



Path Dependence and Interdependence Between Institutions and Development

David Fadiran and Mare Sarr

ERSA working paper 637

October 2016

Economic Research Southern Africa (ERSA) is a research programme funded by the National Treasury of South Africa.

The views expressed are those of the author(s) and do not necessarily represent those of the funder, ERSA or the author's affiliated institution(s). ERSA shall not be liable to any person for inaccurate information or opinions contained herein.

Path Dependence and Interdependence Between Institutions and Development*

David Fadiran[†], Mare Sarr[‡]

30th September 2016

Abstract

Path dependence theory, within the institutions context, means that the path of institutions promulgated within a system historically determines the nature of institutions that will ensue within the same system in the present and in the future. The paper makes use of a newly constructed index of institutions quality, and addresses three related questions; the existence of path dependence in institutions, the interdependence and causality between political and economic institutions, and lastly the interdependence between economic development and institutions. In addressing the first question, I use unit root tests to test the hypothesis that institutions promulgated during colonial times still influence institutions promulgated during the post colonial era. I also test for interdependence between institutions in Nigeria using an error correction model in analysing the extent of interdependence between political and economic institutions. Lastly, I test the *critical juncture* hypothesis—which argues that better institutions lead to economic development and the *modernisation* hypotheses—which argues that economic development leads to better institutions. The results show support for early path dependence in both political and economic institutions. I also find evidence in support of interdependence running from economic to political institutions. Lastly, there is evidence of a long-run association between institutions and economic development, with the evidence supporting the *critical juncture* hypothesis, more than the *modernisation* hypothesis.

Keywords: Institutions, Legislations, Persistence, Economic Growth and Development, Nigeria

JEL Classification: K00, K11, N00, N1, N47, O1, O11

1 Introduction

It is often posited that extractive institutions established during the colonial era have persisted and negatively influence institutions promulgated today. If this is true, then studying institutional persistence and path dependence is key to understanding why some countries performance better than others. However, this

*We are grateful to the participants at the “Path Dependence in Economic Development” conference, organised by European Society for the History of Economic Thought (ESHET), at Universidad EAFIT, Medellin, Colombia (November 2013). The financial support of the Carnegie Foundation is gratefully acknowledged. All errors are the ours.

[†]Post-Doctoral Research Fellow, Department of Economics, University of South Africa, Hazelwood, Pretoria, South Africa. Email: fadirdo@unisa.ac.za

[‡]Associate Professor, School of Economics, University of Cape Town, Rondebosch, 7701, South Africa. Email: mare.sarr@uct.ac.za

research is scarce due to the paucity of long-run institutional data, which often makes testing institutional persistence unfeasible. This paper contributes to filling this research gap by employing new and unique institutional indices for Nigeria—Africa’s most populous country—for the period 1862 to 2011. In particular, the study investigates key features of the evolution of political and economic institutions during this period, including their persistence and their interdependence. To what extent do institutions established by British colonialists in colonial Nigeria set the path for later institutional development, even beyond independence? Do the different types of institutions (political and economic) exhibit any form of stable long-run relationship? These fundamental questions form the basis of the objectives of this paper.

I first test for the persistence of institutions in Nigeria. I then examine the long-run effects of economic institutions and political institutions on each other. In addition to this, I identify the direction of Granger causality between the two institutions. These last two objectives are part of a broader debate on the persistence of institutions, which examines long-run interdependence and causality between economic institutions and political institutions. The final objective of this paper is predicated on a broader strand of the institutions and development debate which argue that institutions have a long-run effect on economic development (*critical juncture* hypothesis) rather than vice versa (*modernisation* hypothesis). I test both these hypotheses for Nigeria. The importance of such debate lies in its policy implications. If indeed inclusive political institutions, bring about sustainable economic institutions in line with [Acemoglu et al. \(2012\)](#), then more attention should be paid to enhancing political institutions in Nigeria ([Lipset, 1959](#); [Huntington, 1984](#); [Pourgerami, 1988](#); [Przeworski and Limongi, 1993](#); [Ken Farr et al., 1998](#); [Giavazzi and Tabellini, 2005a](#); [Acemoglu et al., 2012](#)).

Economic historians and political scientists have developed a rich literature that attempts to conceptualise and test the notion of path dependence ([North, 1994](#); [Liebowitz and Margolis, 1995](#); [Pierson, 2000](#); [Page, 2006](#)). This paper will rely on this conceptualisation to empirically test the persistence and path dependence of economic and political institutions in Nigeria.

Undertaking such a study for Nigeria is of importance for at least two reasons. Nigeria, the most populous country on the continent, has often been perceived as the epitome of a misgoverned state, with poor institutions. Despite vast oil wealth and tremendous revenues, poverty has spread at a very high rate, and has all but doubled in the space of 30 years.¹ If indeed, as the new institutional economics literature suggests, institutions matter for economic development—then having an understanding of the persistent and or path dependent nature of institutions in Nigeria may help to understand the root of this mal-development. A further understanding of the direction of the relative importance of each institution for economic development would be valuable for policy.

The remainder of this paper is organized as follows. Section 2 presents an overview of the literature and the theoretical framework. The empirical methodology is presented in Section 4, while Section 4.3 presents the results and discussion. Section 5 concludes the paper.

¹ Estimated at over US\$400 billion in oil revenues for the past 40 years, Nigeria’s economy has stagnated with a per capita GDP in 2000 (\$1084) barely attaining its 1970 level (World Bank [Group, 2012](#)).

2 Background on institutions and path dependence

Research by North (1990) has been celebrated as a landmark in the literature linking institutions and development. However, earlier economic studies had also examined this relationship (Kormendi and Meguire, 1985; Scully, 1988). In these studies, a cross-sectional regression analysis was used to test the effects of institutions on growth. The former found evidence of an indirect relationship between institutions and growth. The latter found no conclusive effect of economic and political rights on economic performance. Neither revealed a definite causal relationship.

2.1 On the path dependence of institutions

Interest in the persistence of institutions was rekindled by increased consensus on the importance of institutions for economic performance. The validity of the importance of institutions is however entrenched in their stability, and this stability can be linked to persistence (Ebbinghaus, 2005). Therefore, the resurgence of institutions has revived interest in the importance of persistence, because persistence reinforces the validity of institutions.² The resurgence of studies on persistence in institutions has led to renewed interest in path dependence, as this is possibly the most common avenue through which persistent institutions can be conceptualised. This resurgence was in response to the influential study by Acemoglu et al. (2001), which identified three possible avenues through which persistent institutions may occur: Sunk costs, investment incentives, and irreversible investment by the elite. Acemoglu's work is predicated on much more in-depth conceptualisation of path dependence in economics and other social sciences.

A seminal paper in path dependence is the work of David (1985), in which path dependent sequence is defined as one where important influences on the final outcome can be a result of previous minor events, which can be predominantly probabilistic rather than planned. The stochastic nature of such occurrences does not guarantee a fixed set of outcomes. That is, minor events or accidents that happened historically can not be ignored, as there exists a chance of such accidents influencing current outcomes (David, 1985). It is upon this premise that Arthur (1994) argues for the possibility of multiple equilibria within a path dependent model. These studies provide a concise conceptualisation of path dependence. However it is not very clear how this applies to persistent institutions. The new institutional economics (NIE) have incorporated path dependence in the empirical evidence for the long-run, persistent, and changing nature of institutions. For example, North (1990, 1994) laid the foundation for analysis of development and growth in relation to institutions through time by focusing on learning effects and what was termed the "institutional matrix". The institutional matrix was used to exemplify how institutions can persist through *increasing returns* and *lock-in* that emanates from a series of direct and indirect effects of an initial regulation.

