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Determinants of Property Rights Protection in Sub-Saharan Africa

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Determinants of Property Rights Protection in Sub-Saharan Africa**Simplice A. Asongu & Oasis Kodila-Tedika**

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Abstract

This article complements existing literature by assessing determinants of property rights protection with particular emphasis on history, geography and institutions in Sub-Saharan Africa. The empirical evidence is based on a sample of 47 countries for the period 2000-2007. Random effects GLS regressions are employed using property rights measurements from the Mo Ibrahim and Heritage foundations. The results broadly show that ethnic fractionalisation, Polity IV and GDP per capita have positive effects on property rights institutions while the following have negative effects: military rule, the Protestant religion, maturity from colonial independence and population density. The findings have relevant policy implications for countries in the sub-region currently on the path to knowledge-based economies.

JEL Classification: F42; K42; O34; O38; O57

Keywords: Property rights protection; Panel data; Africa

1. Introduction

Over the past two decades, the pioneering contributions of North (1990) have motivated a strand of empirical studies on the quality of economic institutions and private property rights. These are fundamental drivers of economic prosperity at national and per capita income levels (Mauro, 1995; Knack & Keefer, 1995; Acemoglu et al., 2001, 2002; Easterly & Levine, 2003; Rodrik et al., 2004; Pande & Udry, 2006)¹. But what are the

¹ More literature on the relationship between the quality of institutions and the performance of nations can be found in *inter alia*: Acemoglu et al. (2005), Djankov et al. (2003); Baland et al. (2010) and Fosu (2015ab).

determinants of economic institutions and property rights? While it is certain that good institutional quality is highly desirable, circumstances under which a good institutional environment is protected from menaces of interest groups and political classes are also of policy relevance. This has led to a stream of the literature being focused on the determinants of institutional quality (Chong & Zanforlin, 2000; Islam & Montenegro, 2002; Alonso & Garcimartín, 2013; Kanyama-Kalonda & Kodila-Tedika, 2012; Kodila-Tedika, 2014; Kodila-Tedika, & Tcheta-Bampa, 2014), with emphasis on property rights (Mijiyawa, 2013²; Ayyagari et al., 2013). Two gaps are noticeable in the above studies: on the one hand, scholarship on property rights protection is sparse in Africa and on the other hand, the current drive towards knowledge-based economies across the continent invites an inquiry into the determinants of property rights' institutions because such institutions are essential in boosting knowledge economy (KE).

KE has become indispensable for competitiveness in today's World economy. Narratives maintaining this position include: (i) the relevance of KE in reports from the Organization of Economic Co-operation and Development (OECD) and the World Bank (World Bank, 2007; Tchamyu, 2015; Weber, 2011); (ii) the use of KE by developed countries to drive development in the global arena on the one hand and on the other hand, some evidence of catch-up by Latin American and East Asian nations which are increasingly asserting their footprints in KE (Dahlman, 2011; Asongu, 2013a, 2014a; Chandra & Yokoyama, 2011); (iii) the historic KE pattern of Japan has inspired the newly industrialized economies of East Asia (Asongu, 2013b); (iv) the South East Asian miracle holds special KE lessons for Africa (Kim, 2013; Tran, 2011) and (v) the overall KE index of Africa dropped during the period 2000 to 2009 (Anyanwu, 2012; Asongu, 2015a).

² This author has proposed an extensive literature on the determinants of property rights. .

Interest in the intellectual property rights (IPRs) dimension of KE has been concentrated around two principal streams of thought. Accordingly, a stream is of the perspective that growing protection of IPRs is favourable for economic prosperity and development (Falvey et al., 2006; Asongu, 2015b; Gould & Gruben, 1996). Conversely, another stream has documented that growth could be seriously constrained by the protection of IPRs and adoption of IPRs in less developed countries (Yang & Maskus, 2001; Andrés & Asongu, 2015, 2016). The main argument of this latter school of thought maintains that less stringent IPRs are essential at the early stages of industrialization in order to enhance knowledge spillovers in less developed nations. A core intuition of this perspective is that technology in less developed nations is unsuited for innovation, but friendlier to adaptation and imitation³. In the light of above narratives, there has been an evolving interest in how the protection of IPRs affects economic development, technological progress and innovation (Andrés, 2006; Goel & Nelson, 2009; Banerjee et al., 2005; Bezmen & Depken, 2006; Bezmen & Depken, 2004; Andrés & Goel, 2012; Peitz & Waelbroeck, 2006).

