.008)	-0.000 (0.000)
$Life\ Exp_{i,t}$	0.014 (0.010)	0.031** (0.015)	0.033* (0.019)	0.012 (0.010)	-0.014 (0.015)	0.005*** (0.001)
$Threat_{i,t}$	0.003 (0.255)	0.217 (0.287)	0.371 (0.300)	0.110 (0.258)	-0.658* (0.388)	-0.284*** (0.044)
$Rent_{i,t}$	0.186** (0.089)	0.086 (0.143)	0.243** (0.113)	0.125* (0.064)	0.125 (0.115)	-0.069*** (0.025)
$Globalization_{i,t}$	-0.017 (0.019)	-0.040 (0.025)	-0.077*** (0.025)	-0.008 (0.017)	-0.017 (0.017)	-0.003 (0.002)
$AR(1)$	-2.27 (0.023)	-2.06 (0.040)	-3.19 (0.001)	-1.85 (0.064)	-2.00 (0.045)	-2.42 (0.015)
$AR(2)$	-1.24 (0.213)	-1.49 (0.137)	-0.98 (0.326)	-1.26 (0.207)	-1.36 (0.175)	-1.01 (0.314)
$Hansen\ test$	16.89 (0.597)	19.75 (0.410)	16.16 (0.647)	21.64 (0.303)	12.79 (0.849)	53.43 (0.972)
$Hansen\ in - difference\ test$	10.69 (0.382)	14.77 (0.140)	10.99 (0.358)	9.83 (0.455)	6.16 (0.801)	1.01 (0.985)

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and

autocorrelation consistent standard errors are clustered by country. Hansen test: test for validity of the set of instruments; Hansen in difference test: Test for validity of additional moment conditions. AR (1): test for the presence of 1st order autocorrelation of residuals; AR (2): test for the presence of 2nd order autocorrelation in residuals.

Column-1- excluding which democratize fully in the study period other than former members of USSR

Column -2- excluding which democratize partially in the study period other than former members of USSR

Column -3- excluding former USSR member countries

Column-4-excluding OECD countries (the sample becomes non OECD countries

Column-5- only high income countries based on World Bank classification (excluding low and middle income countries)

Column-6- only middle and low income countries based on World Bank classification (excluding high income countries)

Table 10- Non-monotonicity test (robustness check)

Basic Model	1	2	3	4	5	6
extreme point	5.194	5.768	5.556	5.474	5.795	6.137
Slope at:						
Lower bound	-0.188	-0.190	-0.205	-0.164	-0.236	-0.037
	(0.000)	(0.007)	(0.008)	(0.001)	(0.009)	(-3.388)
Upper bound	0.216	0.168	0.2008	0.166	0.207	0.028
	(0.000)	(0.008)	(0.008)	(0.001)	(0.005)	(0.026)
t-value(overall)	3.62	2.38	2.38	3.02	2.39	1.94
	(0.000)	(0.008)	(0.008)	(0.001)	(0.009)	(0.026)

Granger causality

The study also checked whether the direction of causality goes from political competition to human capital accumulation. It is done by testing two hypotheses. The first one tests the existence of homogenous non causal relationship between political competition and human capital accumulation. It is done by regressing the model with lagged political completion variable and then checking for their joint significance. If the null hypothesis or the joint significance of the lagged political completion variable is statistically significant, or in other words, the null hypothesis is rejected, political comptition Granger causes human capital accumulation. Table (11) column (1) presents this result. The result shows political competition Granger-causes human capital accumulation.

The second one tests whether the causality heterogeneous among countries or not. The test is done by first creating interaction terms with country dummy variable and lagged values of political competition and then test their joint significance. If null hypothesis rejected, it means the impact of political competition across countries is not homogenous. Table (11) column (2) presents the result of this hypothesis. The result shows impact of political competition across countries is not homogenous.

Table 11-political competition human capital accumulation Granger causality

$HC_{i,t}$	(1)	(2)
$Growth_{i,t}$	-0.002 (0.004)	-0.001 (0.004)
$r_{i,t}$	-0.001*** (0.000)	0.000 (0.004)
$Life\ Exp_{i,t}$	0.004*** (0.001)	0.002 (0.013)
$Threat_{i,t}$	-0.163*** (0.048)	-0.126 (0.113)
$Rent_{i,t}$	0.028* (0.017)	0.044 (0.047)
$Globalization_{i,t}$	-0.002 (0.006)	-0.004 (0.006)
$PC_{i,t-1}$ and $PC_{i,t-1}^2$	37.54 (0.000)	
$PC_{i,t-1}^1, \dots, PC_{i,t-1}^j, \dots, (PC_{i,t-1}^1)^2, \dots, (PC_{i,t-1}^j)^2$		410.62 (0.000)
$AR(1)$	-2.34 (0.019)	-0.43 (0.667)
$AR(2)$	-1.61 (0.108)	-0.89 (0.374)
$Hansen\ test$	89.61 (0.932)	53.31 (0.942)

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country. Hansen test: test for

validity of the set of instruments. AR (1): test for the presence of 1st order autocorrelation of residuals; AR (2): test for the presence of 2nd order autocorrelation in residuals. In model (1), the value refers to the χ^2 statistic with the corresponding significance level in bracket under the null hypothesis that the coefficients associated to $PC_{i,t-1}$ and $PC_{i,t-1}^2$ are not jointly statistically significant, for model (2), it is the same χ^2 statistic with the corresponding significance level in bracket under the null hypothesis that the coefficients associated to $PC_{i,t-1}^1, \dots, PC_{i,t-1}^j, \dots, (PC_{i,t-1}^1)^2, \dots, (PC_{i,t-1}^j)^2$ that are not jointly statistically significant.

3.5 Summary

This chapter examines how political competition impacts human capital accumulation over time. The interplay between economic institutions that impact labor market and hence human capital formation and political institution captured by the level of political competition is investigated for one hundred fourteen countries for the period 1980 to 2010. It uses the framework of institutions as the fundamental causes of economic development. More specifically, the political replacement effect hypothesis developed by Acemoglu and Robinson (2006) is tested empirically.

The hypothesis states that the implementation of institutional changes and policies that promote human capital formation depend on the political calculation of political elites' probability of staying on power. Political elites who are in charge of the state and faced high level of political competition more likely implements policies or institutional change that promote human capital formation. Similarly, well entrenched political elites whose replacement risk appears low are also likely to adopt or implement technologies or institutional arrangements that will enhance human capital accumulation. Whereas political elites who faced intermediate level of political competition more likely engaged in blocking the institutional changes and policies that promote human capital formation. In the intermediate level where the elites are neither well entrenched nor highly democratic, the risk of replacement is high that institutional changes or technology are more likely to be blocked.

System GMM estimator, which address the key econometric issues in estimating the impact of political competition on human capital formation (high persistence and problem of endogeneity) with small time dimension (seven time periods) and large sample size (one hundred and fourteen countries). There is evidence to support non-monotonic relationship of the Acemoglu and Robinson (2006) hypothesis. There is a U-shaped relationship between the

level of political competition and human capital accumulation level. The result is robust to different estimation techniques: pooled OLS, within group estimator, Least Square Dummy Variable Estimator and difference generalized method of moments. The study finds this result robust to different samples, specific period of the study, with and without control variables, and alternative measure of the level of political competition. The study also finds that political competition Granger-causes human capital accumulation, and that causality from political competition to human capital accumulation across countries is not homogenous.

Chapter Four

Political Competition and Financial Development

4.1 Introduction

There is a strong consensus in the finance literature which studies on the link between financial development and economic growth that financial institutions positively influence economic growth and development. A well developed financial institution channel savings into productive investments. A detailed review of the link between finance and economic growth and development can be found in Levine (2003), Levine (2005), Demirgüç-Kunt & Levine (2008), and Barajas, Chemi and Yousefi (2013). Why then some countries remain financially underdeveloped or fail to develop their financial system?

The existing literature which tries to untangle this question could be broadly categorized into two: those which take predetermined institutional features as the main factors and those who look it from political economy perspective. The former literature traces the origin of legal system to explain differences in financial development across countries (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1997, 1998; LaPorta, Lopez-de-Silanes, and Shleifer, 2008; Beck, Demirgüç-Kunt, and Levine, 2001; Beck *et al*, 2003). They argued the impact of the origin of legal system on financial development goes via differences in the security of property rights, quality of enforcement of private contracts and hence investor protection among the different class of legal systems. They also provide empirical evidence that common law (English) performs better than civil law (German, Scandinavian and French) in investor protection. The rank of the legal systems is that English (common law) outperforming others and German and Scandinavian in the middle and at the bottom the French civil law tradition.