The operational definition of path dependence was further narrowed down in the political science literature, with different forms of path dependence that exist within an institution or organisation's construct conceptualised. Path dependence was categorised into three types These were state dependence, "phat" dependence and path dependence (with the latter exhibiting the highest level of hysteresis, and the first the

²This is evidence of the self reinforcing nature of institutions.

least) (Page, 2006). This concept was further narrowed down into two types of dependence; namely outcome dependence—when the outcome in the current period depends on past outcomes or the time period, and equilibrium dependence—where the long-run distribution over outcomes depends on past outcomes. This can be linked to equilibrium dependence and outcome dependence. While these conceptualisations are necessary, and common within the political science literature, economists are more curious about quantifying these concepts.

The arguments for path dependence in institutions—be it in the form of *lock-in* or *increasing returns*—while sound, thus required empirical proof. This poses a challenge for researchers—especially within the African context where long-time series of data on institutions are not readily available. Although evidence for increasing returns has been shown empirically in some areas of economics, the application to path dependence in institutions, to the best of my knowledge, is not as common (Romer, 1986; Krugman, 1990; Arthur, 1994). In recent times, the increased acceptance of the role of institutions in growth has led to increased inquiry into the dynamics of institutions as well as the interactions between political and economic institutions. To address this, it is necessary to have long-run time-series data on institutions, which can be examined for path dependent properties (Page, 2006; Freeman, 2010; Jackson and Kollman, 2010; Freeman and Jackson, 2012; Jackson and Kollman, 2012).

2.2 On Interdependence Between Political institutions and Economic Institutions

There is no conclusive consensus on the direction of causality and nature of interdependence between political and economic institutions, with results generally falling on both sides. The argument that civil and political liberties tend to play a bigger role in determining market based institutions, than market institutions play in determining political institutions, is not just an argument for the interrelations between the two factors, rather, it also informs the importance of either type of institution for development. It would therefore also inform policy. Proponents of political institutions to economic institutions causality have argued that inclusive political institutions are the foundation upon which growth sustaining economic institutions can be established. They state that any other arrangement is doomed to falter in the long-run. Such occurrences, they argue, is why some nations fail and others succeed (Acemoglu et al., 2012). In a similar vein, empirical evidence of weak contemporaneous feedback effects between the two institutional measures have been found, suggesting that political liberalisation brings about economic liberalisation rather than otherwise (Giavazzi and Tabellini, 2005b).

While Acemoglu and Robinson's argument is compelling, the fact remains that there exists many other compelling arguments to the contrary. For example, Ken Farr et al. (1998) examine the direction of causality between political and economic institutions, and show that when economic liberalisation preceded political institutions, the economy performed better. Similar arguments were put forth by Boldrin and Levine (2013). Therefore, it may not be true that enough attention has been paid to economic institutions to conclusively state that political institutions are determinants of economic institutions. In this respect, country case studies may yield interesting answers given that many countries are likely to depart from the average that cross-country analyses rely upon.

2.3 On interdependence between institutions and economic development

There exists a consensus in most of literature on the influence that institutions have on economic performance. However, the endogeneity that exists between the polity (economic decision makers) and institutional quality, means that causality flowing from economic development to institutions needs to be paid attention as well (Aghion et al., 2002). This was first introduced in the seminal paper by Lipset (1959), which showed evidence of the influence of three measures of development on democracy, namely wealth, industrialisation and urbanisation. This is sometimes termed modernisation theory, which in the context of institutions, refers to the progressive influence of economic performance on institutions. This seminal study focused its analysis on regions outside Africa. As such, care should be taken in making inferences from the study regarding African countries. Despite initial attention to the possibilities of the modernisation hypothesis, research on this aspect of the debate has dwindled over the years. Most of the attention in the literature has shifted towards the *critical juncture* hypothesis, which focuses on the impact of institutions on development.

Studies do exist that have examined this impact. Pourgerami (1988) tested for causality between economic development, democracy and growth, Huntington (1984) found a positive feedback from development to democracy. These studies have mostly been from a cross-country perspective, thus their applicability to this particular study is quite limited and kept at a conceptual level. Most of the earlier studies only focused on political institutions, without taking economic institutions into consideration. Recent studies have looked at both economic freedoms and political freedoms, with focus being on the impact on economic growth, as well as the feedback effect that economic growth has on both political and economic freedoms. Among these studies, no evidence of feedback from political freedoms to either economic freedoms and economic growth was found, while there was evidence for a bilateral relationship between economic freedom and economic growth. Some also found that economic freedom causes political freedom but not the other way round (Przeworski and Limongi, 1993; Barro and Sala-i Martin, 1995; Ken Farr et al., 1998; Giavazzi and Tabellini, 2005b). An alternative approach to examining the interdependence between institutions and economic development was explored by considering prehistoric measures of bio-geography as instruments for modern income levels, and found a strong causal effect of income on democracy Gundlach and Paldam (2009).

The argument in favour of the institutions to economic development causal relationship is known as the *critical juncture* theory. However, evidence for this is mostly from European countries. Studies have also focused on urbanisation, rather than just the economic growth and development impacts of institutions. More recent studies included many non-European countries in their cross-country analyses. They also found evidence of the influence of institutions on economic development. More importantly, these studies were able to show a consistent and positive relationship between institutions and economic growth (Knack and Keefer, 1995; Hall and Jones, 1999; La Porta et al., 1999). Most of these initial studies did not account for the endogenous nature of institutions. However, following convincing arguments for endogenous institutions made by Acemoglu et al. (2001) recent studies have accounted for this endogeneity. These have been able to show that taking this into account, a positive relationship still exists between institutions and economic growth (Fedderke et al., 2001; Dollar and Kraay, 2003; Easterly and Levine, 2003; Rodrik et al., 2004;

[Acemoglu et al., 2012](#)). The evidence certainly points strongly in favour of an interdependence between institutions and economic growth, in which institutions are the more important driver.

The empirical evidence in support of either the *modernisation* hypothesis and the *critical juncture* hypothesis have mostly been from cross-country studies, which often assume homogeneity of unobserved characteristics in their analyses. Cross-country analyses are important to help determine key regressors for a given relationship. However, the assumption of homogeneity has been shown to be problematic. This is not to disregard cross-country regressions, but rather to point to a need for country specific analysis in addition to the cross-country studies ([Maddala and Wu, 2000](#)). This would help identify individual country characteristics that is not possible in cross-country research.

2.4 Theoretical framework

Given the nature of the questions posed in this study, the framework adopted focuses on three different areas. The first is persistence and path dependence, the second is interdependence between political institutions and economic institutions, while the third focuses on the the interdependence and causality between institutions and economic development. To assess interdependence, a relevant framework was developed by [North \(1990\)](#). North approaches the discussion from a transactions cost perspective. Here interactions between individuals within the economy are subject to high levels of uncertainty, which exacerbates the transaction costs that come with each exchange. This then necessitates the development of institutions, legislation or Constitutions, both formal and informal³ that help monitor and contain the possible course of action during exchanges. This in turn reduces the level of uncertainty that comes with exchanges, and hence inherently reduces transaction costs.

[Acemoglu et al. \(2001\)](#) adopted North's notion and definition of institutions and conducted an empirical analysis of the effects of institutions (primarily, protection against risk of expropriation, but also rule of law and property rights) on economic development. Their major contribution was to develop an identification strategy—based on the assumption of institution persistence influenced by [Engerman and Sokoloff \(1994\)](#)—that addresses the issue of endogeneity that had plagued previous studies.

Examining persistence and path dependence of institutions, [North \(1990\)](#) argues that organisations are formed by groups of people brought together by a common purpose to achieve a set of goals and objectives. Organisations that are created are a good reflection of the nature of opportunities provided by what is termed the “institutional matrix”. This term is used to describe the multiple interactions between institutions and their organisational forms. These in turn generate new complimentary institutions, forming the “institutional matrix”. In simple terms, this implies that activities within a given system are highly related within the opportunities allowed for by the present institutional environment. For example, an institutional environment that rewards piracy will result in organisations focused on piracy, while firms and productive organisations would result from an institutional environment that rewards such productivity. In the case of Nigeria, the extractive institutions that were promulgated during colonial times, which espoused easy extraction of resources, may have persisted. These possibly play a role in the extraction friendly institutional environment

³North makes a clear distinction between the two in his seminal paper.

and the looting behaviour reflected in Nigeria's economy.

