The Slave Trade and Military Formation under Colonialism

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October 25, 2022

Abstract

This paper explores the origins of the African colonial military's ethnic composition. I argue that colonial powers believed ethnic groups in regions heavily affected by the slave trade were 'martial races,' and because of this stereotype, certain ethnic groups affected by the Atlantic slave trade were more likely to be recruited into the colonial military. The paper tests the argument with the ethnicity-level slave trade data and the recruitment records from the *Tirailleurs Sénégalais* in colonial French West Africa. Using various specifications, including instrumental variable estimates and spatial lags, an analysis of the ethnicity-level recruitment quota provides evidence consistent with the theory. The findings in this study help us better understand the formation of the indigenous military in the former colonies and the political effects of the slave trade.

1 Introduction

What explains the ethnic composition of the military? Scholars have found that ethnic representation in the military influences inter-ethnic cooperation (Samii 2013), performance in the battlefield (Lyall 2020), the occurrence of coups and civil wars (Ejiogu 2007; Furnivall 1948). Given this importance, however, the origins of ethnic representation in the military have been quite understudied. Especially the creation of the military under colonialism has been largely overlooked in the existing literature. This is surprising since the colonial military laid the foundation for the modern military in many newly independent states, let alone their roles in major battlefields like World War I and II. In this paper, I investigate under what conditions the colonial military was formed and what determined its ethnic composition.

I argue that colonial governments predominantly recruited rank-and-file from certain ethnic groups previously exposed to the slave trade. The slave trade increased both the demand and supply of military conflicts, often called the "gun-slave cycle" or "iron-slave cycle" (Nunn 2008; Nunn and Wantchekon 2011; Whatley 2018; Lovejoy 2012; Hawthorne 1999). The slave trade increased the supply of weaponry, especially firearms, raising the efficiency and benefit of armed conflicts. In addition, since indigenous kingdoms and tribes could make a profit by exporting slaves, the slave trade increased the demand for military conflicts, which offered an opportunity to enslave enemy soldiers and civilians. Therefore, the differential exposure to the slave trade created regional and ethnic variation in the likelihood of experiencing military conflicts.

Ethnic groups' history of experiencing military conflicts provided the empirical grounds for classifying those groups as 'martial races,' the prevailing racial ideology in the colonial era. This belief entailed that martial groups should provide soldiers more suitable for mil-

itary service and wars (Streets 2017). In theory, soldiers from martial ethnic groups could improve the military's ability to fight against external threats because the soldiers should be more competent in performing military tasks. Furthermore, categorizing certain ethnic groups as martial races created ethnic divisions among indigenous populations and motivated martial groups to work as loyal collaborators of colonial rules. Therefore, selective recruitment based on martial races theory involved strategic concerns over balancing external and internal security risks often referred to as the 'guardianship dilemma' (Paine 2022; McMahon and Slantchev 2015) for the colonial government. Given that the slave trade in the past influenced the colonial government's view on which ethnic groups may possess martial traits, ethnic groups most affected by the slave trade were more likely to be recruited into the colonial military. Therefore, the slave trade shapes the pattern of colonial military recruitment.

I test this argument with the ethnicity-level slave trade data collected by Nunn and Wantchekon (2011) and colonial military recruitment data from *the Tirailleurs Sénégalais* in French West Africa (FWA) (Echenberg 1991). A cross-sectional regression analysis controlling for observable confounders provides supportive evidence for the argument. Further addressing endogeneity between the slave trade and colonial military recruitment, I instrument the location of the slave supply with the distances to the location where slaves were demanded. The results provide additional evidence that the colonial governments recruited soldiers from the ethnic groups targeted by the slave trade.

By studying the colonial military, this paper makes the following scholarly contributions. First, the study contributes to the literature on military formation by exploring the cases of colonial troops. The colonial context allows examining how states build armies inside the domestic jurisdiction, not necessarily restrained by the political cost of recruiting soldiers from

the metropole. In addition, studying the colonial military helps understand the origins of the military in newly independent states. In many cases, colonial militaries laid a foundation for the new state's national army (Asal, Conrad and Toronto 2017; Margulies 2018) and often shaped the ethnic composition of a new military (Parsons 1999; Olusanya 1968; Ejiogu 2007).

Second, this study helps identify the root causes of various kinds of political instability raised in newly independent states, including coups, civil wars, ethnic conflicts, and nationalist movements (Ejiogu 2007; Furnivall 1948; Samii 2013; Wilfahrt 2018; Müller-Crepon 2020; Roessler 2011, 2016; Ricart-Huguet 2021; Yi 2022). In particular, the study contributes to the literature of civil–military relations by introducing the colonial case of addressing the guardianship dilemma (Paine 2022; McMahon and Slantchev 2015). McMahon and Slantchev (2015), for instance, illustrates two rationales for selective recruitment dealing with internal and external security problems: privilege and competence. On the one hand, martial races theory reduced the risk of coups and rebellions by inventing the privilege of being treated as superior to other ethnic groups (Barua 1995; Ray 2013). On the other hand, colonial governments expected soldiers from martial races to be more competent on the battlefield, helping address the problem of external security risks. In this regard, this study examines the historical pattern of the guardianship dilemma, which continues to exist today.

This study also has important implications for our understanding of the effects of the slave trade. Most existing studies have focused on the socio-economic effects of the slave trade, for instance, on economic development (Nunn 2008; Nunn and Wantchekon 2011; Pierce and Snyder 2018), social stratification (Whatley 2012; Rönnbäck 2015; Obikili 2016b; Teso 2019), and literacy rates (Obikili 2016a). By exploring how the slave trade influenced military formation and state-building, this work adds to a growing field of research that examines the political effects of the slave trade (Whatley 2012, 2018; Obikili 2016b).

The paper proceeds by introducing the background of colonial military recruitment practices in Africa. Then, I discuss the theoretical argument on how the slave trade shaped the recruitment pattern in the colonial military. The subsequent section presents the empirical strategy and data for testing the theory. Next, I provide results from the cross-sectional regression of colonial military recruitment and instrumental variable analysis. Lastly, the paper concludes.

