Intelligence and Slave Exports from Africa

Asongu, Simplice and Kodila-Tedika, Oasis

January 2019

A G D I   Working Paper

WP/19/005

Intelligence and Slave Exports from Africa[1]

Forthcoming: Journal of Interdisciplinary Economics

Simplice A. Asongu
Development Finance Centre
Graduate School of Business,
University of Cape Town, Cape Town, South Africa
E-mails: asongusimplice@yahoo.com /
asongus@afridev.org /
asimplice@gsb.uct.ac.za

Oasis Kodila-Tedika
University of Kinshasa
Department of Economics,
The Democratic Republic of Congo
E-mail: oasiskodila@yahoo.fr

[1] This working paper also appears in the Development Bank of Nigeria Working Paper Series.

Research Department

Intelligence and Slave Exports from Africa

Simplice A. Asongu & Oasis Kodila-Tedika

January 2019

Abstract

This article examines the role of cognitive ability or intelligence on slave exports from Africa. We test a hypothesis that countries which were endowed with higher levels of cognitive ability were more likely to experience lower levels of slave exports from Africa probably due to comparatively better capacities to organise, corporate, oversee and confront slave traders. The investigated hypothesis is valid from alternative specifications involving varying conditioning information sets. The findings are also robust to the control of outliers.

JEL Classification: I20; I29; N30

Keywords: Intelligence; Human Capital; Slavery

1. Introduction

This study investigates the linkage between cognitive ability in terms of intelligence and slave export intensity[2] from Africa. It is premised on the hypothesis that nations with comparatively

[2] It is important to note that the slave population of interest in this study is the slave population from the African slave trade. This point is worth clarifying upfront because slavery was practiced in many instances. For example it was practiced between American Indians and other ethnic groups. Moreover, while the slaves were from Africa, countries to which they were exported do not affect the cognitive ability of slaves. Cognitive ability is considered as an endogenous or initial condition. "Slave exports" and "slave exports from Africa" are used interchangeably throughout the study.

higher levels of cognitive ability are associated with lower levels of slave trade. The positioning of this inquiry is fundamentally motivated by gaps in the empirical literature.

The contemporary empirical literature on the consequences of slavery from Africa has to the best our knowledge seen renewed interest with the work of Nunn (2008a)[3]. Other studies within the same framework include: Bezemer et al. (2014); Nunn (2008b, 2010b); Philippe (2010); Dell (2010); Nunn and Wantchekon (2011); Whatley and Gillezeau (2010, 2011) and Asongu and Kodila-Tedika (2015). Nunn (2008a) has investigated the concern of whether Africa's current underdevelopment can be elucidated by the slave trade. The author has used data from historical documents reporting slave ethnicities and shipping records to estimate the numerical value of slaves exported from African countries during the slave trade era. He has established a negative nexus between the number of exported slaves and contemporary economic performance. Hence, slave trade has had a negative effect of Africa's economic development.

In another study, Nunn (2008b) has positioned an inquiry by building on some well-established non-contemporary literature. It is important to note that a strand of literature on United States (US) slavery that has been conducted since Conrad and Meyer (1958, 1964) began their studies in the economics of US slavery. On the one hand, a nation's past reliance on slave labor was a crucial determinant of its subsequent economic development among former New World colonies. On the other hand, plantation agriculture specialisation with its use of slave labor, led to economic inequality which resulted in a concentration of power among a small elite, therefore deteriorating economic institutions that were imperative for sustained economic development. After testing the underlying arguments across counties and states in the United States (US) and former New World Economies, Nunn (2008b) has concluded that the use of slaves is negatively linked to subsequent economic development.

[3] Kodila-Tedika (2011) can be consulted for an introduction into the works of Nunn.

Dell (2010) has used regression discontinuity to assess the long-term effect of the Mita: a form of extensive forced labour system of mining in Bolivia and Peru between 1573 and 1812. The findings have shown that the mita effect: decreases consumption in households by about 25% and positively influences stunted growth in children by about 6% in subjected districts. The author has used data from various sources to trace mechanisms of institutional persistence in order to establish that the Mita's influence has endured via its effects on public goods provision and land tenure. Accordingly, while historically, Mita districts were characterised by lower educational attainment and low levels of ownership of large pieces of land, today the economic situation is still almost the same because residents are considerably more likely to be farmers of subsistence. Moreover, the concerned districts are less integrated into networks of roads.

Whatley and Gillezeau (2010, 2011a) have argued that trading of slaves emphasised the incentive to distinguish outsider from insider and constrained the geographic scope of political authority. They have established a positive nexus between the restricted geographic scope of 20th century ethnic groupings and the number of slaves leaving the African West coast. In a latter study, Whatley and Gillezeau (2011b) have investigated the evolutionary processes that were facilitated by encounters of the indigenous African population with colonial powers. They have examined the main effect of slave trade in African economies and argued that trade can be perceived as a perverse instance of the resource curse. The impact of slave trade on Africa is assessed by looking into the nexus between slave exports and slave demand. The line of inquiry also describes circumstances under which slave trade reduced State size and increased ethnic and social stratifications.