It is not sufficient to conceptualise how institutions and organisations within a system interact. Conceptualising path dependence within such a system as described above is also essential. The broad definition of path dependence is quite informative in itself, but limited in its inferential abilities. Levi therefore conceptualised path dependence from an increasing returns viewpoint. According to Levi (1997, 28); “[p]ath dependence has to mean, if it is to mean anything, that once a country or region has started down a track, the costs of reversal are very high. There will be other choice points, but the entrenchments of certain institutional arrangements obstruct an easy reversal of the initial choice. Perhaps the better metaphor is a tree, rather than a path. From the same trunk, there are many different branches and smaller branches. Although it is possible to turn around or to clamber from one to the other—and essential if the chosen branch dies—the branch on which a climber begins is the one she tends to follow”.

Intrinsic in this definition of path dependence is the notion that future decisions are impacted by prior decisions, and this is fundamentally related to the idea of increasing returns to scale in economic theory. According to Arthur (1994), four conditions or characteristics are essential for increasing returns to manifest in a given technology or social context. These are large set-up or fixed costs, learning effects, coordination effects, and adaptive expectations.⁴ Pierson (2000) argues that such assertions regarding technology are important as they clarify relationship characteristics peculiar to social interactions. For example, first, new social constructs such as institutions usually involve a considerable start-up cost. Second, a learning process occurs in both organisations and individuals. Third, activity benefits are enjoyed by both individuals and organisations if coordinated or adapted to the already existing institutional or organisational environment. Finally, there are advantages to ‘betting on the right horse’ or the choice that “passes”, which makes a case for ‘adaptive expectations’ about the actions of others within the system. The basic idea of *increasing returns* path dependence is that the more a choice is made, the greater its benefits. Path dependence can be caused from other avenues as well; *self-reinforcement*, *positive feedbacks*, and *lock-in*. I examine path dependence in institutions in Nigeria from the *lock-in* perspective. *Lock-in* in this regard, means, a path becomes the preferred path over any other alternatives because an ample proportion of the society has already embarked on this path.

3 Data

The data used for this analysis is a set of institutions data constructed for Nigeria in the study by Fadiran (2015). There are three indices constructed in this regard. The first index captures political rights and civil liberties, which are two inseparable dimensions of democracy. The construction methodology follows Gwenhamo et al. (2012) who set the standard normative ideal criteria against which index rating should be done. In this context, the indices assess the extent to which the Nigerian legal framework (Constitutions,

⁴Large set-up – means there is high returns to further investment in the technology; learning effects means that knowledge gained over time results to higher returns from continued use, especially in the case of complex new technologies; coordination effects- means that the more the merrier, as more people pick up a certain technology the individual benefits from the technology increases as well; adaptive expectations- means that there's a tendency for individuals to “choose right” in the case that there are negative returns from choosing an option that fails to win. For example, HD-DVD vs. Blu-ray, Betamax vs. VHS.

Acts of Parliament, Amendments and Statutory Instruments) provides for the specific rights and freedoms. These include: 1) Voting Rights, 2) Freedom of association, 3) Freedom of assembly, 4) Freedom of expression, 5) Extent of arbitrary executive power, 6) Independence of the judiciary and the legislature, 7) Government secrecy, 8) Due process of the law, 9) Freedom of movement, 10) Academic freedom, 11) Religious freedom, 12) Residual category. All the sub-categories are added up to form the composite index: civil and political liberties, with the maximum possible score being 100.

Thus, the civil and political liberties index is characterised by twelve components (sub-indicators), each of which is allocated nominal points. Of these twelve, the first eight sub-components are rated on a scale of 0-10, while the last four on a scale of 0-5. The two other institutional indicators employed, were also constructed in the same study by [Fadiran \(2015\)](#), which are freehold property rights and non-freehold (Customary) property rights. The two are considered separately in order to deduce the interaction between informal institutions (land rights that existed prior to arrival of the British) and formal institutions. The methodology employed in constructing the property rights indices followed Waldron's proposition for characterising ideal property rights, which is in the same parlance as [Fedderke et al. \(2001\)](#) and [Gwenhamo et al. \(2008\)](#).

The components of the two indicators and their assigned score ranges are as follows: the first component assigned a score of 0-20 points, the next four components, a score of 0-15 points each, while the last two components are given a score of 0-10 points each. A score of zero for any of these sub components means a total lack of that right in the Constitution of Nigeria of that year. A full score signals that the Nigerian Constitution in corresponding year catered for the component fully. The components for both freehold and non-freehold property rights are: (1) Right to possess, (2) Right to use, (3) Right to manage, (4) Right to capital, (5) Right to security, (6) Incident of transmissibility, (7) Liability to execution⁵. The scores for all the sub-categories are all added up to form the composite index freehold property rights, and customary (non-freehold) property rights, with the maximum possible score being 100. To capture growth, the real growth rate constructed by the PENN world table by [Feenstra et al. \(2013\)](#) was used. This measure is provided over an extended period of time than those provided by the World Bank and the Central statistics offices of Nigeria.

4 Empirical Methodology

4.1 Path Dependence

This concept of persistence pertains to the level of influence institutions that were established during the colonial era have on the current institutional environment. Although it is widely accepted within the institutions and growth literature that institutions persist over time, such a premise has not been well evidenced empirically. Instead, studies typically provide logical and qualitative explanations for persistence ([North](#),

⁵ The methodology employed in the construction of the index, and the interpretation of the index outcomes are comprehensively discussed in Chapter two of [Fadiran \(2015\)](#).

1994; Liebowitz and Margolis, 1995; Pierson, 2000; Page, 2006). A possible reason for this in research on Africa is the obvious lack of long-run time series data. The newly constructed dataset will provide a means to test the persistence of institutions within the Nigerian context.

In this paper, I follow Page (2006) in his conceptualisation of the notion of path dependence, which presents a way to test the assumption of persistence using the newly constructed institutional variables. Two concepts that relate to path dependence are of interest: Outcome dependence and equilibrium dependence. First, a dynamic process is outcome dependent if the current outcome y_t is determined by past outcomes y_{t-s} where $t = 1, \dots, p$. In Page’s parlance, an outcome dependent process is said to be “*phat*” dependent when the history of outcomes matters, but not the sequence (order) in which that history has occurred. On the other hand, an outcome dependent process is *path dependent* if the sequence of events in history matters. In addition, the data generating process that transforms past outcomes into current outcomes is *equilibrium dependent* if the limiting process or distribution does not converge to a unique probability distribution function (Page, 2006).⁶

Practically, Jackson and Kollman (2010) and Jackson and Kollman (2012) have identified how the new concepts introduced by Page (namely *phat* dependence, outcome dependence, equilibrium dependence and *path* dependence) can be empirically tested. I adopt their approach to test for path dependence as exemplified by Freeman (2010) and Freeman and Jackson (2012).

Employing the concept of persistence in time-series analysis, the aim is to ascertain whether the time-series data for institutions (from 1862–2011) exhibit persistence, and if so, the nature and extent of such persistence. Consider an autoregressive process;

$$AR(1) : y_t = \rho_1 y_{t-1} + e_t, t = 1, 2, \dots, \quad (1)$$

For this process to be stable, $|\rho_1|$ must be less than 1, otherwise it is unstable and exhibits a random walk (Wooldridge, 2003: 363), which is a special case of what is generally known as a unit root process. Freeman and Jackson (2012) show that the existence of outcome dependence and *phat* dependence in a univariate time-series process can be detected with a unit root test (see pages 8 & 23). Furthermore, they show that in multivariate models, error correction models enable the testing of equilibrium dependence (see page 10 & 11 of Freeman and Jackson (2012)). I thus employ unit root tests as well error correction models to investigate the existence of path dependence in the newly constructed indices.