2 Indigenous Military Formation and the Tirailleurs Sénégalais

Why did the colonial powers recruit indigenous soldiers in Africa? The idea of building a military unit comprised of African people, especially those from sub-Saharan Africa, was not widely accepted until the mid-nineteenth century. A significant obstacle to the recruitment was a prevailing racial prejudice against African people that they would not be suitable for military tasks. Therefore, the first task for the proponents of recruiting indigenous soldiers from its West African colonies was to persuade other French policymakers and generals that "such troops, once they were raised, would make good soldiers" (Lunn 1999, p.519).

However, a pressing numerical need from the military conflicts both in Europe and Africa eventually prevailed over the racial prejudice. In particular, at least three factors encouraged colonial powers to recruit from the indigenous populations in Africa. First, wars in nineteenth-century Europe sharpened the need for defense, increasing the cost of sending their military abroad for less urgent issues. Especially in France, expanding the size of the military was a pressing issue due to relatively low birth rates compared to Germany (Abbott 2006; Lunn 1999). Indigenous army, once raised, could work as a large reserve for use in a

European war. Second, the Scramble for Africa beginning in the late nineteenth century increased the need for additional troops for military expedition and conquest (Stapleton 2013, p.17). Colonial powers needed numerical reinforcement to fight against indigenous kingdoms and their European rivals. Lastly, most Europeans did not favor military service in Africa. Serving in the African military was notorious for the distance to travel, vernacular diseases, and risky warfare against the local tribes, which discouraged potential European recruits (Abbott 2006, p.15). Due to the cost of recruiting soldiers from home soil and the rising demand for military forces both in Africa and Europe, colonial powers started looking for alternative recruitment sources.

The origin of the West African colonial military can be traced back to some garrison units in the sixteenth century. However, it was not until the 1850s that regular military units expanded beyond battalion size (Abbott 2006, p.15). In FWA, the *Tirailleurs Sénégalais* was officially found in 1857 by Governor Louis Faidherbe of Senegal (Echenberg 1991, p.7).[1] In its initial phase, the Tirailleurs Sénégalais played a critical role in expanding FWA to the hinterland, especially in the conflicts against the Tukolor and Mandinka Empires (Stapleton 2013, pp. 17-19). During World War I, the size of the Tirailleurs Sénégalais was expanded more than ten times, from 13,000 in 1910 to 180,000 in 1915 (Echenberg 1991, p.26). While the West African soldiers also fought in their continent against the German colonial forces in Togo, their role was even more significant in the French offensives in Europe (Stapleton 2013, p.139). At its peak, it was the largest colonial military in sub-Saharan Africa, and it ultimately laid the foundation for the national military of eight sovereign states nowadays.[2]

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[1] In France, *Sénégalais* often represented the entire region of FWA in general.

[2] FWA covered the territory of Mauritania, Senegal, Mali, Guinea, Ivory Coast, Burkina Faso, Benin, and Niger today.

3 Theoretical Argument: the Slave Trade, Conflicts, and Colonial Military Formation

I identify a two-stage process that links the history of the slave trade to colonial military formation. I argue that the slave trade increased the size and number of military conflicts and raids in certain areas, consequently affecting the colonial government's view on which ethnic groups would provide the most desirable soldiers.

3.1 The Slave Trade and Military Conflicts

First of all, I argue that the past history of the slave trade influenced pre-colonial military conflicts. Previous studies suggested how the slave trade can raise the number of pre-colonial military conflicts, at least in two ways. First, the slave trade increased the supply of weaponry, facilitating the indigenous ruler's military conquests. In exchange for slaves, African merchants and rulers imported weaponry, including horses, firearms, and chainmail (Lovejoy 2012, p.107). The weapons imported to Africa strengthened indigenous rulers and raised the efficiency of using their military power, which increased the number and intensity of conflicts.[3]

For instance, the trans-Atlantic slave trade played a key role in a 'gun revolution,' providing large amounts of firearms to coastal African kingdoms and increasing the number and size of military conflicts (Stapleton 2013). Before the slave trade and import of firearms, the local kingdoms had often operated a small number of professional warriors trained in sword-to-sword combats. The new technology led to a change in military organization, and indigenous states, especially Akans, employed units of hundreds of musketeers (Stapleton 2013, p.92). The kingdoms which first adopted the technology could build an army with

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[3]Curtin called this pattern as a "political model" of enslavement (Curtin et al. 1975).

some semi-professional musketeers and a large number of conscripts. For example, Denkyira, the first state importing European firearms in the mid-seventeenth century among the Akan kingdoms, was able to conquer its neighboring states and expand the territory (McCaskie 2007). Mccaskie reports that "it was only in the last 15 or 16 years that Denkyira, until then a small, thinly populated place, had so improved in power through warfare" (McCaskie 2007, p.11). Other states, including Akwamu and Akyem, followed a similar path and conquered smaller neighbors (McCaskie 2007, p.20).

Also, the slave trade increased the demand for military conflicts and raids. By exporting slaves to European merchants, indigenous elites could earn revenue and pay a debt. Warfare and raids offered an opportunity to produce slaves by capturing enemy soldiers and civilians. In some cases, European merchants were directly involved in enslavement by colluding with some African elites on seizing people for sale, which resulted in more military conflicts to capture war prisoners. Thornton illustrates several instances where European factors incited conflicts either through pressuring or lobbying local rulers, including the Moors and the King of Kajoor's attack on Waalo (Thornton 1999, p.129).[4] Furthermore, since the slave trade was lucrative for indigenous rulers, the control of coastal trade routes became another source of military conflicts in the region (Stapleton 2013, p.85). Warfare and raids by smaller raiders and bandits were also widespread (Thornton 1999, p.130).[5]

3.2 The Image of Martial Races and Colonial Military Formation

The slave trade created ethnic and regional variations in the size and number of military conflicts by increasing both the demand and supply for warfare. I further argue that the

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[4]As opposed to the political model, Curtin called it a "economic model" of enslavement (Curtin et al. 1975).

[5]Nunn and Wantchekon (2011) points out this smaller scale of violence, including raids and abduction, was the origin of mistrust in African society today.

slave trade, by generating the variation in ethnic groups' history of conflicts, influenced the colonial military recruiting from 'martial races,' which had been a dominant recruitment strategy in the British and French colonies (Streets 2017). Colonial governments took ethnic groups' previous involvement in conflicts as an empirical ground for whether certain groups were likely to possess martial traits, which consequently influenced the ethnic make-up of the colonial military.