Bezemer et al. (2014) have assessed the long-run effect on politico-economic development from African indigenous slavery systems. Using data gathered from records of anthropology, the authors establish that indigenous slavery is negatively and robustly linked to contemporary income levels, but not to income levels in the period immediately following independence. One channel via which non-contemporary indigenous slavery has impeded contemporary development is by deteriorating contemporary good governance in Africa.

Unfortunately, to the best our knowledge, the bulk of interesting literature has not sufficiently engaged the emergence and expansion of the phenomenon of slave exports (e.g. Nunn, 2008a; Nunn & Diego, 2012). This article contributes to the existing literature by examining the role of cognitive ability on slave exports. In essence, we postulate a hypothesis that countries which were endowed with higher levels of cognitive ability were more likely to experience lower levels of slave exports. The hypothesis draws from the argument that countries which enjoy higher levels of cognitive ability or intelligence are also associated with citizens that are more organised probably due to their comparatively better abilities to corporate (Jones, 2008; Kodila-Tedika, 2014). Such an organisation can easily monitor activities of slave vendors and confront them accordingly. Nunn and Diego (2012) have demonstrated that ruggedness of landscape facilitated escape from slavery by some victims of slave exports. Normally, such escapes should also be facilitated by some form of intelligence. Moreover, there is some consensus in the fact that intelligent individuals are endowed with capacities which enable them to easily compromise and find solutions (Kodila-Tedika, 2014). Hence, it may be postulated that cognitive ability or intelligence is associated with lower levels of slave exports.

Given that this is a paper that builds on historical evidence, it is relevant to provide some historical perspective that describes the issue being investigated in a historical context. Moreover, such a historical view is necessary to further articulate the genuine exploration of an economic line of inquiry. There is historical evidence with which to substantiate the hypothesis underpinning this article. Accordingly, in the 1700s, North America experienced substantial social unrest owing to slave trade. A direct consequence was the deportation of emancipated slaves (see Aptheker, 1944; Genovese, 1979). It is within this framework that comparatively intelligent slaves were thought to be instigators of resistance against the slave trade. As substantiated by Malowist (1999), African slaves exported to Portugal and other Spanish territories were exclusively employed in towns as domestic workers or for less intellectually qualified jobs. According to the narrative, the importation of slaves was more contingent on the slave's manpower or physical ability, than on his/her intellect.

The first Maroon war in Jamaica in 1725 is a good illustration of the relevance of intelligence in slave trade, because slaves that were intelligent enough to escape and live autonomously in the mountains did so essentially because they thought they could live independently without Masters. There was a similar revolt in Maryland and Virginia of the United States in the eighteenth century (Harris, 1999). These historical perspectives point to the fact that comparatively more intelligent slaves that were exported could cause revolts and resist their status as slaves. Hence, it is logical to postulate that as time went by, slave traders were more interested in slaves with good manpower but with less intellectual emancipation needed for calculated and strategic resistance. A slave trader with an experience in trading slaves who had been sufficiently intelligent to escape from his/her masters with the passage of time, would have preferred exclusively slaves that were likely to be less stubborn to their Masters, once traded. More recently, intelligence has been established to affect economic diversification (Kodila-Tedika & Asongu, 2018).

2. Data and Methodology

2.1 Data

The dependent variable is slave exports. It consists of the estimated number of exported slaves from Africa between 1400 and 1900. It is obtained from Nunn (2008a, 2008b). The data are built by linking shipping data from a plethora of historic documents presenting the ethnicities of slaves that were shipped from Africa during the investigated periodicity. After combining them, the author is able to estimate country-specific numbers of slaves that were shipped from the African continent during the period 1400 and 1900: a period covering Africa's four slave trade episodes. As explained above, we proceed by normalizing export figures by the land surface area of a country. Since, a certain number of countries do not have slave exports, the natural logarithm of one, plus the number of exported slaves per thousand square kilometres, is used (Nunn, 2008a, 2008b).

The independent variable of interest or cognitive ability is measured with the Historic Intelligence Quotient (IQ). This variable has been employed in recent intelligence literature, notably: Lynn (2012) and Danielle (2013). It is measured as the "*national average intelligence quotients of populations, including estimates of indigenous populations for the colonized countries*" (Danielle, 2013, p. 31). IQ within the framework of this study is a number that represents a person's reasoning ability, computed using tests that are problem-solving oriented, as compared to the average age of the person or statistical norm. Danielle exclusively uses two intelligence measures, namely: the IQ and Historic IQ. We use the latter or Historic IQ because it is more consistent with non-contemporary phenomena (e.g. slave trade). Whereas there are different types of intelligence (naturalist, musical, logical-mathematical, existential, interpersonal, bodily-kinesthetic, linguistic, intra-personal, and spatial), this study assumes that most types of intelligences are captured by the IQ. The reasoning-orientation and "problem solving" inclination underlying the IQ can be leveraged to avoid capture during slave trade.