Given the above interesting background, this paper is a direct extension of a stream of studies by Asongu and Andrés on IPRs protection/promotion in Africa. They have examined timelines for IPRs harmonization against software piracy in Africa (Asongu, 2013a) and the World (Andrés & Asongu, 2013a, 2016), notably on: (i) how IPRs matter in the KE-finance nexus (Asongu, 2013b) and (ii) the role of IPRs in the fight against software piracy (Asongu, 2015b).

This study has at least three contributions to the literature. First, it extends a recent strand of literature which has shown that in the fight against piracy, not all IPRs protection channels play a positive role, regardless of legal origins (Asongu, 2015). The strand has been

³ Consistent with Asongu (2015b), this second strand has prominently featured in the debate because of arguments about whether permission for the copying of life-saving pharmaceuticals should be given to developing nations that are less likely to afford for HIV/AIDS treatments but most affected by the disease burden.

broadly supported by Andrés et al. (2015) who have shown that using governance mechanisms to uphold IPRs is not a necessary condition for KE in Africa. This inquiry extends the strand by explaining the protection of property rights through history, geography and religion. Second, apart from the highlighted studies by Andrés, Amavilah and Asongu, the paper also steers clear of the KE literature that is not focused on IPRs (AfDB, 2007; Dahlman, 2007; Aubert, 2005; Bizri, 2009; Britz et al., 2006; Lightfoot, 2011; Makinda, 2007). Third, the positioning of the study also improves understanding of African entrepreneurship and business literature (Oseifuah, 2010; Mensah & Benedict, 2010; Singh et al., 2011; Gerba, 2012; Tchamyu, 2015; Asongu & Tchamyu, 2016), especially in the substantially documented need for investment (Anyanwu, 2007, 2009; Bartels et al., 2009; Darley, 2012; Bartels et al., 2014; Rolfe & Woodward, 2004; Tuomi, 2011). In essence, the protection and promotion of private property rights are very likely to stimulate investment (foreign, domestic and private).

The remainder of the study is organised as follows. Section 2 discusses the theoretical foundations. The data and methodology are covered in Section 3. Section 4 presents and discusses the results while Section 5 concludes with implications.

2. Property rights protection and development

2.1 Property rights protection

The dominant intellectual property (IP) literature maintains that IPRs influence development in two main ways (Bezmen & Depken, 2004; Asongu, 2015b). A first narrative discusses the degree by which IPRs affect the creation of novel knowledge and diffusion of existing knowledge across countries. A second stream on the indirect impact maintains that a country's IPRs regime determines factors needed for economic prosperity from international transactions.

The ‘creation and dissemination of knowledge’ which constitute the first stream holds that the protection of IPRs has origins in endogenous growth theories in which investors are rewarded with higher returns (or profit) through enhanced conditions for research and development (R&D). This increases the stock of knowledge in society and drives-down the cost of potential innovation while at the same time improving the general outlook in knowledge accumulation that is needed for economic prosperity (Romer, 1990; Grossman & Helpman, 1991; Asongu, 2015b).

According to the second stream, a country’s development may also be affected by the manner in which it engages transactions at the international level like Foreign Direct Investment (FDI) flows, trade and technology transfers (Bezmen & Depken, 2014). While some skeptics postulate that adherence to strong IPRs regimes could diminish the need for international transactions like FDI (Yang & Maskus, 2001), another narrative is of the stance that tighter IPRs are essential for increasing: exports (Maskus & Penubarti, 1995); the transfer of technology and FDI (Less & Mansfield, 1996) and avenues of investment (Seyoum, 1996; Mansfield, 1994). In a nutshell, the theory of endogenous growth supports international transactions as an important channel for the transfer of technology and better utilization of resources (Todaro & Smith, 2003).

