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ON THE PERSISTENCE OF PERSISTENCE: LESSONS FROM LONG-TERM TRENDS IN AFRICAN INSTITUTIONS

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Abstract

An influential strand of literature within economics and economic history called ‘persistence studies’ argues that low material living standards in African countries today were determined by institutional choices made in the past. However, the lack of consistent annual data on GDP per capita or institutional variables has meant that this literature has been largely silent as to whether their proposed relationships hold throughout the period it studies. This has made persistence studies vulnerable to criticisms of making leaps of faith or contributing to a ‘compression of history’. Here, we draw on a dataset of tax revenues for African polities for the period 1900–2015, with which we proxy the institutional capacity of a state. We then test whether some of the most influential determinants stressed in the persistence literature exert a consistent effect on our measure of institutions. Our findings suggest that the effect of population density and colonizer identity on institutions is not persistent. We find mixed results for precolonial centralization and ethnic fractionalization, while results for slave exports and settler mortality are more in accordance with theory. Overall, our results support the view that historical persistence should be measured, not simply assumed.

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FOR AT LEAST THREE DECADES, ECONOMISTS HAVE BEEN SEARCHING for the ‘root cause’ of African poverty.¹ Making use of historical variables from precolonial or colonial times, this literature asks how these factors shaped the adoption of suboptimal historical institutions on the continent. Such institutions are then assumed to persist, leading to continued slow growth as evidenced by low GDP per capita today. This is illustrated by what is arguably the most famous contribution to the ‘persistence literature’, by Daron Acemoglu, Simon Johnson, and James Robinson (hereafter AJR), which was instrumental in the authors being awarded the 2024 Nobel Memorial Prize in Economic Sciences.² In this article, initial conditions—in this case the feasibility of European settlement in an area—were argued to determine the imposition of either ‘extractive’ or ‘inclusive’ institutions during the early days of colonial rule. This institutional type is then proposed to have persisted into current times, leading to low GDP per capita as measured in the year 1995. Importantly, this persistence is not directly tested empirically as the authors do not measure the evolution of institutions throughout the colonial and post-colonial period. Their main institutional proxy is drawn from current times, namely a ‘risk of expropriation’ index.³

One legacy of this seminal paper was to make two research design choices accepted as standard practice in the burgeoning ‘persistence studies’ literature. First, institutions are typically measured by proxy, usually applying a subjective indicator from relatively contemporary times. Secondly, the path dependency of institutions is assumed to be essentially unchanging in terms of both function and causal impact on economic performance over time. As we show below, the main changes in this literature over the past decades have been the growing list of historical variables that are deemed to have shaped ‘persistent’ institutions.⁴

A major reason for glossing over the institutional channels of persistence is the lack of long-term time series on key variables. In this article, we address this gap by using a recently collected dataset on annual tax revenues of African polities from 1900 to 2015.⁵ Although previous fiscal datasets

1. Daron Acemoglu and James Robinson, ‘Why is Africa poor?’, *Economic History of Developing Regions* 25 (2010), pp. 21–50.

2. Daron Acemoglu, Simon Johnson, and James Robinson, ‘The colonial origins of comparative development: An empirical investigation’, *American Economic Review* 91, 5 (2001), pp. 1369–1401.

3. The authors explicitly refer to this as a proxy of institutions, and more specifically use averaged risk of expropriation from 1985 to 1995 from Political Risk Services as a proxy for institutions. The datasets were generated by Stephen Knack and Philip Keefer in a series of working papers on institutions and economic performance from 1993 onwards, and is available for purchase from the Political Risk Services Group: <https://epub.prsgroup.com/products/iris-dataset>.

4. There is also a growing list of current-day outcome variables that are used to supplement GDP per capita. For example, many papers in this literature use night lights data from satellite observations as an outcome. However, the argument is still the same: there are no long-run series on night lights, hence the tendency to test in single cross-sections.

5. Thilo Albers, Morten Jerven, and Marvin Suesse, ‘The fiscal state in Africa: Evidence from a century of growth’, *International Organization* 77 (2023), pp. 65–101.

typically only went back a few decades, this dataset covers 48 countries during both the colonial and post-colonial era. Similarly, GDP per capita estimates are typically only available after 1950, but our data allow us to investigate the extent of persistence for a longer time period.⁶

We use this data to define the *fiscal capacity* of a polity as the real revenue it collected per capita from direct taxes and sales taxes. Given that the successful administration of these taxes typically demands an elaborate institutional apparatus to survey, count, assess, and collect from the population of a territory, we view fiscal capacity as a useful proxy for the institutional capacity of a state more generally.⁷ We can then study how some of the most influential historical variables from the persistence literature affect this institutional capacity through time. This allows us to focus directly on the mechanisms and channels of persistence, and evaluate key hypotheses about their impact on African institutions.

For example, a long-debated hypothesis in the literature is whether low historical population densities in Africa led to a general weakness of states, particularly in controlling their territories.⁸ Arguably, measuring direct tax collection is close to directly observing a state's ability to control territory and citizens. We can therefore use our long-run tax dataset to test whether such factors really do persist over time in the way predicted by the literature. We view this as pushing the persistence literature forward by taking seriously Gareth Austin's famous warning against the 'compression of history' in studying Africa's past.⁹

It is important to emphasize that our contribution here is not to contest the validity of persistence studies in general, nor to overturn their causal claims. We also do not have space here to challenge the accuracy of the data or the conceptual frameworks used in this literature. Rather we wish to shed light on when and for what variables the relationships outlined in the literature are statistically identifiable using long-run data. This article thus responds to calls in the literature for identifying the 'mechanisms of persistence' or 'channels of persistence' which have remained relatively unexplored to date.¹⁰

6. With the exception of a few countries, see Morten Jerven, *The wealth and poverty of African states: Economic growth, living standards and taxation since the late nineteenth century* (Cambridge University Press, Cambridge, 2022).

7. See, Timothy Besley and Torsten Persson, 'Why do developing countries tax so little?', *Journal of Economic Perspectives* 28, 4 (2014), pp. 99–120.

8. Jeffrey Herbst, *States and power in Africa: Comparative lessons in authority and control* (Princeton University Press, Princeton, 2000).

9. Gareth Austin, 'The "reversal of fortune" thesis and the compression of history: Perspectives from African and comparative economic history', *Journal of International Development* 20, (2008), pp. 996–1027.

10. Gerardo Munck, 'The theoretical foundations of critical juncture research: Critique and reconstruction', in David Collier and Gerardo Munck (eds), *Critical junctures and historical legacies. Insights and methods for comparative social science* (Rowman & Littlefield, Lanham, 2022), pp. 109–139.

The article proceeds as follows. First, we demonstrate the centrality of the persistence studies literature in African economic history and show how a lack of consistent time series data hobbles this literature. Next, we present our data and empirical methods. We then proceed to test the effect of six factors on fiscal capacity throughout the period 1900–2015, focusing on two sets of ‘initial’ conditions (population density and ethnic fractionalization), two ‘precolonial’ factors (slave trades and precolonial centralization), and two ‘colonial’ factors (settler mortality and colonizer identity). Our findings suggest that the effect of population density and colonizer identity on institutions is not persistent. We find mixed results for precolonial centralization and ethnic fractionalization, while results for slave exports and settler mortality are more in accordance with theory. Concluding, we discuss why and how the persistence of some factors changes so much over time.

Persistence studies and its influence on African economic history

Here we introduce and summarize some of the literature that seeks to identify a root cause of African poverty under the label ‘persistence studies’. Although not all persistence studies focus exclusively on Africa, the continent plays an outsized role in many contributions. This is partly due to its sheer size in many datasets: in AJR, African countries account for 42 percent of the observations. Yet the centrality of Africa is also attributable to an earlier strand in this literature focused on cross-country growth regressions.¹¹ One dominant finding in this literature was the inexplicable persistence of slow average growth in African countries. As summarized by Paul Collier and Jan Gunning in 1999, ‘it is clear that Africa has suffered a chronic failure of economic growth. The problem for analysis is to determine its causes’.¹² Collier later popularized this in the *The Bottom Billion* as stating that ‘the failure of the growth process in these societies simply has to be our core concern’.¹³

The literature was thus prompted by the empirical stylized fact of African persistent economic underperformance in Africa. Viewing African stagnation as a persistent historical phenomenon, in turn set the stage for an emerging literature on how history matters for economic development today. In its second generation the growth literature then began proposing historical

11. Robert Barro, ‘Economic growth in a cross section of countries’, *Quarterly Journal of Economics* 106 (1991), pp. 407–443. For a review of this literature, see also, Steven Durlauf, Paul Johnson, and Jonathan Temple, ‘Growth econometrics’, in Philippe Aghion and Steven Durlauf (eds), *Handbook of economic growth* (North Holland: Elsevier, 2005), pp. 555–667.

12. Paul Collier and Jan Gunning, ‘Explaining African economic performance’, *Journal of Economic Literature* 37 (1999), pp. 64–111.

13. Paul Collier, *The bottom billion: Why the poorest countries are failing and what can be done about it* (Oxford University Press, Oxford, 2007).

variables that could account for African (under)development. This sometimes led to the resurfacing of arguments associated with the dependency school of thought that downplayed policies pursued in post-colonial Africa, and instead argued that economies were set on a path of underdevelopment by events such as the slave trade, colonization or by its geographical disadvantage.¹⁴

New econometric tools also stimulated the search for root causes of under-development. Much of the cross-country growth regression literature has been content with simple correlations (as put in *the* concluding sentence by Paolo Mauro in a paper asserting the relationship between corruption and slow growth: ‘this paper has not analyzed the reverse causal link from poverty to bad institutions, which may deserve further study’).¹⁵ Increasingly, however, a worry emerged about the endogeneity of economic variables proxying for poor economic policy (such as budget deficits, black market for foreign exchange, or inflation). Equally, variables picking up variation in the political or institutional environment (such as assassinations, corruption, or trust in government) were subject to suspicion of reverse causality. There was thus a methodological need for variables that were immune to such accusations. To take Mauro’s example, a country might be poor because it is corrupt, but it could instead be corrupt because it is poor. One way out was then to argue that a country might be poor today because it was colonized a century ago. Given that past colonization could not be caused by poverty today, this appeared to solve the conundrum. In short, finding a variable explaining the pattern of past colonization could provide an exogenous causal determinant of underdevelopment today.

The list of the historical factors that supposedly hold Africa back is long and growing.¹⁶ The role of colonial institutions has received widespread attention, with AJR’s aforementioned argument linking settler mortality to colonial institutional quality being the most well-known. Other studies have emphasized the identity of the colonizers, in particular contrasting British common law institutions against continental European Roman law.¹⁷ Reaching further back still, scholars have used anthropological datasets (such as the Murdock Atlas) and argued that the effects of precolonial centralization in African polities persisted through the colonial and postcolonial periods.¹⁸ The slave trade

14. Walter Rodney, *How Europe underdeveloped Africa* (Verso Books, London, [1972]2018).

15. Paolo Mauro, ‘Corruption and growth’, *Quarterly Journal of Economics* 110 (1995), p. 706.

16. Jerven, ‘Wealth and poverty’ compiles a non-exhaustive list of more than 50 papers with distinct theories, p. 35.

17. Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, ‘Economic consequences of legal origin’, *Journal of Economic Literature* 46 (2008), pp. 285–332; Merima Ali, Odd-Helge Fjeldstad, and Abdulaziz Shifa, ‘European colonization and the corruption of local elites: The case of chiefs in Africa’, *Journal of Economic Behavior & Organization* 179 (2020), pp. 80–100.

18. Stelios Michalopoulos and Elias Papaioannou, ‘Pre-colonial ethnic institutions and contemporary African development’, *Econometrica* 81 (2013), pp. 113–152; Nicola Gennaioli and

also looms large in African economic history, and scholars have used datasets on slave exports to argue that their economic effects persist through today, sometimes via channels such as institutions and trust.¹⁹

Another set of influential arguments concerns the effects of initial conditions, including factor endowments and geography that were assumed to predate the formation of either precolonial or colonial polities. Responding to Stanley Engerman and Kenneth Sokoloff's argument that factor endowments had a persistent effect on economic development in Latin America, Gareth Austin proposed that Africa might have a distinct path of development, with its historical low population densities, but spelled out the effects on technological choice, rather than development outcomes or state strength specifically.²⁰ Jeffrey Herbst and others have famously argued that low historical population densities directly account for the weakness of African states.²¹ Related arguments focus not only on the strength of states, but more specifically on the locus of control, be it people rather than territory, or ports rather than borders, the latter summarized in Frederick Cooper's phrase 'the gatekeeper state'.²² Distance to commercial centres, transport costs, and ruggedness of terrain have all been subject to testing, but perhaps most influentially, it has been argued that the disease environment has had long-lasting negative effects. Malaria prevalence was raised by David Bloom and Jeffrey Sachs, and Marcella Alsan argued that the prevalence of sleeping sickness and the tsetse fly worked through political centralization to have a persistent negative impact on African economic development.²³ Many economists have also highlighted how high ethnic fragmentation (which is usually assumed to be fixed and 'primordial' in this literature) inhibited

Ilia Rainer, 'The modern impact of precolonial centralization in Africa', *Journal of Economic Growth* 12 (2007), pp. 185–234.