The ideology of martial races was the belief that "some groups of men are biologically or culturally predisposed to the arts of war" (Streets 2017, p.1). The concept was initially developed in Britain, citing the bravery and loyalty of Scottish Highlanders in the Seven Years' War and of the Sikhs and Gurkhas in the Sepoy Rebellion (Streets 2017, p.8). Their military successes led the British to search for martial races in other colonies and to advocate preferential recruitment from certain ethnic groups. Similarly, in France, General Charles Mangin, who laid out the French military recruitment policy in Africa, looked for 'les qualités guerrières' or soldiers' capabilities in combat, such as endurance, intelligence, and courage on the battlefield (Mangin 1911, p.83).

As in the Sikhs and Gurkhas cases, the prior history of military conflicts directly influenced the colonial government's understanding of which ethnic groups would likely possess martial traits (Streets 2017, pp. 52-86). For instance, Mangin rated the Zarma people highly in terms of their potential for future recruitment by citing their "remarkable bravery" in the battles near Lake Chad (Mangin 1911, p.87-88). Similarly, in his book, *La Force Noire*, Mangin argues that the history of past conflicts should be a great indicator of martial traits.[6]

Importantly, some anecdotal evidence suggests that involvement in conflicts itself was the

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[6]He states that "the permanent struggles have imprinted on the black race since the most distant ages, a warlike character will necessarily preserve for long centuries" (Mangin 1910, p.228).

main predictor of ethnic groups being identified as martial races, regardless of whether they initiated military conflicts and achieved victory in war. For instance, the Baribas people were acclaimed for their history of offensive warfare, and Mangin noted that those groups would provide resistant and disciplined soldiers. However, Mangin also appraised the long-standing resistance of the Voltaic people even though they eventually lost in war, given that they had successfully defended against foreign invasions for a long time (Mangin 1911, p.86).

Selective recruitment from martial races indicates that colonial powers faced a principal-agent problem in civil-military relations, widely discussed in the recent literature of guardianship dilemma (Feaver 1996, 2009; McMahon and Slantchev 2015; Paine 2022).[7] In the colonial context, colonial governments want their military to be strong enough to protect against external security threats from indigenous kingdoms and other colonial powers. However, strengthening the native military, at the same time, increases the internal risk of rebellions and independence movements. In Burma, for instance, the British government excluded the major ethnic group — the Burmese — from the *Burma Rifles* and recruited instead from other smaller ethnic groups.[8] Callahan notes that "this policy came out of British concerns arming and training Burmans who might someday be swept up in the growing anti-colonial nationalist movement" (Callahan 2005, p.35).

Recruiting from 'martial races' addressed both external and internal security problems. On the one hand, martial races theory would strengthen the military by recruiting from certain ethnic groups renowned for providing a good soldier. On the other hand, selective recruitment from martial races provided a solution to the problem of loyalty, as it implants

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[7]Feaver succinctly summarizes this dilemma that "we create an institution of violence to protect us, but then we fear the very institution we created for protection" (Feaver 1996, p.150).

[8]Furnivall describes that it would be imprudent for the British to recruit the Burmese. He notes that "there could be little reliance on troops raised from among a people with no divisions of caste but united in religion, race and national sentiment with the king and their kinsfolk just across the border, still waiting an opportunity to wipe out defeat in another trial of strength" (Furnivall 1948, p.178).

the idea that the selected groups are naturally distinct from other indigenous populations. Granting the status of martial groups encouraged the selected groups to collaborate with the colonial government and reduced the emotional burden of fighting against their own people (Parsons 1999, p.55). By recruiting soldiers from the martial tribes and elevating the tribes' status, colonial governments could reduce the risk of revolts associated with arming mainstream population.[9] In fact, loyalty was a key component in the concept of martial races from the start; the Gurkhas and Sikhs were praised for their allegiance to the British in the Sepoy Rebellion (MacMunn 1979; Streets 2017).

In sum, the slave trade generated regional variation in military conflicts, which contributed to how colonial governments understood native populations. The government favored recruiting from martial races since it helped address the principal-agent problem in the colonial government–indigenous military relations. As a consequence, it resulted in colonial military comprising more ethnic groups who had been exposed to the slave trade before.

Hypothesis 1: The colonial military recruited more soldiers from the ethnic groups exposed to the slave trade.

4 Empirical strategy and results

4.1 Data

4.1.1 Outcome variable

To investigate the hypothesis, I use the historical ethnic group-level data in Africa, generated by Murdock (1959) and further digitized by Nunn (2008). The outcome variable is

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[9]Creating the internal division in indigenous population was similar to the idea of promoting the inter-ethnic conflicts inside colonies, so-called 'divide and rule' (Furnivall 1948; Cunningham 2011).

the ratio of soldiers each ethnic group provided to the colonial military to the group's total population. I use the recruitment records in the Tirailleurs Sénégalais from Echenberg (1991), which provides the district-level (cercle) recruitment quota in FWA.[10]

Using Echenberg's data, I generated an ethnicity-level recruitment measure with the following procedures. First, I calculated the size of ethnic groups in each administrative district by mapping the historical space of each ethnic group lived (Murdock 1959) onto the district-level map of FWA in 1925 (Huillery 2009).[11] Then, the district-level recruitment quota and the number of the population are weighted by each ethnic group's size in a district and summed at the ethnic group level. Formally, the recruitment quota of each ethnic group i is generated by the following:

$$Recruitment_i = \sum_{j=1}^{n} \alpha_{ij} X_j / \sum_{j=1}^{n} \alpha_{ij} Y_j$$

where n is the number of districts lived by ethnic group i; α_{ij} refers to each ethnic group i's size in the district j; X_j and Y_j refer to the recruitment quota and the number of population in the district j.[12] This measure captures how disproportionately the colonial government relied on certain ethnic groups holding the size of the recruitment pool.[13]

The upper panels in Figure 1 show that the weighted measure reasonably captures the original variation of the recruitment quota in FWA. Figure 1a shows the variation in the recruitment quota, which is normalized by the number of population at the cercle level, and

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[10]In the original data, Echenberg constructs recruitment quota by normalizing that the sum of the quota equals 10,000 in FWA. I weighted the measure so that its sum equals 50,000, reflecting the average size of the Tirailleurs Sénégalais in the 1920s. Doing so captures the exact size of soldiers serving in the colonial military, which helps interpret the substantive effects.