A number of unit root tests have been developed and discussed in the literature. The focus is however on two such tests: (i) the Dickey-Fuller general least squares (DF-GLS test) approach by Elliott et al. (1992); (ii) the Phillips and Perron unit root test, which is based on analysis by Perron and Vogelsang (1992). Tests based on the Augmented Dickey Fuller approach are known to have low power in the presence of structural breaks. That is, they tend to reduce the probability of rejecting a false null hypothesis of non-stationarity (or an alternative of non-stationarity) in the presence of structural breaks (Phillips and Perron, 1988). The Phillips and Perron approach provides a unit root test, which helps circumvent this issue to an extent.

⁶Note the difference between “*phat*” dependence and *path* dependence.

4.2 Interdependence

The first step in exploring the interdependence between institutions is to test for the presence of cointegration between the institutional variables.⁷ If cointegration exists between the variables of interest, then the institutional indicators are linear combinations of each other, and information can be obtained regarding the historical dependence of each individual series on the other.

4.2.1 Johansen's cointegration approach

The link between political institutions and economic institutions and the overall effect on economic success is an important one. In conducting a country specific analysis of interdependence between institutions, I investigate the existence and nature of the long-run relationship between these variables using the standard Johansen cointegration procedure. The estimation of co-integrated variables typically involves an error correction model, which helps identify the short-run dynamics of the relationship under investigation. I therefore employ a vector error correction model (VECM), which distinguishes between long-run and short-run interdependence. A VECM representation of a VAR based model can be expressed as follows:

$$\Delta Y_t = a + \Pi Y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-i} + \varepsilon_t \quad (2)$$

where the $n \times n$ matrix $\Pi = \sum_{j=1}^p A_j - I$ and $\Gamma_i = - \sum_{j=i+1}^p A_j$. If the coefficient matrix Π has a reduced rank r such that $0 \leq r \leq n$, then there exist two $n \times r$ matrices α and β with $\text{Rank}(\alpha) = \text{Rank}(\beta) = r$ such that $\Pi = \alpha\beta'$ and the vector $\beta'Z_{t-1}$, is stationary. In such cases, there are r cointegrating relationships. The vector $\beta'Z_{t-1}$ characterises the long-run equilibrium, while matrix α can be interpreted as the speed of adjustment towards the long-run equilibrium. The matrix of parameters Γ_i reflects the short run dynamics. Since the variables being tested are non-stationary, The 2 is estimated conditional on r . To determine the number of cointegrating vectors, the two likelihoodist approach developed by Johansen (1988), namely, the maximum eigenvalue statistic and the trace statistic are used. The former tests the null of r cointegrating vectors against an alternative of at least $r + 1$ cointegrating vectors, while the latter tests the null of r cointegrating vectors against n cointegrating vectors. The deterministic terms in equation (2) are restricted as constants in cointegrating vectors and no variables are specified as exogenous.

Since there are three institutional variables and possible maximum rank of 2, I test the three following hypotheses. First, a null hypothesis of $H_0 : r = 0$, against the alternative $H_1 : r > 0$; second, the null hypothesis $H_0 : r = 1$, against the alternative $H_1 : r > 1$; and finally, the null hypothesis $H_0 : r = 2$, against the alternative $H_1 : r > 2$. In the cases where only two variables are involved, the hypotheses involve only the first two.

4.2.2 ARDL cointegration approach

The ARDL bounds test approach developed by Pesaran and Shin (1998) and Pesaran et al. (2001) enables consistent estimation in the presence of variables integrated of different orders, typically $I(1)$ and $I(0)$ series.

⁷This is conditional on the non-stationarity of the time series variables being considered.

For this reason I employ the ARDL bounds test as an alternative to the standard Johansen cointegration test. The ARDL approach is also the estimation technique I use in the causality analysis between economic development and institutions.

The ARDL bounds testing approach to cointegration, falls under the family of autoregressive regression models as well as being inclusive of a distributed lag component. An ARDL model is usually of the form $ARDL(p, q)$, in the case of two variables. This approach makes use of the lagged values of the dependent variables (the autoregressive component of the ARDL), and the lagged values of the regressors (the distributed lag component of the ARDL model), in assessing both long-run and short-run co-movement as well as interdependence.

A simple $ARDL(p, q)$ model is of the form⁸:

$$y_t = a + \sum_{i=1}^p \alpha_i y_{t-i} + \sum_{j=0}^q \beta_j x_{t-j} + \varepsilon_t \quad (3)$$

where y_t is the autoregressive dependent variable of order p while x_t represents the distributed lag explanatory variables of order q ; ε_t is a well-behaved random disturbance term, which is serially uncorrelated. The form of the basic ARDL model presented in equation (3) does not lend itself to the analysis of long-run effects. Instead, Pesaran and Shin (1998) show that the basic ARDL (3) can be reparameterised in an error correction model (ECM) form as:

$$\Delta y_t = a + \theta_0 y_{t-1} + \theta_1 x_{t-1} + \sum_{i=1}^p \alpha_i \Delta y_{t-i} + \sum_{j=1}^q \beta_j \Delta x_{t-j} + e_t \quad (4)$$

The ARDL reparameterisation for numerous variables takes the form $ARDL(p, q_1, q_2, \dots, q_{k-1})$ where q_l is number lags for each of the other $k - 1$ variables. The general model is of the form:

$$\Delta y_t = a + \theta_0 y_{t-1} + \sum_{l=1}^{k-1} \theta_l x_{t-1} + \sum_{i=1}^p \alpha_i \Delta y_{t-i} + \sum_{l=1}^{k-1} \sum_{j=1}^{q_l} \beta_{lj} \Delta x_{t-j} + e_t \quad (5)$$

Based the above error correction reparameterisation of the ARDL, the existence of long-run relationships between variables can be tested using cointegration tests. This process involves the performing of a Wald test of the lagged level values of all the variables in the system. Specifically, the Wald test is conducted on the level variables on the right hand side of equation (4). The null hypothesis being tested is that of no cointegration, that is, the coefficients on the lagged level variables in the error correction reparameterisation of the ARDL are jointly zero. This null hypothesis is given by:

$$H_0 : \theta_0 = \theta_1 = \dots = \theta_{k-1} = 0 \quad (6)$$

against the alternative hypothesis H_1 :

$$H_1 : \theta_0 \neq \theta_1 \neq \dots \neq \theta_{k-1} \neq 0 \quad (7)$$

⁸ p is the autoregressive lag component of the dependent variable, which represents the number of lags of the dependent variable included in the RHS of the system. q is the distributed lag component of the explanatory variables, and also represents the number of lags of the explanatory variables to be included in the model on the RHS.

The rejection criteria follows the [Pesaran et al. \(2001\)](#) bounds testing approach to cointegration analysis, which involves a comparison of the obtained Wald F-statistic against the [Narayan \(2005\)](#) critical values. Normally, the Wald F-statistic is compared against the Pesaran critical values, however, [Narayan \(2005\)](#) observed that the [Pesaran and Shin \(1998\)](#); [Pesaran et al. \(2001\)](#) critical values were not applicable to small samples, because they were generated using large sample simulations (i.e. between 500 to 1000 observations and 20 000 to 40 000 replications). [Narayan \(2005\)](#) generated critical values for smaller sample sizes ranging from 30 to 80 observations using the same simulation approach as [Pesaran et al. \(2001\)](#) and showed that the critical values were about 18% larger than the [Pesaran and Shin \(1998\)](#); [Pesaran et al. \(2001\)](#) critical values. The sample size of the data is around 50 for the test of interdependence between economic development and institutions, and 150 for the test of interdependence between institutions. The obtained Wald F-statistics will be compared against the critical values provided by [Narayan \(2005\)](#) in the first case, while the traditional [Pesaran and Shin \(1998\)](#) critical values will be used for the second case. These critical values provide lower and upper values that make up the bounds. The values are provided at three different levels of significance and they differ depending on the restrictions placed on trend and constant, as well as the number of regressors k in the model. These upper and lower critical values are what the Wald test statistics are compared against. If the Wald F-statistic is greater than the corresponding upper critical value, I can then reject the null hypothesis of no cointegration. Consequently, if the F-statistic is lower than the lower critical value from either the [Pesaran and Shin \(1998\)](#) or [Narayan \(2005\)](#) tables, then the null hypothesis cannot be rejected. If however, the F-statistic falls between the lower and upper critical values, the bounds test for cointegration is deemed inconclusive, and unable to determine whether the variables in the model are cointegrated.

