Historical Origins of Firm Ownership Structure and Performance: The Persistent Effects of the African Slave Trade

Lamar Pierce
Olin Business School
Washington University in St. Louis

Jason A. Snyder
Eccles School of Business
University of Utah

This paper demonstrates that severe historical shocks from past centuries are evident in the ownership structure of modern firms. Using data from over 30,000 firms across 41 African countries, we show that firms in areas that suffered high historical slave extraction today are more likely to have concentrated ownership. High slave export countries have more sole proprietorships and more majority ownership structure, particularly in manufacturing where capital investment needs are high. We further demonstrate performance effects through lower labor productivity in firms with concentrated ownership. Although we cannot isolate the mechanisms through which the slave trade might affect structure and performance, concentrated ownership and its associated costs are consistent with extensive evidence that the slave trade caused persistent damage to culture and institutions.

INTRODUCTION

The benefits of partnerships and corporations are myriad. Shared ownership promotes relationship-specific investments (Grossman & Hart, 1986; Baker, Gibbons, & Murphy, 2002) and expands professional and social connections, both of which improve access to expertise and resources (Uzzi, 1996; Sorenson & Audia, 2000; Poppo & Zenger, 2002; Gibbons & Henderson, 2012). Shared ownership can also lower the cost of capital (Fama & Jensen, 1983), providing equity-based financing that is particularly crucial where credit is scarce (Levine, 1997). While shared ownership is pervasive in advanced economies, it is much less common in the developing world, largely because weak institutions and mistrust make it vulnerable to expropriation and rent-seeking (Shleifer & Vishny, 1986; La Porta *et al.*, 1998; Guiso, Sapienza, & Zingales, 2004; Lerner & Schoar, 2005). Managers wishing to invest in and expand their businesses in these countries are caught between Scylla and Charybdis—the same factors that restrict access to credit also impede shared ownership.

La Porta *et al.* (1998) first established that ownership concentration in developing countries can be partly explained by historical factors, namely weak investor protections with roots in colonial occupation in the 19th and 20th centuries. In this paper, we propose that the roots of ownership concentration in Africa may be even deeper—in the institutional and cultural legacy of the African slave trade. The slave trade, which pre-dated colonialism from the 15th to the 18th century, had depopulated Africa of nearly half its potential population by the advent of colonialism (Manning, 1990). The modern economic consequences of the slave trade are significant; it has been linked to both decreased economic development (Nunn, 2008) and access to credit (Pierce & Snyder, 2017; Levine, Lin, & Xie, 2017).

These and other papers (Nunn & Wantchekon, 2011; Whatley & Gillezeau, 2011) argue that the slave trade fundamentally altered the historical path of Africa through three interrelated mechanisms: ethnic fractionalization, institutional inhibition, and cultural mistrust in the financial

sector. The established link between these three mechanisms and African development (Acemoglu, Johnson, & Robinson, 2001; Easterly & Levine, 1997; Fafchamps, 2006)[1] makes it likely that the slave trade also altered organizational structure and function beyond access to credit. As Klüppel, Pierce, and Snyder (2017) explain, there is growing evidence that historical shocks such as the slave trade can shape multiple facets of the business environment. Shocks such as conflict, forced occupation, and persecution have been linked to labor market composition (Fernandez, Fogli, & Olivetti, 2004), labor market entry (Siegel, Licht, & Schwartz, 2011, 2013), entrepreneurship (Grosfeld, Rodnyansky, & Zhuravskaya, 2013), and industry growth (Brown, Cookson, & Heimer, 2017).

We match ethnicity-level slave export data with World Bank data on firm ownership in the modern countries of traditional ethnic homelands, showing that firms in countries with high historical slave exports are more likely to be owned by one individual (sole proprietorship) or to have a majority controlling partner. This ownership concentration is particularly pronounced in manufacturing, where the capital necessary for minimum efficient scale or advanced technology is already restricted through weak credit markets. The performance impact of concentrated ownership is also evident. We show that although firms with majority or sole owners have lower labor productivity across Africa, this problem is particularly great in high slave export countries. These firms are likely unable to either access crucial resources or make capital investments given the limited credit access in these countries (Pierce & Snyder, 2017). All the results are robust to extensive country- and firm-level controls, including the legal origins explanation previously shown by La Porta *et al.* (1998). Instrumental variable models using demand-side determinants of the slave trade produce identical findings. We provide evidence as well that institutions, ethnic fractionalization, and mistrust serve as historically persistent mechanisms for these effects.

---

[1] Also see Easterly and Levine (2016) and Gennaioli *et al.* (2013) for the important role of human capital.

This paper contributes to four important research streams in the fields of strategy and management. First, it answers the growing call for bringing history back into management and strategy (Jones & Khanna, 2006; Morck & Yeung, 2011; Greve & Rao, 2012; Ingram, Rao, & Silverman, 2012; Kipping & Üsdiken, 2014; Madsen, Bednar, & Godfrey, 2014; Klüppel *et al.*, 2017). Studies that focus on periods before the 20th century are rare in the management and strategy literature (Rowlinson & Hassard, 2013),[2] despite the influence and importance of business historians who have studied this era (e.g., Chandler, 1992; Lamoreaux, 1996; Jones, 2000).

Second, it adds to the growing literature on how historical events and conditions continue to shape the modern business environment through culture and institutions. Although most of this literature has focused on the path dependence induced by positive shocks such as technological breakthroughs (David, 1994, 2007; Vergne, 2013), a more recent stream examines negative or "traumatic" shocks (Klüppel *et al.,* 2017) such as conflict, natural disasters, and forced migration that are particularly important for explaining the business history of emerging markets (Austin, Dávila, & Jones, 2017). The historical persecution of Jews, for example, has been linked to modern entrepreneurship (Grosfeld *et al.*, 2013) and financial sector development (Pascali, 2016). Cookson (2010) and Brown *et al.* (2017) similarly link the forced relocation of Native Americans to modern small business credit and industry growth.[3]

Third, the paper contributes to an important literature on the sources and implications of ownership structure in the developing world. The weak institutions and often-high cultural mistrust in developing countries frequently force firms to eschew the important benefits of ownership diversification due to the governance risks of minority ownership. With weak institutions that fail to enforce contracts, ownership remains concentrated (La Porta *et al.*, 2000), hurting management practices (Bloom & Van Reenen, 2010; Bandiera *et al.*, 2013) and encouraging resource expropriation

---

[2] Exceptions include Kieser (1994), Aupperle (1996), Carmeli and Markman (2011), and Silverman and Ingram (2016).
[3] Also see Greve and Rao (2012), Burchardi and Hassan (2013), Rao and Greve (2017), Siegel *et al.* (2011; 2013).

(La Porta *et al.*, 1998; Levine, 2005; Morck, Wolfenzon, & Yeung, 2005). There is growing interest in identifying how the resulting concentrated family ownership (Bloom & Van Reenen, 2010; De Massis, Frattini, & Lichtenthaler, 2013) and constricted private equity investments (Guler & Guillén, 2009; Taussig & Delios, 2015) affect performance in developing areas such as Africa.

Finally, the paper adds to a nascent literature in strategy and management on firms in Africa. Despite its size and growing economic importance, Africa has been historically ignored by these fields,[4] partly due to the lack of reliable data on African firms. Recent work has sought to remediate this shortfall (Yenkey, 2015, 2017; Taussig & Delios, 2015; Birhanu, Gambardella, & Valentini, 2016; George *et al.*, 2016a; Luiz, Stringfellow, & Jefthas, 2017), but few studies examine cross-national differences. Assenova and Sorenson (2017) and Pierce and Snyder (2017) are rare exceptions. We answer the call put forth by Zoogah, Peng, and Woldu (2015), Walsh (2015), George *et al.* (2016b), Mol, Stadler, and Ariño (2017), and others to focus more attention on African firms, and to address many of the remaining challenges faced by African managers.

THE INTITUTIONAL AND CULTURAL LEGACY OF THE AFRICAN SLAVE TRADE

The impact of the slave trade on institutions and trust

The African slave trade is one of the most devastating shocks to human society in history. Between the fifteenth and the eighteenth century, twelve to eighteen million Africans were taken into slavery—reducing the continent's population by as much as 50 percent by 1850 (Lovejoy, 2000). There were four major slave trades: trans-Saharan, Red Sea, Indian Ocean and transatlantic. Although in the early periods most slaves were prisoners of war or victims of large-scale raids, later slaves were often sold by friends, family members, and co-ethnics to slave traders. For example, a

---

[4] See Acquaah (2007) and Julian and Ofori-Dankwa (2013) for exceptions.

19th century group of former slaves in Sierra Leone documented by Koelle (1854) included 25 percent captured in war, 40 percent kidnapped, and 20 percent sold by friends and relatives. Betrayals were motivated by payment or rewards (d'Almada, 1984) or to preempt potential betrayal by rivals, and in aggregate generated a culture of insecurity even within families and communities (Piot, 1996). This culture of mistrust also shaped institutions, corrupting the legal process for the purpose of condemning rivals to slavery with accusations of witchcraft and adultery.

Although the slave trade had widespread impact on Africa, its effect on specific ethnic groups varied widely. Using Murdock's (1967) map of the historical homelands of 970 ethnic groups from the time of the slave trade, Nunn (2008) mapped heterogeneous ethnicity-level slave export levels to modern country borders. The sources for these data—54 samples that detailed 80,656 slaves of 229 ethnic groups—demonstrate substantial heterogeneity in the impact of the slave trade on ethnic groups.[5] Although there are many reasons for differences across ethnic groups, Nunn and others argue that geographic access in ethnic homelands was paramount in determining slave export levels. As Nunn and Puga (2012) demonstrate, Africa is the only place in the world where ruggedness of terrain is positively associated with modern GDP. Peoples in low-lying and fertile areas nearest to the demand markets for the four slave trades were the most likely to be taken (Nunn, 2008).

The heterogeneous effects on ethnic groups are evident in both the psychology and economics of modern Africa. In his initial paper, Nunn (2008) shows decreased economic growth in the countries that encompass the historic homelands of decimated ethnic groups. He presents evidence that growth was retarded through mechanisms of inhibited institutional development and ethnic fractionalization resulting from the slave trade, with the latter mechanism further supported by Whatley and Gillizeau (2011). Subsequent work by Nunn and Wantchekin (2011), who use

---

[5] Original sources include Austen (1979, 1988, 1992) and Eltis *et al.* (1999).

20,000 modern survey responses from 185 ethnic groups, shows direct evidence of higher mistrust in personal, professional, and authority relationships among high-extraction ethnic groups. Similarly, Levine *et al.* (2017) find higher levels of mistrust in financial institutions at the country level.

The legacy of the slave trade in modern society is consistent with a robust literature on historical persistence that supports Paul David's (1994, p. 205) characterization of institutions and culture as "the 'carriers of history'" (Zucker 1977; Inglehart & Baker 2000; Nunn, 2014). Cultural elements such as trust persist across generations through family (Algan & Cahuc, 2010) and religion (Guiso, Sapienza, & Zingales, 2003), and have demonstrated historical foundations in conditions such as military occupation (Putnam, Leonardi, & Nanetti, 1993), warfare (Guiso, Sapienza, & Zingales, 2009), religious institutions (Guiso *et al.*, 2003), and colonialism (Acemoglu *et al.*, 2001). Similarly, institutions such as investor protection (La Porta *et al.*, 1998) and property rights (Acemoglu *et al.*, 2001) persist because of both societal benefits and irreversible investments (Powell, 1991; Acemoglu, Johnson, & Robinson, 2005; Mahoney & Thelen, 2010). In addition, institutions and cultural elements such as trust reinforce one another over time, strengthening their persistence (Tabellini, 2008; Jones, 2006).