Despite the fact that this strand of literature successfully explains cross country variations, it is, however, challenged by the fact that it overlooked the change in financial development over time. Braun and Raddatz (2005) showed the movement of countries ladder of deciles in financial development, using different proxies, varied especially in the recent past despite the inheriting deemed bad legal institutions by the legal origin literature. Different measures of financial development showed variation in growth of financial development over time including reversal. Rajan and Zinglaes(2003) showed French civil law countries had a higher

level of financial development than the English common law counter parts. They further observed reversal in the level of financial development.

The political economy literature, on the other hand, attempts to explain the heterogeneity in financial development from the distributional implication of the financial institutions. Pagano and Volpin (2001) showed how politics (the balance of power between economic and social constituencies) affect financial regulation and reform and thereby financial development. Rajan and Zingales (2003) stressed the role of interest groups in determining financial development. They argued the incumbent industrial firms would oppose financial development if not reversal as it could bring competitors to them and eventually they could lose their preferential position. They further argue that the optimal level of financial development is determined by the relative strength of beneficiaries of financial reform (new entrants) and losers of financial reform (incumbent industrial elites).

Attempts have been done as well to explain the impact of democracy on financial development by extending the interest group theory of Rajan and Zingales(2003). The line of argument in this view is that narrow elites controlled governments opt for financial underdevelopment, as the benefits of financial repression could outweigh the losses mainly because financial reform may erode elites' economic privileges through competition and eventually the erosion of their political power.

Among the very few studies that study regime characteristics on financial development, Girma and Shorthand (2008) tested the link between different regime characteristics and financial development. They found more stable democracies tend to thrive in financial development and the reverse for autocratic countries. Furthermore, transition to democracy and regime stability impacts financial development positively. They also provide evidence that in autocratic governments, either the stock market fails or missing. However, Haber, Razo and Maurer (2003) showed how the autocratic government of Porfirio Díaz in Mexico was able to grow both the economy and the financial sector mainly the banking sector at a faster rate by crafting different arrangements with industrial elites and bankers. There are also other countries (Singapore, Saudi Arabia, China etc.) which have a thriving financial sector despite the fact that they are run by autocratic leaders.

How democracy impacts financial development? The literature stresses the channel through which democracy impacts financial development is the necessity of checks and balance in the

government to avoid expropriation by the government. But, as pointed out by Keefer (2007 p8) “expropriation risk was the same or higher in 35 percent of countries exhibiting competitive elections than in 60 percent of the countries that did not”.

How about when the government is run by elites who are well entrenched, stable and autocratic? In this study, we argue political elites who are in charge of the government calculate their benefit and probability of staying on power to reform and implement policies that foster financial development. Instead of including democracy and autocracy score in the model as independent variables, modeling the interplay between the level of political competition and financial development could have given a precise picture.

The hypothesis this chapter is going to is that political leaders choose the level of financial development which in turn depends on their political calculation of staying on power (political replacement effect). In countries where the level of political competition is medium, fear of losing power, pushes the political elite not to go for financial reform or in the worst case to for financial repression. The political replacement effect gives an incentive for the incumbents to maintain the status quo. On the other hand in countries where the political elites are well entrenched and the level of political competition is low, it is upon the interest of the political elites to adopt policies favorable to financial development so that they themselves can harness its beneficial effect on the economy. In a similar fashion in countries where there is high level of political competition, the more the government becomes accountable to the public, the more difficult to the government to peruse policies which favor minor political elite. Therefore this study expects non-monotonic relationship between the level of political competition and financial development.

The study employed Acemoglu and Robinson (2006) framework that political elites to introduce new institutional change, they calculate the probability of staying on power after introducing the change. If the implementation of institutional change is conditioned on political elites’ calculus of political replacement effect, using autocracy and democracy score in the regression will not capture the true interplay. It is because well entrenched democracies behave the same way as well established democracies in introducing change based on the political replacement effect calculus.

This research will contribute to the literature with its unique perspective of viewing financial development from the political competition aspect. Furthermore, it will be an addition to the

only very few researches that attempted to explore directly the link between political structure and financial development.

The organization of the paper is as follows: section two briefly reviews literature on the legal origin of financial development and political economy of financial development, section three describes in detail the data and methodologies employed for the study, section four discusses and present the result, and finally section five concludes.

4.2 A Brief Overview of Related Literature

The literature on the sources of financial development could be broadly categorized into two: the origin of legal system and the political economy. The origin of legal system uses the predetermined legal system to explain differences in financial development across countries (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998 ; La Porta *et al* 1998; LaPorta, Lopez-de-Silanes, and Shleifer, 2008; Beck, Demirgüç-Kunt, and Levine, 2001; Beck *et al*, 2003). The channel go through in such a way, differences in legal system (traditions) result in differences in the security of property rights, quality of enforcement of private contracts and hence investor protection.

Those countries who were able to form or adopt a legal system with better protection of property rights and enforcement of private contracts achieve higher level of financial development. In fact, European legal traditions spread all over the world through conquest, imposition and adaptation. The argument is there is a legal tradition initially designed to favour the state over the private investor and it perpetuates and there is a legal tradition initially designed to buffer private property from state expropriation. When there is a government who expropriates, depositors will not be able to save their money in the bank which is subjected to expropriation, even bankers wouldn't feel comfortable in channeling fund to investors whom might make arrangement with the government and go away with the money, will eventually end up with a repressed financial sector.

The risk of government expropriation varies across the different legal traditions. Common law (English) performs better than civil law (German, Scandinavian and French) in investor protection. English common law tradition has a judicial buffer against expropriation risk by the state. However within civil law tradition, while the German and Scandinavian legal tradition countries performs better than French tradition as the former are more adaptable to changes compared to the later. The main theme of this theory is that in countries where the legal system enforce private property rights, protect the legal right of investors, savers are more willing to finance investors and hence a developed financial market.(Beck, Demirgüç-Kunt, and Levine, 2001; Beck *et al*, 2003)

The literature also explains the channels through which legal systems impacts financial outcome. LaPorta *et al*. (1997, 1998) argued the common law system come into effect to protect investors from the crown when it was designed. Civil law, on the other hand, puts the state above the judiciary. This channel is called 'political structure' by the law and finance

literature as the difference lies on the relative importance given by the law to the state versus private investors. The other channel is called adoptability of the law to changing environment. Beck *et al.* (2001) argued common law systems are very quick to respond to the dynamics of finance and economy to the contrary to the civil law legal tradition. The former legal tradition gives discretion to the judge as opposed to in the French civil law. The more the legal system buffers itself from reform, makes the legal system static that private investors protection will stay lower with the dynamic financial innovation and hence lower financial development (Beck, Demirgüç-Kunt, and Levine (2003) Beck and Levine (2005)).

Despite the fact that there is a strong agreement in the literature that effective protection of investors facilitate financial development, and the legal origin literature scored success in explaining cross country variation, many studies question the focal argument that the time invariant origin of legal system as the main determinant of investors' protection and financial development. It is, however, challenged by the fact that it overlooked the change in financial development over time. Braun and Raddatz (2005) showed the movement of rank of countries deciles in financial development, using different proxies of financial development, varied especially in the recent past despite the fact that countries inherited bad legal institutions as deemed by the finance and law literature. Different measures of financial development showed variation in growth of financial development over time including reversal. As Rajan and Zingales (2003) showed some civil law countries (Argentinian, France, Germany and Russia) were better financially developed than other countries in the early 20th century but later reversal happen to these countries.

The assumption that countries in the same legal tradition would have the same application of the law is also one of the flaws of this literature. It ignored government capability or state capacity in the line of argument.

In addition to this, this strand of literature fails to explain the within same legal system variation of financial development over time. Stulz and Williamson (2003) tried to explain this within variation by using yet another deep institutional feature such as culture and religion. They found Catholic and Islam not pro-finance where as to the contrary holds for protestant religion. The legal origin literature further doesn't take into account the political systems within which the legal system operates. Among other things, government ownership of banks and controlling interest rate, control and restriction on the flow of finance, and regulation of financial institutions which are considered to impact financial development

negatively cannot be seen separately by themselves sidelining political decisions. Quinn (2000) provided empirical evidence that show there is clear link between financial liberalization and regime characteristics. He showed financial reform is impacted by regime characteristics.