The execution of the ARDL approach requires that a certain number of lags be included, that make up both the autoregressive and distributed lag dimensions of the $ARDL(p, q_1, q_2, \dots, q_{k-1})$ model. Determining the number of lags for each variable can be attained through standard optimal lag selection techniques such as the Akaike information criterion (AIC), the Schwarz's Bayesian information criterion (SBIC), or the likelihood ratio (LR).⁹

4.2.3 Granger causality in levels

I now turn to the final aspect of the causality analysis. Having determined whether the variables of interests are integrated and or cointegrated, making it possible to test the direction of causality (if any). In this section, I give a description of the approach used in testing which of the two hypotheses (modernisation hypothesis or critical juncture hypothesis), if any, is most relevant to characterise Nigeria's development path.

The usual method employed in testing for causality between Y_t and X_t relies on the [Johansen \(1988\)](#) approach and is based on the following equations:

$$Y_t = \alpha_1 + \sum_{i=1}^n \theta_{1i} X_{t-i} + \sum_{j=1}^m \theta_{2j} Y_{t-j} + \varepsilon_t \quad (8)$$

⁹While the length of time over which the variables I have are available is longer than what has been previously available in the literature, the number of observations are still quite limited, and this will have an impact on the possible lag number included in the data. This should be kept in mind as when determining the optimal number of lags for each variable.

$$X_t = \alpha_1 + \sum_{p=1}^q \beta_{1p} Y_{t-p} + \sum_{l=1}^r \beta_{2l} X_{t-l} + u_t \quad (9)$$

where causality is tested between Y_t and X_t , ε_t and u_t are serially uncorrelated random disturbances with zero-means. The lag orders n , m , q , and r are selected using the standard Akaike information criteria (AIC) optimal lag selection technique. In this case I test for the causality between institutions and economic development, where Y_t is a measure of economic development, and X_t is a measure of institutions. Similarly, in the causality test between political institutions and economic institutions, Y_t stands for economic institutions, and X_t stands for political institutions. In both causality tests, the hypothesis being tested is $H_0 : \theta_{11} = \theta_{12} = \dots = \theta_{1n} = 0$, against the alternative that $H_1 : \theta_{1i} \neq 0$ or at least one $\theta_{1i} \neq 0$ for $i = 1, \dots, n$. A rejection of the null hypothesis implies that the variable X_t Granger causes Y_t . In a similar manner, the second null hypothesis being tested is $H_0 : \beta_{11} = \beta_{12} = \dots = \beta_{1q} = 0$, against the alternative that $H_1 : \beta_{1p} \neq 0$ or at least one $\beta_{1p} \neq 0$ for $p = 1, \dots, q$. A rejection of this null hypothesis implies that the variable Y_t Granger causes X_t .

4.2.4 Bivariate ECM in first difference

For robustness purposes, I test interdependence using a bivariate error correction model (ECM) approach. This method is based on the following equations:

$$\Delta Y_t = \alpha_1 + \sum_{i=1}^n \theta_{1i} \Delta Y_{t-i} + \sum_{j=1}^m \theta_{2j} \Delta X_{t-j} + \delta ECM_{t-1} + \varepsilon_t \quad (10)$$

$$\Delta X_t = \alpha_1 + \sum_{p=1}^q \beta_{1p} \Delta X_{t-p} + \sum_{l=1}^r \beta_{2l} \Delta Y_{t-l} + \gamma ECM_{t-1} + u_t \quad (11)$$

where Y_t and X_t were defined previously. ECM_{t-1} is a single period lagged error correction term, which will be obtained from the cointegration analysis to be performed in section 4.2.2. I test the hypothesis that $H_0 : \theta_{21} = \theta_{22} = \dots = \theta_{2m} = 0$, or $H_0 : \delta = 0$, against the alternative that $H_1 : \theta_{2j} \neq 0$ or at least one $\theta_{2j} \neq 0$ for $j = 1, \dots, m$, or $H_0 : \delta \neq 0$. The null hypothesis is tested by comparing the t-statistic of the lagged ECM term, against the critical value at 95% confidence level. A t-statistic greater than the critical value means a rejection of the null hypothesis, which would imply the existence of long-run interdependence from variable X_t to variable Y_t . On the other hand, if the the F-statistic of the model is compared against its critical value, a greater F-statistic would result in the rejection of the null hypothesis, and would in this case imply short-run interdependence running from variable X_t to variable Y_t .

4.3 Results & Discussions

4.3.1 Path dependence

The results of the unit root tests are displayed in Table 1. The DF-GLS shows that all the institutional variables are non-stationary at the 5% level of significance. The Phillips-Perron test however, gives opposing outcomes to the DF-GLS for the freehold property rights index. This discrepancy in unit root tests results.

Table 1: Unit root test

Variable	lags	d-fuller	Critical val	(Δ) d-fuller	critical val	Integral level	p-perron	(Δ) p-perron	Integral level
<i>cvpl</i>	13	-2.011	-2.785	-5.787	-2.784	1	-2.442	-13.795	1
<i>fhpr</i>	3	-0.47	-2.947	-6.115	-2.96	1	-2.944	n/a	0
<i>nfhpr</i>	2	-1.964	-2.959	-6.714	-2.96	1	-2.184	-12.57	1
<i>lgdpcap</i>	7	-0.675	-2.921	-5.728	-2.922	1	-1.228	-5.747	1
<i>growth</i>	4	-5.728**	-2.922	na		0	-5.945	n/a	0

*** signifies the 5% level of significance.

is fairly common, and results from their low power. This may be further influenced by the unusual nature of institutional data, which tend to show no variation over long periods. These data also show sharp jumps due to sudden promulgation or repealing of laws that affect the institutions. Such changes can often lead to structural breaks in a trend, which most traditional unit root tests do not accommodate.

The first differenced versions of the series for the institutional indicators (civil and political liberties, freehold and customary property rights) exhibit stationarity for both approaches. All have corresponding p-values less than 0.05. I therefore conclude that these indices are integrated of (at most) order one (that is, $I(1)$). The implications of this finding are twofold. Firstly the non-stationarity of the institutional indices implies the institutions are asymptotically correlated, and hence exhibit outcome *path* dependence (Jackson and Kollman, 2010, 2012). I can further infer from Page (2006)'s conceptualisation of *path* dependence that this also implies early path dependence. That is, the sequence of initial events has an effect on current events within the institutional environment. Therefore, the laws governing land rights in Nigeria today, including those that promote or curtail civil and political liberties or property rights, exhibit considerable path dependence and hence persistence. Furthermore, inferences can be made about equilibrium dependence in institutions from the cointegration tests I perform in the sections on interdependence (Engle and Granger, 1987; Gregory and Hansen, 1996). The results shown in Table 2 and 3 show that for the full sample (1862-2011) and the shorter period (1914-2011), all three measures of institutions were equilibrium dependent. In addition to this, the same periods (1862-1960 and 1914-2011) show equilibrium dependence, as a cointegrating equation was found for the pair of civil and political liberties and freehold property rights. This signifies a stable long-run association between political institutions and market based economic institutions.