Why should the slave trade influence modern ownership structure?

Pierce and Snyder (2017) provide the first evidence that the slave trade shaped modern firms by restricting access to multiple credit channels and capital investment. Yet these restrictions likely reflect a much broader contracting problem with sources in both weak institutions and mistrust within and across ethnic groups. Indeed, Pierce and Snyder (2017) find that the slave trade might also shape ownership structure. They show that business groups, which are crucial in overcoming capital investment problems in developing countries (Khanna & Palepu, 2000; Khanna & Rivkin, 2001; Fisman & Khanna, 2004; Khanna & Yafeh, 2007; Siegel & Choudhury, 2012), are particularly advantaged in countries with historically high slave exports.

If indeed the historical slave trade led to weaker institutions and mistrust, the prediction for ownership structure and productivity is clear—firms in high extraction countries will be more likely to use concentrated ownership, to the detriment of productivity. Culture and institutions are foundational determinants of firm structure (Henisz & Williamson, 1999). Legal systems with weak shareholder protections (La Porta, Lopez-de-Silanes, & Shleifer, 1999; Djankov *et al.*, 2008), weak contract enforcement (Djankov *et al.*, 2003) and limited property rights protections (Besley & Ghatak, 2010) discourage equity investments by raising the cost of capital or discouraging equity investments entirely. This problem is compounded in areas where mistrust impedes contracting and efficient organizational design (Mayer, Davis, & Schoorman, 1995; Gulati, 1998; Tsai & Ghoshal, 1998; Bloom, Sadun, & Van Reenen, 2012a; George *et al.*, 2016b).

DATA AND EMPIRICAL APPROACH

Data

We use two primary datasets for our analysis. The first dataset details the African slave trade between A.D. 1400 and 1900. For these data, Nunn (2008) estimated the total number of slaves taken from each African country in each of the four major slave routes (Red Sea, Indian Ocean, trans-Saharan, and transatlantic), combining historical slave ethnicity data with shipping data from African ports and regions. The ethnicity data is based on the records of 80,656 slaves of 229 ethnic designations from 54 separate samples. Shipping data came from multiple sources: data for the Indian Ocean, Red Sea, and trans-Saharan trades came from Austen (1979, 1988, 1992), while the *Trans-Atlantic Slave Trade Database* from Eltis *et al.* (1999) detailed the transatlantic trade.[6] Nunn matched ethnicity-level data to traditional homelands mapped by Murdock (1967), which produces slave export data for 52 countries.

---

[6] Nunn (2008) provides details on the development of this database.

The second dataset is the World Bank Enterprise Survey (WES) from 2006-2016, which includes responses from 127,000 firms in 139 countries. The surveys ask managers and owners for opinions and information on firm characteristics, business practices, productivity, and business obstacles. The WES covers 41 countries in Africa for which we have historical slave export data, providing rich self-response data on approximately 30,000 firms. Most of the missing countries are in North Africa, where slave exports were relatively low. Figure 1a presents slave export levels for the 41 countries in our combined dataset, while Figure 1b provides data for one of our key dependent variables—sole proprietorship.

--------- INSERT FIGURES 1A AND 1B HERE -------------

Table 1 presents the summary statistics for both the country- and firm-level variables. Our measure of slave exports is the logged number of slaves divided by geographic area in square kilometers. Also included are measures of three possible mechanisms: ethnic fractionalization, precolonial centralization (a measure of institutional development), and mistrust in financial institutions. Ethnic fractionalization data come from Alesina *et al.* (2003), who measure country-level fractionalization as 1 minus the summed squares of the population share of each ethnolinguistic group. Precolonial centralization data are from Gennaioli and Rainier (2007), who calculate country-level measures of historical centralization from Murdock's (1967) precolonial (but post-slave trade) measures of ethnicity-level government hierarchy. Mistrust data are from the World Bank's *Financial Inclusion Data.* We measure mistrust in financial institutions as a dummy indicating that the respondent did not have a bank account because he or she did not trust financial institutions.

--------- INSERT TABLE 1 HERE -------------

The remaining country-level variables represent standard controls for cross-country research in Africa (e.g., Besley & Reynal-Querol, 2014; Nunn, 2008) that are likely to also influence economic outcomes. The first group is European colonizer dummies, which a broad literature shows to be

highly influential in African development (Acemoglu *et al.*, 2001). We also include environmental and geographic characteristics such as monthly rainfall, longitude, distance from equator, humidity, minimum temperature, coastline length (logged), and an island dummy. Controls for natural resource wealth include per capita oil, diamonds, and gold. Also included are institutional and cultural factors that include the percentage of adherence to Islam and dummies for historical communism and French legal origins.

Firm variables include sole proprietorship and majority ownership—our key dependent variables. These concentrated ownership structures make up the vast majority (85%) of respondents. Also included are dummies indicating three WES size categories based on employment: small (20 or less), medium (between 21 and 99), and large (100 or more). In addition, we control for 28 industry sectors.

EMPIRICAL ANALYSIS

Slave extraction predicts concentrated ownership

We first examine whether firms in high-slave-export countries are more likely be sole proprietorships. We use linear probability models, where the dichotomous sole proprietorship dummy is regressed on the logged number of extracted slaves (normalized by geographic area) and our set of country- and firm-level controls. We use firm-level data to control for important sector-specific differences in ownership that cannot be included as country-level averages due to the limited degrees of freedom with only 41 countries. We cluster standard errors at the country level.[7] The baseline specification is:

$$(1)\ y_{ik} = \beta_0 + \beta_1 \ln(\text{slave exports}_k / area_k) + C_k' \delta + X_k' \gamma + Z_i' \lambda + \varepsilon_{ik},$$

---

[7] Cameron, Gelbach, and Miller's (2008) simulations establish that 41 clusters are enough to produce asymptotically unbiased standard errors.

where y_{ik} is a dummy variable indicating that respondent i in country k is a sole proprietorship and $\ln(\text{slave exports}_k / area_k)$ is the natural log of the number of slaves extracted from country k between 1400 and 1900 normalized by land area. $\mathbf{C}_k$ is a vector of dummy variables representing the European colonizer prior to independence; $\mathbf{X}_k$ is a vector of geographic, climate, and cultural control variables; and $\mathbf{Z}_i$ is a vector of 28 industry sector dummies and three firm-size dummies.

We present regression results in Table 2A, with standard errors in parentheses and p-values in brackets. Column (1) presents estimates without any controls, while columns (2)-(4) cumulatively add controls. Column (5) alternatively uses logistic regression. All models indicate a substantial positive relationship between slave exports and sole proprietorship. The baseline results suggest that 67 percent of firms in the above-median slave export countries would have sole proprietorship, while the below-median would have only 46 percent.

--------- INSERT TABLES 2A AND 2B HERE -------------

Column (6) implements a country-level instrumental variable model to address concerns of endogeneity in the choice by slave traders of where to capture slaves. The primary concern is that slave traders may have captured people historically living within current national boundaries based on pre-existing culture or institutions, which in turn might correlate with modern ownership structure. Nunn (2008) presents strong evidence dispelling this argument. The slave trade was more prevalent in wealthier and less geographically rugged societies (measured by population density). For robustness, we implement Nunn's (2008) IV model using the distance from each African country to the four demand market locations for the major slave trades.

We implement our IV model using all four instrumental variables. Our instruments are weak, with only 41 observations (F-stat is 4.52), so we use Moreira's (2003) conditional likelihood confidence interval correction (Andrews, Moreira, & Stock, 2006). The correction provides the set of parameter estimates that cannot be rejected at the 95 percent confidence level. The IV model in

column (6) is consistent with the base OLS and logit models, finding a positive relationship between slave extraction and sole proprietorship.[8]

Table 2B alternatively uses majority ownership as the dependent variable. Consistent with sole proprietorship, high slave export countries have much higher rates of majority ownership, regardless of the set of control variables included in the regression. The baseline models suggest that 89 percent of firms in the above-median slave extraction countries would have a majority owner, with this share considerably lower at 80 percent in the below-median extraction countries. The results are also robust to different control variables and our IV model.

Manufacturing sector particularly restricted

We next examine ownership structure in a sector where investment capital is crucial for growth and productivity—manufacturing. Capital investment requirements have grown substantially in manufacturing as technological advances have raised the capital equipment to production labor ratio (Berman, Bound, & Griliches, 1994). To do so, we repeat our linear probability model in equation (1), but interact slave exports with the dummy for the manufacturing sector. Consequently, the coefficient on slave exports can be interpreted as the relationship between ownership structure and the slave trade in all other sectors, while the interaction is any addition effect in the manufacturing sector.

We present results for these models in Tables 3A and 3B for both sole proprietorship and majority ownership, respectively. Column (1) presents the model without interactions, which confirms that manufacturing firms are less likely to be solely or majority owned on average. Columns (2)-(5) indicate that the gap between manufacturing and other firms in high slave export countries is much smaller. In the above-median slave export countries, manufacturing firms are one percentage point more likely to be solely owned, while in below-median slave export countries

---

[8] Nunn (2008) finds similar results in the first stage of his IV models, with an equivalent F-stat and individual coefficients.

manufacturing firms are 13 percentage points *less* likely to be solely owned. As we noted earlier, given the credit restrictions in these high slave export countries, this suggests substantial restriction to capital that might restrict investments necessary to reach efficient scale or to adopt modern technology.

--------- INSERT TABLES 3A AND 3B HERE -------------

Productivity implications

We next examine whether the restricted ownership structure observed in Tables 2 and 3 translates to lower firm performance. Although there are many ways to measure performance, we focus on labor productivity for several reasons. First, insufficient capital investment in technology or human resource practices constrains labor productivity (Koch & McGrath, 1996; Brynjolfsson & Hitt, 2000; Bresnahan, Brynjolfsson, & Hitt, 2002; Bloom, Sadun, & Van Reenen, 2012b; Bloom, Draca, & Van Reenen, 2016). Second, we cannot observe growth or survival because the WES data are not longitudinal panels. Third, we cannot rely on profitability or revenue data because of considerable missing data on these questions. While the data on sales and labor compensation are relatively complete, the data on other costs are not. For example, we are able to calculate log(sales/labor expenses) for 25,018 out of 30,965 observations. Annual capital expenditures responses, however, are missing for 14,293 observations. When we tried to calculate productivity using materials or capital expenditures the majority of observations in the dependent variable went missing. Thus, we decided on the conservative measure of labor productivity, which is observable for approximately 5 out of 6 observations.

We calculate labor productivity as the logged ratio of sales to labor costs, and regress it on slave exports, sole proprietorship, and their interaction in Table 4A. We include country fixed effects to account for differences in country-level wages that might erroneously represent low labor costs as high productivity.

Column (1) presents the model without an interaction or sector controls, and shows that sole proprietorships have lower labor productivity. The interacted models in columns (2) and (3) show this problem to be particularly great in high slave export countries. Column (4) restricts our analysis to the manufacturing sector, and we see similar productivity effects.