The 'Population density in 1400' variable is constructed using estimates of historic population from Mc Evedy and Jones (1978). For countries that are grouped with other nations in Mc Evedy and Jones, population is allocated to the nations according to the 1950 population distribution from the United Nations (2007). The total population in 1400 is normalised with each country's land area and computed as described above. Given that the variables are considerably left-skewed and because the area covered by a number of countries today was characterised with zero population density in 1400, a natural logarithm of one plus the population density, computed as people per square kilometre, is used.

"Tech1500" is an index denoting the adoption of military, agricultural and communications technologies, *inter alia*. It is borrowed from Easterly, Comin and Gong (2010). "Year since Neolithic Transition" refers to "the number of thousand years elapsed as of the year 2000" since earliest date recorded of a region located within the national borders of a nation that underwent the transition to primary reliance on livestock and cultivated crops from primary reliance on hunting. This indicator compiled by Putterman (2008) was computed using a plethora of both country- and regional-specific archaeological studies, in addition to encyclopaedic works of more general nature on the Neolithic transition to agriculture from gathering and hunting. More information on methodological assumptions and data sources used in the construction of the variable is available on the website of the Agricultural Transition Data Set.

"Biogeographic conditions" refers to the first principal component of the number of prehistoric domesticable animal species and plant species, computed with the help of a methodology proposed by Olsson and Hibbs (2005). It is interesting to note that Angeles (2011) has insisted on the crucial role that technology and biogeography play in the elucidation of slavery.

"Statehist" is an index denoting the presence of supra-tribal governments between 1CE and 1500 CE on territories representing present-day countries. In a particular year, the value of the index is the product of three indices, notably, an index for: territorial unit and extent, existence of a state and territorial extent and unity. States governing meagre shares of the nation's contemporary territory and a plethora of simultaneously extant states are consigned lower values. Corresponding values are aggregated into periods of 50 years, the period *x* half centuries prior to 1500 is discounted by (1.05) *x* and the ensuing numbers are added. The sum is finally normalized to the interval of between 0 and 1 after dividing by the hypothetical maximum value. This data is from Putterman (2004, revised 2012).

"Mean ruggedness" is the mean value of an index on landscape ruggedness, relative to hundreds of meters above the sea level for a nation. It is calculated using geospatial surface undulation indicators based on a one degree resolution form the Geographically based Economic data (G-Econ) project (Nordhaus, 2006), which depends on more spatially disaggregated elevation variables from New et al. (2002) at a ten minutes resolution. The grid cell level measurement of ruggedness is consolidated up to national level by averaging across the grid cells which are located within the borders of a country. More insights into the computation can be found on the website of the G-Econ project. This variable has been employed in the slave trade literature (see Nunn & Puga, 2012).

The landlock dummy measures whether a country is landlocked and it is determined by the Central Intelligence Agency (CIA) World Fact book using the coastline length of a country. This indicator has been substantially employed to control for the unobserved heterogeneity in African development literature (Asongu, 2012, 2015; Asongu et al. 2017, 2018).

"Absolute latitude" represents the measurement of latitude in terms of degrees of a country's approximate geodestic centroid as shown by the CIA World Fact book. Acemoglu et al. (2001) have articulated the role of geography in African development literature. It is notably for this underlying reason that we are also accounting for other geographic variables in this study. Appendix 1 provides the summary statistics. The correlation matrix is disclosed in Appendix 2 whereas the list of countries is presented in Appendix 3.

It is important to note that there are two main measurement errors associated with Nunn's slave trade data. First, there is a questionable assumption that slaves shipped from one coast within a country are either from countries directly in the interior or from the country that is opened to the sea. Unfortunately, some slaves shipped from the coast of one country could have been from neigbouring countries: either costal and/or landlocked countries. Second, another concern about measurement error is motivated by the fact that in the ethnicity samples, slaves from landlocked countries are likely to be underrepresented. This is essentially because the ethnicity samples used for the computation of the slave trade data encompass exclusively the slave population which survived the voyage journeys from the African continent. Accordingly, everything being equal, voyage survival is a negative function of the distance to the coast. Given the high rate of mortality during the slave trade, this second measurement error is also important. Whereas the two underlying measurements are relevant, Nunn (2008a) has demonstrated empirically that they do not significantly bias the slave trade data.