[11]Huillery (2009) digitized the administrative boundary of FWA in 1925, except Dahomey, which is Benin today.

[12]α_{ij} is normalized by the ratio to the total size of the district j.

[13]Alternatively, I report the result using the share of total recruits coming from an ethnicity i as an alternative measure of military recruitment in Appendix A3.

Figure 1b shows the same attribute at the ethnicity level. Both figures display that the colonial governments heavily recruited soldiers from the regions near the western coast, including Dakar and Casamance. Yet, the figures also show that the colonial governments recruited lots of soldiers from the hinterland as well, notably in the Bambara and Tombouctou regions in modern-day Mali. The number of observations slightly increases in the ethnicity level data, from 101 to 123.

Figure 1: Overview: Colonial Military Recruitment and the Trans-Atlantic Slave Trade in FWA
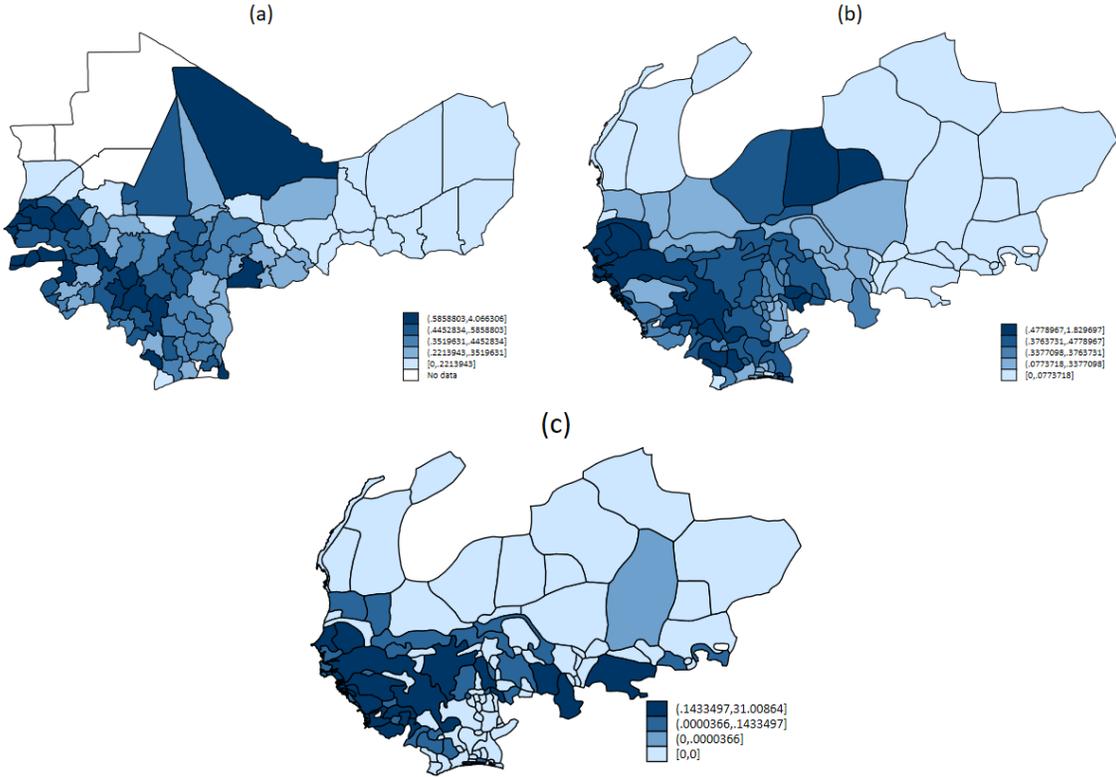
Note: Figure 1a and 1b show the variation in the recruitment quota normalized by the number of population at the cercle and ethnic group level each. The polygons in a darker color represent the regions that provided more soldiers relative to the population. The attributes are divided into five classes. Figure 1c shows the number of slaves exported through the trans-Atlantic trade, normalized by land area.

4.1.2 Explanatory variable

The explanatory variable is the number of slaves taken from each ethnic group in the trans-Atlantic slave trade normalized by land area (Nunn 2008; Nunn and Wantchekon 2011). The data captures the ethnic and regional variation of the exposure to the slave trade.[14] I only use the data of the trans-Atlantic slave trade, given that the number of slaves taken through the Indian Ocean route is zero in the area of FWA. The latest slave trade is recorded in 1897, which assures that the exposure to the slave trade preceded colonial military recruitment with a gap of about 20 or more years. Figure 1c displays the overall pattern of the slave trade in FWA. Slaves were mostly taken from the areas close to the southwestern coast, which manifests that the transaction costs for exporting slaves were lower in the coastal regions than in the hinterland.

4.2 Identification strategy and findings

4.2.1 Controlling for observables

The slave trade is likely to be assigned to ethnic groups in a non-random manner. For instance, Fenske (2014) and Fenske and Kala (2015) show that climate is an important factor; Africans reduced the slave exports during the cold years. Military conflicts and underdevelopment could also be endogenous to the slave exports (Whatley 2018). To reduce the chance that any findings on the relationship are spurious, I use two strategies. The first is to control for observable confounders. Following the former studies, I control for the geographic factors affecting the enslaving and shipping costs (Nunn 2008; Nunn and Wantchekon 2011; Whatley and Gillezeau 2011). These geographical factors include elevation, longitude, lat-

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[14]The data does not differentiate whether certain ethnic groups or areas exported slaves more than others because they were militarily strong and actively enslaved people in the area or because they were more targeted by neighbors and other raiders. However, the French government applies the theory of martial races to the conflict involvement itself rather than to military victories or offensive warfare. Therefore, a more relevant measure for the theory is the degree of exposure to the slave trade itself.