Table 4B replaces sole proprietorship with majority ownership, and finds similar albeit less precise results. Majority owner firms also have lower labor productivity, with this problem being even greater in high slave export countries, although the interaction effect is smaller and less precise than with sole proprietorship. Collectively these models suggest that concentrated ownership is particularly costly for productivity in high slave export countries, likely because many firms that require capital investment or know-how cannot acquire it.

Evidence on possible historically persistent mechanisms

As we note earlier, past research provides three interrelated channels through which the historical slave trade might continue to shape modern businesses: ethnic fractionalization, inhibited institutional development, and intergenerational transmission of cultural mistrust. We measure ethnic fractionalization using data from Alesina *et al.* (2003), which covers all 41 of the countries in our sample. We measure institutions using data on precolonial intraethnic centralization from Gennaioli and Rainier (2007), which covers 38 countries. These are not only well-established historically persistent channels, but also reflect strong elements of trust and cooperation that can be plausibly linked to ownership diversification.

Although prior work has used questions on trust from Afrobarometer (Nunn & Wantchekon, 2011) and World Values Survey (Guiso, Sapienza, & Zingales, 2006), the country-level overlap of these surveys with our slave extraction data is limited and does not provide sufficient variation to test this channel. Nunn and Wantchekon (2011) addressed this limited coverage by

exploiting variation within countries in both respondent and regional ethnicity in the Afrobarometer data because those individual respondents are widely distributed across each country. In contrast, the firm respondents in the WES are concentrated in a few large and ethnically-diverse cities, and the survey provides no information about the ethnic composition of ownership, management, or workforce. Indeed, the variation in ownership structure in our data is mainly at the country level, not the regional level. In unreported results, we find that country-fixed effects explain 12 percent of the variance in sole proprietorship, while regionally-fixed effects explain only 6 percent of the remaining variance. Almost twice as much variation in ownership is explained by country than is explained by region.

Instead, we follow Levine *et al.* (2017) and measure mistrust using the World Bank's *Financial Inclusion Data*, which covers 33 countries in our sample. More specifically, we measure mistrust using a question that indicates the respondent does not have a bank account because they distrust financial institutions.[9] This provides us with country-level measures of mistrust toward financial transactions.

Ethnic fractionalization

To explore the component of ethnic fractionalization that is correlated with slave extraction, we implement a 2SLS regression model, in which historical slave extraction is used to predict the component of ethnic fractionalization associated with modern ownership concentration. Figures 3a and 3b illustrate this concept for ethnic fractionalization. In Figure 3a, we show the association between slave extraction and ethnic fractionalization. While there is a strongly significant and meaningful correlation, slave extraction explains approximately 48 percent of the variation in ethnic fractionalization.[10] In Figure 3b, we isolate that component by taking the predicted values from the regression in Figure 3a and regressing our two measures of ownership concentration against them. What this shows is that the variation in ethnic fractionalization that was induced by the slave trade is

---

[9] The country level averages are survey results that have been population weighted.
[10] This is the R² of the regression in Figure 2.

also correlated with ownership concentration. If ethnic fractionalization were not a relevant channel, then what we would most likely see is an upward-sloping relationship in Figure 3a and no correlation in Figure 3b.[11]

--------- INSERT FIGURES 3A AND 3B HERE -------------

Tables 5A and 5B present both OLS and second-stage 2SLS results for ethnic fractionalization models using the two ownership variables. The first two columns of each group show the simple OLS relationship between fractionalization and access to finance, while the second two present the uncontrolled and controlled 2SLS models. Column (1) shows the strong direct effect of ethnic fractionalization on sole proprietorship, while columns (2) through (4) show that the variation in fractionalization explained by the slave trade also predicts it. Table 5B shows similar results for majority ownership. We note that column (5) in both tables is imprecisely identified, although the large number of control variables puts tremendous pressure on degrees of freedom in a 2SLS model when the standard errors are clustered. Collectively, these models support ethnic fractionalization as a possible channel through which the historical slave trade affects ownership concentration.

--------- INSERT TABLES 5A AND 5B HERE -------------

Institutional inhibition

We implement these same OLS and 2SLS models on political centralization with similar results. Figures 4a and 4b present the raw data for both stages of 2SLS, while Tables 6A and 6B present regression results. Countries with higher slave exports had weaker pre-colonial institutions and more concentrated ownership, and the variation in centralization explained by the slave trade also predicts ownership. We note, however that these results do not hold up to the extensive controls included in column (5), so we are cautious in concluding that centralization is supported as a likely channel.

---

[11] See Appendix for political centralization figures.

--------- INSERT FIGURES 4A AND 4B HERE ------------

--------- INSERT TABLES 6A AND 6B HERE ------------

Mistrust in financial sector. We present the first and second stage models for 2SLS models on mistrust in Figures 5a and 5b. Higher mistrust is associated with higher slave exports in Figure 5a, and Figure 5b shows that the variation in mistrust explained by the slave trade predicts sole ownership. Tables 7A and 7B provide OLS and 2SLS regressions confirming this for sole proprietorship and majority ownership, although the second-stage parameter estimates again become less precise in the fully controlled models.

In summary, our core measures of concentrated ownership appear correlated with the slave-extraction-driven components of ethnic fractionalization, institutions, and mistrust, but one should view these results as suggestive and far from definitive. While it is almost certainly the case that the slave trade does not operate exclusively through these channels, the 2SLS model allows us to study how the component of each channel that is driven by slave extraction is correlated with financing outcomes. We advise caution when interpreting these relationships causally.

DISCUSSION

Our results support the hypothesis that one legacy of the African slave trade is broad problems with contracting that go beyond the credit-access effects found in prior work. Firms in countries with historical slave exports are far more likely to have ownership concentrated in one individual or family, which suggests they are unable to access important resources or equity-based capital for investments and growth. Given the substantial resource- and capital-based advantages of diffuse ownership, this concentration represents a considerable barrier to growth and performance at both the firm and economy levels. Although we acknowledge that the empirical literature correlating ownership concentration and performance is mixed (e.g., Peng & Jiang, 2010), we note that this does

not imply the efficiency of concentrated ownership. Business groups and other concentrated ownership structures likely succeed because they face limited competition from diffusely- and publicly-owned firms.

We note that the multitude of long-term problems associated with the historical slave trade compound to make the costs of concentrated ownership even more severe. Equity markets are an important alternative to corporate debt in markets where credit is hard to come by. Given the results in Pierce and Snyder (2017) and Levine *et al.* (2017) that firms in high slave export countries are particularly constrained in access to credit, their concentrated ownership presents a grim picture for access to capital. Indeed, we observe sole proprietorships and majority owners suffer particularly lower labor productivity in these countries. For manufacturing firms, who are particularly reliant on capital to achieve production efficiency and scale, this problem appears particularly acute.

We caution that, like most papers studying shocks from centuries past, we cannot strongly establish causality. Still, the robustness of our results to comprehensive control variables reduces concerns of omitted variable bias. The larger concern is the impossibility of definitively isolating the mechanisms through which the slave trade continued to influence ownership across centuries. Ethnic fractionalization, weak institutions, and cultural mistrust all are likely channels given the substantial evidence linking them to both the slave trade and contracting problems. Yet as Klüppel *et al.* (2017) note, they all are likely to influence one another over time, making their historical paths intermingled and impossible to separate.

Our 2SLS analysis provides some evidence that institutions and fractionalization play a role in linking modern ownership structure to the historical slave trade, but these models are fundamentally under-identified. We present them solely as supporting evidence for the broad literature in history, the social sciences, and management that explains how institutions and cultural trust matter for contracting. Rowlinson, Hassard, and Decker (2014) note the importance of the

complementary empirical approaches of historians and social scientists, and we rely on literatures from both these streams to support our arguments and data.

Finally, we note that our paper highlights the importance of efforts to increase research on the role of firms in African development. As our study shows, African managers and business owners face obstacles to growth in both debt and equity markets, and other obstacles to business identified in the WES survey are many. Despite the enormity of these problems and the potentially high returns to solving them, management and strategy scholars have historically ignored Africa, with the majority of papers on the continent published in the last two years. And of these recent papers, only a few exploit data across a broad range of African countries. Clearly, there is much more to be done, and history can play an important role in this endeavor. As Austin *et al.* (2017) argue, emerging markets such as Africa have unique business histories that are not simply variants of the history of more commonly studied developed economies.

In our view, the principal constraint for expanding this research stream is accurate firm-level data. Despite extensive searches, the WES is the only dataset with wide coverage of African firms that we could find. We are hopeful that future private or public efforts will gather detailed cross-national data, and believe developing such data will be the primary driver of building our knowledge of doing business in Africa in the future.

References
Acemoglu D, Johnson S, Robinson JA. 2001. The colonial origins of comparative development: an empirical investigation. *The American Economic Review* **91**(5):1369–1401.
Acemoglu D, Johnson S, Robinson JA. 2005. Institutions as a fundamental cause of long-run growth. In *Handbook of Economic Growth.* Elsevier Science; 385–472.
Acquaah M. 2007. Managerial social capital, strategic orientation, and organizational performance in an emerging economy. *Strategic Management Journal*, **28**(12): 1235-1255.
Algan Y, Cahuc P. 2010. Inherited trust and growth. *The American Economic Review* **100**(5):2060–2092.
Andrews D, Moreira M, Stock J. 2006. Optimal two-sided invariant tests for instrumental variables regression. *Econometrica* **74**:715–52.
Assenova VA, Sorenson O. 2017. Legitimacy and the benefits of firm formalization. *Organization Science.*
Aupperle KE. 1996. Crossroads—spontaneous organizational reconfiguration: a historical example based on xenophon's anabasis. *Organization Science* **7**(4):445–460.

Austen R. 1979. The trans-Saharan slave trade: a tentative census. In *The Uncommon Market: Essays in the Economic History of the Atlantic Slave Trade*, Gemery H, Hogendorn J (eds). Academic Press: New York

Austen R. 1988. The 19th century Islamic slave trade from East Africa Swahili and Red Sea coasts: a tentative census. *Slavery & Abolition* **9**: 21–44.

Austen R. 1992. The Mediterranean Islamic slave trade out of Africa: a tentative census. *Slavery & Abolition* **13**: 214–248.

Austin G, Dávila C, Jones G. 2017. Emerging markets and the fugure of business history. *HBS Working Paper*. No. 18-012.

Baker G, Gibbons R, Murphy KJ. 2002. Relational contracts and the theory of the firm. *The Quarterly Journal of Economics* **117**(1): 39-84.

Bandiera O, Lemos R, Prat A, Sadun R. 2013. Managing the family firm: evidence from CEOs at work. *NBER Working Paper*. No. w19722

Berman E, Bound J, Griliches Z. 1994. Changes in the demand for skilled labor within US manufacturing: evidence from the annual survey of manufactures. *The Quarterly Journal of Economics* **109**(2): 367-397.

Besley T, Ghatak M. 2010. Property rights and economic development. *Handbook of Development Economics* **5**: 4525-4595.

Besley T, Reynal-Querol M. 2014. The legacy of historical conflict: evidence from Africa. *American Political Science Review* **108**:319–36.

Birhanu AG, Gambardella A, Valentini G. 2016. Bribery and investment: firm-level evidence from Africa and Latin America. *Strategic Management Journal* **37**(9): 1865-1877.