4.3.2 Substantiating Path Dependence in Institutions in Nigeria

I illustrate path dependence in Nigerian institutions by examining the actual evolution of particular ordinances and institutional categories over time. North (1994) and Pierson (2000) argued that the activities that a group of people or society embark on, is highly dependent on the nature of the institutions present within that society. That is, members of society will tend more towards activities that make the best use of the institutions in place. In the case of Nigeria, the nature of institutions promoted by the colonial administration was extractive (Acemoglu et al., 2001, 2012). Therefore, according to the path dependence *lock-in* theory, societies within Nigeria will become well versed in the extractive behaviour (North, 1994; Pierson, 2000).

The body of laws passed in Nigeria created an environment where an extractive state prevailed. A fitting example relates to Nigeria's mineral and petroleum legislation. A system fraught with rent seeking tends to be one with minimal checks on the executive, and hence results in a society that extends arbitrary executive powers (Knack and Keefer, 1995; Persson et al., 1997). A good example is the Mineral Oils ordinance of 1914, which limited all resource exploration rights within Nigeria to only British companies and persons. This ordinance declared all resources, regardless of the property ownership of the land on which the resources were found, as belonging to the administration. Although the original ordinance was amended numerous times, the "state ownership of resources" aspect of the law has remained unchanged far into the

post-colonial era.¹⁰ Using Levi (1997)'s tree analogy, the 1914 ordinance can be regarded as a bough while the changes can be looked at as its branchlets. This exemplifies how the original arbitrary executive powers have shaped the trajectory of mineral rights throughout the history of Nigeria until now.

An even more telling example of path dependence in Nigeria is the formation and existence the Nigerian state itself. Prior to the advent of colonial administration in the country that is now know as Nigeria, numerous Kingdoms existed. With the advent of British colonial rule, some of these kingdoms were annexed and incorporated into the Lagos colony in 1862, and the Northern and Southern Nigerian Protectorates in 1900. The Lagos colony was subsequently incorporated into the Southern Nigerian Protectorate in 1906, and was eventually joined with the Northern Nigerian Protectorate in 1914 to form Nigeria. Using Levi (1997)'s metaphor, the Amalgamation Act of 1914 can be regarded as a bough that set the path for the future organisation and governance of the country even beyond independence. The formation of Nigeria as a single entity was the product of British colonialism and had to do with the administrative and financial convenience of managing of a unified territory. There was little concern for the manner in which unification affected the native populations of *Hausa*, *Igbo* or *Yoruba*. Independence did not fundamentally change this course as the new political elites continued to climb the branchlets that sprouted out of the amalgamation bough. For many years after Nigeria's independence, laws and institutions were aimed at solidifying Nigeria as a unified nation, as the various communities were forced to negotiate their own identities and a common identity as part of a process of post-independence. This resulted in the Constitution of the Federal Republic of Nigeria, which composed of 36 states in a spirit of decentralisation and recognition of regional differences.

Another illustration of path dependence and persistence of institutions in Nigeria is the freehold property rights system, which was instituted to the detriment of customary land law, and has persisted over time. The current system of land law in Nigeria is more influenced by the English freehold system than customary land law.

These illustrations highlight the importance of *lock-in* in path dependence. This is highlighted by the amalgamation of 1914, the embedding of the 1978 Land Act into the Constitutions, and the costs attached to shifting of the legal system. They point to the fact that prominent institutions in Nigeria have persisted simply because of the impossibility and prohibitive cost of reversing an initial sequence of events of laws.

4.3.3 Interdependence between economic and political institutions

In the review of the literature on interdependence between political and economic institutions, I highlight the lack of a consensus on the direction of interdependence (Giavazzi and Tabellini, 2005a; Friedman, 2009; Acemoglu et al., 2012). The main premise of the argument by Acemoglu et al. (2012) is that the inclusivity of political institutions tends to drive economic liberalisation, rather than vice versa. Following the methodology discussed earlier, The first step is to test for cointegration between economic institutions (which is represented by both freehold property rights and customary land rights) and political institutions (civil and political liberties).

¹⁰The amendments include: the repealing of exclusive exploration rights to the British in 1925; the 1946 ordinance which vested control of all of Nigeria's minerals and resources to the Crown; and further ordinances in 1969, 1971 and 1979.

Table 2: Cointegration Test

Year	Variables	rank	Eigenvalue	Trace Stats	Critical Stats	Cointegration
1863-2011	<i>cvpl, fhpr, nfhpr</i>	1	0.10221	13.7766*	15.41	Yes
	<i>cvpl, fhpr</i>	1	0.09693	6.679	3.76	Yes
	<i>cvpl, nfhpr</i>	0	.	13.0263*	15.41	No

* Represents the rejection of the null hypothesis at the 95% level of confidence. The null hypothesis being tested is that the number of cointegration vectors is higher the rank in question. The null hypothesis is rejected if the Trace Statistic > Critical Statistic. In some tests, the decision criteria never occurs, in which case the cointegration test has a full rank.

The results of the Johansen test for cointegration are reported in Table 2. Evidence of cointegration is found between civil and political liberties and freehold property rights for both time periods 1862-1914 and 1862-2011 and no cointegration for 1914-2011 and the post-independence period.¹¹ No cointegration is found between customary land rights and civil liberties in all the periods. The Johansen null for any of the cointegration tests for the post-independence period also could not be rejected.¹² This indicates that institutions supporting civil and political liberties during colonial times affect the long-run equilibrium outcomes of freehold property rights. However, those promulgated post-independence have no long-run influence on freehold property rights. This could be because the institutional environment in Nigeria has been disjointed post-independence, so that no form of long-run co-movement can be established between political and economic institutions.

I perform a Pesaran ARDL bounds test as an alternative to the conventional Johansen approach. The results for this test are presented in Table 3. The critical bounds employed were constructed by Narayan (2005) which adjusts the Pesaran et al. (2001) critical bounds for estimations with smaller sample sizes. The Pesaran bounds were created for large sample sizes, while the Narayan adaptation were for sample sizes between 30 and 80. Unfortunately, the sample size for the test of cointegration between economic and political institutions is above 80 but below 150, which is larger than the Narayan sample size but smaller than the Pesaran sample size. This results indicates that the test for cointegration is inconclusive at the 90% significance level, between freehold property rights and civil and political liberties. It also reveals no cointegration between customary land rights and civil and political liberties. This is in support of the Johansen cointegration test.

¹¹A point of interest from the cointegration test is the inference that can be made about path dependence from these results. According to Freeman (2012), a linear time series with constant coefficients is a typical example of a process that exemplifies outcome dependence. More specifically, the presence of cointegrating vectors give evidence of some form of path dependence, within a multiple moving equilibria, where the number of cointegrating vectors (rank r) determines the number of moving equilibria. Thus the variables between which there is existence of cointegration, can also be deemed as having persistent properties. This supports the unit root test for persistence. On more than one occasion, the evidence indicated that there was cointegration between the institutional variables, and it can be seen that these variables are persistent and exhibit equilibrium dependence. (This is only limited to the periods for which cointegration tests were carried out, and found to be cointegrated.)

¹²This is an interesting result, as it implies that institutions and events during colonial times have persisted until the present time. However, if I examine the institutions and events along the path of Nigeria's institutional history since independence, they have not been persistent.

Table 3: ARDL Test of cointegration between institutions

Years	Equation	F-stat	p-value	Cointegration Inference
1863-2011	$cvpl, fhpr$	5.883	0.004	Yes
	$fhpr, cvpl$	1.013	0.366	No
	$cvpl, nfhpr$	2.194	0.116	No
	$nfhpr, cvpl$	2.129	0.123	No

*, ** and *** signify 10%, 5% and 1% level of significance respectively. The first variable in the variables column is the dependent variable while the second variable is the regressor. The Critical values for the bounds test, in a case with unrestricted intercept and unrestricted trend, obtained from the [Narayan \(2005\)](#), for a case of K=1 were 6.820 - 7.670 and 5.725 - 6.450, for the lower bound and upper bound at the 95% and 90% levels of significance respectively. The critical values from the Pesaran table for a similar case were 6.56 - 7.30 and 5.59 - 6.26 for the lower bounds and upper bounds at the 95% and 90% levels of significance respectively.