itude, precipitation, sea contiguity, presence of an important river, and distance from the coast.[15] I also control for cities and ports of Dakar, Saint Louis, Bais du Levrier, Conakry, Bafoulabe, and Gao. Also, for the subset of units with available data, I control for additional pre-colonial factors, including jurisdictional hierarchy, water availability, ecological and agriculture suitability (Michalopoulos and Papaioannou 2013). The inclusion of pre-colonial jurisdictional hierarchy addresses a potential concern that the slave export might have been easier in the areas where states are underdeveloped. Lastly, in some specifications, I account for the geographical clustering by using a spatial lag both for colonial military recruitment and the slave trade. The discussion above leads me to construct the following cross-sectional linear regression analysis:

$$ln(Recruitment_i) = \alpha + \beta ln(Slave\_trade_i) + \gamma X_i + \epsilon$$

where i refer to the unit of an ethnic group. *Recruitment* is the ethnicity-level recruitment quota normalized by the total population of each ethnic group. *Slave_trade* is the main explanatory variable of interest, which accounts for the number of slaves exported from each ethnic group normalized by its land area. X is the covariates varying in ethnic groups, and ϵ denotes the error term. Throughout the specifications, I use the ordinary least square (OLS) model and the generalized spatial two-stage least squares (GS2SLS) to account for spatial clustering in colonial military recruitment and the slave trade.

Table 1 provides evidence for the relationship between the slave trade and the colonial military recruitment pattern in FWA. Model 1-3 use the OLS, whereas Model 4-6 account for spatial spillovers in the recruitment and slave exports. Model 1 and 4 report the association between the slave trade and military recruitment without controls. Model 2 and 5 control for

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[15]I use the mean value of district-level data provided by Huillery (2009).

Table 1: Regression Analysis of Military Recruitment in FWA

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ln(Slaves per land area)	0.121***	0.104***	0.0995***	0.118***	0.105***	0.101***
	(0.0299)	(0.0247)	(0.0251)	(0.0294)	(0.0235)	(0.0237)
Local resistance			0.00102			0.00135
			(0.00135)			(0.00145)
Year of colonial conquest			-0.00574**			-0.00590**
			(0.00283)			(0.00266)
European trade counter			-0.0105			-0.0162
			(0.0517)			(0.0494)
Trade taxes per capita			0.212***			0.215***
			(0.0702)			(0.0682)
Geography	No	Yes	Yes	No	Yes	Yes
Cities and Ports	No	Yes	Yes	No	Yes	Yes
Spatial Weights	No	No	No	Yes	Yes	Yes
Observations	123	123	123	123	123	123

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Generalized spatial two-stage least squares (GS2SLS) are used for the spatial specifications. The models assumed the spatial spillovers both for the recruitment and the slave trade (Spatial Durbin Model). The contiguity weighting matrix is used.

the geographical factors, including latitude, longitude, altitude, precipitation, sea contiguity, presence of an important river, distance from the coast, and the location of ports and cities of FWA.[16] Model 3 and 6 further include some factors that may influence the colonial recruitment pattern, although they might have also influenced by the slave trade. Throughout the specifications, the coefficients for the slave trade are positive and statistically significant at the 99% level.

In Table 2, I further control for potential confounders that may have affected the slave trade. In addition to the geographic factors in Table 1, I include more geographic factors, which are only available for 75 ethnic groups in the FWA area. In particular, the models control for the level of the pre-colonial jurisdictional hierarchy, addressing the possibility that ethnic groups who attained strong political and military power in the pre-colonial period were

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[16]The ports and cities include Dakar, Saint Louis, Bais du Levrier, Conakry, Bafoulabe, and Gao.

Table 2: Regression Analysis of Military Recruitment in FWA

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ln(Slaves per land area)	0.0847**	0.0792**	0.0660**	0.0863***	0.0829***	0.0707***
	(0.0331)	(0.0339)	(0.0300)	(0.0302)	(0.0305)	(0.0271)
Jurisdictional hierarchy	-0.0626**	-0.0679***	-0.0349	-0.0285	-0.0287	-0.0251
	(0.0246)	(0.0255)	(0.0231)	(0.0269)	(0.0274)	(0.0213)
Geography	No	No	Yes	No	No	Yes
Cities and Ports	No	Yes	Yes	No	Yes	Yes
Spatial Weights	No	No	No	Yes	Yes	Yes
Observations	75	75	75	75	75	75

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Additional geographic factors include water area of a group in 1000's of km, ecological suitability index (malaria), land suitability for agriculture.

able to resist both enslavement and the colonial military (Westwood 2016, p.1).[17] Similar to the results in Table 1, Model 1-3 report the OLS regression outputs, and Model 4-6 account for the spatial clustering. The results remain robust to these specifications, which provides supportive evidence to *Hypothesis 1* that the slave trade affected which ethnic groups were more likely to serve in the colonial military.

The estimated effects on colonial military recruitment are quite substantial. Based on Model 2 in Table 1, the finding suggests that a 10% increase in *ln(slaves per land area)* is associated with a 3% increase in the *ln(soldiers per population)*. To illustrate, for an ethnic group of 100,000 populations that initially contributed the mean level of soldiers (about 1,200) to FWA, one standard deviation increase in the slave export variable raises the number of soldiers to about 2,000, which is a 66% increase in the number of soldiers.

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[17]Michalopoulos and Papaioannou (2013) shows that the pre-colonial jurisdictional hierarchy is strongly associated with the level of economic development in Africa today.

4.2.2 IV estimates

To further address potential endogeneity between the slave trade and colonial military recruitment, I use an instrumental variable. In particular, the strategy aims to deal with another possible route of the gun-slave cycle; slaves could have been taken from conflict-prone areas, and ethnic groups residing in such regions naturally earned a martial reputation without exposure to the slave trade. If the assumptions are satisfied, an instrumental variable retrieves an unbiased estimate of the slave trade's effect, even if the circular relationship exists between military conflicts and the slave trade. The previous studies examining the impact of the slave trade commonly used the distances from the locations where ethnic groups resided to the sites where slaves were demanded as an instrument (Nunn 2008).[18] Following the estimation strategy by Nunn (2008), I use the distance from the living area of each ethnic group to the closest demand location for the ethnic groups on the western coast of Africa, which is Salvador, Brazil.