2.2 Methodology

Consistent with recent development (Asongu, 2013) and intelligence or cognitive ability (Kodila-Tedika & Asongu, 2015a, 2015b) literature, the specification in Eq. (1) examines the correlation between cognitive ability and slave exports.

$$SE_i = \alpha_1 + \alpha_2 CA_i + \alpha_3 C_i + \varepsilon_i \ , \qquad (1)$$

where, SE_i (CA_i) represents a slave exports (cognitive ability) indicator for country i , α_1 is a constant, C is the vector of control variables, and ε_i the error term. CA is the *cognitive ability* variable while C entails: population density in 1400; Tech1500; biogeographic conditions; Statehist; mean ruggedness, landlock dummy, absolute latitude and "year since neolithic transition". In accordance with the underlying cognitive ability literature, the purpose of Eq. (1) is to estimate if cognitive ability affects slave exports. The estimation process is by Ordinary Least Squares (OLS) with standard errors that are corrected for heteroscedasticity.

3. Empirical Results

Table 1 presents the empirical results based on OLS. The following findings can be established. The investigated hypothesis is confirmed because Historic IQ is negatively correlated with the dependent variable or slave exports. This negative nexus is robust to alternative specifications and the employment of varying conditioning information sets to control for a plethora of historical, cultural and geographic variables. Most of the significant control variables have the expected signs. Population density in 1400 is negatively correlated with the dependent variable. This is essentially because the area covered by a number of countries today was characterised with zero population density in 1400 (Mc Evedy & Jones, 1978; United Nations, 2007). The European descent variable is positively correlated with the slave exports because Europeans significantly contributed to slave trade (Acemoglu et al., 2005). The Tech1500 index is intuitively supposed to be positively correlated with the slave exports because it denotes the adoption of military, education, agricultural and communication technologies which are most likely to positively influence openness and trade activities (Easterly & Gong, 2010; Tchamyou, 2017, 2018; Tchamyou & Asongu, 2017).

The variable 'Statehist' which denotes the presence of supra-tribal government is positive, most likely because chiefs and kings played a critical role in aiding slave exporters. Such assistance fundamentally consisted of capturing potential slaves and putting them at the disposal of slave exporters (Smith, 2009). Logically, the sign of latitude is expectedly negative because trading of slaves was largely centred on the Equator of Africa. Hence, export intensity decreases as one move either North towards the Arctic Circle or South towards the Antarctic Circle. While landlocked countries were most likely to be negatively correlated with the dependent variable because the predominant means of transportation was shipping, the expected sign is not significant[4].

Consistent with Nunn and Wantchekon (2011), "terrain ruggedness" was a negative factor in slave trade, since it facilitated escapes and local resistance. African biogeographic conditions have been documented to have severely handicapped its economic development (Angeles, 2011, p. 37). These include: trade, *inter alia.* The number of years since the "Neolithic transition" is negatively related to slave trade probably because, with growing civilisation, human beings become increasingly aware of the need to treat people equally, irrespective of the colour of their skin.

It is important to note that the estimated coefficients corresponding to the independent variable of interest change in terms of magnitude with variations in the conditioning information set or control variables. Such changes in size are traceable to the meaningfulness of the variables in the conditioning information set, to the effect of the independent variable of interest or Historic IQ on the dependent variable. Such meaningfulness is apparent because the additional variables in the conditioning information set influence the residual variance. When they reduce the residual variance, there is an improved power and precision. For example, when all variables except Historic IQ are omitted, the size of the IQ coefficient is 37 percent higher relative to the unconstrained model in the first specification. Moreover, the coefficient of determination is also about four times higher in the last specification, compared to the first specification. It follows that historic and economic characteristics selected for the conditioning information set influence how intelligence affects slave export intensity. In other

[4] Some examples of landlocked countries in Africa include: Burkina Faso and the Central African Republic.

words, the negative responsiveness of slave export to intelligence is contingent on whether specific historic and economic factors are considered in the modeling exercise.

Consistent with Kodila-Tedika and Asongu (2015c), we check for the efficiency and robustness of our findings by controlling for outliers. To this end, two main empirical approaches are employed from Huber (1973) and Hadi (1992). The first empirical approach from Huber consists of using Iteratively Reweighted Least Squares (IRWLS). Midi and Talib (2008) have emphasized that compared to OLS, this estimation technique has the advantage of supplying robust estimators. This is essentially because it simultaneously resolves issues arising from the presence of outliers and heteroscedasticity or non-constant error variances. The findings are presented in the first column of Table 2. In the second column, the technique by Hadi is employed to detect outliers. Hence, outlier countries are detected and excluded accordingly, notably: China, India and Japan. The negative relationship between cognitive ability and slave exports is confirmed. Moreover, the significant control variables have the expected signs.