Bloom N, Draca M, Van Reenen J. 2016. Trade induced technical change? The impact of Chinese imports on innovation, IT and productivity. *The Review of Economic Studies* **83**(1): 87-117.

Bloom N, Sadun R, Van Reenen J. 2012a. The organization of firms across countries. *The Quarterly Journal of Economics* **127**(4): 1663-1705.

Bloom N, Sadun R, Van Reenen J. 2012b. Americans do IT better: US multinationals and the productivity miracle. *American Economic Review* **102**(1): 167-201.

Bloom N, Van Reenen J. 2010. Why do management practices differ across firms and countries?. *The Journal of Economic Perspectives* **24**(1): 203-224.

Bresnahan TF, Brynjolfsson E, Hitt LM. 2002. Information technology, workplace organization, and the demand for skilled labor: firm-level evidence. *The Quarterly Journal of Economics* **117**(1): 339-376.

Brynjolfsson E, Hitt LM. 2000. Beyond computation: information technology, organizational transformation and business performance. *The Journal of Economic Perspectives* **14**(4): 23-48.

Brown JR, Cookson JA, Heimer RZ. 2017. Law and finance matter: lessons from externally imposed courts. *Review of Financial Studies* **30**(3):1019–1051.

Burchardi KB, Hassan TA. 2013. The economic impact of social ties: evidence from German reunification. *The Quarterly Journal of Economics* **128**(3):1219–1271.

Carmeli A, Markman GD. 2011. Capture, governance, and resilience: strategy implications from the history of Rome. *Strategic Management Journal* **32**(3): 322-341.

Chandler AD. 1992. Organizational capabilities and the economic history of the industrial enterprise. *The Journal of Economic Perspectives* **6**(3):79–100.

Cookson JA. 2010. Institutions and casinos on American Indian reservations: an empirical analysis of the location of Indian casinos. *The Journal of Law and Economics* **53**(4):651–687.

D'Almada A. 1984. *Tratado Breve Dos Rios de Guiné Do Cabo-Verde*. University of Liverpool: Liverpool.

David PA. 1994. Why are institutions the "carriers of history"?: path dependence and the evolution of conventions, organizations and institutions. *Structural Change and Economic Dynamics* **5**(2):205–220.

David PA. 2007. Path dependence: a foundational concept for historical social science. *Cliometrica* **1**(2):91–114.

De Massis A, Frattini F, Lichtenthaler U. 2013. Research on technological innovation in family firms: present debates and future directions. *Family Business Review* **26**(1): 10-31.

Djankov S, La Porta R, Lopez-de-Silanes F, Shleifer A. 2003. Courts. *The Quarterly Journal of Economics* **118**(2): 53-517.
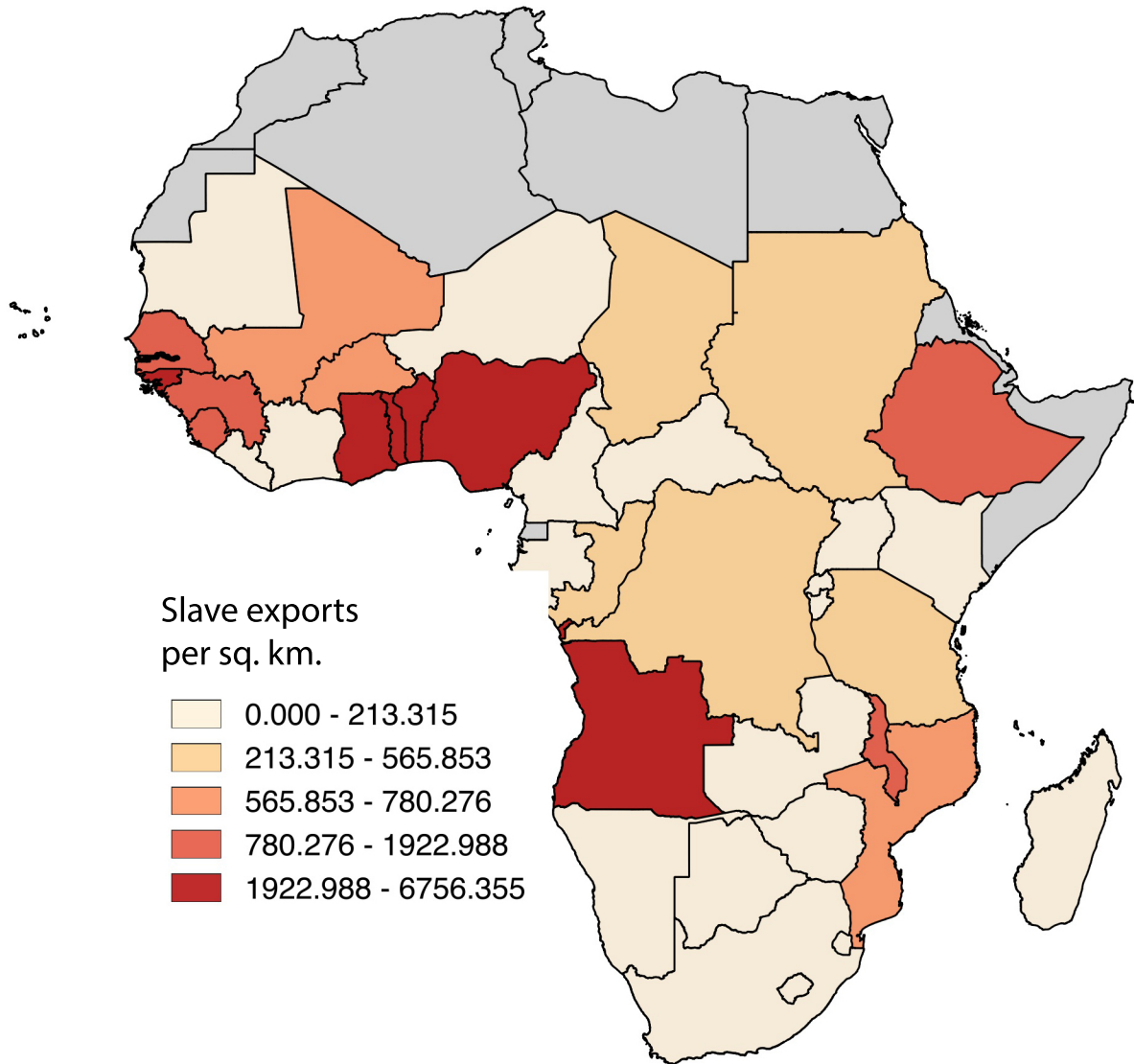
Djankov S, La Porta R, Lopez-de-Silanes F, Shleifer A. 2008. The law and economics of self-dealing. *Journal of Financial Economics* **88**(3): 430-465.

Easterly W, Levine R. 1997. Africa's growth tragedy: policies and ethnic divisions. *The Quarterly Journal of Economics* **112**(4): 1203-1250.

Easterly W, Levine R. 2016. The European origins of economic development. *Journal of Economic Growth* **21**(3): 225-257.

Eltis D, Behrendt S, Richardson D, Klein H. 1999. *The trans-Atlantic slave trade: a database on CD-ROM*. Cambridge University Press: New York.

Fafchamps M. 2006. Development and social capital. *The Journal of Development Studies* **42**(7): 1180-1198.

Fama EF, Jensen MC. 1983. Separation of ownership and control. *The Journal of Law and Economics* **26**(2): 301-325.

Fernandez R, Fogli A, Olivetti C. 2004. Preference formation and the rise of women's labor force participation: evidence from WWII. *Quarterly Journal of Economics* **119**(4):1249–1299.

Fisman R, Khanna T. 2004. Facilitating development: the role of business groups. *World Development* **32**(4): 609-628.

Gennaioli N, La Porta R, Lopez-de-Silanes F, Shleifer A. 2013. Human capital and regional development. *Quarterly Journal of Economics* **128**:105–64.

Gennaioli N, Rainier I. 2007. The modern impact of precolonial centralization in Africa. *Journal of Economic Growth* **12**: 185-234.

George G, Corbishley C, Khayesi JN, Haas MR, Tihanyi L. 2016a. Bringing Africa in: promising directions for management research. *Academy of Management Journal* **59**(2): 377-393.

George G, Kotha R, Parikh P, Alnuaimi T, Bahaj AS. 2016b. Social structure, reasonable gain, and entrepreneurship in Africa. *Strategic Management Journal* **37**(6): 1118-1131.

Gibbons R, Henderson R. 2012. Relational contracts and organizational capabilities. *Organization Science* **23**(5): 1350-1364.

Greve HR, Rao H. 2012. Echoes of the past: organizational foundings as sources of an institutional legacy of mutualism. *American Journal of Sociology* **118**(3):635–675.

Grosfeld I, Rodnyansky A, Zhuravskaya E. 2013. Persistent antimarket culture: a legacy of the pale of settlement after the holocaust. *American Economic Journal: Economic Policy* **5**(3):189–226.

Grossman SJ, Hart OD. 1986. The costs and benefits of ownership: a theory of vertical and lateral integration. *Journal of Political Economy* **94**(4): 691-719.

Guiso L, Sapienza P, Zingales L. 2003. People's opium? Religion and economic attitudes. *Journal of Monetary Economics* **50**(1): 225-282.

Guiso L, Sapienza P, Zingales L. 2004. The role of social capital in financial development. *American Economic Review* **94**:526–56.

Guiso L, Sapienza P, Zingales L. 2006. Does culture affect economic outcomes?. *Journal of Economic Perspectives* **20**(2): 23-48.

Guiso L, Sapienza P, Zingales L. 2009. Cultural biases in economic exchange?. *The Quarterly Journal of Economics* **124**(3): 1095-1131.

Gulati R. 1998. Alliances and networks. *Strategic Management Journal* **19**(4): 293-317.

Henisz WJ, Williamson OE. 1999. Comparative economic organization—within and between countries. *Business and Politics* **1**(3): 261-277.

Inglehart R, Baker WE. 2000. Modernization, cultural change, and the persistence of traditional values. *American Sociological Review* **65**(1):19–51.

Ingram P, Rao H, Silverman BS. 2012. History in strategy research: what, why, and how?. In *Advances in Strategic Management*, Kahl SJ, Silverman BS, Cusumano MA (eds). Emerald Group Publishing: Bingley; 241–273.

Jones E. 2006. *Cultures Merging: A Historical and Economic Critique of Culture*. Princeton University Press : Princeton, NJ.

Jones G. 2000. *Merchants to Multinationals: British Trading Companies in he Nineteenth and Twentieth Centuries*. Oxford University Press.

Jones G, Khanna T. 2006. Bringing history (back) into international business. *Journal of International Business Studies* **37**(4): 453-468.

Julian SD, Ofori-Dankwa JC. 2013. Financial resource availability and corporate social responsibility expenditures in a sub-Saharan economy: the institutional difference hypothesis. *Strategic Management Journal* **34**(11): 1314-1330.

Khanna T, Palepu K. 2000. Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups. *Journal of Finance* **55**:867–91.

Khanna T, Rivkin JW. 2001. Estimating the performance effects of business groups in emerging markets. *Strategic Management Journal* 45-74.

Khanna T, Yafeh Y. 2007. Business groups in emerging markets: paragons or parasites? *Journal of Economic Literature* **45**(2): 331-372.

Kieser A. 1994. Why organization theory needs historical analyses—and how this should be performed. *Organization Science* **5**(4):608–620.