2.2 Property rights protection and development

Borrowing from the underlying literature (Shadlen et al., 2005; Asonguet al., 2016), the principal forms of IPRs are patents and copyright. The latter is a *form of expression* in terms of artistic work or written material whereas the former protects the ideas motivating industrial processes and products. The processes of invention and artistic creation could take the form of public commodities and become the object of concerns in collective action if the government does not put mechanisms in place to enforce patents and copyright laws. This ‘collective action issue’ is tackled with IPRs which are designed to offer authors and

inventors temporal monopolies. The issue arising from IPRs management is the trade-off between producer and consumer needs. The trade-off remains very complex, essentially because the features of ideas and expressions are distinguished commodities. Accordingly, IPRs are significantly different from classic property rights because of tangibility. The main idea here is that the consumption of ideas is non-excludable and non-rival. In other words, the idea can be used repeatedly without depletion by an unlimited number of consumers. But restricted use can stifle innovation and limit the production of ideas (Yang & Maskus, 2001; Bessen & Maskin, 2000; Helpman, 1993; Shadlen et al., 2005; Maskus, 2000). Therefore, the principal challenge in IPRs management is to avoid the deterrence of distribution while creating incentives for the provision of ideas and knowledge.

In order to strike the interesting balance between distribution and provision, there has been a historic curtailment of IPRs. For instance, the private rights to ideas are not granted automatically upon possession. Neither are these rights indefinite. Hence, when patents and copyrights expire, they enter into the public entity (Asongu, 2014b). In the perspective of being subject to a variety of automatic exceptions, the rights to private property are also limited. Hence, the use of protected commodities and ideas are also endowed to third parties. This dimension of copyright is governed by the fair-use doctrine which enables third parties to use copyrighted products irrespective of the intention of third parties.

According to Lessig (2001, p. 249), prior to the 1980s, governments in the world offered weak and porous copyright protection. The fundamental changes in IPRs laws that were introduced during this period were meant to overcome the shortcomings that distinguished tangible property from IPRs (Shadlen et al., 2005). From an African perspective, apart from debates on trade-off between reduced diffusion of novel commodities and innovation, there has been a recent stream of studies by Asongu and Andrés on IPRs protection/promotion. They have examined: (i) timelines for IPRs harmonization in Africa

(Asongu, 2013a) and the world (Andrés & Asongu, 2013a, 2016) against software piracy; (ii) how IPRs matter in the KE-finance nexus (Asongu, 2013b) and (iii) the role of IPRs in the fight against software piracy (Asongu, 2014b). The present inquiry extends this strand of the literature by explaining the protection of property rights with particular emphasis on history, geography and religion.

The engaged literature clearly articulates the importance of property rights in the development process. Hence, understanding the determinants of these property rights in Sub-Saharan Africa is important for the post-2015 development agenda because property rights drive investment on the one hand and on the other hand, investment is needed for growth and poverty reduction. In policy essence, investment, growth and poverty reduction are essential in the post-2015 sustainable development agenda because a 2015 World Bank report on the Millennium Development Goals (MDGs) has revealed that extreme poverty has been decreasing in all regions of the world with the exception of Sub-Saharan Africa (World Bank, 2015).

3. Data and Methodology

The study examines a panel of 47 countries with data from the Heritage Foundation and Wall Street Journal (HER-WSJ), Mo Ibrahim Foundation and World Bank Development Indicators (WDI). The property rights variables are obtained from the first-two sources. With regard to the first source, the variable evaluates the ability of people to accumulate private property that is guaranteed within a legal framework which is clearly respected by the State. It measures the level at which private property rights are protected by the law and respected by the State. These include: expropriation risks, independence of the judiciary system, corruption in the judicial system and the capacity of corporations and individuals to respect contracts. The measurement has been substantially used in empirical studies to measure private property (Ayyagari et al., 2013).