4. Conclusion

The contemporary literature has not comprehensively covered the emergence and expansion of the phenomenon of slave exports from Africa (e.g. Nunn, 2008a; Nunn & Diego, 2012). This article contributes to the existing stream by examining the role of cognitive ability on slave exports from Africa. We postulate and justify a hypothesis that countries which are endowed with higher cognitive ability are more likely to experience lower levels of slave exports probably due to relatively better abilities to organise, corporate, oversee and confront slave vendors. Our findings with alternative specifications involving varying conditioning information sets confirm the investigated hypothesis. The findings are also robust to the control of outliers.

The findings are broadly consistent with Jones (2008) and Kodila-Tedika (2014) on the postulation that countries enjoying higher cognitive ability levels in terms of intelligence are relatively more organised by virtue of their abilities to corporate more effectively. According to the strand of studies, such an organisation can: easily oversee and tackle the activities of slave vendors; find solutions and compromises and facilitate escapes from slavery. Moreover, this study has assumed that most types of intelligences are captured by the IQ. Hence, the reasoning-orientation and "problem solving" inclination underlying the IQ can be leveraged to avoid capture during slave trade. The extant literature on the subject can be improved by empirically investigating channels via which intelligence or cognitive ability reduces slave exports. These are beyond the scope the present inquiry and thus evidently ample room for future research.

A major caveat is this study is the issue of reverse causation which is not adequately addressed. Accordingly, it is conceivable that African cognitive ability led to slave exports, but it is also conceivable that current and lagged slave exports reflected cognitive ability. Clarifying this caveat could also be an interesting line of future inquiry.

Table 1: Ordinary Least Squares Estimations

	Eq1	Eq2	Eq3	Eq4	Eq5	Eq6	Eq7
Historic IQ	-12 329.208***	-12 144.687***	-19 428.821***	-17 388.560***	-19 371.190***	-18 879.537***	-19 458.819***
	(3 853.880)	(4 238.942)	(6 200.370)	(5 978.300)	(5 640.256)	(5 90.467)	(5 678.357)
Pop density in1400		0.001	-0.000	-0.001	-0.003**	0.001	-0.003*
		(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.,002)
European descent		-179.151	463.179	1 584.886	2 341.701**	2 062.648**	2 364.201**
		(405.109)	(695.937)	(1 007.122)	(921.011)	(995.179)	(933.766)
Tech 1500			-106 202.883	84 029.950	517 338.769***	248 205.128*	521 403.838***
			(145 871.757)	(109 465.374)	(175 835.759)	(143 787.695)	(177 765.641)
Statehist			513 587.664**	581 818.607**	694 758.338***	671 648.946***	700 306.866***
			(237 031.057)	(252 274.285)	(213 621.846)	(251 925.137)	(213 373.270)
Absolute latitude				-3 866.905	2 527.059	-4 239.555*	2 321.952
				(2 389.677)	(2 147.431)	(2 398.137)	(2 316.762)
Landlock				-35 930.383	-82 649.978	-54 865.393	-83 216.052
				(62 410.261)	(61 787.073)	(63 134.802)	(62 750.493)
Meanruggedness				-43 137.873**	-35 042.774**	-32 727.732**	-34 283.703**
				(17 902.984)	(15 295.125)	(16 161.882)	(16 219.357)
Biogeographic Conditions					-194 193.510***		-188 791.737***
					(48 911.697)		(53 318.498)
Neolithic Transition						-44.310**	-4.407
						(16.933)	(14.875)
Constant	1 149 473.422***	1 139 176.724***	1 558 807.001***	1 336 578.775***	1 076 495.655***	1 521 889.654***	1 101 845.106***
	(356 619.334)	(381 692.025)	(498 729.738)	(431 217.584)	(337 259.569)	(451 158.725)	(352 088.658)
Number of observations	139	133	102	78	73	78	73
R^2	0.108	0.109	0.146	0.331	0.454	0.370	0.455

Notes. ***,**,*: significance levels at 1%, 5% and 10% respectively. () : Standard errors in parentheses. Pop: Population. Tech 1500: index on adoption of military, agricultural and communication technologies.
Statehist: index denoting the presence of supra-tribal government on territory representing the present-day country. IQ: Intelligence Quotient.

Table 2: Controlling for outliers

	Huber (1973)	Hadi (1992)
Historic IQ	-5 502.065*	-20 312.660***
	(2 815.586)	(6 132.664)
European_descent	479.808	2 422.178**
	(368.847)	(996.065)
Pop density in1400	-0.001	-0.019**
	(0.001)	(0.009)
Absolute latitude	1 096.870	1 926.767
	(852.546)	(2 354.763)
Biogeographic Conditions	-50 975.228*	-186 024.845***
	(30 494.220)	(52 505.641)
Meanruggedness	-10 387.873	-36 226.367**
	(6 488.046)	(16 619.527)
Tech 1500	153 037.140*	531 404.943***
	(85 582.573)	(176 418.930)
Landlock	-16 009.642	-95 907.254
	(14 617.587)	(64 990.264)
Neolithic Transition	-0.976	1.835
	(3.281)	(14.303)
Statehist	136 116.726	747 407.655***
	(96 665.112)	(216 957.361)
Constant	335 906.590**	1 156 993.440***
	(149 672.096)	(390 077.084)
Number of observations	73	70
R^2		0.468

Notes. ***,**,*: significance levels at 1%, 5% and 10% respectively. () : Standard errors in parentheses. Pop: Population. Tech 1500: index on adoption of military, agricultural and communication technologies. Statehist: index denoting the presence of supra-tribal government on territory representing the present-day country.