The political economy literature of financial development traces the main source of heterogeneity of financial development from the distributional implication that financial institutions would bring. Due to this distributional implication, financial development will have both opponents (incumbent industrial elite tend to lose from financial development as it brings in new competitors by making access to finance easy who have innovative idea)and promoters. The group interest theory of financial development by (Rajan and Zingales, 2003) has put forward another argument in which the optimal level of financial development is going to be determined by the relative strength of opponents and backers of financial development. When there is a well functioning financial market, it attracts savings and channels them into productive investments. It will enhance competition in a sector which needs external finance to start up with innovative idea, Rajan and Zingales (2003) identified the industrial sector. It is the interest of incumbent firms to lobby the political elite to block/reverse financial reform as the pie of their rent is under threat from the new entrant.

In the same political economy context, there is endowment view that emphasizes initial endowments of land, climate and the disease environment for current institutions (it includes financial institutions). These initial conditions when they appear to be favorable influenced colonialists to settle and establish institutions favorable for long-term development. On the other hand, in the case of unfavorable conditions, they set up institutions to extract resources without being settled there in case of unfavorable ones. Acemoglu, Johnson and Robinson (2001) provides evidence to this view that European colonizers install extractive institutions in countries where they faced higher rates of mortality, while in favorable environments where they face lower level of mortality, they settled and set up institutions friendly to long run economic growth and development. Beck, Demirguc-Kunt, and Levine (2003) applied the settler mortality hypothesis used by Acemoglu, Johnson and Robinson (2001) to financial development. They found empirical support that endowment does influence current financial institutions. Initial institutions persist as it gives advantage to benefiter within the political process and can be used to explain current cross country disparities. Easterly and Levine (2003) also provide empirical support for the view that endowments influence today

institutions including financial ones. The line of argument here is initial endowment influence institutions and these institutions predict today's economic outcomes.

Girma and Shorthand (2008) studied the between different regime characteristics and financial development. They found more stable democracies tend to thrive in financial development and the reverse for autocratic countries. Furthermore, transition to democracy and regime stability impacts financial development positively. They also provide evidence that in autocratic governments, either the market fails or missing. One thing that is far from clear in their analysis is the characteristics of regime stability variable included in the regression. Does it exclusively reflect autocracy or democracy, or both?

In this study, we employed Acemoglu and Robinson (2006) framework that political elites to introduce new institutional change, they calculate the probability of staying on power after introducing the change. This probability of staying on power doesn't necessarily be captured by introducing autocracy and democracy score in the regression if well entrenched democracies behave the same way as well established democracies in introducing change based on the political replacement effect calculus.

4.3 Data and Methodology

4.3.1 Data

The data we used are taken from different sources: the data base by Beck, Demirgüç-Kunt, and Levine (2000), POLITY IV (Marshall, Jaggers and Gur, 2013), the World Bank WDI (world development indicators), Chinn and Ito (2006) capital openness, Čihák, Demirgüç-Kunt, Feyen, and Levine (2012) (Global Financial Development Database (GFDD)) IMF (International financial statistics) and Laporta *et al.* (2008). The detail of the data used is explained in Appendix 1.

They analysis is based upon annual series and the five years frequency after taking moving average over five years so as to remove business cycle fluctuation which is particularly true for economic and financial data. For many countries, the stock market data is available starting from late 80s or beginning of 90s so that we are forced to use annual serious from 1991 to 2013 for the analysis. But since banking sector data is available for many countries starting from 70s, we used averaged data over five years from 1970 to 2005.

Measures of Financial Development

Two proxies to measure financial development are used for the study. The ratio of private credit from deposit money banks to the private sector to overall GDP (private sector credit/GDP) to measure the development of the banking sector. The other proxy used to measure the level of financial development in the equity market is the total value of stock traded both as a percentage of GDP are used to measure the development of the arms length finance. Both proxies used are ratios to the total GDP.

PCBDM: the ratio of private credit from deposit money banks to the private sector to overall GDP (private sector credit/GDP). It is the amount of fund channeled to the private sector via the banking sector. It doesn't include credits channeled to government, government agencies and state owned enterprises which are controlled by the political elite and more likely subjected to favor. Credit issued by the central bank is not part of it. Yet private firms involved in PCGDP could be favored in the credit allocation though they are owned by individuals. Despite is caveats it is a preferred measure of financial intermediation to the private sector in the finance literature. Therefore higher level of credit access and availability to the private sector is associated with higher level of this measure of financial development.

We used this proxy of financial development from the financial development and structure dataset by Beck, Demirgüç-Kunt, and Levine (2000).

Stock market capitalization/GDP (SMKC): it measures size of equity. The larger the stock market capitalization the more funds are available to be channeled to the productive investment. In arms length finance, once firms are listed in the market, government cannot control the quantity of the funds available nor the way it uses the fund. In this proxy, however, we cannot distinguish whether the stock market is dominated by state owned firms or oligarchies or small investors.

Total value of stocks traded/GDP (SMTV): total stock value traded as a percentage of GDP. It measures stock market liquidity as a percentage of GDP. The higher the value of the stock market traded, it is expected that turn of stock market is higher and thereby as well more participants in the market. Confidence in the financial institution could be higher when it protects investor's right and transparent and it could translate to very strong participation of small investors. Data availability for both stock market capitalization and total value of stock traded is very limited. For most of the countries used in the analysis, data is available either in the late 80s or the beginning of 90s. We opted to use Global Financial Development Database (GFDD) by Čihák *et al.* (2012) for the two proxies because the data is available for a relatively longer time period for many countries.

Political competition (polcomp): the variable we use to measure political competition is obtained from the POLITY IV database (Marshall, Monty, Jaggers & Gurr, 2013). It has a composite index from two dimensions of political competition: the first one measure how free is the political participation is free from the government control and the other measures how political participation is institutionalized. The resulting composite index ranges between 1 and 10 with 1 representing 'suppressed' (lowest degree of political competition) and 10 'institutionalized electoral' (highest degree of political competition).

Control Variables

Lagged GDP growth (lgdpg): the level and sophistication of financial institutions is highly determined by structural conditions that limit demand of financial development affects. Economies at the early stage of industrialization do not necessarily need well developed financial institutions as the forces of demand and supply in the market have their role (Becerra, Cavallo and Scartascini, 2012). The effect of increase in demand for financial development can be captured by adding lagged GDP in our regression equation.

Trade openness (openness): trade openness is expected to increase the level of financial development as it makes capital free to move across boundaries as suggested by Rajan and Zingales(2003). The sum of total export and import as a percentage of GDP in the literature is used to proxy trade openness.

Financial openness (kaopen): It is an index by Chinn and Ito (2006) constructed to measure financial openness. it is calculated by using principal component of four binary dummy variables that codify restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions. We used Chinn-Ito index from Chinn and Ito (2006).

Banking crisis (bcrisis): occurrences of banking crisis might contribute to the loss of public trust on financial institutions and hence a reversal or discontinuity on financial development. We, therefore, controlled the presence of banking crisis using a lagged dummy from GFDD dataset. For the five years period regression, we constructed a dummy with 1 in which a county experiences crisis at least one crisis in the five years period and zero otherwise.

Legal origin: the origin of country's legal system from LaPorta, Lopez-de-Silanes, and Shleifer (2008). A dummy variable for the four categories of the origin of country's legal system: French legal origin (legor_fr), German legal origin(legor_ge), Scandinavian legal origin(legor_sc) and common law origin(legor_uk). This control variable is introduced to check the law and finance literature claim. One of the criticism on the law and finance literature taking origin of legal origin as the determinant of financial development is that legal origins does not reflect the quality of the rules and enforcement by themselves but some other factors that influence financial development.

International capital mobility: changes in international capital mobility affect the level of financial development but it affects all countries at the same time. In this analysis factors that affect all countries simultaneously like international capital mobility are expected to be captured in the years dummy as suggested by Girma and Shorthand (2008). Some other factors that are left to be controlled and appear to be time invariant country specific are going to be captured by the country specific dummy.

This analysis doesn't control for institutional quality indicator for government effectiveness and bureaucratic quality as it is partly reflected in the political competition indicator used in the analysis. Based on Acemoglu and Robinson (2006) hypothesis that the study opt not to

include government effectiveness and bureaucratic indicator as it also follows the non-monotonic relationship with political competition which is part of the regression equation.