19. Nathan Nunn 'The long-term effects of Africa's slave trades', *Quarterly Journal of Economics* 123 (2008), pp. 139–176; Nathan Nunn and Leonard Wantchekon, 'The slave trade and the origins of mistrust in Africa', *American Economic Review* 101 (2011), pp. 3221–3252.

20. Kenneth Sokoloff and Stanley Engerman, 'Institutions, factor endowments, and paths of development in the New World', *Journal of Economic Perspectives* 14 (2000), pp. 217–232; Gareth Austin, 'Resources, techniques, and strategies south of the Sahara: Revising the factor endowments perspective on African economic development, 1500–2000', *Economic History Review* 61 (2008), pp. 587–624.

21. Herbst, 'States and power'.

22. As per the Nieboer-Domar hypothesis, see for an application to the Cape Colony. Erik Green, 'The economics of slavery in the eighteenth-century Cape Colony: Revising the Nieboer-Domar hypothesis', *International Review of Social History* 59 (2013), pp. 39–70; Frederick Cooper, *Africa since 1940: The past of the present* (Cambridge University Press, Cambridge, 2002). For an argument for how the post-colonial geopolitical set up meant that rulers did not have to fight for territory, see Robert Bates, *Prosperity and violence: The political economy of development* (Norton, 2001).

23. David Bloom and Jeffrey Sachs, 'Geography, demography, and economic growth in Africa', *Brookings Papers on Economic Activity* 2 (1998), pp. 207–296; Marcella Alsan, 'The effect of the tsetse fly on African development', *American Economic Review* 105 (2015), pp. 382–410.

administrative centralization and consensus formation in African polities, thereby hindering the development of stable political institutions.²⁴

These approaches have been criticized for several reasons. One is the lack of precision in contemporary cross-sectional estimates of GDP per capita, where measurement error may be at least as high as plus or minus 40 percent.²⁵ Other outcome variables, such as nighttime satellite data, have not fared much better.²⁶ The historical cross-sectional variables may be even more contested. Observations are often said to be sparse, of varying provenance and sometimes extrapolated or inconsistently coded.²⁷ Econometric concerns of the validity of the approach itself also loom large, even abstracting from data quality.²⁸ For our purpose, the fundamental question is different: whether the relationship is actually persistent through time. The worry is best summarized by Gareth Austin's objection that persistence studies that do not pay adequate attention to the time elapsed between two distant cross-sections amount to a 'compression of history'.²⁹ This is intimately connected to the importance of mechanisms, that is, the choice and trajectory of the institutional variables connecting the historical variable to a present-day outcome.³⁰

Two brief examples illustrate the importance of institutional mechanisms.

The first pertains to a long-debated question in the historiography of African economic development, namely variation in the adoption of the plough in Africa and the impacts this had on political systems. In a classic study, Jack Goody argued, without reference to a strict statistical test, that it is plausible that the lack of the plough explains the lack of feudalism in historical Africa. The absence of a plough, in turn, came down to agro-climatic conditions. This argument was supported by historical observations of political systems, such as those in kingdoms in areas that today belong to Rwanda and Ethiopia, which can be described as pseudo-feudal. In these areas, population densities were high, the soils were suitable for ploughing, and

24. William Easterly and Ross Levine, 'Africa's growth tragedy: Policies and ethnic divisions', *Quarterly Journal of Economics* 112 (1997), pp. 1203–1250.

25. Morten Jerven, *Poor numbers: How we are misled by African development statistics and what to do about it* (Cornell University Press, Ithaca, 2013).

26. Denis Cogneau and Yannick Dupraz, 'Questionable inference on the power of pre-colonial institutions in Africa' (Paris School of Economics: Working Paper 25, 2014).

27. Leticia Arroyo Abad and Noel Maurer, 'History never really says goodbye: A critical review of the persistence literature', *Journal of Historical Political Economy* 1 (2021), pp. 1–31; David Albouy, 'The colonial origins of comparative development: An empirical investigation: Comment', *American Economic Review* 102 (2012), pp. 3059–3076.

28. Timothy Conley and Morgan Kelly, 'The standard errors of persistence', *Journal of International Economics* 153 (2025): 104027.

29. Austin, 'Compression of history'.

30. See, for example, Ewout Frankema, 'Why Africa is not that poor', in Alberto Bisin and Giovanni Federico (eds), *The handbook of historical economics* (London: Academic Press, 2021), pp. 557–584; Hans-Joachim Voth, 'Persistence: Myth and mystery', in Alberto Bisin and Giovanni Federico (eds), *The handbook of historical economics* (London: Academic Press, 2021), pp. 37–55.

cattle-drawn ploughs were an option since, in the highlands, sleeping sickness did not make cattle holding impossible.³¹

On the other hand, in *Why Nations Fail*, Daron Acemoglu and James Robinson argue that farmers in what is today the Democratic Republic of Congo could have adopted the plough and therefore could have enjoyed higher returns in agriculture were it not for the problem that private property rights were not secure and well defined. The root cause of insecure property rights was agroclimatic conditions, which inhibited European settlement.³² Similar to Goody, these authors posit a link between geography and developmental outcomes. However, for Goody, institutions were at the end of a causal chain of reasoning. For Acemoglu and Robinson, they are an intermediate link between geography and modern-day development. This means they potentially discount the notion that tropical soils prevalent in Africa have shallow soil fertility, so that the plough would not have been a productive choice of technique.

The second example pertains to the composition and often-decried 'narrowness' of postcolonial elites in African states. In a seminal contribution, Robert Bates argued, based on initial fieldwork in Zambia, and later generalized in *Markets and States in Tropical Africa* and other works, that urban areas were more politically important, driving demand for state intervention in agricultural markets.³³ Through marketing boards, leaders could not only keep food prices low but also collect a premium by offering low prices on cash crops to farmers and transfer these premiums to urban industrialization efforts. Bates further nuanced this argument to account for the exceptions that confirmed the rule.³⁴ The prime examples were Côte d'Ivoire under Félix Houphouët-Boigny and Kenya under Jomo Kenyatta, where cocoa and coffee farmers, respectively, were politically important and economic policy was hence more in accordance with that favoured by the Bretton-Woods institutions.

These arguments motivated statistical tests such as those by William Easterly and Ross Levine, who pointed to Bates to justify the rationale of testing for ethnical fragmentation as a proxy for biased narrow elites.³⁵ Although

31. Jack Goody, *Technology, tradition and the state in Africa* (Routledge, London, [1971]2018).

32. Daron Acemoglu and James A. Robinson, *Why nations fail: The origins of power, prosperity, and poverty* (Crown Business, London, 2012).

33. Robert Bates, *Rural responses to industrialization: A study of village Zambia* (Yale University Press, Haven, CT, 1976); Robert Bates, *Markets and states in tropical Africa: The political basis of agricultural policy* (University of California Press, Oakland, CA, 1981); Robert Bates, *Beyond the miracle of the market: The political economy of agrarian development in Kenya* (Cambridge University Press, Cambridge, 1989); Robert Bates, 'Agricultural policy and the study of politics in post-independence Africa', in Douglas Rimmer (ed.), *Africa 30 Years On* (James Currey, London, 1991).

34. *Ibid.*; Bates, 'Village Zambia'.

35. Easterly and Levine, 'Growth tragedy'; It also influenced economists such as Jeffrey Sachs and Andrew Warner, who tested for interventions in agricultural markets, classifying states that

both sets of authors were concerned about the ‘narrow’ composition of African elites, and the effect this might have had on economic outcomes, the implication for the institutional mechanism is quite different. In Bates’ version, post-colonial states were, if anything, too ‘strong’ and interventionist in their regulation of markets. In Easterly and Levine’s version, however, African states were weak and divided, because their ethnic parochialism prevented them from formulating policies and crafting durable institutions that could command the assent of the masses.

Such ambiguities can, in the end, only be resolved by careful evaluation of the historical context, careful formulation of counterfactuals along the causal chain, and examination of the proposed mechanisms at each point in time. We contribute to this latter point by drawing on a new dataset that allows us to examine persistence over time and test more precisely whether historical factors have the predicted effect on institutional mechanisms.

Data and methodological approach

The persistence literature has suggested that some ‘institutions’, be they of colonial or pre-colonial heritage, or owed to geographical or factor endowments, persisted to the present. We have argued that, without a solid foundation in data, much of the literature relies on a leap of faith that the correlations demonstrated hold true over time. Fortunately, these propositions are testable using long-run time series analyses on fiscal institutions, because the persistent causal effect on income is said to be determined by the strength or shape of ‘institutions’ more generally, and often quite specifically by the extent of state capacity itself. Conceptually, we build on the fiscal capacity framework developed by Tim Besley and Torsten Persson, according to which revenue-hungry governments decide whether to invest in institutions that survey the population and enforce the collection of direct and certain broad-based indirect taxes.³⁶ Although these investments yield substantial gains in the long run through higher tax revenues, they are costly in the short run. In particular, the gains and costs of these investments can depend upon a territory’s population density or other aspects of economic and political structure, all of which can influence a country’s ‘taxability’ and hence the costs and profits of investments in fiscal capacity. Moreover, governments with access to ‘easy’ income from natural resources, overseas aid,

had existing marketing boards as ‘closed’ in regressions testing for the economic impact of openness, see: Jeffrey Sachs and Andrew Warner, ‘Sources of slow growth in African economies’, *Journal of African Economies* 6 (1997), pp. 335–376.

³⁶ Timothy Besley and Torsten Persson, *Pillars of prosperity: The political economics of development clusters* (Princeton University Press, Princeton, NJ, 2011); more specifically: Timothy Besley, Ethan Ilitzki, and Torsten Persson, ‘Weak states and steady states: The dynamics of fiscal capacity’, *American Economic Journal: Macroeconomics* 5, (2013), pp. 205–235.

or tariffs on international trade may choose to forego costly investments in fiscal capacity, strategically under-tax domestic sources, and privilege 'easy' external revenues.³⁷

Two implications for our work emerge from this. First, we are interested in investigating whether governments in Africa made the same choices over time in designing fiscal institutions, indicating persistence, or whether these choices changed, in which case we would emphasize dynamism over persistence. For example, the institutional choices made by colonial governments might have reflected quite different political priorities than those faced by independent African governments. If this were the case, what matters for our argument is that fiscal institutions would be ruptured after independence, which we would interpret as counteracting the literature emphasizing persistence from colonial times.³⁸

A second implication is that, as fiscal capacity results from a wide variety of institutional factors, it can be seen as a holistic measure of institutions. Indeed, we show in [Appendix A1](#) that our measure of fiscal capacity is strongly correlated with other institutional measures used in the persistence literature, in particular the World Bank governance indicators. Nonetheless, it is important to caveat that even these indicators capture only some dimensions of what might be termed 'state capacity', which is conceptually broader than our notion of fiscal capacity. Moreover, the correlation between fiscal capacity and other dimensions of 'state capacity', such as administrative or coercive capacity, may change over time, something we are unable to test given the short time frame over which we have comprehensive data for these governance indicators.³⁹ It is also worth noting that, despite their strong correlation, fiscal capacity is not synonymous with 'good' institutions. As Thandika Mkandawire famously emphasized, white minority-run states such as Apartheid South Africa or Rhodesia developed high degrees of fiscal and coercive capacity, while excluding the Black majority from democratic processes.⁴⁰ Not coincidentally, in [Appendix A1](#), we find much higher

37. The tendency of African governments to turn to external revenues has been emphasized in particular by Jean-François Bayart, 'Africa in the world: A history of extraversion', *African Affairs* 99 (2000), pp. 217–267.

38. Evidence that colonial governments did indeed tax less than newly independent African states is presented by Dhammika Dharmapala and Marvin Suesse, 'Decolonization, legitimacy and fiscal capacity: Event study evidence from Africa' (Munich: CESifo Working Paper No. 12059).

39. For an overview on the multiple dimensions of state capacity and the attendant debate in political science surrounding that concept, see: Jonathan K. Hanson and Rachel Sigman, 'Leviathan's latent dimensions: Measuring state capacity for comparative political research', *The Journal of Politics* 83 (2021), pp. 1495–1510; Hendrix S. Cullen, 'Measuring state capacity: Theoretical and empirical implications for the study of civil conflict', *Journal of Peace Research* 47 (2010), pp. 273–285; Stuti Khemani, 'What is state capacity?' (Washington DC: World Bank Policy Research Working Paper 8734, 2019); Pavithra Suryanarayan, 'Endogenous state capacity', *Annual Review of Political Science* 27 (2024), pp. 223–243.

40. Thandika Mkandawire, 'On tax efforts and colonial heritage in Africa', *The Journal of Development Studies* 46 (2010), pp. 1647–1669.

correlations between fiscal capacity and technocratic measures of ‘Government Effectiveness’ than between fiscal capacity and measures of popular legitimacy, such as ‘Voice and Accountability’, even for a later period.