References

Acemoglu, D., Johnson, S. & Robinson. J. (2001). "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91(5), pp. 1369–1401.

Acemoglu, D., Johnson, S. & Robinson. J. (2005). "The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth". *American Economic Review*, 95(3), pp. 546-579.

Angeles, L. (2011). "On the Causes of the African Slave Trade and African Underdevelopment", mimeo.

Aptheker, H. (1944). American negro slave revolts, 2e éd., New York, Columbia University Press.

Asongu, S. A. (2012). "Government Quality Determinant of Stock Market Performance in African Countries", *Journal of African Business*, 13 (3), pp.183-199.

Asongu, S. A. (2013). "How has mobile phone penetration stimulated financial development in Africa?" *Journal of African Business*, 14(1), pp. 7-18.

Asongu, S. A., (2015). "On Taxation, Political Accountability and Foreign Aid: Empirics to a Celebrated Literature", *South African Journal of Economics*, 83(2), pp. 180-198.

Asongu, S. A., & Kodila-Tedika, O., (2015). "Intelligence and Slave Export Intensity: A Cross-Country Empirical Assessment", *African Governance and Development Institute Working Paper* No. 029, Yaoundé.

Asongu, S. A., Tchamyou, V. S., Asongu, N., & Tchamyou, N. P., (2017). "The Comparative African Economics of Inclusive Development and Military Expenditure in Fighting Terrorism". *Journal of African Development*, 19(2), pp. 77-91.

Asongu, S. A., Tchamyou, V. S., Minkoua, N, J. R., Asongu, N., & Tchamyou, N. P., (2018). "Fighting terrorism in Africa: Benchmarking policy harmonization", *Physica A: Statistical Mechanics and its Applications*, 492(February), pp. 1931-1957.

Bezemer, D., Bolt, J. & Lensink, R. (2014), "Slavery, Statehood and Economic Development in Sub-Saharan Africa", *World Development* 57(May), pp. 148–163.

Comin, D., Easterly, W. & Gong. E. (2010). "Was the Wealth of Nations Determined in 1000 BC?", *American Economic Journal: Macroeconomics* 2 (3), pp. 65-97.

Conrad, A.H. & Meyer, J.R. (1958). "The Economics of Slavery in the Ante Bellum South". *The Journal of Political Economy*, 66(2), pp. 95-130.

Conrad, A.H. & Meyer, J.R. (1964). The Economics of Slavery. Chicago: ALDINE Publishing Company.

Danielle, V., (2013). "Does the intelligence of populations determine the wealth of nations?",*The Journal of Socio-Economics*, 46(2013), pp. 27-37.

Dell, M. (2010). "The persistent effects of Peru's mining Mita". *Econometrica*, 78(6), pp. 1863–1903.

Easterly, W., Comin, D. & Gong, E. (2010). "Was the Wealth of Nations Determined in 1000 BC?," *American Economic Journal: Macroeconomics*, 2(3), pp. 65-9.

Genovese, E. D. (1979). Fromrebellion to revolution, Baton Rouge, Louisiana State University Press.

Hadi, A. S., (1992). "Identifying multiple outliers in multivariate data". *Journal of the Royal Statistical Society,* 54(3), pp. 761–771.

Harris, J. E. (1999). La diaspora africaine dans l'Ancien et le Nouveau Monde, in Ogot, B. A. (dir), Histoire générale de l'Afrique. L'Afrique du XVIe au XVIIIe siècle, Ed. Unesco, Paris.

Huber, P. J., (1973). "Robust Regression: Asymptotics, Conjectures and Monte Carlo", *The Annals of Statistics*, 1(5), pp. 799-821.

Kodila-Tedika, O. (2011). "Esclavagisme et colonisation : quelles conséquences en Afrique ? Résumé critique des travaux de l'économiste Nathan Nunn"**.** *Revue Congolaise d'Economie,* 6(1), pp. 41-61.

Kodila-Tedika, O., & Asongu, S. A., (2015c). "Tribalism and Financial Development", *African Governance and Development Institute Working Paper* No. 15/018, Yaoundé.

Kodila-Tedika, O., & Asongu, S. A. (2015a). "The effect of intelligence on financial development: a cross-country comparison". *Intelligence*, 51(July-August), pp. 1-9.