On the second source, the variable from the Mo Ibrahim Foundation is composed of many underlying indicators measuring the same dimension from varying sources or measuring similar dimensions from the same source. The underlying variables are: property rights from the African Development Bank and World Bank; property rights from the Berstelmann Foundation; guaranteed of rights from the Economist Intelligence Unit (EIU) and property rights from the Heritage Foundation and the World Street Journals. The two variables of property rights are used for robustness purposes.

The control variables are broadly consistent with Ayyagari et al. (2006). In fact they have been rationally used in the literature. To them, we have added other variables, notably: the judicial process, the size of the State or population and independence. Justice is measured by the judicial process, which ranges from 1 to 100, with higher values for higher justice quality. The EIU data is commissioned by the Mo Ibrahim Foundation. This indicator assesses the extent to which the judicial process or courts are subject to interference or distortion by interest groups. It refers to the measurement of democratic institutional quality in a country: Polity 2. This index measures the level of democracy corrected for dictatorial influence. This index ranges from -10 to 10, with higher values indicating better democratic institutions. The data on Polity IV is obtained from WDI.

Ethnic fragmentation (*Ethnicfract*) is obtained from Alesina et al. (2003). Ethnic fragmentation measures for each country, the probability that two generic individuals are not from the same ethnic group. Legal origin (*Origdroitang*) is a dummy variable that takes the value of 1 for English common law countries and 0 otherwise. This indicator was proposed by La Porta et al. (1999). From the data, we have created religious variables in accordance with the logic of Ayyagari et al. (2006). For instance, if the protestant religion is dominant in a given area, a value of 1 is assigned it. The GDP per capita variable is from Penn World Tables while the military rule indicator is from Raul et al. (2013).

Table 1 below presents the summary statistics. The means of the variables are quite comparable and judging from the standard deviations we can be confident that reasonable estimated nexuses would emerge.

Table 1 – Summary statistics

Variables	Mean	Std. Dev.	Min	Max
Property Rights (Heritage foundation)	38.159	14.778	10	70
GDP per capita (log) (t-4)	7.562	.952	5.743	9.871
GDP per capita (log) (t-1)	7.589	.965	5.743	10.062
Judicial process	30.478	31.702	0	100
PropertyRights (Fondation Mo Ibrahim)	44.517	19.834	0	93.452
Catholics religion	.2917	.455	0	1
Protestants religion	.042	.200	0	1
Muslims religion	.271	.445	0	1
Other religion	.396	.490	0	1
Common law	.422	.495	0	1
Military rule	.336	.473	0	1
Independancy	41.729	18.571	5	160
Population (log)	8.651	1.582	4.358	11.873
GDP per capita (log)	7.598	.969	5.743	10.062
EthnicFractionalization	.673	.208	.0582	.930
Polity IV	-6.323	24.618	-88	10

Std. Dev. Standard Deviation. Min: Minimum. Max: Maximum.

3. Empirical results

The first table of this section presents baseline estimation results. The first-two columns of the table entail findings from Fixed Effects and Random Effects models. With the knowledge that some variables do not vary substantially while others are dummies, the Random Effects model is preferred to the Fixed Effects option. Moreover, the null hypothesis of the Hausman test is not rejected, which suggests that the Random Effects model is a better fit. Hence, the interpretations in Table 2 begin from the second column with the Random Effects model.

Many researchers have used cross sectional regressions in order to examine the hypothesis of institutional efficiency in which per capita income or general economic growth is strongly influenced by institutions. To the best of our knowledge, Clague et al. (1996) were

the first to examine the North (1981) and Rosenberg and Birdzell (1986) hypothesis on the positive association between enhanced economic activities and the quality of institutions. A substantial bulk of the literature has produced results that are coherent with the underlying hypothesis (see for example Kaufmann & Kraay, 2002; Keefer & Knack, 2002; Feng, 2003). Our estimations broadly confirm this hypothesis since development is accompanied with an improvement in property rights. The coefficient is the second highest in terms magnitude. Clague et al. (1996) have established that the quality of institutions improves with maturity from colonial independence because time helps consolidate stronger institutions. Unfortunately our findings do not enable us to validate this assertion from an African perspective.