Empirically, we implement this conceptual framework using a new dataset on institutions that can serve to ‘decompress history’ and unpack the black box of when and how institutions matter for economic development. This new dataset, published by Thilo Albers, Morten Jerven, and Marvin Suesse, covers tax revenues for African polities for the period from 1900 to 2015.⁴¹ The dataset includes itemized government revenues of all territories on the continent (with the addition of Madagascar, but the exclusion of smaller islands), with a coverage above 90 percent for country-year combinations. The original creation of the dataset rested on ensuring data quality at the point of entry by comparing a variety of primary sources, including reports from colonial authorities, African governments, international organizations and scholarly sources. All the items from historical sources were then recoded to fit modern International Monetary Fund (IMF) classifications to achieve intertemporal and cross-sectional comparability. With this high-quality annual data over a century, we can test the persistence of ‘deep’ determinants of development that rely on institutional mechanisms.

In our empirical definition of fiscal capacity, we make two important choices. First, as we are interested in measuring institutional capacity, we use only income from direct taxes and sales taxes to proxy for domestic fiscal capacity in our benchmark analysis. This relies on the notion that these taxes require a greater capacity for counting and collecting revenues than trade or resource taxes.⁴² However, we also replicate our analyses for an alternative measure based on total ordinary revenues in [Appendix B](#). Apart from direct and sales taxes, this latter measure includes trade taxes and customs, non-tax ordinary income, and, most importantly, profits from state enterprises and public service fees. As this measure still excludes extraordinary revenues, [Appendix B](#) also presents separate results controlling for access to resource revenues, aid and subsidies, and foreign credit. Although the overall pattern is similar to that in our benchmark regression, estimates for these alternative specifications are somewhat more volatile, given their greater exposure to external shocks, such as global trade, resource, or credit cycles.

Secondly, to express nominal tax data as a real quantity that can be meaningfully compared across time and space (especially in a high-inflation environment), we follow the original dataset’s approach and deflate our nominal tax series using nominal wages. One advantage of this deflator stems from

41. The dataset is available through <https://sites.google.com/site/tnhalbers/fiscal-capacity-data>.

42. This follows the argument made by seminally by Besley and Persson, ‘Developing countries’, but has been widely used elsewhere, for example: Mark Dincecco and Mauricio Prado, ‘Warfare, fiscal capacity, and performance’, *Journal of Economic Growth* 17 (2012), pp. 171–203.

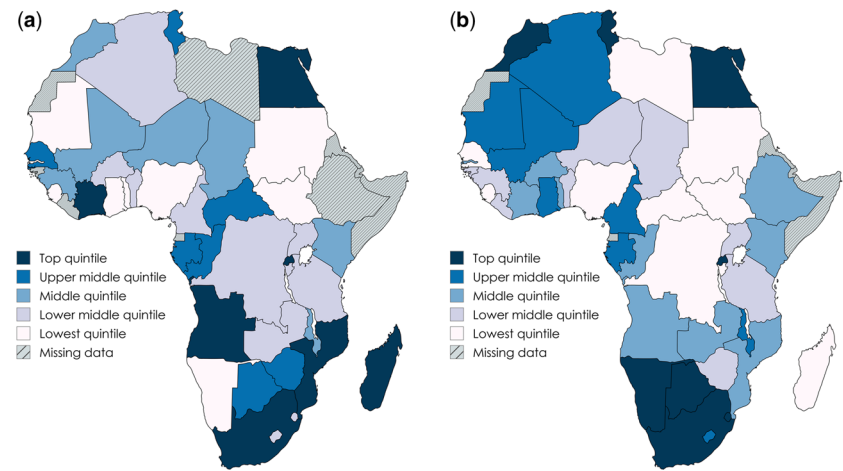


Figure 1 Fiscal capacity in colonial and independent polities across two cross-sections. Panel (a) 1925 cross-section Panel (b) 2010 cross-section.

it incorporating country-year specific information on inflation dynamics, under the assumption that these are captured by (largely urban) wage dynamics.⁴³ We further normalize real tax revenues by the size of a polity’s population, so that we get our measure of real tax collection per capita (expressed in wage days):

$$\begin{aligned} \text{Real tax collection } pc_{i,t} \\ = \left(\text{Nominal tax revenue}_{i,t} / \text{Nominal daily wages}_{i,t} \right) / \text{Population}_{i,t} \end{aligned}$$

To illustrate how the capacity to collect changed over time, we provide a map of Africa with cross sections of real fiscal capacity measured in labour days, a century ago and today (Figure 1). It shows some persistence, notably in parts of southern and northern Africa. Yet it also shows some striking examples of change, such as Côte d'Ivoire and Angola, which were in the top quintile (top 20 percent) in the early twentieth century, but are not in that category in the early twenty-first. Conversely, few taxes were collected in Morocco and Namibia in the 1920s, but both polities are in the top quintile a century later.

43. In Figure A1, we therefore compare tax income deflated by wages against another frequently used measure: taxes as a share of nominal GDP. Although the two match relatively closely, the latter is much more erratic, as abrupt changes substantially influence nominal GDP (which in turn are largely driven by business cycles). Our measure, in contrast, is more stable over time, its dynamics represent fiscal rather than macroeconomic changes, and it is moreover available for the entire century.

However, a ‘persistence’ interpretation of the two cross sections in [Figure 1](#), covering a time span of more than eighty years, suffers from the same ‘compression-of-history’ critique we outlined above. Instead, our approach for testing persistence is twofold. First, we simply graph our raw data. For example, consider the left-hand side of [Figure 2](#), where we plot fiscal capacity as an *annual* time series from 1900 to 2015. The graph displays one line for African polities in the top tercile (top 33 percent) of fiscal capacity in the late colonial period (1950), one for those in the middle tercile in 1950, and one for those in the lower tercile in the same year. The line for the high fiscal capacity group generally lies above the other two lines throughout the period. This suggests that polities with higher levels of fiscal capacity during the late colonial period continued to have higher levels of fiscal capacity compared to other territories both before and after decolonization. High-tax institutions, in other words, do seem to genuinely persist.

This claim is further undergirded by panel (b) of [Figure 2](#), which presents the results of an Ordinary Least Squares regression. The regression setup has the advantage of not relying on the coarse tercile splits of the previous graph, instead exploiting a more granular disaggregation of the main independent variables.⁴⁴ In this particular analysis, we explain fiscal capacity in each decade between 1900 and 2015, with fiscal capacity in 1950. The dots show the resulting coefficient for each decade, and the bars the 95 percent-confidence interval for each coefficient. A confidence interval not including the zero line indicates that the coefficient is statistically significant at the 95 percent-level and that, therefore, the variable in question (fiscal capacity in this case) can be said to exercise a persistent effect.⁴⁵ This effect is present in all decades analysed here: African polities that taxed more in the decade starting in 1950 persistently taxed more both in the first half and in the second half of the twentieth century. We reach the same conclusions when employing total ordinary revenues as a dependent variable, or when controlling for access to natural resources, aid or debt in [Appendix B](#).

For the remainder of the article, we run similar analyses, using both descriptive statistics and regression analyses to test six prominent hypotheses on African development in the literature.

As noted, there is a range of hypotheses and variables to pick from. We have chosen those we consider having the most currency in the existing literature. Many of the variables we test have been used as proxies to test a wide range of hypotheses. Ethnic fragmentation is a prime example—it has

44. Descriptive graphs and regression analysis complement each other. While the former allows for an easy analysis of the raw numbers over time, the categorization into terciles reflects a somewhat arbitrary division. The regressions do not rely on such a priori grouping of countries. Moreover, they allow for tests of statistical significance.

45. Although the 95 percent cut-off is, in some sense, quite arbitrary, it aligns well with standard practice in empirical economics.

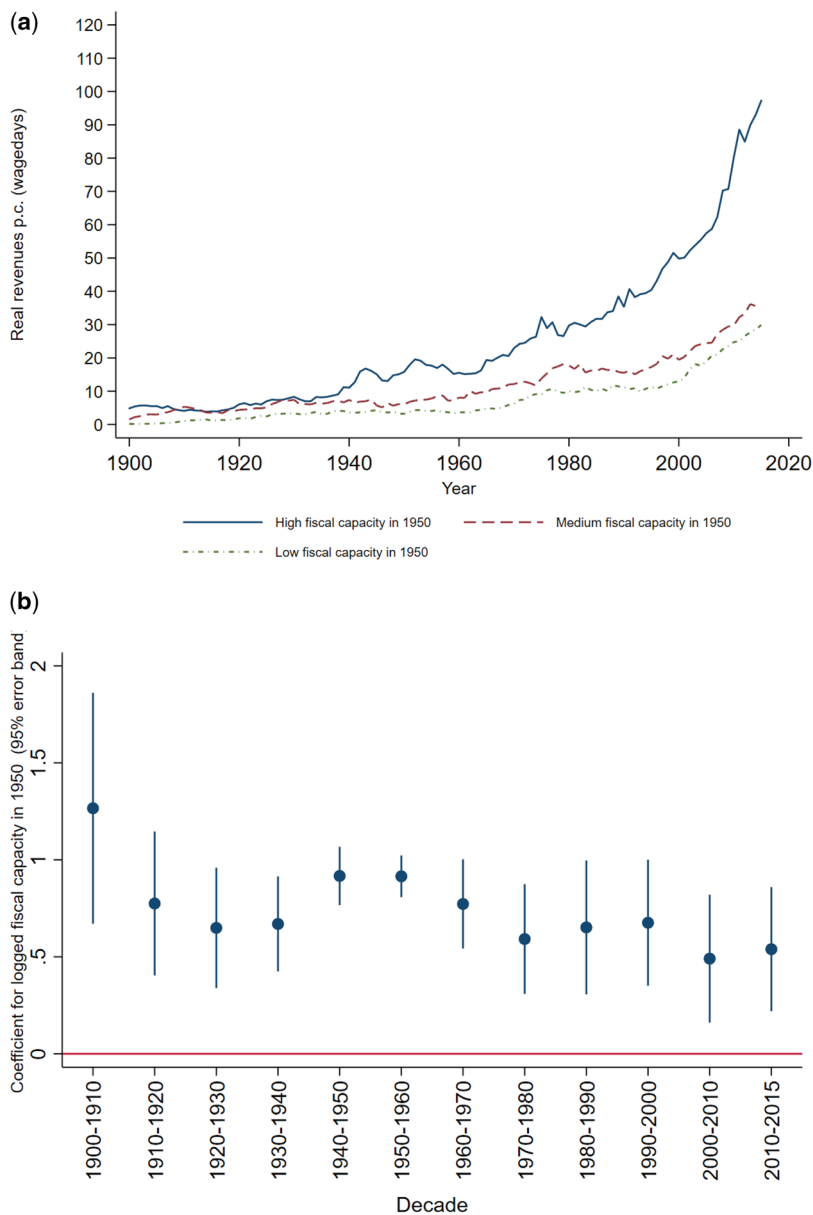


Figure 2 Testing persistence in fiscal capacity 1900–2015. Panel (a) Raw data Panel (b) Unconditional regression.

been used in regression analyses to proxy for, among others, narrow elites, corruption, homogeneity, social capital, arbitrary borders, legitimacy, probability of civil war or conflict, or pre-colonial legacies.

We have grouped these six hypotheses into three categories

1. initial conditions;
2. pre-colonial institutions; and
3. colonial institutions.

We would like to emphasize that in employing these categorizations, we are following the language and conceptual frameworks used in the literature we are testing, and that we do not search ourselves for something akin to ‘initial conditions’ or ‘deep roots’ of African development. Indeed, in his essay on the role of factor endowments determining the path of economic development, Austin cautions against such approaches.⁴⁶ Not only are factor endowments subject to dynamic change over time, but even seasonal variation determines whether labour is abundant or scarce, which in turn has implications for the choice of institutions, production technique, and technology adoption. In our view, this further underscores the importance of checking whether and when the allegedly persistent variables become significant. We are thus not arguing that the hypotheses mapped in the ‘deep roots’ literature are accurate or well-defined in some conceptual sense. Instead, we are testing one specific aspect of them: their degree of persistence.

Results: Does persistence persist?

Initial conditions

The so-called ‘initial conditions’ or deep determinants that we test for here are political geography, as proxied by population density, which has been argued to determine state weakness.⁴⁷ We also consider ethnic fractionalization, but note that the conceptual understanding of ethnicity and its impact on economic development and state formation is subject to debate in the literature.⁴⁸

Our first indicator of initial conditions—broadly capturing factor endowments—is population density. Herbst argued that low population density inhibited the projection of state power and, by extension,

⁴⁶. Austin, ‘Factor endowments’.

⁴⁷. Herbst, ‘States and power’.

⁴⁸. Anthony Hopkins, ‘The new economic history of Africa’, *The Journal of African History* 50 (2009), pp. 155–177.

undermined the strength of African states.⁴⁹ The abundance of land relative to people made territorial control more expensive, constrained the state's ability to tax, and made the Lockean 'contract' of property rights less feasible. This aligns with Cooper's typology of the African state as a gatekeeper state, essentially arguing that the state chose to control only certain points to extract revenue.

We thus test whether and how population density affects revenue collection. Our results are displayed in [Figure 3](#). On the left-hand side, we divide all African polities into three groups based on their population density in 1900 and plot their annual trajectories of fiscal capacity. It is apparent that the trajectories for the low, medium, and high groups lie very close to each other, and at times switch their order. For example, while polities with *high* historical population density tax less than the other two groups between 1950 and 1990, this relationship is absent in the first half of the century and after 1990.