4.3.2 Empirical Specification

The study estimates a panel data model with time and fixed effect by including second degree polynomial equation of political competition so as to capture whether there exists non-monotonic relationship or not.

$$FD_{i,t} = \alpha FD_{i,t-1} + \sum_{m=1}^M \rho_m PC_{i,t}^m + \sum_{j=1}^J \beta_j X_{ji,t} + \mu_i + \mu_t + u_{i,t} \dots \dots \dots (1)$$

Where $FD_{i,t}$ is the dependent variable financial development indicators. To measure financial development in the banking sector, the ratio of private credit from deposit money banks to the private sector to overall GDP (pcbdm) is used. Similarly, total stock market traded as a percentage of GDP (smtv) is used to proxy the level of financial development in the equity market. Hence $FD_{i,t}$ represents:

1. the ratio of private credit from deposit money banks to the private sector to overall GDP (pcbdm)
2. total stock market traded as a percentage of GDP (smtv)

$PC_{i,t}$ is the explanatory variable of interest, political competition(polcomp), $X_{ji,t}$ includes a vector of control variables such as lagged GDP growth(lgdpg), trade openness (openness), lagged bank crisis(lbcrisis), financial openness (keopen), μ_i is an unobserved time-invariant country-fixed effect which is intended to capture the effect of all omitted variables. μ_t is the time fixed effect that capture shocks and trends for all countries. $u_{i,t}$ is the transitory disturbance term which captures all others omitted factors with $E[u_{i,t} | FD_{i,t-1}, X_{i,t}, PC_{i,t}^m, \mu_i, \mu_t] = 0$ for all i and t . The estimation technique and with the corresponding estimation issues are presented below.

4.3.3 Estimation Issues

Estimating equation (1) by pooled OLS (henceforth denoted POLS) is likely to inconsistent estimates as a result of the presence of lagged dependent variable $FD_{i,t-1}$. This is because the lagged dependent variable $FD_{i,t-1}$ and country fixed effect μ_i are necessarily correlated. Using pooled OLS regression for our model has the following limitations: (a) it assumes by construction that political competition and other control variables used in the regression as exogenous determinants of financial development, (b) it doesn't control for time invariant factors which are specific to countries, and (c) it doesn't allow for dynamic adjustments for financial development.

An alternative method is to estimate to this equation by within group estimator (hereafter WG), removing the fixed effect by taking first differences which will also give inconsistent estimate because the dependent variable $FD_{i,t-1}$ is correlated with $u_{i,t}$ which will induce a downward biased estimate for α despite the fact that with low α or large enough T reduces the severity of the bias (Nickell 1981). Here also the estimator assumes by construction that political competition and other control variables used in the regression as exogenous determinants of financial development.

This bias can be corrected by LSDV dynamic panel data estimator as suggested by Kiviet (1995). This method is calculates the exact bias and proposes a method to remove the bias. But yet the assumption of exogeneity of the political competition and other control variables is still not solved.

Alternative approach to estimate equation (1) is to use generalized method of moments (GMM). This estimation technique is can be done in two way with each method have their corresponding merits and caveats. One can be done by differencing equation (1) with respect to time. The country fixed effect term doesn't appear here because it vanishes with time differencing.

$$\Delta FD_{i,t} = \gamma \Delta FD_{i,t-1} + \sum_{j=1}^j \beta_j \Delta X_{ji,t} + \sum_{m=1}^m \rho_m \Delta PC_{i,t}^m + \Delta \mu_t + \Delta u_{i,t} \dots\dots\dots$$

....(2)

The GMM estimator solves the bias resulting from lagged dependent variable and fixed effects, the estimate is still biased if political competition is correlated with other changes

that affects the level of financial development. Arellano and Bond (1991) developed a Difference Generalized Method of Moments (henceforth denoted DIF-GMM) estimator that uses lagged level of independent variable as instruments for differenced variables which are not strictly exogenous. This estimator may also suffer from weak instruments if the variables are close to a random walk. The presence of weak instruments underestimates the degree of autocorrelation in the dependent variable. In the presence of highly persistence variable makes this method not preferable over the other which is explained below. However, it corrects the bias that comes as a result of non-strict exogenous independent variables and it uses lagged level of the independent variable as an instrument to solve the problem of endogeneity.

Blundell and Bond (1998) developed another estimator system GMM (henceforth denoted SYS-GMM), compared to DIF-GMM, it uses lagged differences as instruments assuming they are uncorrelated with fixed effects despite the fact that it is very difficult to validate with a priori theoretical arguments. Another problem with DIF-GMM and particularly to SYS-GMM estimators is the as Roodman (2009) pointed out instrument proliferation which in turn generate low values of Hansen tests of instruments exogeneity.

There are still concerns for applying the GMM estimator for our model. Since the time horizon we are dealing with is too short for the influence of initial condition to disappear soon for the level of financial development indicator. Suffice it is to say the lagged difference in financial development could be correlated with country fixed effects. That is using lagged levels for differenced variables as an instrument ends up being weak instrument. In order to solve this problem, Blundell and Bond (1998) suggested the use of an approach that combines the use of both level and difference equations as an instrument.

Given all these limitations of GMM estimators we also use an alternative estimation method bias corrected LSDV dynamic panel data estimator as suggested by Kiviet (1995). This method calculates the exact bias and proposes a method to remove the bias. We report and compare the results obtained from all the estimators discussed above.

4.3.4 Hypothesis Test for non-monotonicity

The main interest of the study is to test whether there exists non-monotonic relationship in particular U-shaped relationship between the level of financial development and the degree of political competition. Many empirical works that tried to test the presence of U shaped relationship by simply taking the significance of a quadratic term in the regression with the expected sign (positive in the case of U-shaped relationship) and then check the estimated extreme point is within the data range. This is the way done in many empirical studies:

After setting $m = 2$ in the degree of political competition polynomial $\sum_{m=1}^m \rho_m \Delta PC_{i,t}^m$.

$$H_0 : \rho_1 < 0 \text{ and } \rho_2 > 0$$

Vs.

$$H_1 : \rho_1 \leq 0 \text{ and/or } \rho_2 \geq 0 \dots\dots\dots(3)$$

Then they conclude the relationship is non-monotonic if they fail to reject H_0 . This way of testing appears weak and misleading the true relationship is convex and monotonic (Lind and Mehlum, 2010).

Therefore, a proper test of non-monotonic relationship has to be undertaken. Lind and Mehlum (2010) developed the test to be done in the following way as described below.

They suggest the appropriate test for the presence of U shaped relationship is to test the combined null hypothesis H_0 against H_1 as follows:

$$H_0 : \rho_1 + 2\rho_2 PC_{\min} \geq 0 \text{ and/or } \rho_1 + 2\rho_2 PC_{\max} \leq 0$$

Vs.

$$H_1 : \rho_1 + 2\rho_2 PC_{\min} < 0 \text{ and } \rho_1 + 2\rho_2 PC_{\max} > 0 \dots\dots\dots(4)$$

Where PC_{\min} and PC_{\max} are the minimum and maximum level of political competition observed in the data range respectively. The idea behind this test is assuming that there exists only one extreme point, a relationship is U shaped when the slope of the curve is negative at the start and positive at the end of observed range of the dataset $[PC_{\min}, PC_{\max}]$. Failing to reject the H_0 null hypothesis means there is no enough evidence for the non-monotonic U-shaped relationship. Whereas rejecting the null hypothesis H_0 means there is enough

evidence for the existence of a non-monotonic relationship between the degree of political competition and the level of financial development. As described in the introductory part of this chapter, it is hypothesized that in countries where the political elites are well entrenched and the level of political competition is low and in countries where there is established democracy whereby the level of political competition is high, it is incumbent upon the interest of the political elites to adopt policies favorable to financial development. On the other hand, non-entrenched autocrats and intermediate democracies where the level of political competition is intermediate due to political replacement, no institution change or technology is adopted. In the end, it is therefore expected that the relationship between the levels of financial development in the estimated equation (1) to be non-monotonic. Higher or lower level of political competition are expected to be associated with higher level of financial development and intermediate level of political competition to be associated with lower level of financial development.

4.4 Result and Discussion

Table-12- below presents the summary statistics of the variables used for the analysis. The mean, standard deviation (overall, within and between the panels), minimum and maximum are presented. The data used for the banking sector is the five years frequency from 1970 to 2005 after taking moving average over five years so as to remove business cycle fluctuation which is particularly true for economic and financial data.

Table -13- below presents the correlation matrix of the variables used in the analysis. As can be seen in the table, most of the regressors are strongly correlated with human capital accumulation variable. Furthermore the signs of the correlations are consistent with the Acemoglu and Robinson (2006) theoretical hypothesis. The other control variables included from the literature appear to have the same expected sign in the correlation matrix as well.