Kipping M, Üsdiken B. 2014. History in organization and management theory: more than meets the eye. *The Academy of Management Annals* **8**(1):535–588.

Klüppel L, Pierce L, Snyder J. 2017. The deep historical roots of organization and strategy: traumatic shocks, culture, and institutions. *Organization Science.* Forthcoming.

Koch MJ, McGrath RG. 1996. Improving labor productivity: human resource management policies do matter. *Strategic Management Journal* 335-354.

Koelle S. 1854. *Polyglotta Africana; or A Comparative Vocabulary of Nearly Three Hundred Words and Phrases, in More than One Hundred Distinct African Languages.* Church Missionary House: London.

Lamoreaux NR. 1996. *Insider Lending: Banks, Personal Connections, and Economic Development in Industrial New England.* Cambridge University Press.

La Porta R, Lopez-de-Silanes F, Shleifer A. 1999. Corporate ownership around the world. *The Journal of Finance* **54**(2): 471-517.

La Porta R, Lopez-de-Silanes F, Shleifer A, Vishny RW. 1998. Law and finance. *Journal of Political Economy* **106**(6):1113-1155.

La Porta R, Lopez-de-Silanes F, Shleifer A, Vishny RW. 2000. Investor protection and corporate governance. *Journal of Financial Economics* **58**(1): 3-27.

Lerner J, Schoar A. 2005. Does legal enforcement affect financial transactions? The contractual channel in private equity. *The Quarterly Journal of Economics* **120**(1): 223-246.

Levine R. 1997. Financial development and economic growth: views and agenda. *Journal of Economic Literature* **35**(2): 688-726.

Levine R. 2005. Finance and growth: theory and evidence. *Handbook of Economic Growth* **1**: 865-934.

Levine R, Lin C, Xie W. 2017 The origins of financial development: how the African slave trade continues to influence financial development. NBER working paper 23800.

Lovejoy P. 2000. *Transformations in Slavery: A History of Slavery in Africa: 2nd ed.* Cambridge University Press: New York.

Luiz J, Stringfellow D, Jefthas A. 2017. Institutional complementarity and substitution as an internationalization strategy: the emergence of an African multinational giant. *Global Strategy Journal* **7**(1): 83-103.

Madsen GC, Bednar JS, Godfrey PC. 2014. Africa, the informal economy, and the hermeneutic circle. In *Advancing Research Methodology in the African Context: Techniques, Methods, and Designs,* Zoogah DB (eds). Emerald Group Publishing Limited.

Mahoney J, Thelen K. 2010. *Explaining Institutional Change: Ambiguity, Agency, and Power.* Cambridge University Press.

Manning P. 1990. *Slavery and African Life.* Cambridge University Press: Cambridge, UK.

Mayer RC, Davis JH, Schoorman FD. 1995. An integrative model of organizational trust. *Academy of Management Review* **20**(3): 709-734.

Mol MJ, Stadler C, Ariño A. 2017. Africa: the new frontier for global strategy scholars. *Global Strategy Journal* **7**(1): 3-9.

Morck R, Wolfenzon D, Yeung B. 2005. Corporate governance, economic entrenchment, and growth. *Journal of Economic Literature* **43**(3): 655-720.

Morck R, Yeung B. 2011. Economics, history, and causation. *Business History Review* **85**(1):39–63.

Moreira M. 2003. A conditional likelihood ratio test for structural models. *Econometrica* **71**:1027–48.

Murdock G. 1967. *Ethnographic Atlas*. University of Pittsburgh Press: Pittsburgh.

Nunn N. 2008. The long-term effects of Africa's slave trades. *The Quarterly Journal of Economics* **123**(1):139–176.

Nunn N. 2014. Historical development. In *Handbook of Economic Growth*, Durlauf S (eds). Elsevier Science; 347-402.

Nunn N, Puga D. 2012. Ruggedness: the blessing of bad geography in Africa. *Review of Economics and Statistics* **94**: 20-36.

Nunn N, Wantchekon L. 2011. The slave trade and the origins of mistrust in Africa. *American Economic Review* **101**(7):3221–3252.

Pascali L. 2016. Banks and development: Jewish communities in the Italian renaissance and current economic performance. *Review of Economics and Statistics* **98**(1):140–158.

Peng MW, Jiang Y. 2010. Institutions behind family ownership and control in large firms. *Journal of Management Studies* **47**(2): 253-273.

Pierce L, Snyder J. 2017. The historical slave trade and firm access to finance in Africa. *The Review of Financial Studies*. Forthcoming.

Piot C. 1996. Of slaves and the gift: Kabre sale of kin during the era of the slave trade. *Journal of African History* **37**: 31–49.

Poppo L, Zenger T. 2002. Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal* **23**(8): 707-725.

Powell WW. 1991. Expanding the scope of institutional analysis. In *The New Institutionalism in Organizational Analysis*.

Putnam R, Leonardi R, Nanetti R. 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press: Princeton.

Rao H, Greve H. 2017. Disasters and community resilience: Spanish flu and the formation of retail cooperatives in Norway. *Academy of Management Journal*. Forthcoming.

Rowlinson M, Hassard JS 2013. Historical neo-institutionalism or neo-institutionalist history? Historical research in management and organization studies. *Management & Organizational History* 8(2):111–126.

Rowlinson M, Hassard J, Decker S. 2014. Research strategies for organizational history: a dialogue between historical theory and organization theory. *Academy of Management Review* **39**(3):250–274.

Shleifer A, Vishny RW. 1986. Large shareholders and corporate control. *Journal of Political Economy* **94**(3, Part 1): 461-488.

Siegel J, Choudhury P. 2012. A reexamination of tunneling and business groups: new data and new methods. *Review of Financial Studies* **25**:1763–98.

Siegel J, Licht A, Schwartz S. 2011. Egalitarianism and international investment. *Journal of Financial Economics* **102**:621–42.

Siegel JI, Licht AN, Schwartz SH. 2013. Egalitarianism, cultural distance, and foreign direct investment: a new approach. *Organization Science* **24**(4):1174–1194.

Silverman BS, Ingram PL. 2016. Managing agency problems in early shareholder capitalism: an exploration of Liverpool shipping in the 18th century. *Organization Science*.

Sorenson O, Audia PG. 2000. The social structure of entrepreneurial activity: geographic concentration of footwear production in the United States. *American Journal of Sociology*, **106**(2): 424-462.

Tabellini G. 2008. The scope of cooperation: values and incentives. *Quarterly Journal of Economics* **123**:905–50.

Taussig M, Delios A. 2015. Unbundling the effects of institutions on firm resources: The contingent value of being local in emerging economy private equity. *Strategic Management Journal* **36**(12): 1845-1865.

Tsai W, Ghoshal S. 1998. Social capital and value creation: the role of intrafirm networks. *Academy of Management Journal* **41**(4): 464-476.

Uzzi B. 1996. The sources and consequences of embeddedness for the economic performance of organizations: the network effect. *American Sociological Review*. 674-698.

Vergne JP. 2013. QWERTY is dead; long live path dependence. *Research Policy* **6–7**(42):1191–1194.

Walsh JP. 2015. Organization and management scholarship in and for Africa… and the world. *The Academy of Management Perspectives* **29**(1): 1-6.

Whatley W, Gillezeau R. 2011. The impact of the transatlantic slave trade on ethnic stratification in Africa. *The American Economic Review* **101**(3): 571-576.

Yenkey CB. 2015. Mobilizing a market: ethnic segmentation and investor recruitment into the Nairobi securities exchange. *Administrative Science Quarterly* **60**(4): 561-595.

Yenkey CB. 2017. Fraud and market participation: social relations as a moderator of organizational misconduct. *Administrative Science Quarterly*.

Zoogah DB, Peng MW, Woldu H. 2015. Institutions, resources, and organizational effectiveness in Africa. *The Academy of Management Perspectives* **29**(1): 7-31.

Zucker LG. 1977. The role of institutionalization in cultural persistence. *American Sociological Review* **42**(5):726–743.

Figure 1a
Slave exports across Africa

Slave exports
per sq. km.

- 0.000 - 213.315
- 213.315 - 565.853
- 565.853 - 780.276
- 780.276 - 1922.988
- 1922.988 - 6756.355

Data comes from Nunn (2008).

Figure 1b
Sole ownership of firms across Africa

Probability firm
has one owner

- 0.00 - 0.57
- 0.57 - 0.62
- 0.62 - 0.63
- 0.63 - 0.68
- 0.68 - 0.81
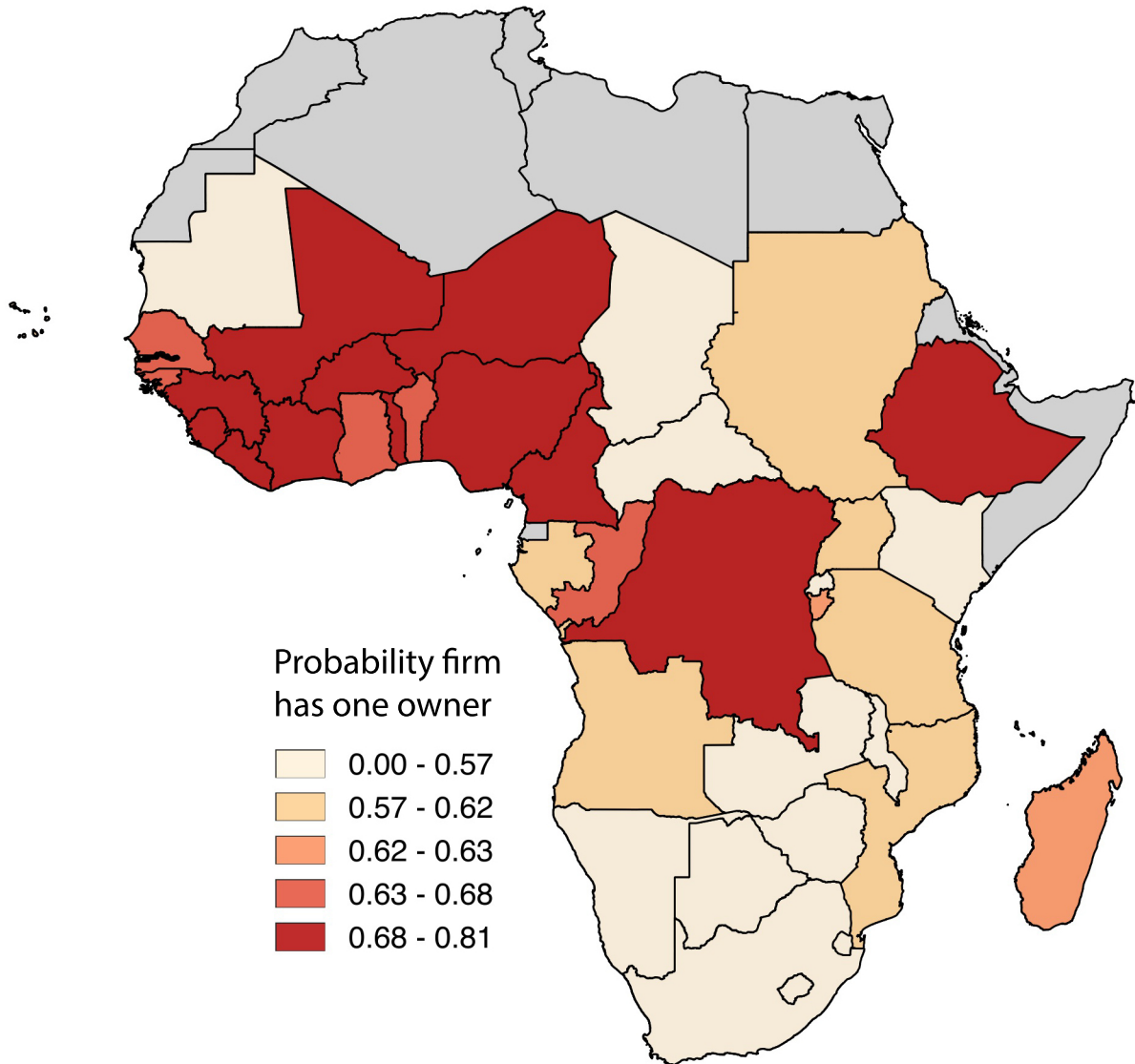
Data comes from the World Enterprise Survey data.