The right-hand side confirms that historical population density does not appear to exert a persistent effect on fiscal capacity. Only in the decade between 1960 and 1970, the first post-colonial decade for most polities, did population density have a significant impact on fiscal capacity. Moreover, while the theoretical expectation would be that low population densities are associated with lower taxation, the statistical results indicate the opposite trend, although it is largely statistically insignificant. The results in [Appendix B](#) similarly indicate negative or near-zero coefficients. We therefore conclude that there is little evidence that population density exerts an influence on the institutional trajectories of African polities that is both persistent and in line with the theoretical literature.

Our second potential explanatory variable in the 'initial conditions' category is ethnic fragmentation. The dataset is the same as that used in Easterly and Levine's influential paper, where data on linguistic fragmentation were assembled to create a measure of the probability, between zero and one, of drawing two random people in a population who belong to different linguistic groups.⁵⁰ Theory would have it that high ethnic fragmentation would undermine policy consensus and state-building, though some of the newer literature, as noted above, suggests the relationship might be weak or non-existent.

[Figure 4](#) shows mixed results for the relationship between ethnic fractionalization and fiscal capacity. The descriptive graph on the left-hand side indicates that less fractionalized countries were indeed able to tax more from the 1980s onward (when a substantial part of the literature on the adverse effects of ethnic fractionalization was being written), but this relationship

49. Herbst, 'States and power'.

50. Easterly and Levine, 'Growth tragedy'.

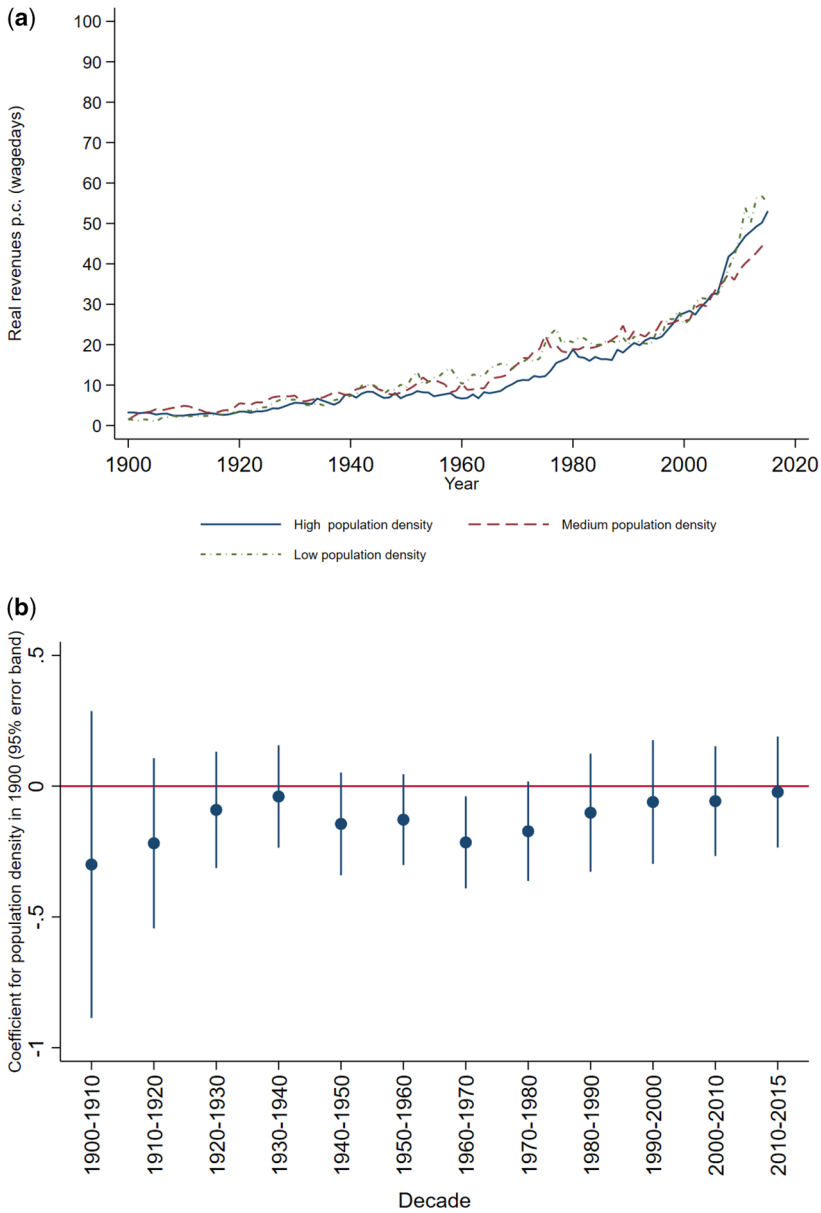


Figure 3 Testing persistence in the effect of population density on fiscal capacity 1900–2015. *Panel (a)* Raw data *Panel (b)* Unconditional regression.

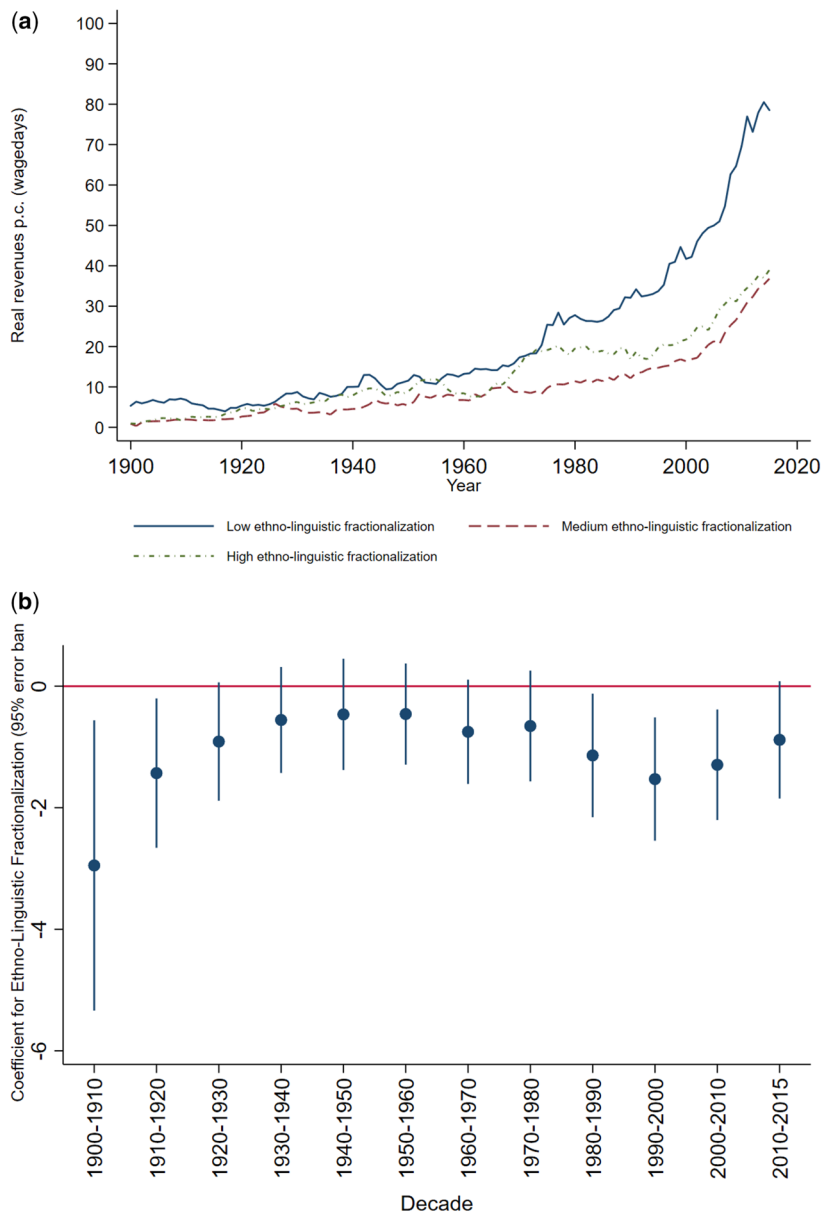


Figure 4 Testing persistence in the effect of ethnic fractionalization on fiscal capacity 1900–2015. Panel (a) Raw data Panel (b) Unconditional regression.

was not always present. Of course, this may not be unreasonable given the theory. During the colonial period, one has little reason to expect that the ethnic structure of the colony would impact the state's ability to collect taxes. However, three factors caution against too strong of a conclusion. First, the line graph also shows that polities with very high ethnic fractionalization tend to exhibit *higher* fiscal capacity than those with medium ethnic fractionalization. If ethnic divisions inhibited state-building, we would expect the opposite pattern. The decade-by-decade analysis on the right-hand side of Figure 4 provides a more fine-grained view. It shows that the relationship between ethnic fractionalization and fiscal capacity was statistically significant in the first two to three decades under consideration. This speaks against the above-mentioned argument that state-building and ethnic fractionalization should be unrelated during colonial times. Thirdly, the regression results indicate that in the 1960s and 1970s, when independent African states were being captured, and when institutions were used to intervene in markets and collect taxes as Bates posited, the relationship is insignificant. The fact that the relationship is again significant in the 1990s and 2000s might indicate that it is subject to omitted variable bias, for example if more fractionalized states happened to be more likely to enter macroeconomic crises for other reasons. Relatedly, when controlling for access to external revenues in Appendix B, we find the coefficient turns insignificant again after 2010, suggesting the effect of ethnic fractionalization may be mediated by the external political and economic environment. At the very least, these results suggest that ethnic fragmentation has a non-linear effect or is dependent on interactions with contextual variables. For example, the argument that ethnic fragmentation persistently hampered economic development is at odds with the impressive development experiences in countries like Kenya and Côte d'Ivoire in the 1960s and 1970s. One factor that may have weakened the ability of these states to distribute rents was the subsequent experience of adverse external shocks—such as the collapse of coffee and cocoa prices in the 1980s. Macroeconomic context may thus help to interpret the patterns.

Pre-colonial institutions

Although slavery may have survived colonialism in some regions, it certainly predated it.⁵¹ Its appearance and dominance in pre-colonial Africa are linked to what we grouped into initial conditions, in particular, factor endowments. As per Evsey Domar, slavery appears as a rational labour institution in conditions of low population densities, as states and elites take control of

51. Paul Lovejoy and Jan Hogendorn, *Slow death for slavery: The course of abolition in Northern Nigeria, 1837–1936* (Cambridge University Press, Cambridge, 1993).

labour rather than land in relatively land-abundant conditions.⁵² As already mentioned, slavery, or rather slave exports, provides a potential explanation for underdevelopment in Africa.⁵³ In earlier formulations, such as in Joseph Inikori, it was argued that slave exports hampered economic development through direct effects—lack of labour and limited market formation.⁵⁴ In a very influential formulation of the persistence argument, Nunn and Leonard Wantchekon emphasized its effects in undermining interpersonal trust, and by extension, the development of institutions.⁵⁵ In short, the claim is that slave exports hindered the formation of pre-colonial states and stymied post-colonial development. In the figure below, we examine how the relationship with fiscal capacity manifests.

The results in both panels of [Figure 5](#) suggest that slave exports are indeed persistently associated with lower fiscal capacity throughout the twentieth century. Polities that suffered a high proportion of exported slaves before the advent of formal colonialism consistently underperform those polities with medium exports. These, in turn, generally underperform polities with few exports. This is also borne out in the regression analysis. Although the size of the effect strengthens somewhat after decolonization, suggesting that the negative effects of slavery on social trust might become reinforced with more local input into policies, the effect is visible throughout. One empirical catch is the extraordinarily strong coefficient in the colonial decade from 1900 to 1910, which would speak against the ‘activation’ thesis. However, this result should probably not be overemphasized; the magnitude of taxes extracted during this period was very small in most polities, so that relatively small deviations can produce comparatively large effects. A final caveat is that we find the effect of slave exports diminishes significantly in the interwar period when using total revenues as the dependent variable (see [Appendix B](#)). As this measure includes revenue from trade taxes, and is therefore susceptible to swings in the global trade cycle, this attenuation may well reflect the common and large external shocks African polities experienced during this period. This underscores our preference for using a more stable measure of fiscal capacity based on domestic taxes in our benchmark specification.

The idea that independent African states that built on solid precolonial institutional foundations constituted more cohesive and legitimate states is linked to the popular notion of the ‘antiquity of states’, and Robert Putnam’s ideas of the importance of social capital and social cohesion.⁵⁶ One of the

52. Evsey Domar, ‘The causes of slavery or serfdom: A hypothesis,’ *The Journal of Economic History* 30 (1970), pp. 18–32.