Table 12-Summary statistics for the banking sector

Variable	Mean	Min	Max	Std. Dev. (overall)	Std. Dev. (within)	Std. Dev. (between)
			219.8	34.04		28.53
pcbdm	33.996	0.337	4		18.40	
polcom	5.342	1	10	3.60	2.14	2.92
polcom2	41.55	1	100	39.53	21.79	33.08
			436.5	48.62		
trade_ma	73.38	0.56	7		20.31	42.22
gdpg_ma	3.97	-21.66	56.84	4.51	3.93	2.52
crisisn	0.14	0	1	0.35	0.32	0.14
ka_open	0.42	0	1	0.34	0.20	0.28
legor_fr	0.57	0	1	0.49	0	0.49
legor_ge	0.09	0	1	0.28	0	0.31
legor_sc	0.02	0	1	0.16	0	0.15
legor_uk	0.30	0	1	0.46	0	0.45

Table 13-pair-wise correlations on financial development (banking sector)

	pcbdm	polcomp	polcomp2	openness	lgdpg	lcrisis	ka_open
pcbdm	1						
polcomp	0.3532***	1					
polcomp2	0.4109***	0.9816***	1				
trade	0.2296***	-0.0427	-0.0430	1			
lgdpg	- 0.0261	-0.1291***	-0.1136***	0.1654***	1		
lcrisis	-0.1316***	0.1293***	0.0947	-0.0642	-0.1729***	1	
ka_open	0.4986***	0.3017***	0.3400***	0.2584***	0.0188	-0.0033	1

GMM estimation technique is the preferred method for estimating dynamic panel data models with possible endogenous variables within the model like the one used in this analysis. The Difference Generalized Method of Moments (DIF-GMM) uses lagged levels as instruments for differenced variables which are not strictly exogenous (Arellano and Bond, 1991). But political institution measures is highly persistent that applying lagged levels as instruments could result in weak instruments. To overcome this problem, Blundell and Bond (1998) developed System Generalized Method of Moments (SYS-GMM), in which it is possible to use the combination level instruments in the difference equation and difference instruments in the level equation. Another advantage of using this method for our analysis is that it has the advantage of using time invariant variables, in our case origin of legal system(dummy variable), which cannot be identified in the difference GMM. Two specification tests are required to check the validity of the estimation. Hansen J (test of over identification) test is used to check on the validity of instruments. AR test till order three is checked to check absence of serially correlated error. There will be AR of order one present by construction. But when there is serial correlation of higher order, to solve the threat on the validity of instruments, deeper lags are used in the instrument and the corresponding AR test is checked. If there the errors are serially correlated of order two, AR(2) test will be statistically significant, and lagged differences or levels of order two are not any more valid instrument. In this study we checked the AR test for different orders and rule out lags as instrument if their corresponding AR test appears significant. For instance, if AR(2) appears significant, we check whether AR (3) or more, and if it is insignificant, we use lag of three or more for the instrument.

Table(14) presents regression result of the model without controlling for legal origin for the five estimation techniques. In all the estimators, heteroskedasticity and autocorrelation consistent standard errors are clustered by country. As expected POLS estimator biases upward the coefficient of autoregressive variable where as the WG estimator biases it downward. The KWG estimator corrects the bias is used to detect the upper and lower limit of the lagged variable coefficient in applying GMM estimator. The lagged variable coefficient variable for SYS-GMM lies within the two limits and very close to KWG estimator and is statistically significant. As expected the lag coefficient appears outside the POLS and WG range. The coefficients for the level of political competition and its square term are also significant showing the expected sign in POLS, WG, KWG, DIFF-GMM and SYS-GMM estimators.

Regarding control variables, lagged GDP growth has positive effect on the banking sector as expected. It is also statistically significant at 1% by KWG estimator, 5% by POLS and SYS-GMM estimators and at 10% for WG estimator. Trade openness variable appears to be insignificant in all estimators. Financial openness has the expected positive effect on the banking sector with high statistical significant in all estimators but SYS-GMM. Banking crisis has the expected negative effect on the banking sector with a high level of statistical significance.

For SYS-GMM estimator, Arellano-Bond test for AR (1) test is statistically significant which is expected, errors are serially correlated of order one by construction. But Arellano-Bond test AR (2) test shows statistical significance which means there is second order serial autocorrelation. Hence, second lag of endogenous variables cannot be used as a valid instrument. So lag of three or more has to be used to have a valid instrument and the AR(3) test and of order more tests have to be not statistically significant. Since in this estimation both AR(1) and AR(2) are statistically significant, we start the lag limit from three to rule out endogenous instruments. Both the Hansen test of over identifying restriction and exogeneity of instruments are not statistically significant.

Test for non-monotonicity is also done for each estimator according to the procedures described above in the estimation issues section. Table (15) below shows the detailed output of the test of non-monotonicity of U-shaped relationship. The test result shows there is U-shaped relationship between political competition and financial development in all five the estimators used. The test result is reported the corresponding t-value and p-value at the lower bound, upper bound and overall and the resulting extreme point for each estimator. Strong evidence for U-shaped relationship is presented by each estimation technique at both the upper boundary and the lower boundary.

Table 14-regression result for banking sector

pcbdm	POLS	WG	KWG	DIFF-GMM	SYS-GMM
lpcbdm	0.963*** (0.029)	0.687*** (0.067)	0.942*** (0.031)	0.608** (0.256)	0.955*** (0.066)
polcomp	-1.352* (0.799)	-2.749*** (1.031)	-2.051* (1.049)	-7.165** (3.300)	-6.55** (3.302)
polcomp2	0.152** (0.073)	0.219** (0.102)	0.177* (0.094)	0.592** (0.279)	0.6** (0.275)
L.gdp	0.392** (0.183)	0.314* (0.164)	0.411*** (0.156)	0.622 (0.508)	1.24 (0.852)
openness	0.001 (0.010)	0.054 (0.035)	0.020 (0.032)	-0.140** (0.0589)	-0.034 (0.032)
L.crisis	-5.649*** (1.544)	-5.921*** (1.823)	-5.949*** (1.495)	3.947 (3.011)	1.950 (4.403)
ka_open	7.740*** (1.993)	8.711*** (2.240)	8.026*** (2.937)	16.94** (8.510)	5.738 (4.758)
constant	-2.071 (2.003)	5.859 (3.643)			
Hansen test				50.62 (0.370)	23.82 (0.203)
Test for AR(1)				-1.34 (0.180)	-2.21 (0.027)
Test for AR(2)				-2.87 (0.004)	-2.92 (0.003)
Test for AR(3)				0.60 (0.548)	0.87 (0.385)
Hansen in-diff test					3.84 (0.698)
R2	0.88	0.852			
Number of observations	642	642	642	501	642

Note: robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The sample includes one hundred thirty nine countries. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country.

Table 15- Test for non-monotonicity political competition and financial development (banking)

Basic Model	POLS	WG	KWG	DIF-GMM	SYS- GMM
extreme point	4.46	6.28	5.80	6.05	5.45
Slope at:					
Lower bound	-1.04 (.056)	-2.31 (.003)	-1.69 (.025)	-5.98 (.01)	-5.35 (.020)
Upper bound	1.68 (.007)	1.62 (.065)	1.48 (.049)	4.66 (0.04)	5.45 (.007)
t-value(overall)	1.60 (.056)	1.52 (.06)	1.65 (.04)	1.69 (.04)	1.94 (.02)

Note: the values in the bracket are p-values

Political leaders choose the level of financial development which in turn depends on their political calculation of staying on power (political replacement effect). In countries where the level of political competition is medium, fear of losing power, pushes the political elite not to go for financial reform or in the worst case to for financial repression. On the other hand in countries where the political elites are well entrenched and the level of political competition is low, it is upon the interest of the political elites to adopt policies favorable to financial development so that they themselves can harness its beneficial effect on the economy. In a similar fashion in countries where there is high level of political competition, the more the government becomes accountable to the public, the more difficult to the government to peruse policies which favor minor political elite. Table (14) above shows the test outcome for all the regression models used. As shown below in all models used the null hypothesis is rejected, hence there is enough evidence to support the existence of non-monotonic relationship between the degree of political competition and financial development (banking sector).

The same model is run by adding more control variables such human capital and inflation. The human capital variable is measured by the average years of schooling (yrs_sch) from Barro and Lee(2013) human capital database and inflation data is obtained from World Bank world development indicators. The main result here remains unchanged. The non-monotonic relationship remains hold with the additional control variables. Table(16) below presents the regression output.