Figure 2a
Sole ownership and slave exports
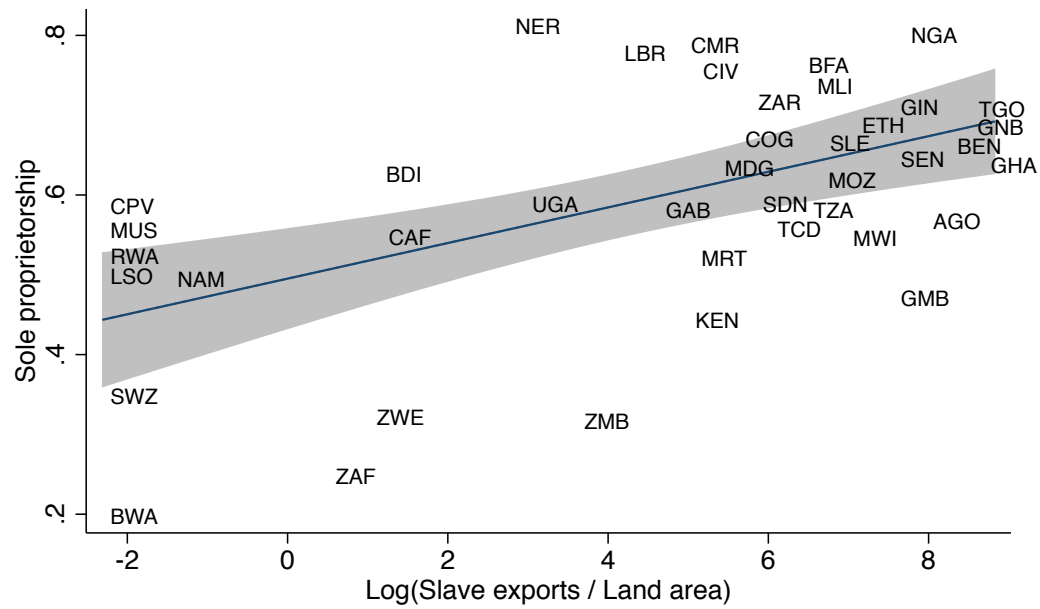
Data comes from Nunn (2008) and the World Enterprise Survey data. Small changes to the positions of the countries were made to prevent the overlapping of the country labels.

Figure 2b
Single majority owner and slave exports
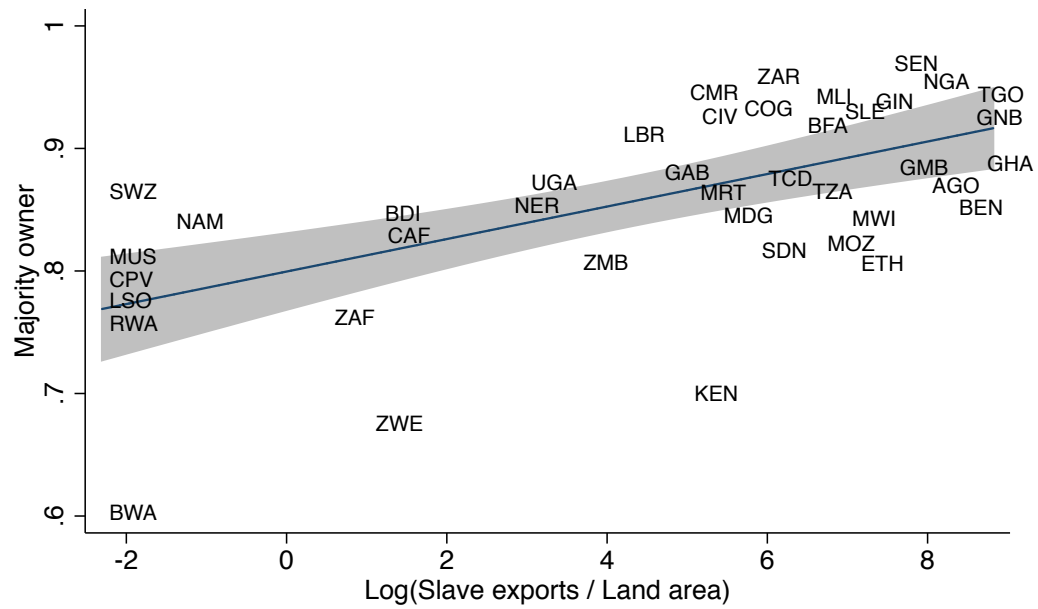
Data comes from Nunn (2008) and the World Enterprise Survey data. Small changes to the positions of the countries were made to prevent the overlapping of the country labels.

Figure 3a
Ethnic fractionalization and slave exports

Data comes from Nunn (2008) and Alesina et al. (2003). Small changes to the positions of the countries were made to prevent the overlapping of the country labels.

Figure 3b
Sole owner and predicted values for ethnic fractionalization
(from regression in figure 3a)

Data comes from Nunn (2008), Alesina et al. (2003), and the World Enterprise Survey data. Small changes to the positions of the countries were made to prevent the overlapping of the country labels.

Figure 4a
Political centralization and slave exports
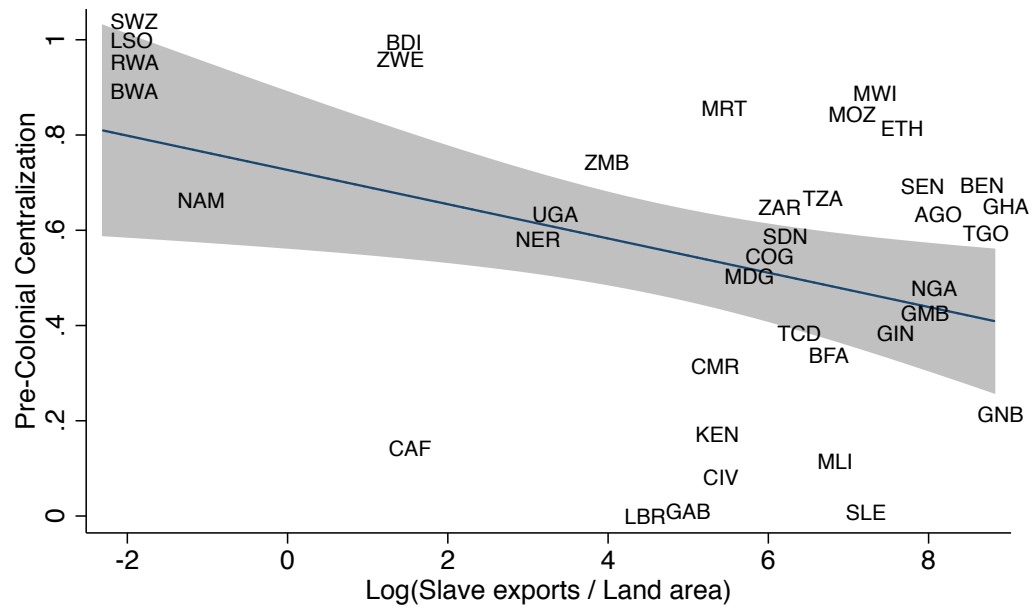
Data comes from Nunn (2008) and Gennaioli and Rainier (2007). Small changes to the positions of the countries were made to prevent the overlapping of the country labels.