53. Nunn, ‘Slave trades’.

54. Joseph Inikori, *Forced migration: The impact of the export slave trade on African societies* (Hutchinson, 1982).

55. Nunn and Wantchekon, ‘Origins of mistrust’.

56. Originally created by Valerie Bockstette, Areendam Chanda and Louis Putterman, ‘States and markets: The advantage of an early start’, *Journal of Economic Growth*, 7 (2002), pp. 347–369 and updated by Oana Borcan, Ola Olsson, and Louis Putterman, ‘State history and economic

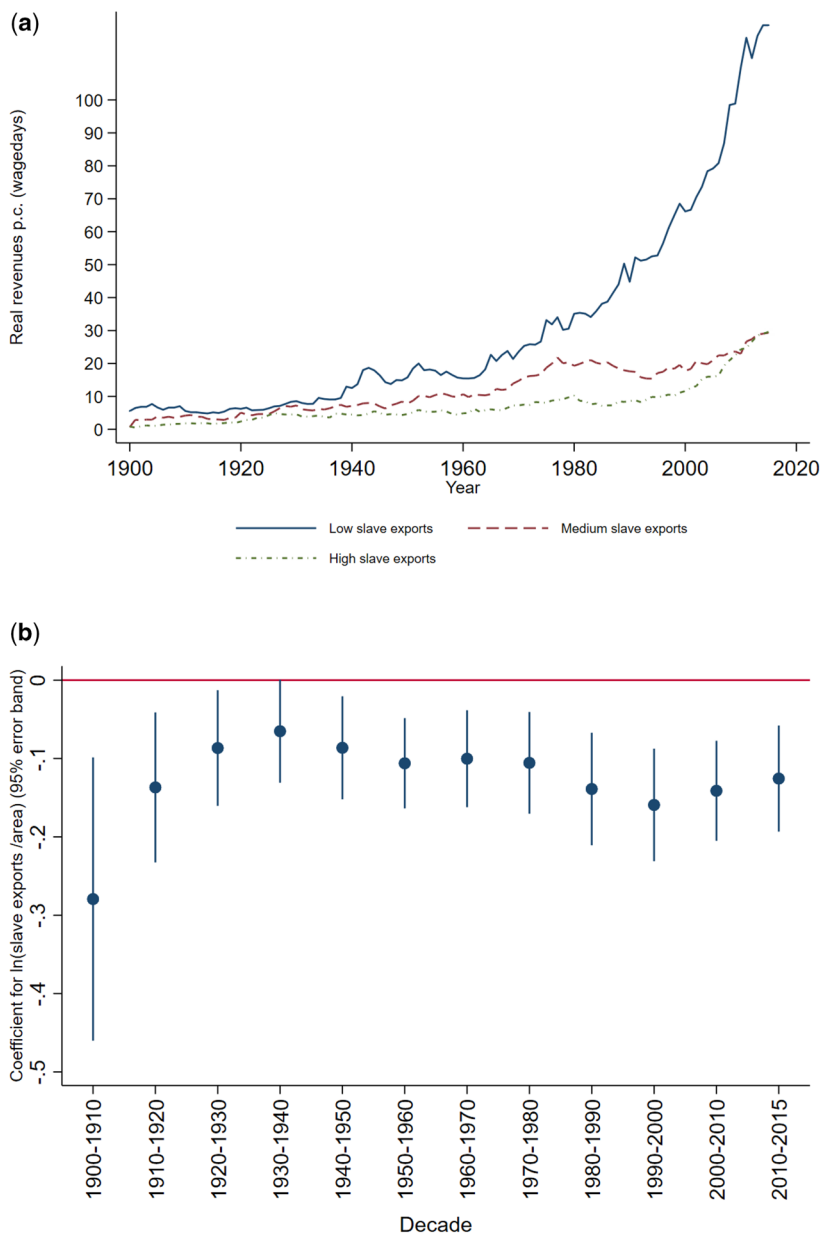


Figure 5 Testing persistence in the effect of slave exports on fiscal capacity 1900–2015. Panel (a) Raw data Panel (b) Unconditional regression.

first papers suggesting that congruence with precolonial states might solve the African slow growth puzzle was by Pierre Englebert.⁵⁷ Since then, there have been a number of papers that exploit the datasets created by anthropologists (such as that by Murdock) that describe societies as being dominantly matrilineal, pastoral or according to other typologies. The most influential is the level of pre-colonial centralization, which is argued to have a lasting impact on public goods provision today.⁵⁸

Our results offer only qualified support for these theses. Panel (b) of Figure 6 suggests that precolonial institutions were not associated with significantly higher levels of fiscal capacity until the 1990s (when countries with high pre-colonial centralization start to diverge markedly from the rest of Africa). The alternative specifications in Appendix B show a similar pattern. Although one could argue that the positive effect of pre-colonial institutions required independent African states to manifest itself, this argument is not entirely convincing for reasons that partly mirror those provided for ethnic fractionalization. First, in panel (a), the tercile of countries with the lowest degree of pre-colonial institutions outperforms the middle tercile since at least the late 1950s, which is not in line with the theory. Secondly, it is unclear why the beneficial effect of early institutions would suddenly appear in the 1990s, at least three decades after most African countries had attained independence. Once again, it might be more likely that the many shocks that started to hit African economies in this decade, such as export declines, civil wars, structural adjustment, and debt crises, just happened to disproportionately affect countries with lower levels of precolonial centralization. Alternatively, the introduction of multiparty democracy during the 1990s may have elicited differential effects. Although it is a plausible argument that multiparty democracy requires strong precolonial institutions, this is once again an argument that rests on the time-varying interaction of different contextual variables, rather than on the direct effect of a 'deep' factor of development.

development: Evidence from six millennia', *Journal of Economic Growth* 23 (2018), pp. 1–40; Robert Putnam, Robert Leonardi, and Raffaella Nanetti, *Making democracy work* (Simon Schuster, London, 1993).

57. Pierre Englebert, 'Pre-colonial institutions, post-colonial states, and economic development in Tropical Africa', *Political Research Quarterly* 53 (2000), pp. 7–36; Morten Jerven, 'Social capital as a determinant of economic growth in Africa' (Stockholm: Ratio Working Papers 108, 2006), provides a review of the early economics papers associating slow growth in Africa with a lack of social capital.

58. Michalopoulos and Papaioannou, 'Pre-colonial institutions'; while our empirical measure follows Gennaioli and Rainer, 'Precolonial centralization', as this is computed at the country level.

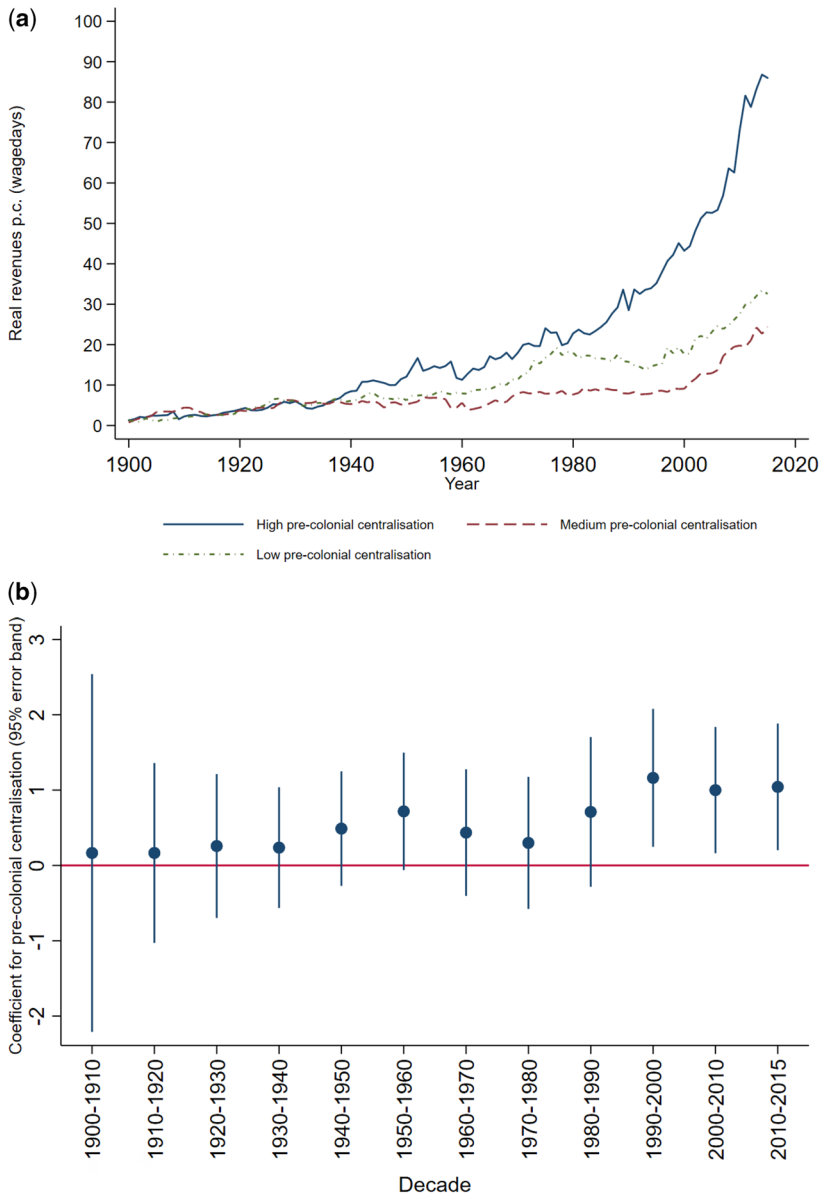


Figure 6 Testing persistence in the effect of pre-colonial centralization on fiscal capacity 1900–2015. *Panel (a) Raw data Panel (b) Unconditional regression.*

Colonial institutions

Perhaps the most obvious place to start our analyses of the persistent effects of colonial institutions is the ‘legal origins’ hypothesis suggested by La Porta et al., essentially arguing that the legal systems imposed by colonizers exert an effect on current-day outcomes. In particular, they argued that the British Empire transplanted a better set of institutions from other colonizers.

In Figure 7, we therefore plot the fiscal capacity of (former) British, French, and the smaller colonizers (Portugal and Belgium) in the left-hand panel. On the right panel, we plot the coefficient of an indicator variable denoting colonization by Britain. The results suggest that, if anything, British colonies exhibited *lower* levels of fiscal capacity until World War II. It is only after 1940 that non-British colonies lost their significant edge in fiscal capacity. And it is not until 1970 that (former) British colonies surpass the others in state building, and it is not until much later (in the 1990s) that the effect tends briefly towards (marginal) statistical significance. In other words, contrary to the literature, ‘good’ British institutions turned out to be associated with weaker states for much of the twentieth century and only became beneficial towards the end of the observation period.⁵⁹

It could, of course, be that institutions changed and adapted over time, and that the pace of institutional change differed between former British and French colonies. However, this is *not* what legal origins literature argues; instead, it stresses that the British legal system was better at protecting property rights, a feature that is supposed to be hard-wired into its institutional structure. Instead, we favour an explanation based on a more recent literature that attempts to place British property rights in their historical context, effectively demonstrating that the differences between the Empires at the start of the twentieth century was small indeed.⁶⁰

Finally, we turn to AJR’s colonial origins hypothesis, where it was argued that colonizers settled in larger numbers where settler mortality was lower, so that these locations received ‘productive institutions’ as opposed to ‘extractive institutions’ (see discussion in the introduction).

In Figure 8, panel (a), we therefore track the association between AJR’s settler mortality variable and our measure of fiscal capacity. The results demonstrate a relatively consistent ranking between high, medium, and low mortality polities, with the latter exhibiting the highest level of fiscal capacity for much of the twentieth century. Similarly, in panel (b), high settler

59. This apparent change in taxation strategies within the colonial period also casts doubt on the hypothesis that colonisers taxed according to fixed blueprints, a critique also raised by: Ewout Frankema and Marlous van Waijenburg, ‘Metropolitan blueprints of colonial taxation? Lessons from fiscal capacity building in British and French Africa, c. 1880–1940’, *The Journal of African History* 55 (2014), pp. 371–400.

60. Christopher Coyle, Aldo Musacchio, and John D. Turner, ‘Law and finance in Britain c. 1900’, *Financial History Review* 26 (2019), pp. 267–293.