Table 4: Test for Granger causality between political and economic institutions 1862-2011

VAR Granger causality test in levels							
Equation	chi2	df	p-val	Inference			
$fhpr \Rightarrow cvpl$	8.847***	1	0.003	Yes			
$cvpl \Rightarrow fhpr$	0.007	1	0.933	No			
Bivariate ECM causality test in first-difference							
Equation	ECM _{t-1}	Std. err	z	p-val	[95% Conf. Interval]	Inference	
$fhpr \Rightarrow cvpl$	0.176***	0.051	-3.420	0.001	-0.277	-0.075	Yes
$cvpl \Rightarrow fhpr$	-0.013	0.012	-1.120	0.264	-0.037	0.010	No

*, ** and *** signify 10%, 5% and 1% level of significance respectively. The Null hypothesis is one of no Granger causality, that is the first variable in the variable column does not Granger cause the second variable in the column. In the VAR in levels causality approach, the null hypothesis is rejected in the Chi-square value is greater than the critical value, or if the p-value is less than 0.05. In the difference bivariate ECM approach, we reject the null if the Z-stat is greater than the critical value, or the P-value is less than 0.05. In both instances, a rejection of the null hypothesis implies that the first variable Granger causes the second variable, The last column reports the inferred result, whether or not the first variable Granger causes the second variable.

The Granger causality analysis is performed, which is dependent on the existence of a cointegrating relationship between political institutions and economic institutions. Previous studies have paid reasonable attention to sub-Saharan African countries, and in many of those cases, the argument has been that the interdependence runs from political to economic institutions ([Ken Farr et al., 1998](#); [Acemoglu et al., 2001](#); [Acemoglu and Robinson, 006b](#); [Acemoglu et al., 2012](#)). Table 4 shows the results for Nigeria, employing the two methodologies discussed earlier. The initial cointegration tests found there to be one cointegrating relationship between $cvpl$ and $fhpr$, but none between $cvpl$ and $nfhpr$. The VAR Granger causality tests (in levels) confirm this, as evidence of interdependence between $cvpl$ and $fhpr$ was found, with the direction going from the latter to the former. The results obtained from the tests above paint a picture of a dynamic relationship between economic and political institutions in Nigeria. In essence freehold property rights Granger causes political and civil liberties, as shown in equation (12) This linear relationship reads as:

$$cvpl = 0.278 + 0.769 * fhpr \quad (12)$$

$$fhpr = 2.065 - 0.133 * cvpl \quad (13)$$

Therefore no support was found for [Giavazzi and Tabellini \(2005a\)](#) or [Acemoglu et al. \(2012\)](#)'s argument that political institutions cause economic institutions. Rather, the findings are in tune with [Ken Farr et al. \(1998\)](#). One intriguing finding is the lack of any interdependence or cointegration between customary property rights and political liberalisation in Nigeria. This could be because Nigeria was a non-settler colony, and thus the passing of laws pertaining to customary rights in land did not systematically relate to the laws that affected the political freedoms of the natives during colonial times. By contrast, in settler colonies like Kenya, numerous laws undermining customary property rights were passed simultaneously with laws that weakened civil and political liberties to force natives to provide cheap labour to European settlers ([Letete et al., 2013](#)).

4.3.4 Interdependence between institutions and economic development

In the analyses of the long-run causal relationship between economic development and institutions, the results will either point towards the *modernisation* hypothesis or the *critical juncture* hypothesis. The measure of economic development employed is per capita growth of gross domestic product. This variable comes from the Penn World Table 8.0 ([Feenstra et al., 2013](#)). Studies have argued that the sequence of events matter for development, suggesting that if economic liberalisation precedes political liberalisation, then economic development is attained faster ([Giavazzi and Tabellini, 2005b](#)).

Table 5: ARDL test of cointegration between economic development and institutions

Year	Equation	F-stat	p-value	Cointegration Inference
1952-2011	<i>cvpl, growth</i>	4.829**	0.012	No
	<i>growth, cvpl</i>	9.161**	0.000	Yes
	<i>fhpr, growth</i>	1.934	0.155	No
	<i>growth, fhpr</i>	11.074***	0.000	Yes
	<i>nfhpr, growth</i>	2.384	0.104	No
	<i>growth, nfhpr</i>	10.019**	0.000	Yes

*, ** and *** signify 10%, 5% and 1% level of significance respectively. The first variable in the variables column is the dependent variable while the second variable is the regressor. The Critical values for the bounds test, in a case with unrestricted intercept and unrestricted trend, obtained from the [Narayan \(2005\)](#), for a case of K=1 were 9.585 - 10.420, 6.605 - 7.735 and 5.765 -6.500 for the lower bound and upper bound at the 99%, 95% and 90% levels of significance respectively.

The first step is to test for the existence of a long-run relationship between economic development and institutions, which is a necessary condition for the existence of long-run interdependence. As shown in [Table 5](#), cointegration relationships exist between economic development and all three institutional measures. However, this long-run co-movement only runs only from institutions to growth. The reverse is not true.

While there is evidence of a long-run relationship between the three measures of institutions and economic growth. In none of the equations can a claim be made for causality between institutions and economic development. None of the institutional indicators, significantly impact economic growth in the long-run.

5 Conclusion

In this paper, I set out to determine whether or not there is path dependence and hence persistence in institutions. I also examine whether there exists any form of interdependence between political and economic institutions, and the direction thereof. Finally, I examine the interactions as well as the nature of interdependence between institutions and economic performance.

The results indicate that there is indeed path dependence and persistence in institutions in Nigeria. I argue that many of the institutions established during colonial times have had an impact on the current state of institutions in Nigeria. This equates to outcome dependence as conceptualised by Page (2006). In analysing persistence, empirical evidence of path dependence does not suffice. I substantiate the empirical evidence through illustrations of persistence of institutions in Nigeria's history. It was shown that Nigeria's institutional history with regard to resource ownership, amalgamation, and freehold property rights, exemplifies path dependence. I further argue that path dependence in Nigeria in these instances can be explained by the "lock-in" concept.

I also test for long-run co-movement between political institutions and economic institutions, and find that the long-run interdependence seems to go from market based institutions to political institutions. The overall picture is one of interdependence between the two types of institutions, with the evidence pointing more towards dependence of political institutions on market based economic institutions. Such a finding has policy implications for Nigeria. It suggests that maybe more attention needs to be paid to freehold land rights, even as the overall concern is to improve the quality of all institutions in Nigeria.

I also examine the interdependence between institutions and economic development. The results show that, again, isolating a single relationship is problematic when analysing the nature of interdependence between institutions and economic development. Evidence of the existence of a long-run association between political institutions and both freehold and customary property rights and economic growth was found, with growth being the dependent variable. However, when considered as whole, there was no evidence of Granger causality between any of the three institutions and economic growth.

Finally, I am aware of some of the methodological concerns over the use of subjectively constructed indicators for institutions, which means a certain level of caution needs to be taken when interpreting these results. Notwithstanding, these results provide substantial information about the dynamics of institutional changes in Nigeria.