Figure 4b
Sole owner and predicted values for political centralization
(from regression in figure 4a)
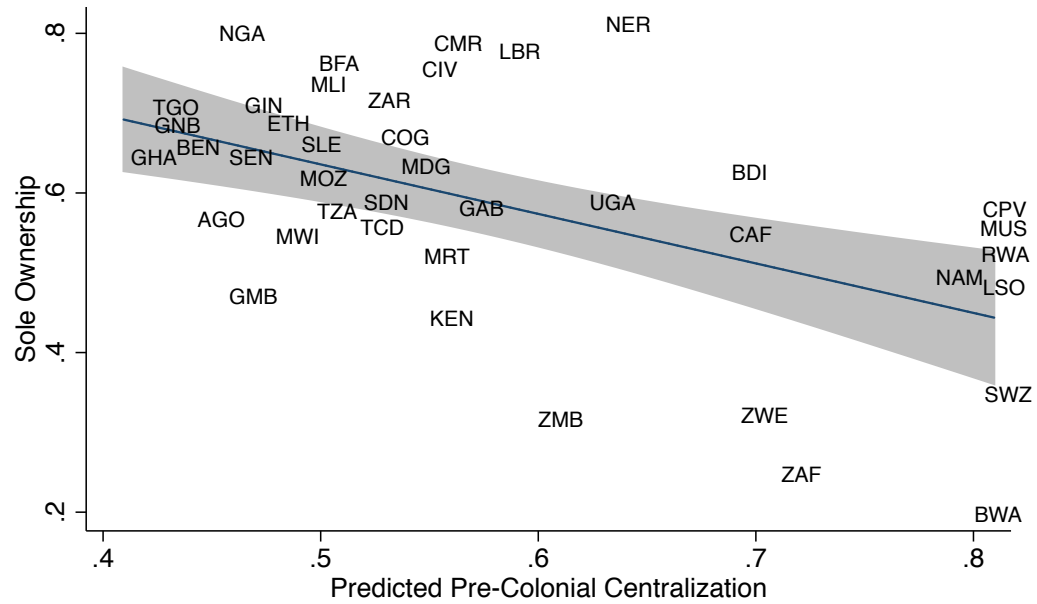
Data comes from Nunn (2008), Gennaioli and Rainier (2007), and the World Enterprise Survey data. Small changes to the positions of the countries were made to prevent the overlapping of the country labels.
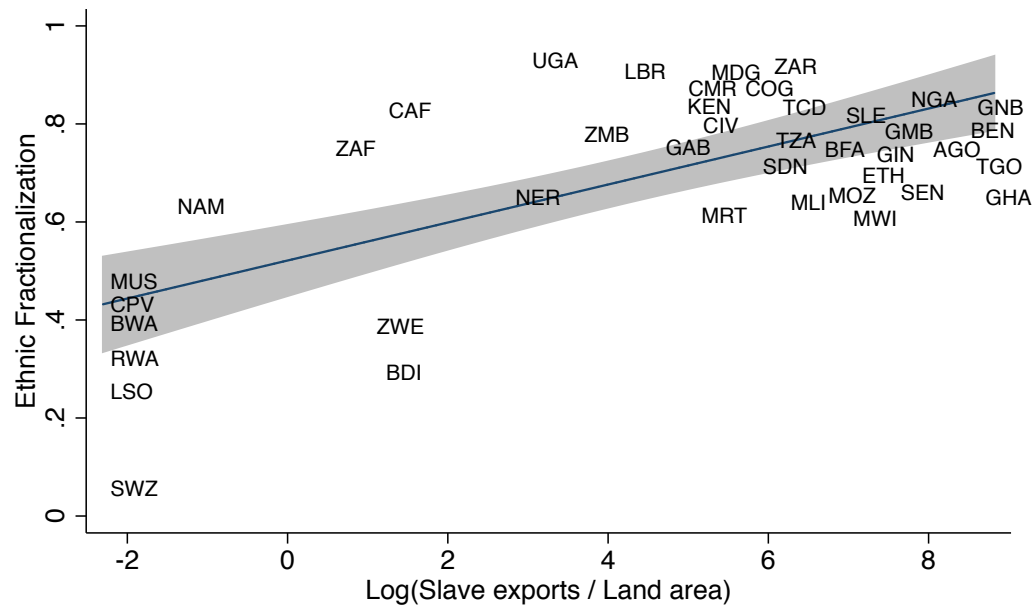
Figure 5a
Financial mistrust and slave exports
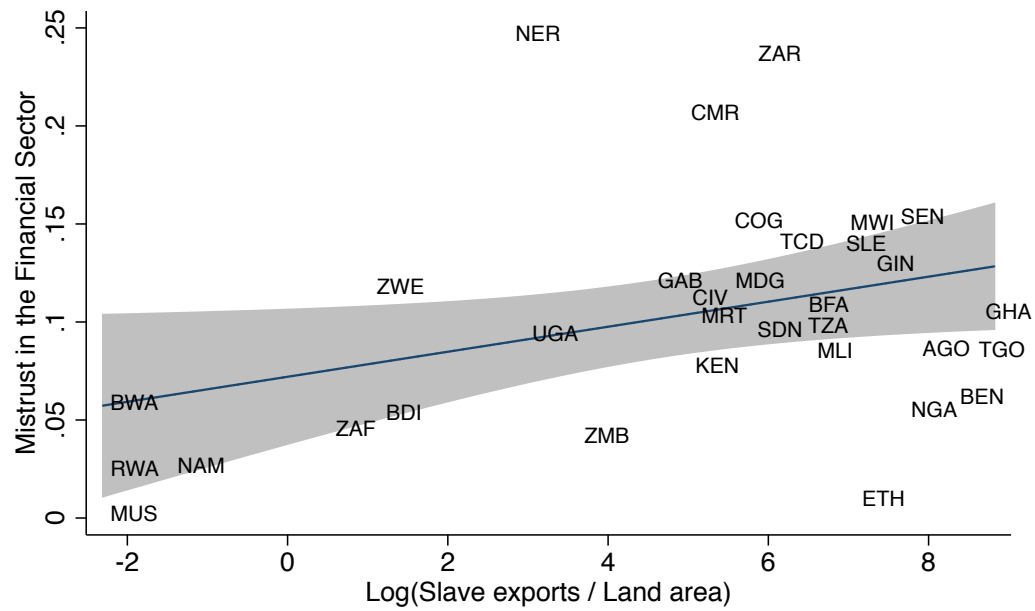
Data comes from Nunn (2008) and the World Bank's Financial Inclusion Data. Small changes to the positions of the countries were made to prevent the overlapping of the country labels.

Figure 5b
Sole owner and predicted values for Financial mistrust
(from regression in figure 5a)

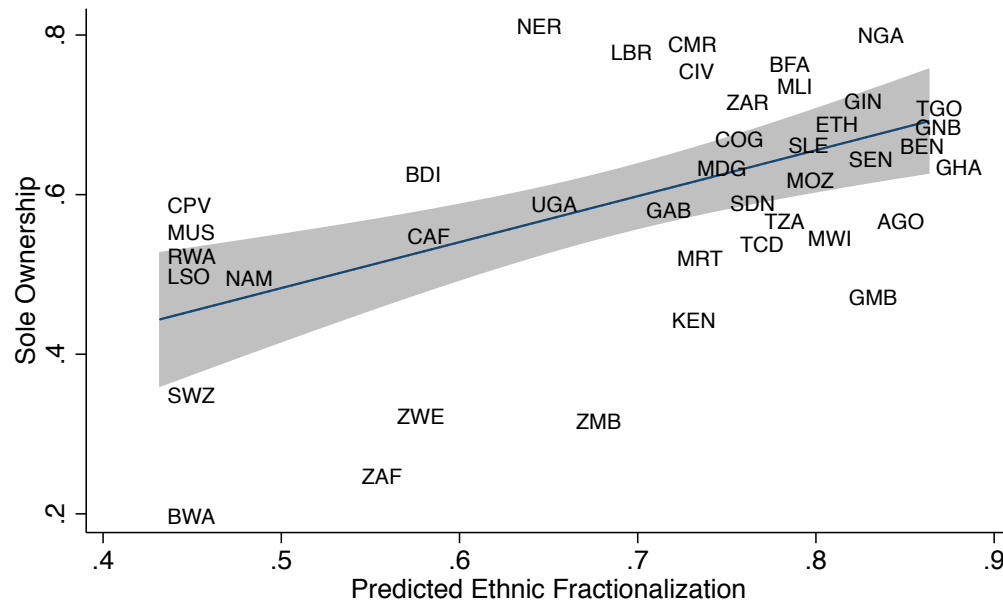Data comes from Nunn (2008), the World Bank's Financial Inclusion Data, and the World Enterprise Survey. Small changes to the positions of the countries were made to prevent the overlapping of the country labels.

Table 1
Summary statistics

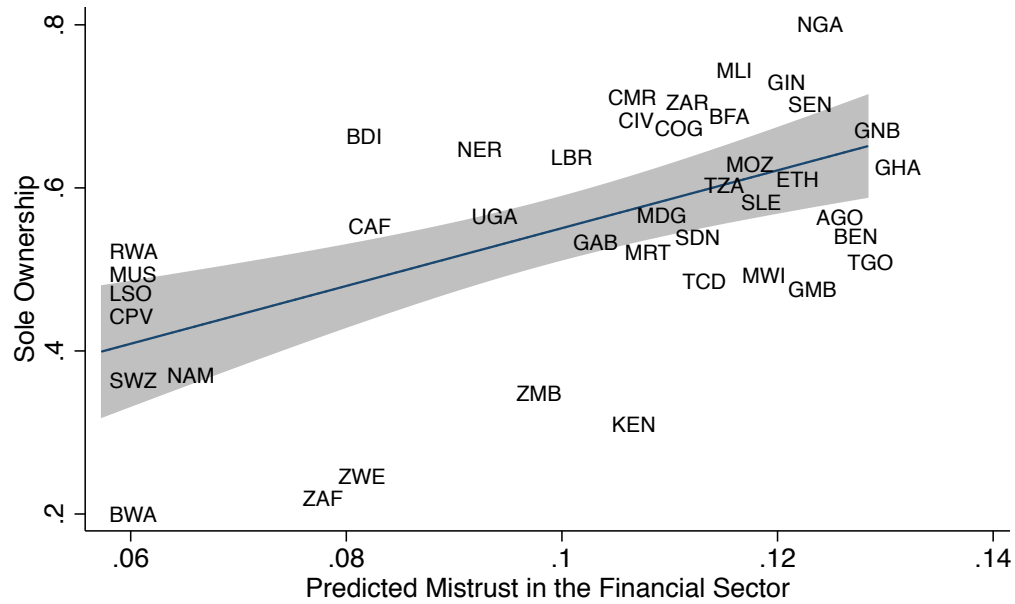|	Obs	Mean	SD	Min	Max
Country-Level Variables					
Log(Slave exports / Land area)	41	4.26	3.62	-2.30	8.82
Ethnic fractionalization	41	0.69	0.20	0.06	0.93
Pre-Colonial centralization	38	0.56	0.31	0.00	1.00
Mistrust in financial sector	33	0.10	0.06	0.00	0.25
British colony	41	0.39	0.49	0.00	1.00
French colony	41	0.37	0.49	0.00	1.00
Netherlands colony	41	0.07	0.26	0.00	1.00
Portuguese colony	41	0.10	0.30	0.00	1.00
Log(Coastline / Land area)	41	-0.97	3.05	-4.61	5.48
Log(Population 1400)	41	-1.20	2.05	-8.59	1.74
Absolute latitude	41	12.33	7.89	0.20	30.00
Longitude	41	14.88	19.92	-24.04	57.79
Min of monthly average rainfall (mm)	41	7.68	11.46	0.00	46.00
Max of monthly afternoon avg humidity	41	71.41	11.72	35.00	95.00
Min of avg monthly low temp (C)	41	8.63	7.22	-9.00	19.00
Log(Land area in millions of sq. kms)	41	-1.43	1.74	-6.29	0.92
Indicator variable for small islands	41	0.05	0.22	0.00	1.00
Percent Islamic	41	25.88	31.67	0.00	99.00
Former communist country	41	0.10	0.30	0.00	1.00
Legal origin indicator: French	41	0.59	0.50	0.00	1.00
Log(Diamond production per capita)	41	-5.11	2.57	-6.91	2.19
Log(Oil production per capita)	41	-7.30	3.52	-9.21	2.65
Log(Gold production per capita)	41	-5.99	5.34	-13.82	3.08
Minimum Atlantic distance (000s of kms)	41	6.84	2.95	3.65	15.25
Minimum Indian distance (000s of kms)	41	6.56	3.61	0.03	11.91
Minimum Saharan distance (000s of kms)	41	3.83	1.38	1.77	6.64
Minimum Red Sea distance (000s of kms)	41	3.69	1.39	0.51	6.47
Firm-Level Variables					
Sole proprietorship	30,004	0.57	0.50	0.00	1.00
Small size firm	30,965	0.62	0.49	0.00	1.00
Medium sized firm	30,965	0.27	0.45	0.00	1.00
Large sized firm	30,965	0.11	0.31	0.00	1.00
Majority owner	29,754	0.85	0.36	0.00	1.00

Note: See Nunn (2008) for detailed description of country-level variables and the sources for each variable.

Table 2A and 2B
Slave trade and ownership structure

Table 2A

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Sole proprietorship					
Log(Slave exports / Land area)	0.039	0.032	0.032	0.016	0.073	0.043
	(0.008)	(0.006)	(0.007)	(0.005)	(0.026)	[0.025 , 0.083]
	[0.00]	[0.00]	[0.00]	[0.01]	[0.00]	
Year fixed effects	Yes	Yes	Yes	Yes	Yes	No
Sector and firm size controls	No	Yes	Yes	Yes	Yes	No
Colonizer controls	No	No	Yes	Yes	Yes	No
Geography controls	No	No	No	Yes	Yes	No
Specification	OLS	OLS	OLS	OLS	Logit	IV
Unit of Analysis	Firm	Firm	Firm	Firm	Firm	Country
Clusters	41	41	41	41	41	41
Observations	30,004	30,004	30,004	30,004	30,004	41

Table 2B

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Majority owner					
Log(Slave exports / Land area)	0.016	0.013	0.013	0.013	0.070	0.024
	(0.003)	(0.003)	(0.003)	(0.005)	(0.035)	[0.014 , 0.051]
	[0.00]	[0.00]	[0.00]	[0.01]	[0.05]	
Year fixed effects	Yes	Yes	Yes	Yes	Yes	No
Sector and firm size controls	No	Yes	Yes	Yes	Yes	No
Colonizer controls	No	No	Yes	Yes	Yes	No
Geography controls	No	No	No	Yes	Yes	No
Specification	OLS	OLS	OLS	OLS	Logit	IV
Clusters	41	41	41	41	41	41
Observations	29,754	29,754	29,754	29,754	29,754	41

Note: Parentheses contain standard errors clustered at the country level, brackets contain p-values, except in column (6) where they contain confidence intervals. Slave exports / Land area is measured as slaves exported per million square kilometers. Firm controls include sector indicators and size indicators. Colonizer controls include British, French, Portuguese, and Belgium indicators. Geography controls include longitude, absolute latitude, lowest month rainfall, maximum humidity, coastline area, island indicator, diamond production per capita, gold production per capita, and oil production per capita.