All societies may not have the same conception of what is good for their members (Weber, 1958; Banfield, 1958; Putnam, 1993; Landes, 1998, 2000). This asymmetry in perspective creates intentional differences. Though some authors have emphasised the importance of cultural values to explaining differences in the quality of institutions across countries (North, 1990; Greif, 1994; Lal, 1999), there are relatively few empirical studies that have analysed the effect of culture on institutional quality. Some studies that have empirically assessed the nexus have concluded on a significant relationship between cultural variables and institutional quality (e.g. see La Porta et al., 1999; Stulz & Williamson, 2003; Licht et al., 2005, 2008; Nunn, 2012; Alesina & Giuliano, 2015). First, one very common way to measure these cultural dimensions is to use proxies that capture religion. This dimension is considered in the third column of Table 2. However, this consideration does not fundamentally change the behaviour of the variables. Second, only the variable on protestant religion is of statistical interest. Accordingly, the growth of Protestantism tends to mitigate property rights in Africa while other religions have the opposite effect, though not significantly.

Table 2. Dependent Variable: Property Rights (Mo Ibrahim Foundation)

	(1)	(2)	(3)	(4)	(5)	(6)
Judicial	.398*** (.024)	.399*** (.023)	.399*** (.023)	.399*** (.023)	.399*** (.023)	.411*** (.023)
Independancy	.052 (.038)	.033 (.037)	.034 (.037)	.021 (.038)	.034 (.037)	.002 (.037)
Common law	.693 (1.363)	.739 (1.359)	.820 (1.385)	.501 (1.370)	.738 (1.361)	1.084 (1.342)
Military rule	-4.810*** (1.396)	-4.952*** (1.390)	-5.009*** (1.4039)	-4.239*** (1.498)	-4.981*** (1.455)	-5.195*** (1.371)
Population (log)	.151 (.602)	-.040 (.595)	-.048 (.596)	-.235 (.614)	-.033 (.603)	-.693 (.615)
GDP per capita (log)	6.068*** (.922)	5.766*** (.910)	5.757*** (.912)	5.534*** (.927)	5.776*** (.923)	5.275*** (.907)
EthnicFractionalization	16.443*** (3.9367)	16.872*** (3.922)	17.075*** (3.981)	17.107*** (3.923)	16.844*** (3.949)	19.987*** (3.967)
Polity IV	.1376*** (.0269)	.132*** (.027)	.133*** (.027)	.132*** (.027)	.132*** (.027)	.138*** (.026)
Catholic Religion			.463 (1.501)			
Other religion				1.893 (1.495)		
Muslims Religion					.107 (1.542)	
Protestants Religion						-10.678*** (3.075)
Constant	-26.536** (11.603)	-22.106* * (11.405)	-22.255** (11.428)	-19.124 (11.636)	-22.259* (11.631)	-13.298 (11.518)
Hausman (p-value)	0.7223					
R ² within	0.6283	0.6280	0.6281	0.6292	0.6280	0.6392
R ² between	0.6983	0.6659	0.6653	0.6010	0.6684	0.5523
R ² overall	0.6226	0.6229	0.6230	0.6246	0.6229	0.6350
Obs	374	374	374	374	374	374
Method	Fixed-effects (within) regression	Random- effects GLS regression	Random- effects GLS regression	Random- effects GLS regression	Random- effects GLS regression	Random- effects GLS regression

Standard errors in parentheses. *, **, ***: significance levels at 10%, 5% and 1% respectively.