References

- Acemoglu, D., S. Johnson, and J. A. Robinson: 2001, 'The Colonial Origins of Comparative Development: An Empirical Investigation'. *THE AMERICAN ECONOMIC REVIEW* **91**(5).
- Acemoglu, D. and J. A. Robinson: 2006b, 'Persistence of power, elites and institutions'. Technical report, National Bureau of Economic Research.
- Acemoglu, D., J. A. Robinson, and D. Woren: 2012, *Why nations fail: the origins of power, prosperity and poverty*, Vol. 4. SciELO Chile.
- Aghion, P., A. Alesina, and F. Trebbi: 2002, 'Endogenous political institutions'. Technical report, National bureau of economic research.
- Arthur, W. B.: 1994, *Increasing returns and path dependence in the economy*. University of Michigan Press.
- Barro, R. and X. Sala-i Martin: 1995, 'Economic growth'. *Boston, MA*.
- Boldrin, M. and D. K. Levine: 2013, 'The case against patents'. *The journal of economic perspectives* **27**(1).
- David, P. A.: 1985, 'Clio and the Economics of QWERTY'. *The American economic review* pp. 332–337.
- Dollar, D. and A. Kraay: 2003, 'Institutions, trade, and growth'. *Journal of monetary economics* **50**(1), 133–162.
- Easterly, W. and R. Levine: 2003, 'Tropics, germs, and crops: how endowments influence economic development'. *Journal of monetary economics* **50**(1), 3–39.
- Ebbinghaus, B.: 2005, 'Can path dependence explain institutional change?: Two approaches applied to welfare state reform'.
- Elliott, G., T. J. Rothenberg, and J. H. Stock: 1992, 'Efficient tests for an autoregressive unit root'.
- Engerman, S. L. and K. L. Sokoloff: 1994, 'Factor endowments: Institutions, and differential paths of growth among new world economies: A view from economic historians of the united states'. *National Bureau of Economic Research*.
- Engle, R. F. and C. W. Granger: 1987, 'Co-integration and error correction: representation, estimation, and testing'. *Econometrica: journal of the Econometric Society*.
- Fadiran, D.: 2015, 'Essays on Institutional Evolution and Economic Development: Evidence From Nigeria'. Ph.D. thesis, University of Cape Town.
- Fedderke, J. W., R. H. de Kadt, and J. M. Luiz: 2001, 'Indicators of political liberty, property rights and political instability in South Africa: 1935–97'. *International Review of Law and Economics* **21**(1).
- Feenstra, R. C., R. Inklaar, and M. Timmer: 2013, 'The next generation of the Penn World Table'. Technical report, National Bureau of Economic Research.
- Freeman, J.: 2010, 'Can Time Series Methods Be Used to Detect Path Dependence?'. In: *NSF sponsored conference on Path Dependence, University of Minnesota, June*.
- Freeman, J. R. and J. E. Jackson: 2012, 'Symposium on Models of Path Dependence'. *Political Analysis* **20**(2).

- Friedman, M.: 2009, *Capitalism and freedom*. University of Chicago press.
- Giavazzi, F. and G. Tabellini: 2005a, 'Economic and political liberalizations'. *Journal of Monetary Economics* **52**(7).
- Giavazzi, F. and G. Tabellini: 2005b, 'Economic and political liberalizations'. *Journal of Monetary Economics* **52**(7).
- Gregory, A. W. and B. E. Hansen: 1996, 'Residual-based tests for cointegration in models with regime shifts'. *Journal of econometrics* **70**(1), 99–126.
- Group, W. B.: 2012, *World development indicators 2012*. World Bank Publications.
- Gundlach, E. and M. Paldam: 2009, 'The transition of corruption: From poverty to honesty'. *Economics Letters* **103**(3), 146–148.
- Gwenhamo, F., J. Fedderke, and R. de Kadt: 2008, 'Measuring institutions: The zimbabwe case'. *Economic research South Africa working paper* **112**.
- Gwenhamo, F., J. W. Fedderke, and R. De Kadt: 2012, 'Measuring institutions Indicators of political rights, property rights and political instability in Zimbabwe'. *Journal of Peace Research* **49**(4), 593–603.
- Hall, R. E. and C. I. Jones: 1999, 'Why do some countries produce so much more output per worker than others?'. *The quarterly journal of economics* **114**(1).
- Huntington, S. P.: 1984, 'Will more countries become democratic?'. *Political Science Quarterly* pp. 193–218.
- Jackson, J. E. and K. Kollman: 2010, 'A formulation of path dependence with an empirical example'. *Quarterly Journal of Political Science* **5**(3), 257–289.
- Jackson, J. E. and K. Kollman: 2012, 'Modeling, measuring, and distinguishing path dependence, outcome dependence, and outcome independence'. *Political Analysis* **20**(2).
- Johansen, S.: 1988, 'Statistical analysis of cointegration vectors'. *Journal of economic dynamics and control* **12**(2).
- Ken Farr, W., R. A. Lord, and J. L. Wolfenbarger: 1998, 'Economic freedom, political freedom, and economic well-being: a causality analysis'. *Cato J.* **18**, 247.
- Knack, S. and P. Keefer: 1995, 'Institutions and economic performance: cross-country tests using alternative institutional measures'. *Economics and Politics* **7**(3).
- Kormendi, R. C. and P. G. Meguire: 1985, 'Macroeconomic determinants of growth: cross-country evidence'. *Journal of Monetary economics* **16**(2).
- Krugman, P.: 1990, 'Increasing returns and economic geography'. Technical report, National Bureau of Economic Research.
- La Porta, R., F. Lopez-de Silanes, A. Shleifer, and R. Vishny: 1999, 'The quality of government'. *Journal of Law, Economics, and organization* **15**(1).
- Letete, E. M., M. Sarr, and J. Fedderke: 2013, 'Institutions and Political Instability in Kenya: Measurement and Tests of Institutional Persistence and Interdependence.'. Available at SSRN 2263484.

- Levi, M.: 1997, 'A model, a method, and a map: Rational choice in comparative and historical analysis'. *Comparative politics: Rationality, culture, and structure* **28**.
- Liebowitz, S. J. and S. E. Margolis: 1995, 'Path dependence, lock-in, and history'. *Journal of Law, Economics, & Organization* pp. 205–226.
- Lipset, S. M.: 1959, 'Some social requisites of democracy: Economic development and political legitimacy'. *American political science review* **53**(01), 69–105.
- Maddala, G. and S. Wu: 2000, 'Cross-country growth regressions: problems of heterogeneity, stability and interpretation'. *applied Economics* **32**(5), 635–642.
- Narayan, P. K.: 2005, 'The saving and investment nexus for China: evidence from cointegration tests'. *Applied economics* **37**(17).
- North, D. C.: 1990, *Institutions, institutional change and economic performance*. Cambridge university press.
- North, D. C.: 1994, 'Economic performance through time'. *The American economic review* **84**(3), 359–368.
- Page, S. E.: 2006, 'Path dependence'. *Quarterly Journal of Political Science* **1**(1).
- Perron, P. and T. J. Vogelsang: 1992, 'Nonstationarity and level shifts with an application to purchasing power parity'. *Journal of Business and Economic Statistics* **10**(3).
- Persson, T., G. Roland, and G. Tabellini: 1997, 'Separation of powers and political accountability'. *The Quarterly Journal of Economics* pp. 1163–1202.
- Pesaran, M. H. and Y. Shin: 1998, 'An autoregressive distributed-lag modelling approach to cointegration analysis'. *Econometric Society Monographs* **31**.
- Pesaran, M. H., Y. Shin, and R. J. Smith: 2001, 'Bounds testing approaches to the analysis of level relationships'. *Journal of applied econometrics* **16**(3).
- Phillips, P. C. and P. Perron: 1988, 'Testing for a unit root in time series regression'. *Biometrika* **75**(2), 335–346.
- Pierson, P.: 2000, 'Increasing returns, path dependence, and the study of politics'. *American political science review*.
- Pourgerami, A.: 1988, 'The political economy of development: A cross-national causality test of development-democracy-growth hypothesis'. *Public Choice* **58**(2), 123–141.
- Przeworski, A. and F. Limongi: 1993, 'Political regimes and economic growth'. *The journal of economic perspectives* pp. 51–69.
- Rodrik, D., A. Subramanian, and F. Trebbi: 2004, 'Institutions rule: the primacy of institutions over geography and integration in economic development'. *Journal of economic growth* **9**(2).
- Romer, P. M.: 1986, 'Increasing returns and long-run growth'. *The Journal of Political Economy* **94**.
- Scully, G. W.: 1988, 'The institutional framework and economic development'. *The Journal of Political Economy* **96**(3).
- Wooldridge, J. M.: 2010, *Econometric analysis of cross section and panel data*. MIT press.