Table 16-regression result by adding more control variables

pcbdm	POLS	WG	KWG	DIFF-GMM	SYS-GMM
lpcbdm	0.953*** (0.025)	0.690*** (0.067)	0.942*** (0.028)	0.404 (0.646)	0.880*** (0.192)
polcomp	-1.673** (0.759)	-3.013*** (1.117)	-2.320** (1.177)	-10.818 (25.156)	-12.733** (6.196)
polcomp2	0.164** (0.067)	0.236** (0.107)	0.194* (0.106)	0.445 (1.777)	1.077** (0.536)
opennes	0.003 (0.009)	0.074* (0.038)	0.023 (0.042)	-0.185 (0.501)	0.001 (0.096)
lgdpg	0.637*** (0.202)	0.434* (0.226)	0.543*** (0.201)	1.348 (1.608)	1.000 (1.210)
crisisn	-10.759*** (2.606)	-9.698*** (2.766)	-10.101*** (2.038)	-12.854 (37.612)	-10.660 (15.051)
ka_open	6.147*** (2.007)	8.586*** (2.381)	7.772*** (2.936)	-30.616 (78.789)	10.614 (25.933)
inflation	-0.000 (0.001)	-0.001 (0.002)	-0.002 (0.003)	-0.034 (0.039)	0.034 (0.044)
yrs_Sch	0.521*** (0.196)	-0.163 (0.951)	0.069 (0.951)	7.263 (15.788)	1.280 (2.688)
AR(1)				-0.59 (0.553)	-1.52 (0.129)
AR(2)				-1.05 (0.294)	-2.20 (0.028)
AR(3)				-0.58 (0.562)	0.64 (0.525)
Hansen test				8.43 (0.392)	16.08 (0.711)
hansen in-diff-test				2.56 (0.862)	1.72 (0.974)

Note: robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The sample includes one hundred thirty nine countries. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country.

We run the same model adding legal system origin dummy. Since the legal origin dummy variable is time invariant, we can't run the model in WG, KIVET and DIF-GMM estimators. The pattern of legal origin in the law and finance literature doesn't appear to hold in this model. All the origin of legal systems' coefficients are statistically insignificant. Similar result that the impact of legal origin vanishes when it is introduced in the political economy model is obtained in Girma and Shorthand (2008) and Keefer (2007). They argued that legal system origin passes through political variable. Yet the coefficient of the lagged variable, the political competition with its square terms appears to have the expected sign. The non-monotonicity of political competition on the banking sector also holds as can be seen in table (18) below (the results of non-monotonicity test is presented in detail).

Table 17- regression output with origin of legal system dummy

pcbdm	POLS	SYS-GMM
lpcbdm	0.962*** (0.031)	0.929*** (0.055)
polcomp	-1.336* (0.790)	-7.049*** (2.685)
polcomp2	0.149** (0.072)	0.489** (0.232)
L.gdpg	0.389** (0.183)	2.156*** (0.7164)
openness	0.001 (0.010)	-0.028 (0.029)
L.crisis	-5.560*** (1.542)	0.637 (6.489)
ka_open	7.620*** (1.964)	5.217 (6.014)
legor_fr	-0.483 (2.210)	-0.966 (2.138)
legor_ge	-.135 (2.346)	-3.453 (3.139)
legor_sc	0.796 (3.394)	3.741 (8.478)
constant	0.4473 (3.112)	
Hansen Test		27.62 (0.231)
Test for AR(1)		-2.18 (0.028)
Test for AR(2)		-2.98 (0.003)
Test for AR(3)		0.05 (0.963)
Hansen in-difference test		4.93 (0.442)
Number of observations	642	642
Adjusted R2	0.881	

Note: robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The sample includes one hundred thirty nine countries. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country.

There is evidence of non-monotonic relationship between political competition and financial development in the two regressions after introducing origin of legal system dummy in the model. Table (18) presented the detailed test result of the U-shaped test.

Table 18-Test for non-monotonicity with origin of legal system dummy

Basic Model	POLS	SYS- GMM
extreme point	4.49	5.16
Slope at:		
Lower bound	-1.04 (.06)	-5.68 (.00)
Upper bound	1.64 (.00)	6.60 (.00)
t-value(overall)	1.60 (.06)	2.59 (.00)

Note: values in the bracket are p-values

Robustness Analysis

This study also do robustness check of the main result in two different ways: using a similar index the level of political competition and subsample analysis. Polity2 score from the Polity IV data is used to proxy the level of political competition. It is a combined score of AUTOC (a score that measure the level of autocracy) and DEMOC (it measures the level of democracy). It ranges from -10 (strongly autocratic) to +10 (strongly democratic). It is very distinct from political competition index. However, the two are highly correlated in the sense that in highly autocratic countries, the level of political competition is expected to be low and the reverse is expected to hold for highly democratic countries, so that we can use to proxy one for the other. Due to the presence of square term in our political competition variable, we have to get rid of the negative values in the index and the new index should be strictly positive. It is done by recoding the Polity score from 1 to 7 in ascending order (the new proxy is denoted as ‘pol’ in the regression table reported below). Political competition and polity2 the result of the regression output is reported in column (1) of table (19). In the subsample analysis, we dropped the time period from 1970 to 1990 and run the model whether the result is driven by some particular period. Column (1) of table (19) reports this regression output.

Subsample regressions are also run for robustness check. Firstly, it is done by changing the time period of the data in order to verify that the result is not as a result of particular time period pattern. And hence it is done first by dropping the period up to 1985 and rerun the regression, and the result is in line with the main findings of this analysis. Column (2) of

Table (19) presents this result. The other sub-sample analysis that is made is changing the number of countries from the analysis whether it is driven some part of countries. We dropped all sub-Saharan African countries and see whether the result holds or not. By the same fashion, Column (3) of table (19) presents all countries but sub-Saharan African countries. The same analysis is replicated by dropping high income countries according to the World Bank classification. Colum (4) of table (19) presents this result.

Test for non-monotonocity for all robustness checks is also done and reported in table (19). In all the regressions, the non-monotonocity holds.

Table 19– robustness check (banking sector)

pcbdm	(1)	(2)	(3)	(4)
lpcbdm	0.964*** (0.038)	0.961*** (0.072)	0.945*** (0.0764)	0.909*** (0.0500)
polcomp		-4.918* (2.962)	-3.263** (1.641)	-7.566* (4.537)
polcomp2		0.523* (0.283)	0.317** (0.150)	0.722** (0.361)
lgdpg	1.083* (0.593)	0.659 (0.584)	1.350*** (0.519)	1.627*** (0.591)
openness	-0.030 (0.027)	-0.011 (0.029)	0.00144 (0.0333)	0.0203 (0.0270)
lcrisis	-3.899 (4.425)	7.170 (8.322)	-0.525 (3.176)	-5.148 (4.604)
ka_open	7.995** (3.534)	3.556 (5.792)	2.520 (4.087)	1.604 (5.235)
pol	-7.837* (4.492)			
pol2	0.924* (0.490)			
_cons	10.713 (9.520)	2.925 (7.889)		
Hansen test	50.92 (0.190)	19.58 (0.106)	45.35 (0.113)	65.45 (0.325)
AR(2)	-2.78 (0.05)	-2.69 (0.007)	-2.28 (0.023)	-2.98 (0.003)
AR(3)	0.19 (0.852)	0.74 (0.476)	-0.55 (0.58)	0.29 (0.773)
Hansen in diff	5.93 (0.431)	1.77 (0.77)		
Number of observations	642	438	450	463

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The sample includes 139 and 138 countries for (1) and (2) respectively. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country.

Table 20-non-monotonicity (robustness check/banking sector)

Basic Model	(1)	(2)	(3)	(4)
extreme point	4.24	4.69	5.13	5.23
Slope at:				
Lower bound	-5.98 (.04)	-3.87 (.05)	-2.62 (.025)	-6.12 (.05)
Upper bound	5.09 (.018)	5.54 (.02)	3.08 (.01)	6.88 (.00)
t-value(overall)	1.70 (.04)	1.61 (.05)	1.95 (.02)	

Table (21) and (22) present summary statistics and pair-wise correlation coefficients between variables used for stock market analysis.