The works of La Porta et al. (1998, 1999, 2008) have underlined the significant role of judicial-systems' legal origins in the protection of private property rights or enhancement of government performance. Beck et al. (2003) have also shown that developing countries of French civil law have lower levels of private property rights protection compared to their English common law counterparts. Hence, there is consensus in the literature on the advantages of English common law (e.g. Agbor, 2015; Asongu, 2012). Our findings are consistent with this consensus. While the effect is positive, albeit not significant, in our regressions we have a variable that directly captures the effect of justice. However, if the *common law* effect substantially reflects the judicial process of a country, it could be logical to find the effect insignificant, since the variable measuring the judicial process is highly

significant. In other words, the common law effect will be indirect when we control for the effect of justice.

Another strand of the literature maintains that institutions (political & economic) are not chosen by all members of the society, but by a group of individuals that hold political power at a certain point in time. This group results from conflict of interest. The group that emerges victorious in these conflicts provides institutions that maximise personal gain (in terms of political power and personal income) and not necessarily the society's income at large. North (1981) has substantially contributed to laying the foundations for this literature. However, other researchers have followed-suit to postulate that political motivations of certain government elite weaken property rights and control power in order to benefit from national wealth as much as possible (Robinson, 1998; Gradstein, 2004; Acemoglu & Robinson, 2000, 2005, 2008; Acemoglu et al., 2008; North et al., 2009, 2012; Nunn, 2011). Empirical studies of this approach are substantial and entail many political, economic and cultural factors. Among these contributions is that of Keefer and Knack (1996) which investigates the role of democracy in the quality of institutions. The authors have observed a direct correlation between constraints weighing on the executive and the quality of institutions. Our results are broadly consistent with the consensus that democracy has a non-negligible role in the respect of property rights institutions.

Observations from a plethora of authors corroborate the hypothesis on the effect of inequality on property rights institutions (Alesina & Perotti, 1996; Rodrick, 1999; Keefer & Knack, 2000). Keefer and Knack (2002) have used income-inequality as a measure of social polarisation and shown that countries with high inequality have the least levels of private property rights. Next, ethnic divisions can also exert similar effects because they are associated with polarised societies. They could also engender conflicts in redistribution because different ethnic groups may be more concerned about the prosperity of those from

their ethnicity than in society at large. This type of division could fuel political instability and weak economic institutions. The findings of Easterly and Levine (1997) and Collier (2000) support this thesis. A negative relationship between the quality of institutions and inequality has been established by Easterly (2007). Finally, Acemoglu et al. (2005) have suggested three potential determinants of institutional quality: the level of democracy, income inequality and natural resources. In our estimations, ethnic fragmentation as well as military rule could also reflect the above narratives. This confirms the fact that the politico-geographic dimension is an important factor in Africa.

Table 3. Dependent Variable: Property Rights (Heritage Foundation)

	(1)	(2)	(3)	(4)	(5)
Judicial	.202*** (.049)	.201*** (.050)	.200*** (.049)	.200*** (.049)	.208*** (.050)
Independancy	-.462*** (.136)	-.477*** (.137)	-.468*** (.136)	-.471*** (.136)	-.496*** (.138)
Common law	1.544 (3.692)	1.464 (3.759)	1.455 (3.736)	1.556 (3.769)	1.702 (3.736)
Military rule	-5.857*** (2.230)	-5.873*** (2.261)	-5.680*** (2.306)	-5.861*** (2.266)	-5.874*** (2.236)
Population (log)	-1.808 (1.399)	-1.764 (1.429)	-1.921 (1.480)	-1.779 (1.428)	-2.131 (1.447)
GDP per capita (log)	1.913 (1.697)	1.888 (1.720)	1.856 (1.720)	1.936 (1.733)	1.80 (1.711)
EthnicFractionalization	14.023 (9.297)	14.095 (9.504)	14.266 (9.455)	13.864 (9.466)	16.099* (9.602)
Polity IV	.005 (.040)	.005 (.040)	.005 (.040)	.005 (.040)	.006 (.040)
Catholic Religion		.718 (3.742)			
Other Religion			.948 (3.370)		
MuslimsReligion				.334 (3.675)	
Protestants Religion					-7.554 (6.863)
Constant	41.837** (20.685)	42.105** (20.954)	42.973 (21.041)	41.830** (21.226)	45.70 ** (21.056)
R ² within	0.1019	0.1042	0.1041	0.1036	0.1058
R ² between	0.4574	0.4509	0.4535	0.4529	0.4569
R ² overall	0.3906	0.3853	0.3886	0.3869	0.3923
Obs	278	278	278	278	278
Method	Random-effects GLS regression	Random-effects GLS regression	Random-effects GLS regression	Random-effects GLS regression	Random-effects GLS regression