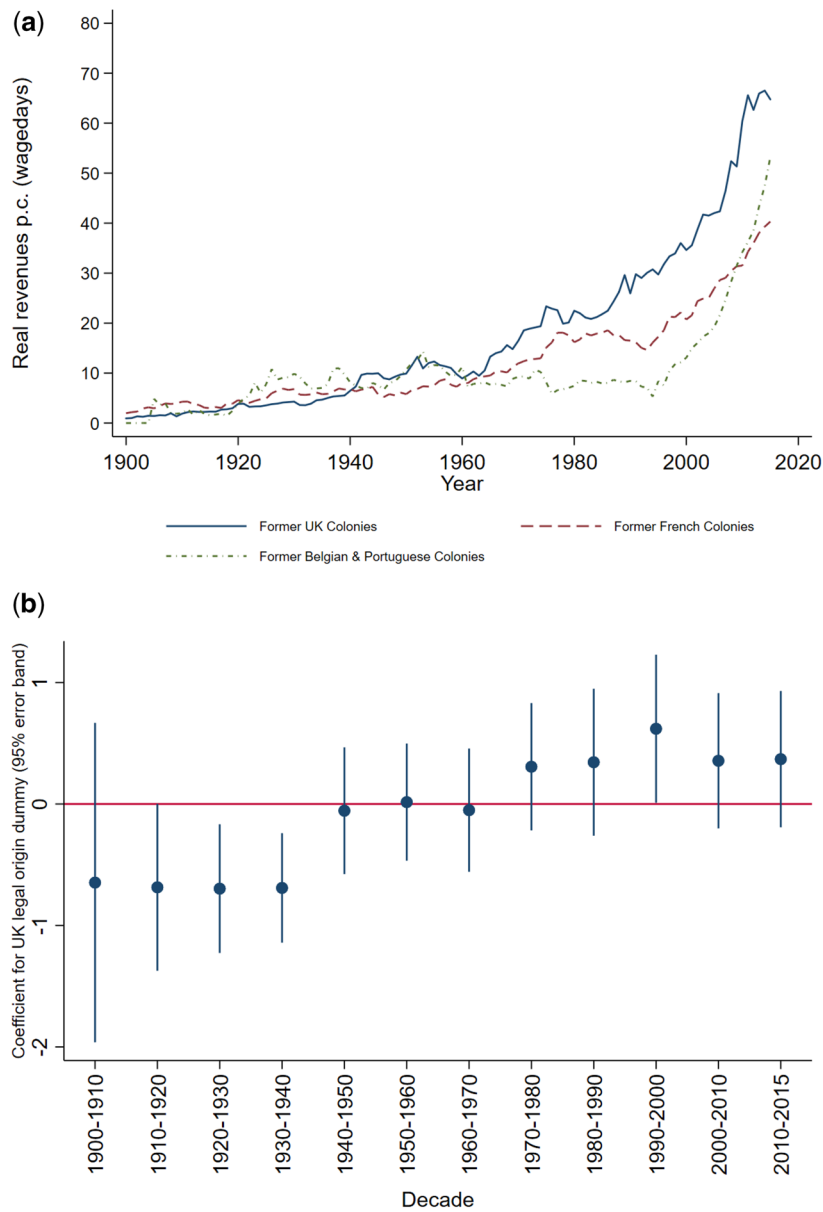


Figure 7 Testing persistence in the effect of colonizer identity on fiscal capacity 1900–2015. Panel (a) Raw data Panel (b) Unconditional regression.

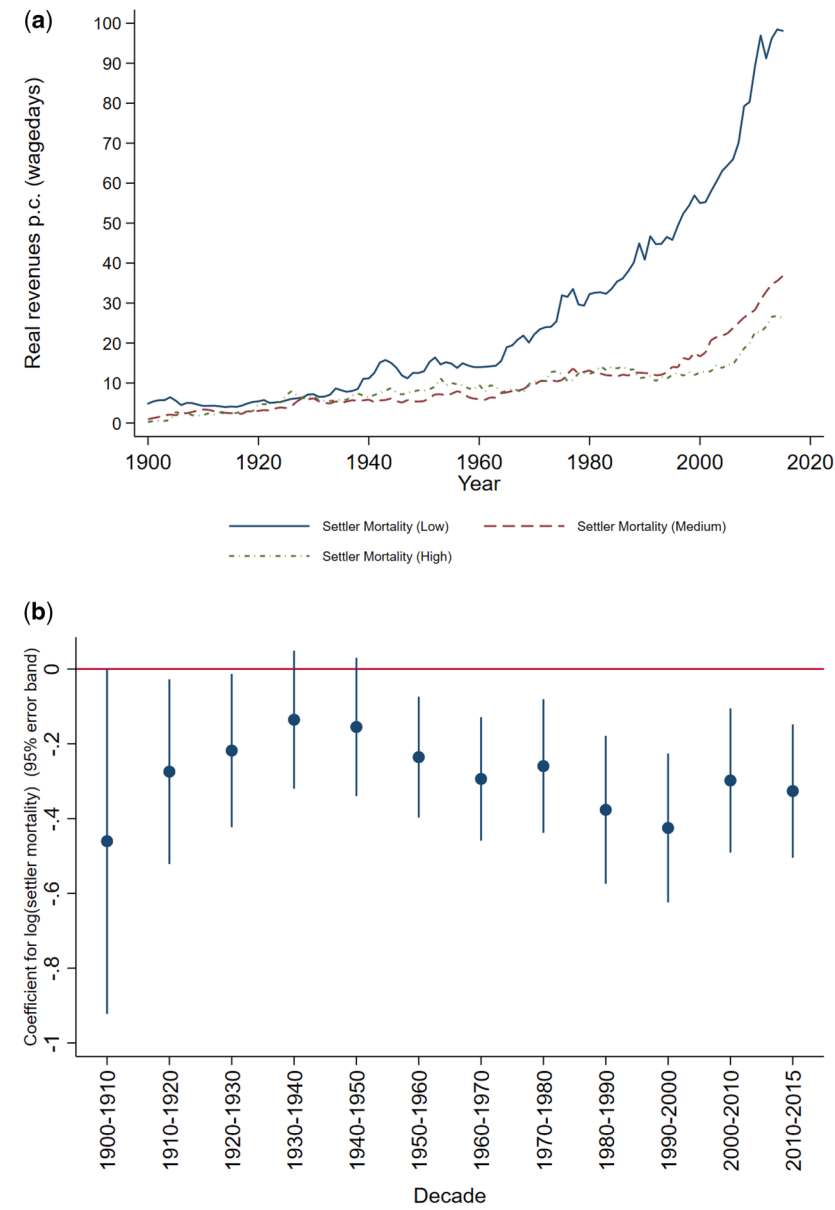


Figure 8 Testing persistence in effect of settler mortality on fiscal capacity 1900–2015. Panel (a) Raw data Panel (b) Unconditional regression.

mortality is statistically associated with lower fiscal capacity in all cross-sections save two. This exception in the 1930s and 1940s is somewhat of an outlier and may reflect the effects of the Great Depression on African economies. This is supported by the results in [Appendix B](#), which show that the interwar attenuation of the effect is stronger when total revenues are used as the dependent variable, as this measure includes trade taxes that were particularly sensitive to the global business cycle of the period. The effect is also partially eroded during the 1930s and 1940s in panel (b) when controlling for access to resource exports, subsidies, and credit, that is, other components particularly affected by swings in the global interwar and war-time business cycle. This does serve as a reminder that institutions do not operate in a historical vacuum, and that external events, including external macroeconomic and political shocks, can affect their operation.

It must also be emphasized that we do not assess other elements of AJR's thesis, such as the historical accuracy of their characterization of colonialism, the quality of their data or the exogeneity of their instrumental variable, but only focus on the consistency of estimates over time. In this sense, the theory is broadly consistent with the empirical evidence.

Conclusion

It has been argued here that data availability has fundamentally shaped the literature.⁶¹ A lack of time-series data on the central variables capturing economic and state development in Africa has raised the risk of compressing history by arguing that such relationships persisted over time. Our analyses of newly created time-series data on fiscal capacity have the potential to change that. The fate of the 'colonizer identity' variable is instructive in this regard.⁶² It holds only for the decades in which such arguments were made. The fact that that UK legal origins had a negative impact on fiscal capacity from the 1900s through the 1940s, and only displays the 'right' sign in the aftermath of the growth crisis in Africa in the 1970s and 1980s, invites a reformulation of the original argument and further inspection of the possible causal mechanisms at play. Similarly, our results suggest that the impact of pre-colonial structures on fiscal capacity is a relatively recent phenomenon.

The data on settler mortality has been subject to a lot of criticism, both on how the dataset was extrapolated and whether the restriction criteria holds.⁶³ In our test, it can be said to perform according to expectations, but if anything, the test does perhaps raise the question of what the prediction

61. Jerven, 'Wealth and poverty'.

62. La Porta, Lopez-de-Silanes, and Shleifer, 'Legal origins'.

63. Albouy, 'Comment'.

of the colonial origins hypothesis should be in an African country sample. AJR does not make a causal claim on the size of the state, but argues that it determines its quality, as proxied by the current-day risk of expropriation. Here, low settler mortality is indeed associated with higher fiscal capacity, but this leaves open the question of what expectations we should have for the historical role and rate of extraction.

Perhaps most strikingly, the predictions linking fiscal capacity and population density do not hold true in this investigation. It stands to reason that revenue strategies in colonial and post-colonial states were determined not only by population densities but by a more complicated calculus, including natural resources and crop types. The simple hypothesis predicting that higher population densities are easier to tax does not hold for African polities.

In sum, we show that failing to examine the entire trajectory of variables or to pay attention to the historical context of institutional development, especially in the 'post-colonial' decades, risks misreading the varied patterns of development in Africa.

Appendix A: Descriptives

Table A1 Correlation between fiscal capacity and World Bank governance indicators, 1996–2015

<i>World Bank governance indicators</i>	<i>Government effectiveness</i>	<i>Control of corruption</i>	<i>Regulatory quality</i>	<i>Rule of law</i>	<i>Political stability</i>	<i>Voice and accountability</i>
<i>Correlation coefficient with fiscal capacity</i>	0.652	0.637	0.608	0.5778	0.389	0.324

Note. Pairwise correlation coefficients reported. All coefficients statistically significant at the 1 percent-level.

Table A2 Descriptive statistics

<i>Variable</i>	<i>Source</i>	<i>Observations</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
<i>Fiscal capacity, entire sample</i>	<i>Albers et al., 'The Fiscal State'</i>	4,486	15.63	23.81	0	281.83
<i>Fiscal capacity, 1950</i>	<i>Albers et al., 'The Fiscal State'</i>	4,756	8.46	7.09	0.75	31.10
<i>Population density</i>	<i>Ewout Frankema and Morten Jerven, 'Writing history backwards or sideways: towards a consensus on African population, 1850–2010.' The Economic History Review 67 (2014), 907–931</i>	5,104	96.09	133.24	2.36	676.71
<i>Ethno-linguistic fractionalization</i>	<i>Easterly and Levine, 'Growth Tragedy'.</i>	5,104	0.60	0.27	0	0.93
<i>Slave exports per area</i>	<i>Nunn, 'Slave Trades'.</i>	5,104	899.26	1,551.35	0.1	6,756.45
<i>Precolonial centralization</i>	<i>Gennaioli and Rainer, 'Precolonial centralization'.</i>	4,292	0.51	0.32	0.008	1

<i>Variable</i>	<i>Source</i>	<i>Observations</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Mini- mum</i>	<i>Maxi- mum</i>
<i>British colony</i>	<i>La Porta, Lopez-de-Silanes and Shleifer, 'Legal origins'.</i>	5,104	0.36	0.48	0	1
<i>French colony</i>	<i>La Porta, Lopez-de-Silanes and Shleifer, 'Legal origins'.</i>	5,104	0.41	0.49	0	1
<i>Belgian or French colony</i>	<i>La Porta, Lopez-de-Silanes and Shleifer, 'Legal origins'.</i>	5,104	0.14	0.34	0	1
<i>Settler mortality</i>	<i>Acemoglu, Johnson and Robinson, 'Colonial origins'</i>	4,872	375.08	546.4	15.5	2,940

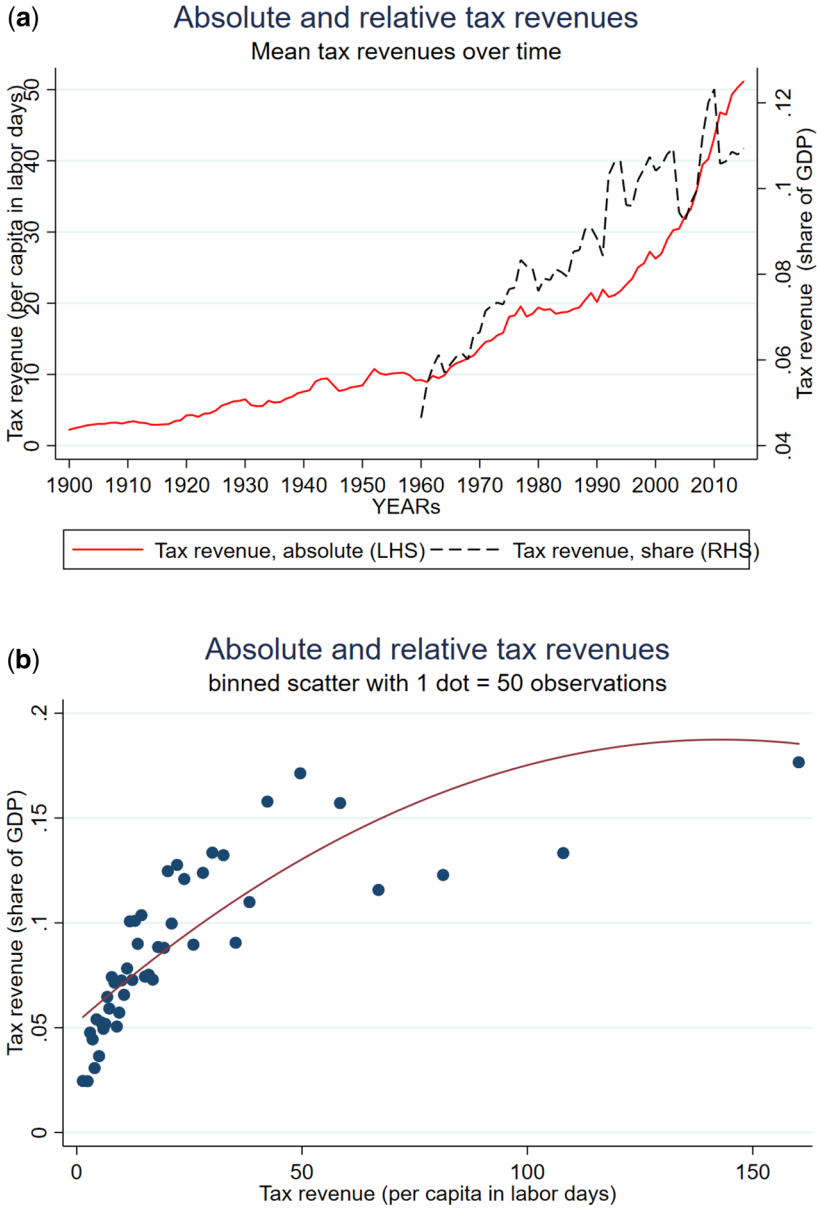


Figure A1 Taxes with Wage Deflator vs Taxes as share of nominal GDP.
Panel (a) Mean taxes, 1900–2015 Panel (b) Scatter, 1900–2015.