Table 21-summary statistics (stock markets)

Variable	Mean	Min	Max	Std. Dev.(overall)	sta. Dv(within)	sta. Dev.(between)
smtv	26.05	0.001	387.54	45.36	27.93	33.93
lsmtv	25.66	0.001	387.54	44.94	28.26	33.12
smkc	43.57	0.01	996.93	51.32	28.25	49.51
lsmkc	43.21	0.01	996.93	50.95	28.4	49.03
polcomp	6.76	1	10	3.12	1.15	2.92
polcomp2	55.589	1	100	36.16	12.61	33.95
lcrisis	0.10	0	1	0.30	0.28	0.10
openness	81.71	0.02	531.73	47.69	20.22	43.14
lgdpg	3.89	-64.04	149.97	7.37	6.87	2.79
ka_open	0.50	0	1	0.36	0.16	0.33
legor_ge	0.11	0	1	0.31	0	0.31
legor_sc	0.02	0	1	0.15	0	0.15
legor_uk	0.28	0	1	0.44	0	0.44
legor_fr	0.58	0	1	0.49	0	0.49

Table 22- pair-wise correlation between variables (stock market)

	smtv	lsmtv	smkc	lsmkc	polcomp	polcomp2	lcrisis	opennnness	lgdpg	ka_open
smtv	1									
lsmtv	0.943*	1								
smkc	0.651*	0.581*	1							
lsmkc	0.650*	0.652*	0.81*	1						
polcomp	0.104*	0.101*	0.05	0.05	1					
polcomp2	0.154*	0.148*	0.08	0.07	0.979*	1				
lcrisis	0.023	0.07	-0.07	-0.05	0.067*	0.069*	1			
opennnness	0.060	0.06	0.21*	0.21*	-0.099*	-0.091*	-0.04	1		
lgdpg	-0.01	-0.05	-0.01	-0.03	-0.122	-0.117*	-0.14	0.143*	1	
ka_open	0.256*	0.251*	0.22*	0.21*	0.3376*	0.399*	0.026	0.153*	-0.05	1

Table 23-regression (total value of stock market traded as a percentage of GDP)

smtv	POLS	WG	KIVET	DIFF-GMM	SYS-GMM
lsmtv	0.960*** (0.011)	0.810*** (0.020)	0.933*** (0.018)	0.748*** (0.0311)	0.939*** (0.0216)
polcomp	-1.646*** (0.533)	-2.679** (1.256)	-2.181 (1.669)	-5.426** (2.536)	-3.986* (2.061)
polcomp2	0.148*** (0.044)	0.187* (0.099)	0.156 (0.140)	0.348* (0.188)	0.326** (0.159)
kaopen	0.142 (0.212)	-0.345 (0.441)	-0.105 (0.545)	-5.365** (2.186)	-4.217* (2.323)
lgdpg	0.194* (0.105)	0.367** (0.166)	0.375*** (0.125)	-1.625* (0.893)	0.0685 (0.902)
openness	-0.008 (0.008)	0.026 (0.034)	0.018 (0.032)	0.366* (0.190)	0.123 (0.144)
lcrisis	-3.357*** (1.209)	-3.514*** (1.311)	-3.873*** (1.339)	0.0716 (0.0490)	-0.0135 (0.0400)
AR(2)				-3.00 (0.00)	- (0.003)
AR(3)				-0.02 (0.986)	0.09 (0.926)
Hansen				82.44 (1.0)	87.15 (1.0)
Hansen in-diff					1.65 (1.0)
Adjusted R2	0.911	0.772			

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The sample includes 103 countries. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country.

The same analysis is done to financial development for the stock market (the result is reported in table (23) above). All the five estimation techniques are applied here as well. The autoregressive coefficient is significant in all estimations. Similarly, the political competition indicator with the respective square term is statically significant with the expected sign. Lagged GDP and lagged banking crisis are also significant with the expected sign. The autoregressive coefficient in SYS-GMM is between POLS and WG estimators and very close to KIVET estimator. The DIFF-GMM one is outside this interval. Lagged GDP growth and lagged bank crisis have significant coefficient for the first three estimators with the expected sign.

Test for monotonicity presented below in table (24) shows there is a clear non-monotonic relationship between the financial development indicator in the stock market and the level of political competition.

Table 24 -Non-monotonicity test (total value of stock market traded as a percentage of GDP)

Basic Model	POLS	WG	KWG	DIF-GMM	SYS- GMM
extreme point	5.69	7.18	7.00	7.80	6.11
Slope at:					
Lower bound	-1.78 (.0009)	-2.48 (.010)	-2.04 (.11)	-4.73 (.01)	-3.33 (.029)
Upper bound	1.638 (.000)	1.13 (.08)	1.01 (.23)	1.52 (.15)	2.53 (.03)
t-value(overall)	3.17 (.000)	1.39 (.08)	0.73 (.23)	1.03 (.15)	1.80 (.03)

The origin of legal system dummy introduced in the dynamic panel data model as it is done for the banking sector above. Since the origin of legal system is time invariant dummy variable, the estimation is possible only in the two estimators: POLS and SYS-GMM. The coefficients of the legal origin dummy appear to be not significant. This result is in line with political economy literature of finance by Rajan and Zingales (2003) and Girma and Shorthand (2008). But the relationship between the financial development indicator and political competition still holds. Table(25) below reports these estimations results.

Table 25 - regression results with legal origin dummy(stock market)

smtv	POLS	SyS-GMM
lsmtv	0.956*** (0.011)	0.928*** (0.0291)
polcomp	-1.560*** (0.546)	-6.590** (3.067)
polcomp2	0.139*** (0.046)	0.503** (0.227)
kaopen	0.158 (0.216)	-3.304* (1.997)
lgdpg	0.197* (0.107)	-0.636 (1.291)
opennes	-0.010 (0.009)	0.215 (0.147)
lcrisis	-3.317*** (1.214)	3.20e-05 (0.0334)
legor_fr	-1.171* (0.674)	0.408 (6.088)
legor_ge	-0.484 (1.072)	6.868 (10.14)
legor_sc	1.430 (1.394)	10.34 (20.56)
AR(2)		-2.94 (0.003)
AR(3)		0.06 (0.950)
Hansen		78.70 (1.0)
Hansen in-diff		-10.81 (1.0)
Adjusted R2	0.911	

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The sample includes 103 countries. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country.

Robustness check for stock market

Three robustness checks are done: (1) altering the time period to check whether particular time period driven the result; (2) use alternative measure of political competition; and (3) change the sample by dropping some regions in the sample. In all the robustness checks, the preferred SYS-GMM is employed.

In (1), some time periods before and after the end and beginning of the study period of the study period respectively. It is intended to check whether the result is driven by some particular time period. In this robustness check, time periods before 1996 and after 2006 are dropped. The result still holds. The result is reported in column (1) of table (26). In (2) the same index used in the banking sector for the robustness for political competition is used to check the validity of the result in the stock sector as well. The index is constructed from polity2 index of POLITY IV project database. The result appears to hold in this case as well. Column (2) of table (14) presented the estimation results. In (3), it is done by dropping all sub-Saharan African countries so as to check the result is driven by some specific region. table (14) column (3) presented the result.

For all the robustness checks, test for non-monotonicity is also done. The result in table (27) below shows there is strong evidence that the relationship between the level of political competition and the level of financial development are non-monotonic and U-shaped in particular.

Table 26 - Robustness
check (Stock market)

smtv	(1)	(2)	(3)
lsmtv	0.923*** (0.025)	0.964*** (0.016)	0.955*** (0.025)
polcomp	-6.840** (3.122)		-5.219* (2.916)
polcomp2	0.549** (0.236)		0.495** (0.232)
lcrisis	0.834 (8.648)	-9.654*** (3.406)	- 14.891*** (5.055)
kaopen	0.790 (1.239)	-0.247 (0.749)	-1.156 (0.805)
lgdpg	0.354 (0.414)	0.188 (0.210)	0.367 (0.297)
opennes	0.040 (0.038)	-0.001 (0.015)	0.020 (0.023)
poli		-5.961* (3.581)	
poli2		0.689* (0.391)	
AR(2)	-2.32 (0.020)	-2.90 (0.04)	-2.71 (0.07)
AR(3)	-0.62 (0.533)	0.03 (0.978)	-0.11 (0.914)
Hansen	85.89 (0.544)	86.60 (1.0)	69.73 (1.0)
Hansen in-diff	26.92 (1.0)	-1.24 (1.0)	-3.12 (1.0)
Number of observations	835	1 753	1 542

All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country.

Table 27-U-test for robustness analysis (stock market)

Basic Model	(1)	(2)	(3)
extreme point	6.22	4.32	5.27
Slope at:			
Lower bound	-5.74 (.015)	-4.58 (.05)	-4.22 (.04)
Upper bound	4.14 (.01)	3.68 (.03)	4.67 (.00)
t-value(overall)	2.15 (.01)	1.63 (.05)	1.72 (.04)

Granger causality

The study also checked whether the direction of causality goes from political competition to financial development. It is done by testing two hypotheses: homogenous non causality and heterogeneous non causality. The first one tests the existence of homogenous non causal relationship between political competition and the level of financial development. It is done by regressing the model with lagged political completion variable and then testing for their joint significance. If the null hypothesis or the joint significance of the lagged political completion variable is statistically significant, then political competition Granger-causes financial development. Table (28) column (1) presents this result. The result shows political competition Granger-causes financial development.

The second one tests whether the causality heterogeneous among countries or not. The test is done by first creating interaction terms with country dummy variable and lagged values of political competition and then test their joint significance. If null hypothesis rejected, it means the impact of political competition across countries is not homogenous. Table (28) column (2) presents the result of this hypothesis. The result shows impact of political competition across countries is not homogenous. The causality test is done for the banking sector.