Standard errors in parentheses. *, **, ***: significance levels at 10%, 5% and 1% respectively.

In Table 3 above, we have changed the measurement of property rights. Some conclusions drawn from Table 2 seem invalid. In effect, the colonial independence variable which was previously not significant is now weakly significant. However, its instability is articulated by a negative sign. Accordingly, the advantage related to experience from colonial independence is no longer relevant at this stage. Per capita income has also become insignificant. This is equally the case with democracy and the protestant religion. Ethnic fragmentation is also no longer significant as before. In effect, it is only significant in the last column.

In Table 4, we attempt to address the issue of endogeneity in per capita income by using lagged variables. To this effect, we create two lags of one period and four periods. We notice that military rule and judicial variables continue to behave in the same way. The results found in Table 3 for the colonial independence variable are persistent. It is largely significant with a negative sign. The size of the population is now negatively significant, though the relationship is not solid. The behaviour of *democracy* is consistent with the last-two tables and when we consider the Mo Ibrahim index, the effect of the coefficient becomes significant. However, it loses its significance if the Heritage Foundation and Wall Street Journal index is used. The protestant religion also appears to have a negative effect on property rights. What is strikingly apparent is the direction of the sign of ethnic fragmentation. This variable is consistently significant in all estimations. Hence, the hypothesis of a varying effect theoretically predicted for this variable is not verified anywhere. The judicial variable and military rule indicator appear to be more robust than other variables exploited in this study.

Table 4: Dependent Variable: Property Rights

	Property Rights (Fondation Mo Ibrahim)		Property Rights (Heritage Foundation and Wall Street Journal)	
	(1)	(2)	(1)	(2)
Judicial	.415*** (.024)	.4151*** (.030)	.208*** (.050)	.174*** (.051)
Independancy	-.080** (.040)	-.071 (.057)	-.494*** (.138)	-.290 (.186)
Common law	.648 (1.480)	.871 (1.886)	1.723 (3.735)	.556 (3.946)
Military rule	-7.923*** (1.471)	-9.190*** (1.850)	-5.840*** (2.239)	-6.546** (3.135)
Population (log)	-2.518*** (.593)	-2.613*** (.746)	-2.144 (1.446)	-1.469 (1.516)
GDP per capita (log) (t-1)	-.538 (.681)		1.746 (1.701)	
GDP per capita (log) (t-4)		-.632 (.871)		1.433 (2.076)
EthnicFractionalization	18.263*** (4.282)	18.810*** (5.393)	16.040* (9.593)	6.107 (9.861)
Polity IV	.182*** (.027)	.193*** (.036)	.006 (.040)	.100 (.107)
Protestants Religion	-10.758*** (3.373)	-8.818** (4.302)	-7.576 (6.859)	-12.321* (7.207)
Constant	52.615*** (7.283)	53.339*** (9.201)	46.176** (21.018)	42.612 (26.407)
R ² within	0.6177	0.6386	0.1057	0.0343
R ² between	0.3040	0.1009	0.4563	0.4950
R ² overall	0.6163	0.6269	0.3919	0.4435
Obs	339	215	278	173
Method	Random-effects GLS regression	Random-effects GLS regression	Random-effects GLS regression	Random-effects GLS regression

Standard errors in parentheses. *, **, ***: significance levels at 10%, 5% and 1% respectively.