Appendix B: Alternative specifications

This Appendix provides the results for alternative specifications. For each variable, Panel (a) uses total ordinary revenue (excluding resource revenues) as a dependent variable. Panel (b) uses our benchmark definition of fiscal capacity as the dependent variable, but controls for the time-varying proxies of income from resource revenues, overseas aid, and foreign credit developed by AJS (see pp. 80–81 for more details). They measure potential income from:

- resource exports through movements in the price of a country's principal export commodities (both mineral and agricultural);
- overseas aid through budget surpluses in the main donor countries weighted by the political proximity of each African country to these donors (the latter measured by voting similarity in the UN General Assembly);
- foreign credit by proxying a country's borrowing costs.

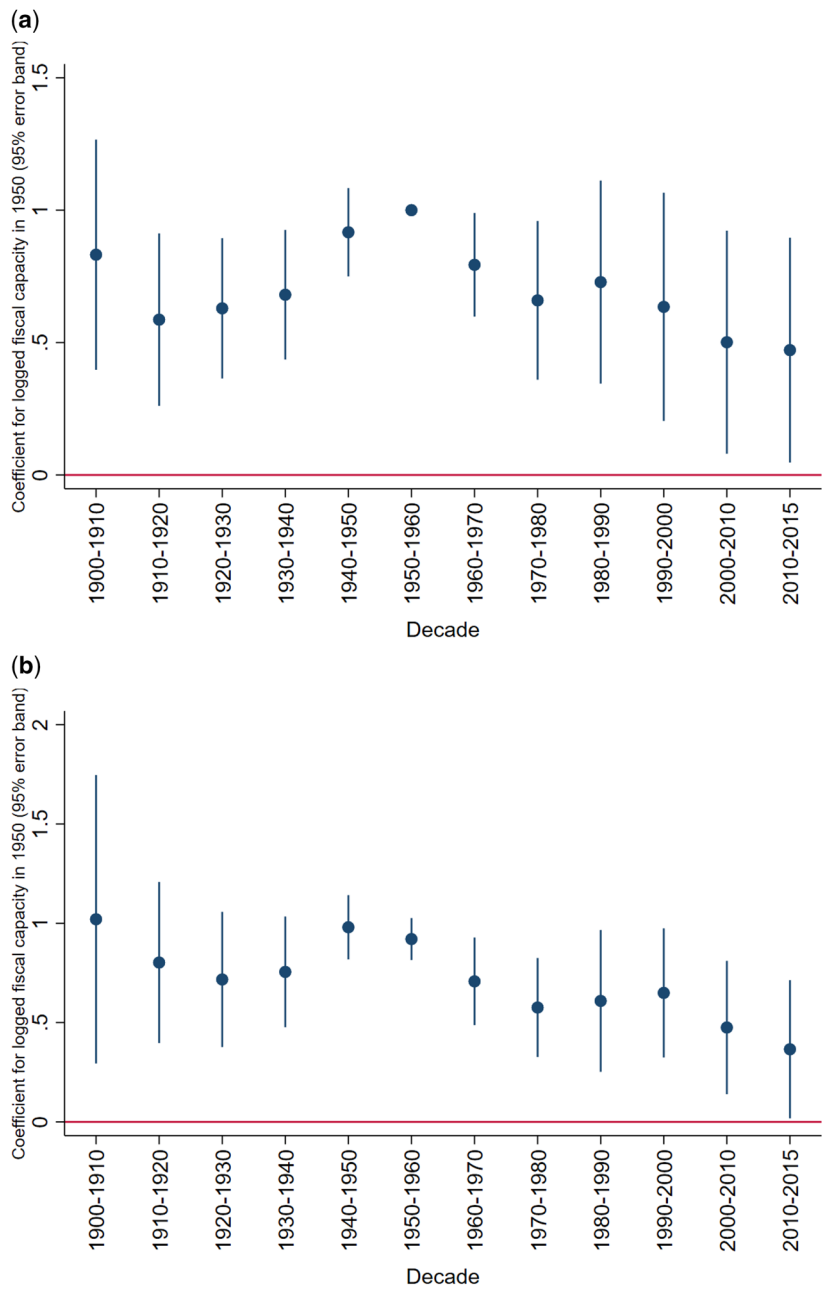


Figure B1 Coefficients for fiscal capacity in 1950. Panel (a) Total revenue as dependent var. Panel (b) Conditional regression.

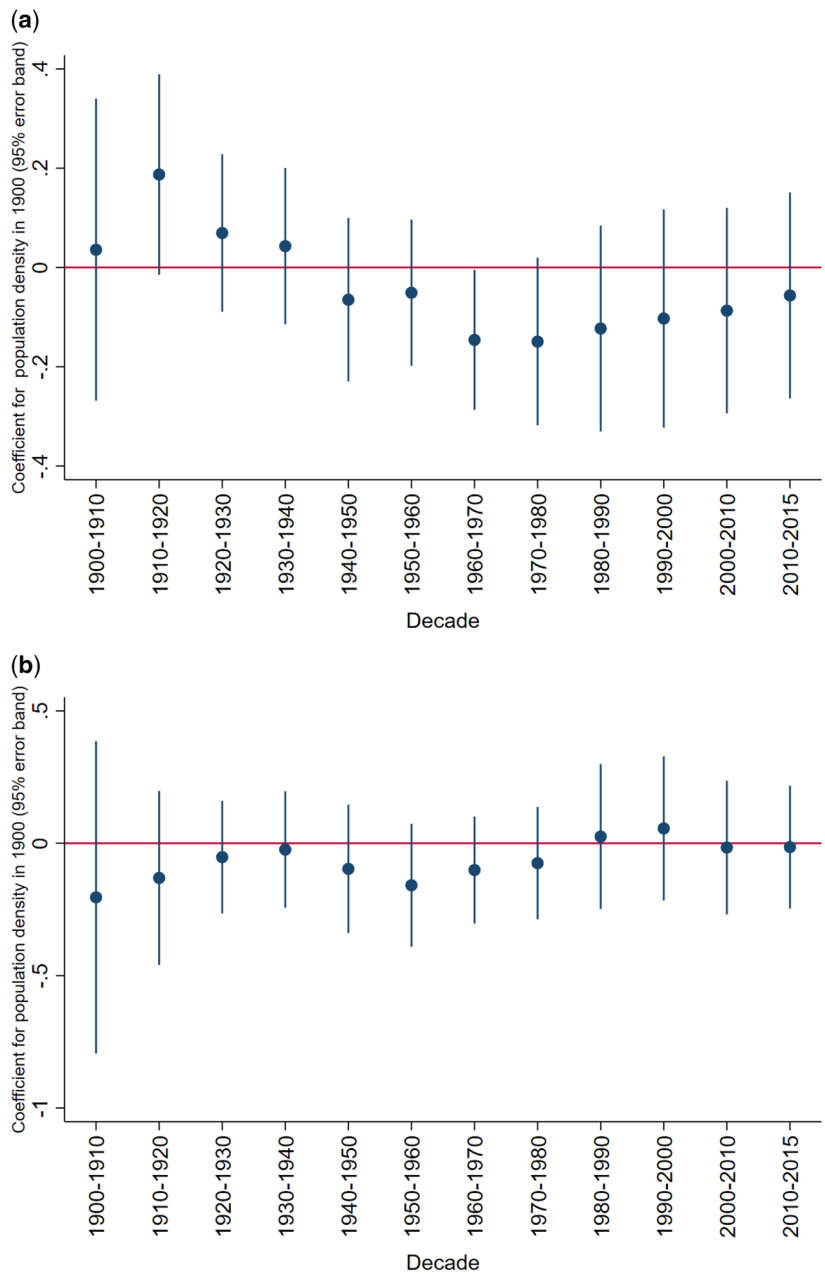


Figure B2 Coefficients for population density. Panel (a) Total revenue as dependent var. Panel (b) Conditional regression.

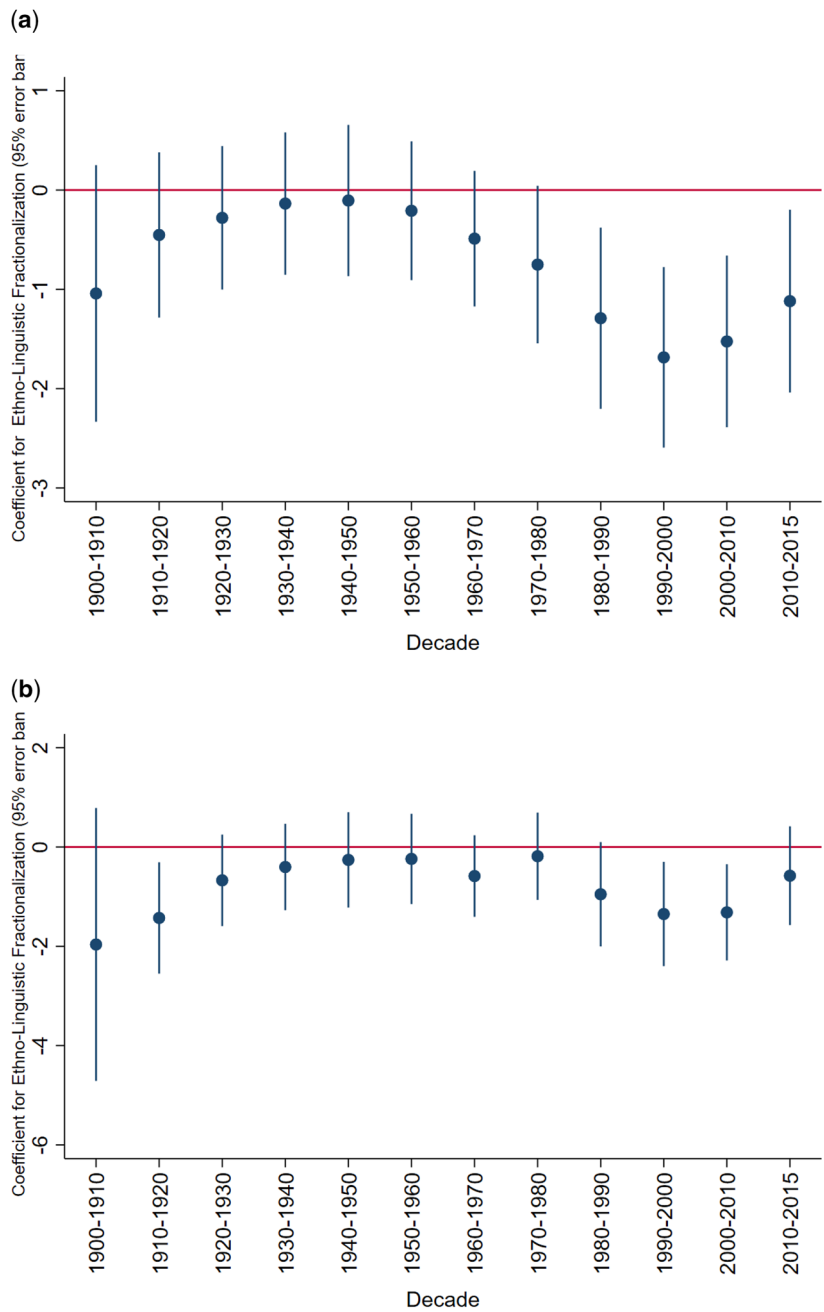


Figure B3 Coefficients for ethnic fractionalization. Panel (a) Total revenue as dependent var. Panel (b) Conditional regression.