Kodila-Tedika, O., & Asongu, S. A. (2015b). "Intelligence, Cognitive ability and HIV/AIDS: Fresh Exploration", *Intelligence*, 53 (November-December), pp. 154–159.

Kodila-Tedika, O., & Asongu, S. A. (2018). "Does Intelligence Affect Economic Diversification?", *German Economic Review*, 19(1), pp. 74–93.

Lynn, R., (2012). "IQs predict differences in the technological development of nations from 1000 BC through 2000 AD". *Intelligence*, 40 (5), pp. 439–444.

Malowist, M. (1999). La lutte pour le commerce international et ses implications pour l'Afriquein Ogot, B. A. (dir), Histoire générale de l'Afrique. L'Afrique du XVIe au XVIIIe siècle, Ed. Unesco, Paris.

McEvedy, C. & Jones, R., (1978), *Atlas of World Population History,* New York: Penguin Books.

Midi, H. & Talib, B. A., (2008). "The Performance of Robust Estimator on Linear Regression Model Having both Continuous and Categorical Variables with Heteroscedastic Errors", *Malaysian Journal of Mathematical Science*s, 2(1), pp. 25-48.

New, M., Lister, D., Hulme, M. & Makin. I. (2002). "A High-Resolution Data Set of Surface Climate over Global Land Areas". *Climate Research*, 21(1), pp. 1-25.

Nordhaus, W. D. (2006). "Geography and Macroeconomics: New Data and New Findings". *Proceedings of the National Academy of Sciences*, 103(10), pp. 3510-3517.

Nunn, N. (2008a), "The Long-Term Effects of Africa's Slave Trades," *Quarterly Journal of Economics*, 123(1), pp. 139-176.

Nunn, N. (2008b), "Slavery, Inequality, and Economic Development in the Americas: An Examination of the Engerman-Sokoloff Hypothesis" in Helpman, E. (ed.), *Institutions and Economic Performance*, pp. 148-180. Harvard University Press.

Nunn, N. (2010b), “Shackled to the Past: The Causes and Consequences of Africa’s SlaveTrades,” Diamond, J.and Robinson, J. A. (eds.), *Natural Experiments of History*, pp. 142-184. Harvard University Press.

Nunn, N. and Puga, D. (2012). ‘‘Ruggedness: The Blessing of Bad Geography in Africa”, *Review of Economics and Statistics,* 94(1), pp. 20–36.

Nunn, N. & Wantchekon, L. (2011). “The Slave Trade and Origins of Mistrust in Africa”, *American Economic Review*, 101(7), pp. 3221–3252.

Olsson, O. & Hibbs, D. Jr., (2005). “Biogeography and long-run economic development,” *European Economic Review*, 49(4), pp. 909-938.

Philippe, A. (2010), “L’impact économique de l’esclavage dans les pays de l’ancienne Afrique Occidentale Française”, *Mémoire de DEA*, Paris School of Economics.

Putterman, L. (2004), “State Antiquity Index (Statehist)”, http://www.econ.brown.edu/fac/Louis_Putterman/antiquity%20index.htm

Putterman, L. (2008). “Agriculture, Diffusion and Development: Ripple Effects of the Neolithic Revolution,” *Economica*, 75(300), pp. 729-748.

Smith, D., (2009). “African chiefs urged to apologise for slave trade”, The Guardian (November, 2009). http://www.theguardian.com/world/2009/nov/18/africans-apologise-slave-trade (Accessed: 26/08/2015).

Tchamyou, V. S., (2017). “The Role of Knowledge Economy in African Business”, *Journal of the Knowledge Economy*, 8(4), pp. 1189–1228.

Tchamyou, V. S., (2018). “Education, Lifelong learning, Inequality and Financial access: Evidence from African countries”, *Contemporary Social Science*. DOI: 10.1080/21582041.2018.1433314.

Tchamyou, V. S., &Asongu, S. A., (2017). “Information Sharing and Financial Sector Development in Africa” *Journal of African Business*, 18(7), pp. 24-49.

United Nations, (2007), United Nations Common Database, New York: United Nations Statistics Division.

Whatley, W. & Gillezeau, R. (2010), “The Slave Trade and Ethnic Stratification in Africa”, University of Michigan Working paper. https://economics.wustl.edu/files/economics/imce/whatleygillezeau_slaveethnicitydraft.pdf (Accessed: 29/05/2017).

Whatley, W. & Gillezeau, R., (2011a), “The Impact of the Transatlantic Slave Trade on Ethnic Stratification in Africa”, *American Economic Review Papers and Proceedings*, 101(3), pp. 571-576.

Whatley, W. & Gillezeau, R., (2011b), "The Fundamental Impact of the Slave Trade on African Economies", Rhode, P., Rosenbloom, J. and Weiman, D., *Economic Evolution and Revolution in Historical Time*, Stanford, Stanford University Press.