Table 3 reports the results from instrumental variable analyses. I use the natural log of the distance from Salvador, Brazil, to each ethnic group's living area as an instrument. Following the suggestions from Betz, Cook and Hollenbach (2018, 2020), I use the Spatial-2SLS (S-2SLS) to account for spatial dependence in the dependent variable. The first stage regression shows that the relationship between the instrument and the slave trade is negative, indicating that the number of slaves exported is lower as the distance from the location of demand is farther. The second stage results show that the effect of the slave trade remains positive and statistically significant at the 99% level, even after controlling for geographic factors. Under the assumption that the location of slave demand affects the colonial military recruitment exclusively through the number of slaves exported, the analysis provides further evidence for *Hypothesis 1.*

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[18]The location of slave demand includes Virginia, USA; Havana, Cuba; Haiti; Kingston, Jamaica; Dominica; Martinique; Guyana; Salvador, Brazil; and Rio de Janeiro, Brazil (Nunn 2008, p.160).

Table 3: Instrumental Variable Regression Analysis

	Model 1	Model 2	Model 3	Model 4
ln(Slaves per land area)	0.328***	0.333***	0.155***	0.173***
	(0.0697)	(0.0710)	(0.0534)	(0.0538)
Geography	No	No	Yes	Yes
Cities and Ports	No	Yes	No	Yes
Spatial Weights	Yes	Yes	Yes	Yes
Observations	123	123	123	123
First stage: DV is ln(Slaves per land area)				
ln(Distance from Salvador)	-1.178***	-1.140***	-5.296**	-5.123**
	(0.288)	(0.290)	(2.156)	(2.173)
IV F-stat	16.66	15.49	6.031	5.558

Standard errors in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.2.3 Martial Races

The theory suggests that the French military's recruitment from martial races is the reason why the ethnic groups exposed to the slave trade provided more soldiers to the military than the others. The previous analyses provide evidence consistent with a key observable implication of the theory that exposure to the slave trade is associated with a greater likelihood of colonial military recruitment. However, based on the preceding tests, we cannot determine whether the slave trade influenced colonial military recruitment by shaping the colonial government's understanding of martial races. I address the issue in two ways. First, I examine whether the groups viewed as 'martial races' received a higher recruitment quota than the other groups. Second, I test the martial races theory against an alternative mechanism that can account for the effects of the slave trade on military recruitment in the earlier findings.

Figure 2: Martial Races and Colonial Military Recruitment
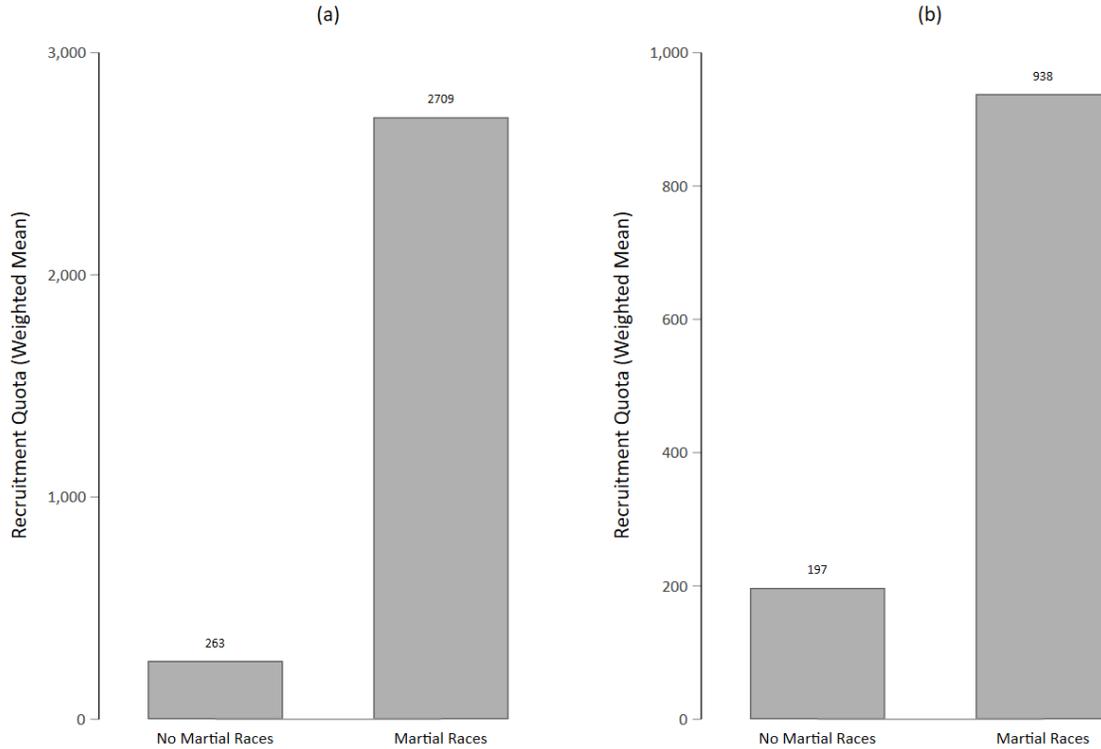
Figure 2 shows that, in general, the French colonial government set higher recruitment quotas for 'martial races' than the other groups. The figure should be read with caution since ethnic grouping is subjective, and it is not a rigid or natural division. To address the sensitivity, I use two measures of martial races. The left panel uses a conservative measure that assigns eight martial races stated in the official document to eight 'ethnic' groups in the dataset.[19] The right panel uses a lenient measure that assigns martial races to thirty-four associated/related groups characterized by a "close genetic relationship" with the eight groups in Murdock (1967, p.4). Figure 2 empirically supports the martial races theory that the colonial governments favored recruiting from certain groups that they viewed as possessing martial traits, regardless of how I count them. In Appendix A2, I also report that this

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[19]Bambaras, Toncouleurs, Wolofs, Srurrakolés (Soninke), Songhaïs, Mossis, Foulahs (Peullis), and Malinkés (*Comite' D'Assistance aux Troupes Noires* 1917, p.24). Other documents similarly cite these groups (Mangin 1910, 1911). For the discussion of which groups were considered as martial races, see Lunn (1999).

recruitment pattern is robust to controlling for potential confounders, including geography.