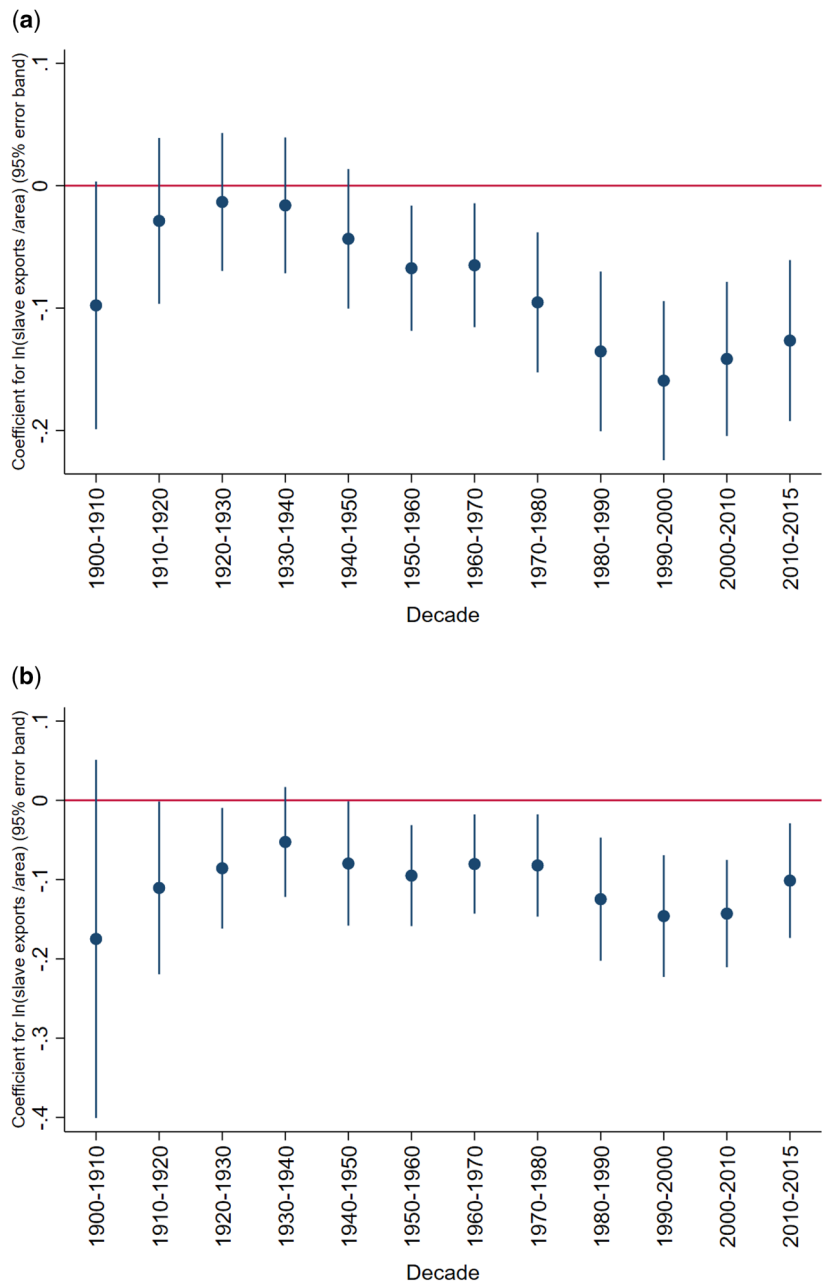


Figure B4 Coefficients for slave exports. Panel (a) Total revenue as dependent var. Panel (b) Conditional regression.

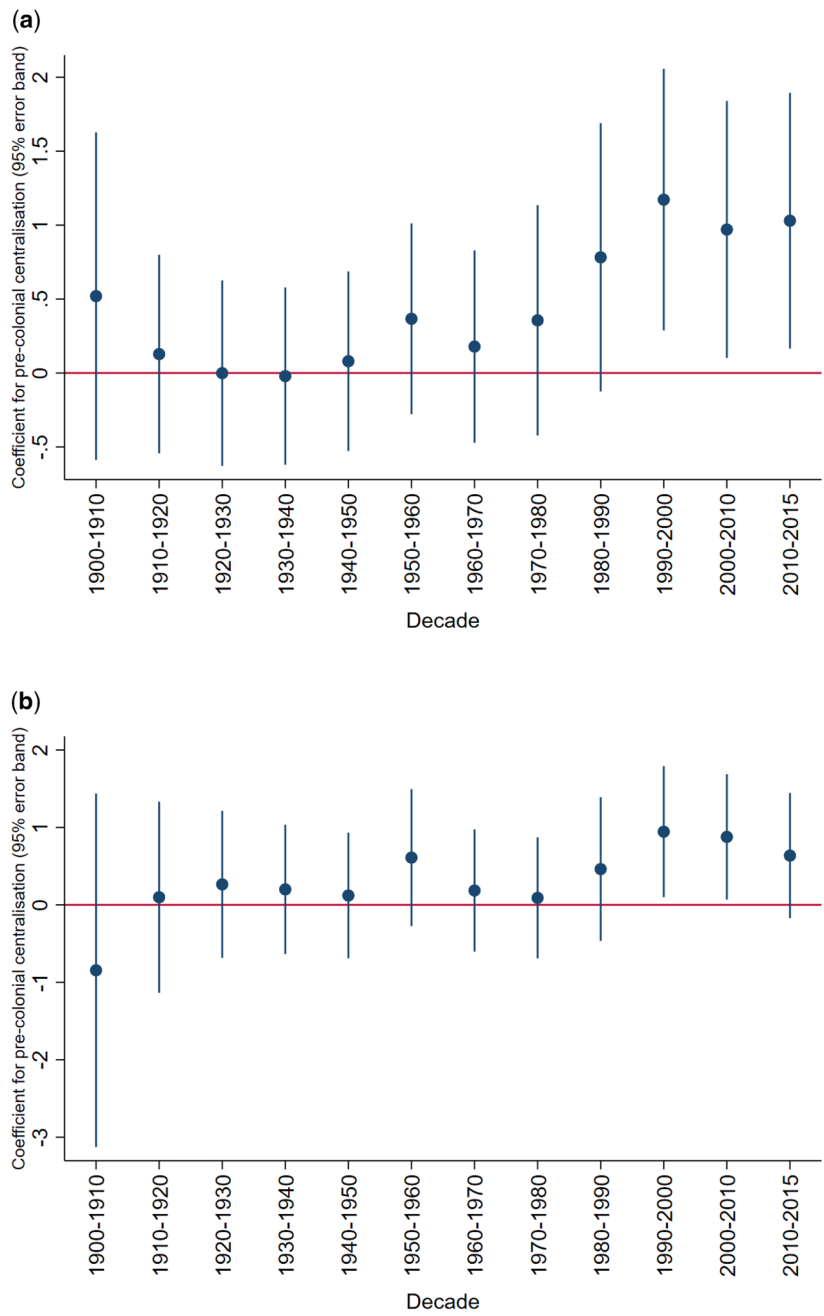


Figure B5 Coefficients for precolonial centralization. Panel (a) Total revenue as dependent var. Panel (b) Conditional regression.

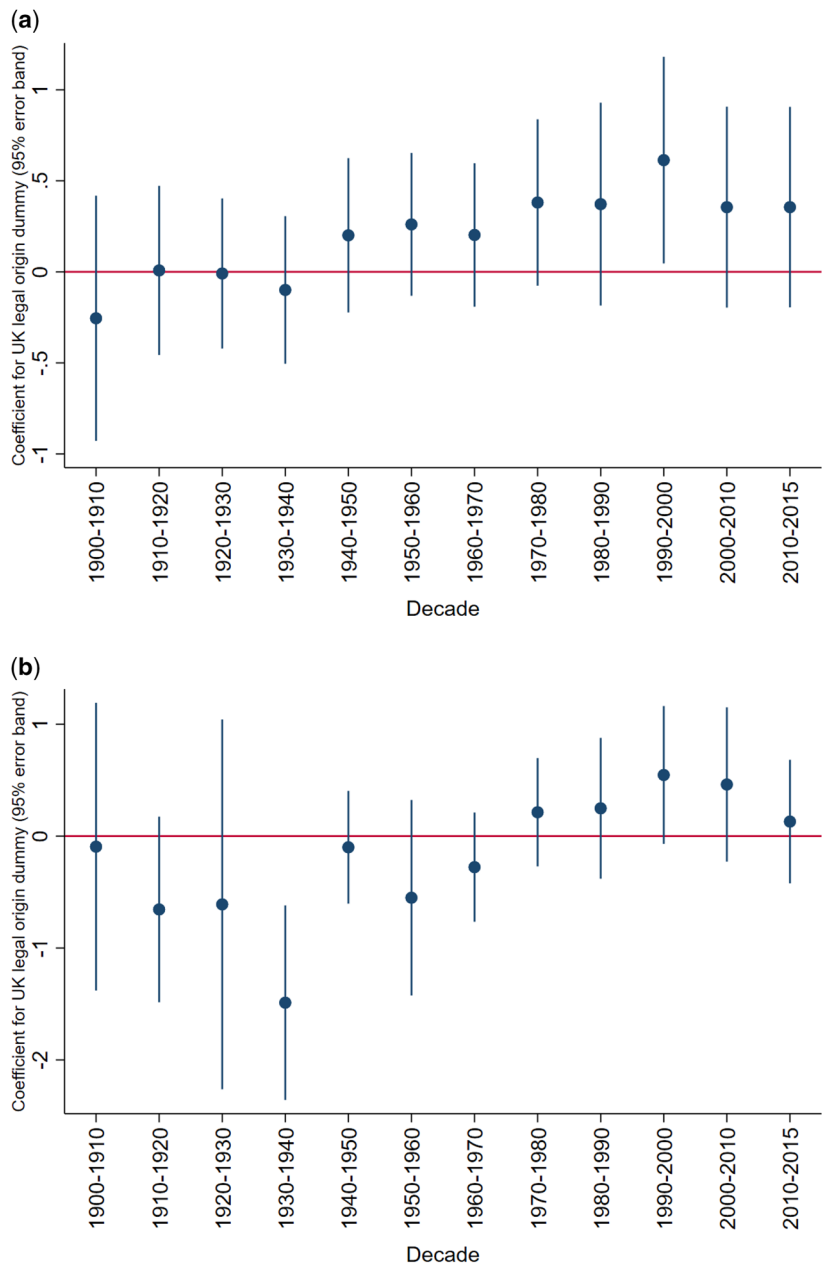


Figure B6 Coefficients for colonizer identity. Panel (a) Total revenue as dependent var. Panel (b) Conditional regression.

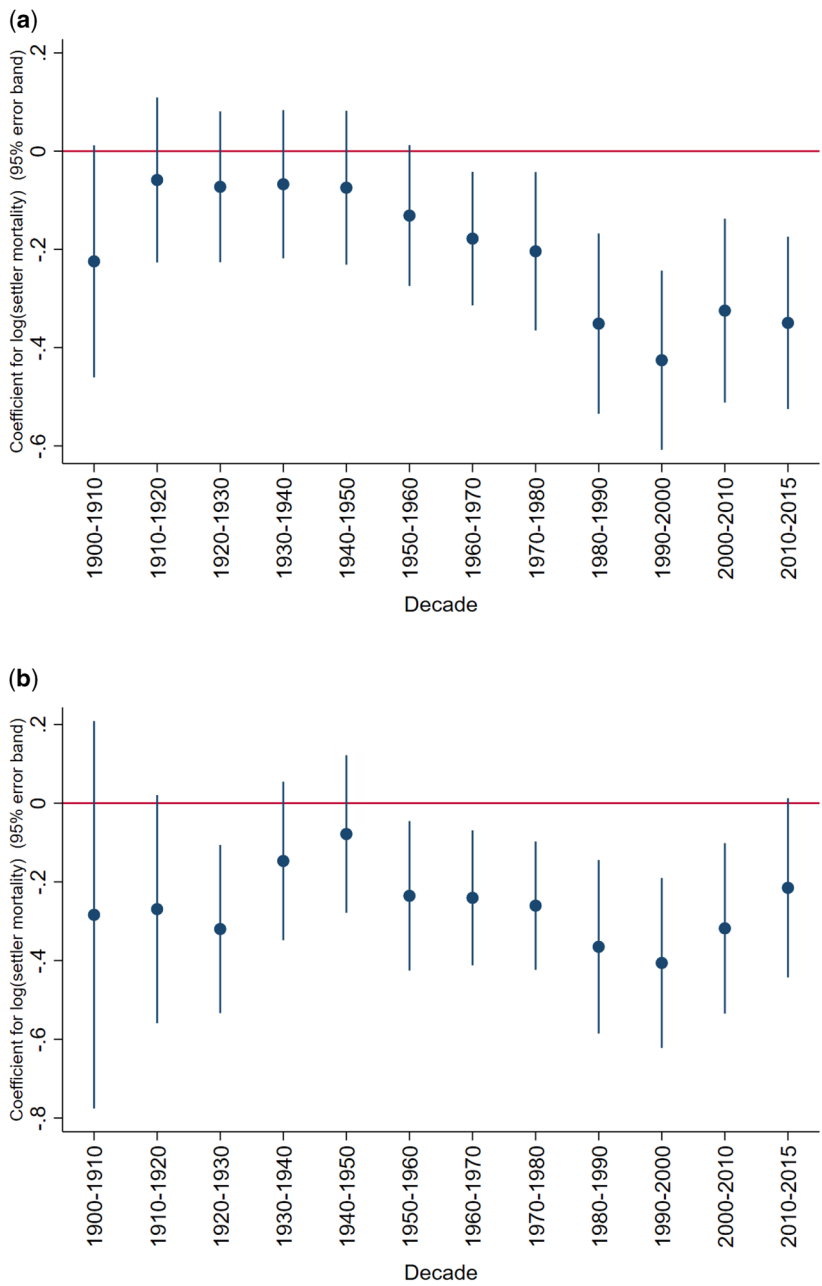


Figure B7 Coefficients for settler mortality. Panel (a) Total revenue as dependent var. Panel (b) Conditional regression.