Appendix 1: Descriptive Statistics

	Obs	Mean	Std. Dev
Historic IQ	142	84.59648	11.03489
European_descent	162	31.30754	41.37928
Pop density in1400	183	1911231	8371189
Absolute latitude	114	28.15278	17.75862
Biogeographic conditions	101	.0772379	1.392351
Mean ruggedness	114	1.263002	1.105888
Tech 1500	118	.4868644	.3141906
Landlock	195	.1897436	.3931074
Neolithic Transition	165	4814.242	2453.842
Statehist	153	.4510381	.2434273
Slave exportation	189	82911.63	356199.9

Obs: Observations. Std. Dev: Standard Deviation. IQ: Intelligence Quotient. European_descent: Variable on European Descent. Pop: Population. Biogeographic conditions refer to the first principal component of the number of prehistoric: (i) domesticable animal species and (ii) plant species. Seventh, 'mean ruggedness' is the mean value of an index on landscape ruggedness (relative to hundreds of meters above the sea level) for a nation. Tech1500 is an index denoting the adoption of military, agricultural and communications technologies, inter alia. Sixth, 'Statehist' is an index denoting the presence of supra-tribal government on territory representing the present-day country, entailing years 1CE to 1500 CE.

Appendix 2 : Correlation Matrix

Absolute latitude	1										
Statehist	0.52	1									
Slave exportation	-0.28	0.01	1								
Historic IQ	0.72	0.64	-0.39	1							
Biogeographic Conditions	0.84	0.65	-0.30	0.70	1						
Meanruggedness	0.20	0.32	-0.24	0.33	0.22	1					
Neolithic Transition	0.50	0.66	-0.19	0.55	0.75	0.27	1				
Landlocked	-0.04	-0.15	-0.02	-0.21	-0.15	0.11	-0.20	1			
Tech 1500	0.69	0.73	-0.11	0.68	0.85	0.19	0.74	-0.14	1		
European_descent	0.73	0.24	-0.28	0.68	0.62	0.16	0.32	-0.10	0.43	1	
Pop density in1400	0.06	0.31	-0.07	0.21	0.07	0.08	0.41	-0.14	0.25	-0.13	1

European_descent: Variable on European Descent. Pop: Population. Biogeographic conditions refer to the first principal component of the number of prehistoric: (i) domesticable animal species and (ii) plant species. Seventh, 'mean ruggedness' is the mean value of an index on landscape ruggedness (relative to hundreds of meters above the sea level) for a nation. Tech1500 is an index denoting the adoption of military, agricultural and communications technologies, inter alia. Sixth, 'Statehist' is an index denoting the presence of supra-tribal government on territory representing the present-day country, entailing years 1CE to 1500 CE.

Appendix 3: List of countries

Afghanistan; Angola; Albania; United Arab Emirates; Argentina; Australia; Austria ;Belgium; Benin ; Burkina Faso; Bangladesh; Bulgaria; Bosnia and Herzegovina; Belarus; Belize; Bolivia; Brazil; Bhutan; Botswana; Central African Republic; Canada; Switzerland; Chile; China; Cote d'Ivoire; Cameroon; Congo; Colombia; Costa Rica; Cuba; Czech Republic; Denmark; Algeria; Ecuador; Egypt; Spain; Estonia; Ethiopia; Finland; Fiji; France ; Gabon; United Kingdom; Germany; Ghana; Guinea; Guinea-Bissau; Equatorial Guinea; Greece; Guatemala; Guyana; Hong Kong; Honduras; Croatia; Hungary; Indonesia; India; Ireland; Iran; Iraq; Israel; Italy; Jordan; Japan; Kazakhstan; Kenya; Cambodia; Republic of Korea; Laos; Lebanon; Liberia; Libya; Lesotho; Lithuania; Latvia; Morocco; Republic of Moldova; Madagascar; Mexico; Macedonia; Mali; Malta; Myanmar; Mongolia; Mozambique ; Mauritania; Malawi; Malaysia; Namibia; Niger; Nigeria; Nicaragua; Netherlands; Norway; Nepal; New Zealand; Oman; Pakistan; Panama; Peru; Philippines; Papua New Guinea; Poland; Portugal; Paraguay; Romania ; Russian Federation ; Saudi Arabia ; Sudan ; Senegal ; Singapore ; Sierra Leone ; El Salvador ; Somalia ; Singapore ; Serbia ; Suriname ; Slovakia; Sweden; Swaziland; Syria; Chad; Thailand; Tajikistan; Turkmenistan; Tonga; Tunisia; Turkey; United Republic of Tanzania; Uganda; Ukraine; Uruguay; United States ; Uzbekistan; Venezuela; Vietnam; Yemen; South Africa; Congo Democratic Republic; Zambia and Zimbabwe.