5. Concluding implications and future research directions

The present paper has extended existing property rights literature on entrepreneurship, IPRs protection channels and knowledge economy by examining historic, geographic and institutional determinants in a sample of 47 Sub-Saharan Africa countries for the period 2000-2007. Random Effects Generalised Least Squares (GLS) regressions are employed using property rights measurements from the Mo Ibrahim and Heritage foundations. The results broadly show that ethnic fractionalisation, Polity IV and GDP per capita have positive effects on property rights institutions while the following exert negative effects: military rule, the Protestant religion, maturity from colonial independence and population density.

The positive effect of GDP per capita implies that development drives IPRs more in developed countries, compared to their developing counterparts. As a policy implication, Sub-Saharan African countries need less stringent IPRs because they are at the early stage of industrialisation. However, as their GDP per capita incomes grow, more stringent IPRs would need to be adopted. This is consistent with the fact that the current technology in Africa is more imitative and adaptive in nature. Hence, the sub-region should be adapted to copying commodities that are technology-intensive because at its current stage of industrialisation, its technology is more imitative and adaptive. In essence, innovation and development policies that are tailored towards supporting less stringent property rights are relevant for enhanced know-how and reversed engineering. This policy direction is broadly consistent with a strand of recent African knowledge economy literature which maintains that less stringent IPRs can boost scientific publications (Asongu, 2014c) and inclusive development (Asongu, 2014d). Hence, policies that encourage less stringent IPRs would go a long way to increasing living standards and reducing poverty in the post-2015 sustainable development agenda. Conversely, as countries in the sub-region develop industrially and their per capita incomes increase, more stringent IPRs would need to be adopted.

We have also established that Polity IV positively affects property rights institutions. This confirms previous findings that have used Polity IV as a measurement of property rights institutions (see Acemoglu & Johnson, 2005; Ali, 2013). Asongu (2014e) has criticised Acemoglu, Johnson and Ali by arguing that Polity IV was originally designed as a measurement of the durability of political systems and later broadened to incorporate regime type. While we agree with Asongu (2014e) that the measurement is more favourable to advanced countries that are characterised with more stable and democratic political regimes, it is also important to acknowledge that encouraging more Western-oriented political institutions would create suitable conditions for property rights institutions that are essential

for investment, employment, economic growth and poverty reduction in Sub-Saharan Africa. The narrative underlying the effect and corresponding policy implications also explains why the impact of military rule on property rights is negative.

The fact that maturity from colonial independence has a negative effect on property rights institutions should not be construed as ‘colonial independence’ being a bad process/event for the continent. Like many developed countries which were once colonised but now enjoy strong property rights institutions, we believe that the relationship can be Kuznets shape such that as countries in the sub-region mature in colonial independence they would also enjoy strong IPRs as they develop in terms of per capita income. This narrative is consistent with the *time* and *level* hypotheses for the benefits of political institutions, notably, in: Turkey (Sayari, 1977), India (Wade, 1985), many countries in Africa (Lemarchand, 1972) and Latin America (Weyland, 1998) and post-1990 communist countries like Russia (Varsee, 1997). It should be noted that immediately after independence, countries in the sub-region experienced lost decades in economic prosperity and per capita income growth (see Fofack, 2014). This note builds on the established finding that per capita income is positively associated with property rights institutions.

The negative effect of the protestant religion (which somewhat contradicts the traditional positive association between the ‘protestant ethic’ and development of private rights) may be traceable to the fact that Western religions are mixed with traditional animist cultures in most African countries. Moreover, the inherent entrepreneurial culture in the protestant ethic (that builds on the need to create businesses and institutions for private gain) has lost its original significance in Africa because most protestant churches are fundamentally motivated by the need to preach and practice Jesus’ teachings in a different way, while simultaneously espousing the idea that being poor is a path to paradise.

Whereas the findings have strong implications for countries in the sub-region currently on the path to knowledge-based economies, future research can improve the existing literature by directly assessing the relationship between property rights institutions and knowledge economy. To this end, the World Bank's four dimensions of the Knowledge economy index can be engaged, namely: education, institutional regime and economic incentives, information and communication technology and innovation.

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