Lastly, I examine an alternative to the martial races hypothesis, which can explain the positive association between the slave trade and higher recruitment quotas for martial races. One plausible pathway is the spillover of early recruitment practices, which coincided with the days of the slave trades, to later recruitment in the 20th century. Because the slave trade was still active in the early years of the *Tirailleurs Sénégalais*, the previous findings can be explained if the early military recruitment was directly related to the slave trade and spillovers into the later recruitment.[20] One could point out the earlier practices of the French colonial military, the *rachet*, purchasing slaves directly on the market (Echenberg 1991, p.8).[21] This mechanism suggests that the *rachet* shaped the ethnic composition of the early French colonial military, and the previous findings merely capture the persistence of the early composition.

To evaluate the weights of these competing mechanisms, I differentiated the slave exports in the 16th-19th centuries, respectively. I use the number of slaves taken from each ethnic group in the 1500s, the 1600s, the 1700s, and the 1800s, normalized by land area. The *rachet* mechanism focuses on the supply of slaves on the market at the time of military recruitment. Hence, it implies that the effects of the slave trade in the 1800s should be positive and significant because it was the time that the slave trade was active and could directly influence the ethnic composition of *Tirailleurs Sénégalais*. On the contrary, the martial races argument suggests that previous trades should also influence military recruitment because of their

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[20]Scholars point out that initial racial understanding tends to persist (Caplan 1995; Rand and Wagner 2012).

[21]In the Appendix, Table A3 shows some early slaves purchases in the *Tirailleurs Sénégalais*. Direct purchase of slaves on the open market slowly ceased due to the political atmosphere following the 1848 Revolution in France and the need for more professionalized soldiers in the era of Scramble for Africa. However, the end of slavery did not abruptly shift the recruitment practices. Instead, the *Tirailleurs Sénégalais* paid an enlistment bonus to a slave's master and indirectly recruited slaves to the military, at least until the early 1900s (Echenberg 1991, pp. 9-13).

Table 4: Regression Analysis of Military Recruitment in FWA

	Model 1	Model 2	Model 3	Model 4	Model 5
ln(Slaves in 1500s per land area)	-0.0832	-0.0829	-0.0620	-0.0922	-0.0366
	(0.184)	(0.184)	(0.141)	(0.184)	(0.136)
ln(Slaves in 1600s per land area)	0.241**	0.241**	0.210***	0.266***	0.207***
	(0.0965)	(0.0969)	(0.0696)	(0.0903)	(0.0645)
ln(Slaves in 1700s per land area)	0.0940*	0.0987*	0.0819**	0.0752	0.0970**
	(0.0523)	(0.0545)	(0.0407)	(0.0490)	(0.0384)
ln(Slaves in 1800s per land area)	0.0310	0.0305	0.0190	0.0325	0.00549
	(0.0685)	(0.0688)	(0.0503)	(0.0664)	(0.0482)
Geography	No	No	Yes	No	Yes
Cities and Ports	No	Yes	Yes	No	Yes
Spatial Weights	No	No	No	Yes	Yes
Observations	123	123	123	123	123

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

roles in generating military conflicts, which formed the colonial government's understanding of martial groups.

The models in Table 4 provide supportive evidence for the martial races argument. The results show that the slave trade in the 1600s and 1700s significantly influenced colonial military recruitment. On the contrary, the result is inconsistent with the *rachet* mechanism since the export during the 1800s did not significantly increase an ethnic group's likelihood of being recruited into the colonial military. Instead, it shows that the slave trade in the past centuries explains colonial military recruitment, supporting the martial races argument.

To test the robustness of overall findings, I conduct sensitivity analyses in Appendix A3. First, I use alternative measures of outcome and explanatory variables. In Table A3-1, I show that the finding is robust to using the raw number of soldiers from each ethnic group without normalization. Similarly, I found the result remains similar in Table A3-2 with an alternative measure of the slave trade, *ln(Slave export)*, the natural log of the number of slaves

exported from each ethnic group, which does not account for groups' land area. In Table A3-3, I report the result with both variables, and the finding remains robust to the changes. Table A3-4 replicates Model 4, 5, and 6 in Table 1 with different spatial specifications. The finding is robust to alternatively controlling for spatial spillovers. Lastly, Table A3-5 reports the district-level analyses using the original recruitment measure without transformation, and the finding remains similar. In sum, the results from the sensitivity analyses support the main finding that the colonial military recruited more soldiers from the ethnic groups exposed to the slave trade.

5 Discussions and Conclusion

In this paper, I examined how the military was formed under colonialism. I argued that based on the racial stereotype, the colonial governments sought soldiers who would create an efficient and loyal army. I further argued that the trans-Atlantic slave trade influenced the martial image of ethnic groups by creating regional variation in armed conflicts. As a result, the colonial government recruited soldiers from the ethnic groups who experienced the slave trade in the pre-colonial periods. The statistical analyses with various specifications, including spatial lags and IV estimates, provide evidence consistent with the theory. Furthermore, I suggest that the positive association between the slave trade and colonial military recruitment comes from the government's preference for recruiting from certain ethnic groups rather than directly purchasing slaves.

This study contributes to our understanding of state-building and military formation by exploring how the coercive force of state emerges under colonialism. While scholars acknowledged the importance of the issue, military formation under colonial rule was understudied so far. This study shows that military formation under colonialism also experienced a similar

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problem common in most civil-military relations nowadays. Colonial governments wanted to ensure the 'protection *by* and *from* the military' (Feaver 1996, p.154). In the colonial context, one such solution was preferential recruitment from martial races. While there is little controversy about whether colonial governments favored recruiting from certain ethnic groups viewed as martial races, it does not imply that the strategy helped attain the goal of building a strong and loyal military. Rather, the concept was inherently self-contradictory. Sometimes, martial races referred to "the most advanced" people who experienced civilization (*Comite' D'Assistance aux Troupes Noires* 1917, p.21), but were also praised for "warrior instincts that remain extremely powerful in primitive races" (Lunn 1999, p.521). In reality, the idea of martial races was a complex social construction made up of the day-to-day experiences of military officials, the ideology of racism, and the strategic calculation of relatively 'safe' groups that would not revolt against them. Then, it permeated to a general belief that some ethnic groups would constitute an efficient and loyal army, which the colonial government wanted the most.