Table 28-granger causality: banking sector

	(1)	(2)
lgdpg	0.232 (0.796)	1.282 (1.022)
openess	0.010 (0.079)	-0.076* (0.043)
lcrisis	-19.583 (17.216)	-0.622 (8.573)
ka_open	-4.495 (7.839)	22.314 (14.210)
$PC_{i,t-1}$ and $PC_{i,t-1}^2$	7.18 (0.0276)	
$PC_{i,t-1}^1, \dots, PC_{i,t-1}^j, \dots, (PC_{i,t-1}^1)^2, \dots, (PC_{i,t-1}^j)^2$		1280.1 (0.00)
AR(1)	-1.27 (0.205)	1.13 (0.260)
AR(2)	-1.95 (0.051)	-0.37 (0.714)
AR(3)	0.52 (0.602)	-0.97 (0.330)
Hansen test	0.000 (1.000)	0.000 (1.000)

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. All the models include time dummies. P-values are reported in square brackets. Heteroskedasticity and autocorrelation consistent standard errors are clustered by country. Hansen test: test for validity of the set of instruments. AR (1): test for the presence of 1st order autocorrelation of residuals; AR (2): test for the presence of 2nd order autocorrelation in residuals. In model (1), the value refers to the χ^2 statistic with the corresponding significance level in bracket under the null hypothesis that the coefficients associated to $PC_{i,t-1}$ and $PC_{i,t-1}^2$ are not jointly statistically significant, for model (2), it is the same χ^2 statistic with the corresponding significance level in bracket under the null hypothesis that the coefficients associated to $PC_{i,t-1}^1, \dots, PC_{i,t-1}^j, \dots, (PC_{i,t-1}^1)^2, \dots, (PC_{i,t-1}^j)^2$ that are not jointly statistically significant

4.5 Summary

This chapter examines how political competition impacts financial development in both banking sector and stock market. For the banking sector, five years average data is used from period 1970 to 2005. it covers more than 136 countries. Due to availability, for the stock market, annual data for over 100 countries from 1991 to 2013 is used in the analysis. The availability of data is the only reason for the variation in the sample. In this study, we employed Acemoglu and Robinson (2006) framework that political elites to introduce new institutional change, they calculate the probability of staying on power after introducing the change. This probability of staying on power doesn't necessarily be captured by introducing autocracy and democracy score in the regression if well entrenched democracies behave the same way as well established democracies in introducing change based on the political replacement effect calculus.

Since the study employs dynamic panel data models with possible endogenous variables within system GMM is the preferred estimator, which address the key econometric issues in estimating the impact of political competition with small time dimension and large sample size. This estimator also corrects the bias that comes as result of lagged regressor of the dependent variable. Four other estimators such as POLS, WG, KIVET and DIFF-GMM are also used for comparison and robustness.

This study provides empirical evidence that: (1) lagged GDP growth impacts financial development of any measure positively; (2) lagged banking crisis is associated with financial development negatively; (3) trade openness and financial development are linked positively; (4) the impact of legal origin dummy with the presence of political institution variable appears insignificant; (5) political competition Granger-causes financial development; and (5) there is political replacement effect in financial development

The finding of this paper highlight there is evidence for political competition impacting financial development non-monotonically. In countries where the political elites are well entrenched and the level of political competition is low, it is upon the interest of the political elites to adopt or implement policies favorable to financial development so that they themselves can harness its beneficial effect on the economy. In a similar fashion in countries where there is high level of political competition, the more the government becomes accountable to the public, the more difficult to the government to peruse policies which favor

minor political elites. In countries where the level of political competition is medium, political elites tend to block reform.

This study contributes to the literature with its unique perspective of viewing financial development from the political competition aspect. It provides empirical evidence for the presence of political replacement effect in financial development. However, the channel through which political competition impacts financial development is not covered in this study. It will be a potential area for future research.

Chapter Five

Conclusion

Some countries are financially developed and some underdeveloped. Some countries have higher level of human capital accumulation and others not. Both human capital and financial development are very important to economic growth. Some underdeveloped countries are growing at a faster rate while some are not. The question that immediately comes is why then those countries that are under developed do not peruse policies or institutional changes so as to catch up those who are developed very well.

Different studies have different theoretical explanations for this important question. This study employs institutions as the main determinants of economic development framework to answer the question. Economic institutions are the rules of the game that shape and govern incentives for either economic progress (in case of good economic institutions) or stagnation (when the economic institutions are bad). However, these economic institutions are determined by political institutions as argued by Acemoglu and Robinson (2006).

Economic growth or change in financial development and human capital accumulation in particular creates winners and losers of the process. Already powerful groups may block good economic institutions that would bring progress for the majority if they deem their privileges are going to be threatened. In line with this argument, Acemoglu and Robinson (2006) developed a hypothesis that the political elites' calculus of the political replacement effects as the determinant either for the adoption or blockage these good economic institutions. This study tested this hypothesis for human capital accumulation and financial development.

It provides empirical support for the Acemoglu and Robinson (2006) hypothesis of political replacement effect on human capital accumulation that the implementation of institutional changes and policies that promote human capital formation depend on the political calculation of political elites' probability of staying on power. Incumbent political elites who faced high or low level of political competition more likely implements policies or institutional change that promote human capital formation where as political elites who faced intermediate level of political competition more likely engaged in blocking the institutional changes and policies that promote human capital formation.

Five estimation techniques are used to check the validity of the result but system GMM is the preferred estimator, because there is lagged dependent variable and potential endogenous variables as regressor. Furthermore, the data used have small time dimension (seven time periods) and large sample size (one hundred fourteen countries). There is strong evidence to support non-monotonic relationship of the Acemoglu and Robinson (2006) hypothesis. This result is robust to different samples, specific period of the study, with and without control variables, and alternative measure of the level of political competition and alternative estimation techniques: POLS, WG, KWG, DIFF-GMM with their caveats to this particular analysis.

The same political replacement effect is examined for financial development in chapter four. Five years average data is used for the banking sector for the period 1970 to 2005 for 138 countries. For the stock market, over 100 countries from 1991 to 2013 annual data is used in the analysis. The availability of data is the only reason for the variation in the sample. The same Acemoglu and Robinson (2006) framework of political replacement effect is examined. This probability of staying on power doesn't necessarily be captured by introducing autocracy and democracy score in the regression if well entrenched democracies behave the same way as well established democracies in introducing change based on the political replacement effect calculus. Looking financial development using the political competition perspective has the advantage of capturing non-monotonic impact of democratic institutions as opposed to the usual way of looking it by introducing democracy and autocracy score in the regression by the political economy literature in finance. For example, Girma and Shorthand (2008) provide evidence of highly democratic countries performing better in financial development.

After employing the same methodology as used for human capital formation in chapter three, political replacement effect is also holds for financial development. There is consensus in the finance literature that financial development is impacts economic growth positively (Levine ,2003; Levine ,2005; Demirgüç-Kunt and Levine (2008), and Barajas, Chami and Yousefi, 2013). Leone *et al.* also provide empirical evidence for the political replacement of economic growth. the study also finds that political competition Granger causes both human capital accumulation and financial development.

This study contributes to the literature with its unique perspective of viewing financial development and human capital accumulation from the political competition aspect. The political replacement effect impacts both financial development and human capital

accumulation. However, this study doesn't look the channels through which political competition impacts financial development and human capital accumulation. It will be a potential area for future research. The study doesn't build theoretical models how human capital accumulation or financial development evolves over time vis-à-vis political competition. This area will be a potential area for future research as well.

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Appendix

Appendix1

Variables definition and sources used in chapter four

variable	definition	unit of measurement	source
pcgdp	The ratio of private credit from deposit money banks to the private sector to overall GDP (private sector credit/GDP).	% of GDP	Finstat
smcgp	stock market capitalization/GDP):	% of GDP	GFDD
smtvgdp	total value of stocks traded/GDP	% of GDP	GFDD
polcomp	political competition	index(1-10)	POLITY IV
openness	sum of import and export/GDP	% of GDP	WDI
kaopen	financial openness	index	Chinn-Ito(2006)
bcrisis	Dummy variable for the presence of banking crisis (1=banking crisis, 0=none)	dummy	GFDD
gdpg	real GDP growth rate using constant 2005 \$	% change	WDI
legal	dummy variable (legal system origin)	dummy	LLSDV

Appendix 2

The distribution of the origin of legal system for the sample of countries used in the study

- 1= English Common law=bright green
- 2=French civil law=light green
- 3=Germany legal origin=light red
- 4=Scandinavian legal origin=bright red