Table 3A and 3B
Slave trade and ownership structure:
Cross-industry differences

Table 3A

	Dependent variable: Sole proprietorship				
	(1)	(2)	(3)	(4)	(5)
Log(Slave exports / Land area)	0.038	0.029	0.029	0.013	Absorbed
	(0.007)	(0.006)	(0.006)	(0.005)	
	[0.00]	[0.00]	[0.00]	[0.02]	
Manufacturing sector	-0.120	-0.196	-0.163	-0.136	-0.178
	(0.030)	(0.017)	(0.070)	(0.071)	(0.071)
	[0.00]	[0.00]	[0.03]	[0.06]	[0.02]
Slave exports * Manufacturing sector		0.024	0.012	0.009	0.007
		(0.003)	(0.004)	(0.002)	(0.003)
		[0.00]	[0.01]	[0.00]	[0.02]
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Sector and firm size controls	No	No	Yes	Yes	Yes
Colonizer controls	No	No	No	Yes	No
Geography controls	No	No	No	Yes	No
Country fixed effects	No	No	No	No	Yes
Clusters	41	41	41	41	41
Observations	30,004	30,004	30,004	30,004	30,004

Table 3B

	Dependent variable: Majority owner				
	(1)	(2)	(3)	(4)	(5)
Log(Slave exports / Land area)	0.015	0.012	0.011	0.011	Absorbed
	(0.003)	(0.003)	(0.003)	(0.005)	
	[0.00]	[0.00]	[0.00]	[0.02]	
Manufacturing sector	-0.044	-0.071	-0.044	-0.026	-0.038
	(0.015)	(0.011)	(0.028)	(0.032)	(0.032)
	[0.01]	[0.00]	[0.12]	[0.42]	[0.24]
Slave exports * Manufacturing sector		0.008	0.007	0.006	0.005
		(0.002)	(0.003)	(0.002)	(0.002)
		[0.00]	[0.02]	[0.01]	[0.01]
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Sector and firm size controls	No	No	Yes	Yes	Yes
Colonizer controls	No	No	No	Yes	No
Geography controls	No	No	No	Yes	No
Country fixed effects	No	No	No	No	Yes
Clusters	41	41	41	41	41
Observations	29,754	29,754	29,754	29,754	29,754

Note: Parentheses contain standard errors clustered at the country level and brackets contain p-values. Slave exports / Land area is measured as slaves exported per million square kilometers. Firm controls include sector indicators and size indicators. Colonizer controls include British, French, Portuguese, and Belgium indicators. Geography controls include longitude, absolute latitude, lowest month rainfall, maximum humidity, coastline area, island indicator, diamond production per capita, gold production per capita, and oil production per capita.

Table 4A and 4B
Slave trade, ownership structure, and productivity

Table 4A

| | Dependent variable: Log (Labor productivity) | | | |
	(1)	(2)	(3)	(4)
Log(Slave exports / Land area)	Absorbed	Absorbed	Absorbed	Absorbed
Sole proprietorship	-0.189	-0.060	-0.059	-0.041
	(0.071)	(0.030)	(0.024)	(0.030)
	[0.01]	[0.05]	[0.02]	[0.18]
Slave exports * sole		-0.044	-0.041	-0.042
		(0.011)	(0.010)	(0.014)
		[0.00]	[0.00]	[0.01]
Sector and firm size controls	No	No	Yes	Yes
Country-Year fixed effects	Yes	Yes	Yes	Yes
Sector	All	All	All	Manufacturing
Clusters	41	41	41	41
Observations	24,354	24,354	24,354	11,551

Table 4B

| | Dependent variable: Log (Labor productivity) | | | |
	(1)	(2)	(3)	(4)
Log(Slave exports / Land area)	Absorbed	Absorbed	Absorbed	Absorbed
Majority owner	-0.084	-0.034	-0.035	-0.029
	(0.036)	(0.018)	(0.023)	(0.029)
	[0.02]	[0.06]	[0.14]	[0.32]
Slave exports * majority		-0.022	-0.020	-0.011
		(0.016)	(0.016)	(0.014)
		[0.17]	[0.22]	[0.41]
Sector and firm size controls	No	No	Yes	Yes
Country-Year fixed effects	Yes	Yes	Yes	Yes
Sector	All	All	All	Manufacturing
Clusters	41	41	41	41
Observations	24,364	24,364	24,364	11,573

Note: Parentheses contain standard errors clustered at the country level and brackets contain p-values. Slave exports / Land area is measured as slaves exported per million square kilometers. Firm controls include sector indicators and size indicators. Colonizer controls include British, French, Portuguese, and Belgium indicators. Geography controls include longitude, absolute latitude, lowest month rainfall, maximum humidity, coastline area, island indicator, diamond production per capita, gold production per capita, and oil production per capita.

Table 5A and 5B
Slave trade and ownership structure
Ethnic fractionalization as a historical channel

Table 5A

| | Dependent variable: Sole proprietorship | | | | |
	(1)	(2)	(3)	(4)	(5)
Ethnic fractionalization	0.524	1.810	1.259	1.375	1.321
	(0.158)	(0.664)	(0.320)	(0.407)	(1.214)
	[0.00]	[0.01]	[0.00]	[0.00]	[0.28]
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Sector and firm size controls	No	No	Yes	Yes	Yes
Colonizer controls	No	No	No	Yes	Yes
Geography controls	No	No	No	No	Yes
Specification	OLS	IV	IV	IV	IV
Clusters	41	41	41	41	41
Observations	30,004	30,004	30,004	30,004	30,004

Table 5B

| | Dependent variable: Majority owner | | | | |
	(1)	(2)	(3)	(4)	(5)
Ethnic fractionalization	0.271	0.729	0.532	0.552	1.082
	(0.079)	(0.245)	(0.129)	(0.168)	(0.808)
	[0.00]	[0.00]	[0.00]	[0.00]	[0.18]
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Sector and firm size controls	No	No	Yes	Yes	Yes
Colonizer controls	No	No	No	Yes	Yes
Geography controls	No	No	No	No	Yes
Specification	OLS	IV	IV	IV	IV
Clusters	41	41	41	41	41
Observations	29,754	29,754	29,754	29,754	29,754

Note: Parentheses contain standard errors clustered at the country level and brackets contain p-values. Instrumental variables regressions use Log(Slave exports / Land area) as an instrument. Slave exports / Land area is measured as slaves exported per million square kilometers. Firm controls include sector indicators and size indicators. Colonizer controls include British, French, Portuguese, and Belgium indicators. Geography controls include longitude, absolute latitude, lowest month rainfall, maximum humidity, coastline area, island indicator, diamond production per capita, gold production per capita, and oil production per capita.

Table 6A and 6B
Slave trade and ownership structure:
Pre-Colonial centralization as a historical channel

Table 6A

	Dependent variable: Sole proprietorship				
	(1)	(2)	(3)	(4)	(5)
Pre-Colonial centralization	-0.238	-1.270	-1.202	-1.376	0.275
	(0.125)	(0.484)	(0.438)	(0.584)	(0.269)
	[0.07]	[0.01]	[0.01]	[0.02]	[0.31]
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Sector and firm size controls	No	No	Yes	Yes	Yes
Colonizer controls	No	No	No	Yes	Yes
Geography controls	No	No	No	No	Yes
Specification	OLS	IV	IV	IV	IV
Clusters	38	38	38	38	38
Observations	28,559	28,559	28,559	28,559	28,559

Table 6B

	Dependent variable: Majority owner				
	(1)	(2)	(3)	(4)	(5)
Pre-Colonial centralization	-0.072	-0.670	-0.631	-0.777	0.529
	(0.084)	(0.270)	(0.226)	(0.352)	(0.379)
	[0.40]	[0.01]	[0.01]	[0.03]	[0.16]
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Sector and firm size controls	No	No	Yes	Yes	Yes
Colonizer controls	No	No	No	Yes	Yes
Geography controls	No	No	No	No	Yes
Specification	OLS	IV	IV	IV	IV
Clusters	38	38	38	38	38
Observations	28,286	28,286	28,286	28,286	28,286

Note: Parentheses contain standard errors clustered at the country level and brackets contain p-values. Instrumental variables regressions use Log(Slave exports / Land area) as an instrument. Slave exports / Land area is measured as slaves exported per million square kilometers. Firm controls include sector indicators and size indicators. Colonizer controls include British, French, Portuguese, and Belgium indicators. Geography controls include longitude, absolute latitude, lowest month rainfall, maximum humidity, coastline area, island indicator, diamond production per capita, gold production per capita, and oil production per capita.

Slave trade and ownership structure:
Mistrust in the financial sector as a historical channel

Table 7A

	Dependent variable: Sole proprietorship				
	(1)	(2)	(3)	(4)	(5)
Mistrust in financial sector	1.317	7.199	4.920	6.867	1.375
	(0.494)	(3.359)	(2.137)	(3.758)	(1.154)
	[0.01]	[0.03]	[0.02]	[0.07]	[0.23]
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Sector and firm size controls	No	No	Yes	Yes	Yes
Colonizer controls	No	No	No	Yes	Yes
Geography controls	No	No	No	No	Yes
Specification	OLS	IV	IV	IV	IV
Clusters	33	33	33	33	33
Observations	28,012	28,012	28,012	28,012	28,012

Table 7B

	Dependent variable: Majority owner				
	(1)	(2)	(3)	(4)	(5)
Mistrust in financial sector	0.506	2.890	2.054	2.881	1.635
	(0.252)	(1.307)	(0.887)	(1.609)	(1.390)
	[0.05]	[0.03]	[0.02]	[0.07]	[0.24]
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Sector and firm size controls	No	No	Yes	Yes	Yes
Colonizer controls	No	No	No	Yes	Yes
Geography controls	No	No	No	No	Yes
Specification	OLS	IV	IV	IV	IV
Clusters	33	33	33	33	33
Observations	27,805	27,805	27,805	27,805	27,805

Note: Parentheses contain standard errors clustered at the country level and brackets contain p-values. Instrumental variables regressions use Log(Slave exports / Land area) as an instrument. Slave exports / Land area is measured as slaves exported per million square kilometers. Firm controls include sector indicators and size indicators. Colonizer controls include British, French, Portuguese, and Belgium indicators. Geography controls include longitude, absolute latitude, lowest month rainfall, maximum humidity, coastline area, island indicator, diamond production per capita, gold production per capita, and oil production per capita.