This paper also sheds light on the political effects of the slave trade. Earlier studies have shown that the slave trade affected economic development by increasing ethnic stratification and mistrust (Nunn and Wantchekon 2011; Whatley and Gillezeau 2011). This study highlights that the slave trade had directly influenced the political realm by determining the ethnic composition of the military. Furthermore, colonial military recruitment had a lingering influence on the politics of a new independent state. Since the military was an instrumental player in post-independence politics, the mode of ethnic composition in the military heavily affected the likelihood of coups in new states (Ejiogu 2007). From this perspective, this paper provides evidence that modern political problems associated with new states' military can be further traced back to the era of the slave trade.

6   Appendix

A1. Descriptive statistics

	Mean	S.D.
ln(Quota/pop.)	.2864222	.1786997
ln(Slaves per land area)	.193523	.5099843
Jurisdictional hierarchy	1.2	.8219949
Latitude	11.73232	3.639147
Longitude	-4.646845	7.414537
Altitude	862.1132	477.1052
Precipitations	1109.303	760.4213
Coastal border	.3252033	.4703667
Important river	.8373984	.370511
Distance from the coast	539.0553	396.689
Local resistance	23.849	13.41991
Year of colonial conquest	1882.961	12.32195
European trade counter	.1219512	.3285678
Trade taxes per capita	.2071254	.3312139
Water area	1.092589	2.624316
Soil suitability	.3082828	.222231
Ecological suitability (Malaria)	.7957256	.3257794
Cities and Ports	.0406504	.1982867
ln(Distance from Salvador)	3.727158	.1506703
Observations	123	

A2. Testing Martial Races Theory

In this section, I further test whether the groups viewed as martial races provided more soldiers to the colonial military. Table A2 provides supportive evidence to the martial races

Table A2: Regression Analysis of Military Recruitment in FWA

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Martial races (conservative)	2446.9***	2335.8***	2103.1***			
	(230.8)	(236.7)	(240.4)			
Martial races (lenient)				740.8***	717.0***	536.6***
				(151.8)	(155.1)	(181.7)
Local resistance			-16.98**			-17.81*
			(6.721)			(9.641)
Year of colonial conquest			-6.187			-20.46
			(13.54)			(16.86)
European trade counter			447.1*			710.4**
			(232.6)			(289.1)
Trade taxes per capita			-120.0			-283.3
			(330.8)			(417.6)
Geography	No	Yes	Yes	No	Yes	Yes
Cities and Ports	No	Yes	Yes	No	Yes	Yes
Observations	123	123	123	123	123	123

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

theory that the colonial governments favored recruiting from the groups they viewed as having martial traits. Model 1 and 4 examine the relationship without controls; Model 2 and 5 include geographic factors; Model 3 and 6 further control for post-treatment variables. The first three models use a conservative measure of martial races, treating only eight groups as martial races. Model 4, 5, and 6 use a lenient measure. Regardless of specifications and measure choice, I find that the groups sorted as martial races received a higher recruitment quota from the colonial government.

A3. Alternative measures

Table A3-1 replicates Table 1 in the manuscript with an alternative measure of military recruitment (outcome variable), the number of soldiers from each ethnic group in FWA. I find the main finding robust when the outcome variable is measured alternatively.

Table A3-1: Regression Analysis of Military Recruitment in FWA

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ln(Slaves per land area)	371.8**	440.7***	360.0**	385.1***	436.4***	392.3***
	(142.2)	(150.9)	(153.9)	(115.5)	(121.5)	(128.7)
Local resistance			-31.39***			-5.406
			(8.261)			(8.182)
Year of colonial conquest			-14.36			4.954
			(17.33)			(15.32)
European trade counter			489.2			272.0
			(316.4)			(268.6)
Trade taxes per capita			-250.7			396.3
			(429.6)			(374.3)
Geography	No	Yes	Yes	No	Yes	Yes
Cities and Ports	No	Yes	Yes	No	Yes	Yes
Spatial Weights	No	No	No	Yes	Yes	Yes
Observations	123	123	123	123	123	123

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3-2 replicates Table 1 in the manuscript with an alternative measure of the slave trade (explanatory variable), the natural log of the number of slaves exported from each ethnic group. The finding indicates that the main finding remains robust even if the explanatory variable is alternatively measured.

Lastly, Table A3-3 uses the raw measures for both the explanatory and outcome variables. I find that the main finding remains robust with the changes in both the outcome and explanatory variables.

Table A3-4 replicates Model 4, 5, and 6 in Table 1 by specifying different spatial matrices. I used the row-standardized contiguity weighting matrix for Model 1, 2, and 3. Model 4, 5, and 6 are specified with the inverse-distance weighting matrix. The main finding is robust to using different spatial specifications.

Table A3-5 uses districts (cercles) as the unit of analysis, instead of ethnic groups. This

Table A3-2: Regression Analysis of Military Recruitment in FWA

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ln(Slave export)	0.0146***	0.00979***	0.00916***	0.0120***	0.0113***	0.00985***
	(0.00378)	(0.00334)	(0.00332)	(0.00400)	(0.00328)	(0.00317)
Local resistance			0.00161			0.00147
			(0.00144)			(0.00151)
Year of colonial conquest			-0.00652**			-0.00645**
			(0.00291)			(0.00272)
European trade counter			0.0277			0.0259
			(0.0514)			(0.0491)
Trade taxes per capita			0.192***			0.183***
			(0.0724)			(0.0699)
Geography	No	Yes	Yes	No	Yes	Yes
Cities and Ports	No	Yes	Yes	No	Yes	Yes
Spatial Weights	No	No	No	Yes	Yes	Yes
Observations	123	123	123	123	123	123

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3-3: Regression Analysis of Military Recruitment in FWA

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ln(Slave export)	88.40***	106.2***	88.97***	69.30***	82.22***	78.40***
	(16.55)	(17.83)	(18.25)	(14.54)	(15.22)	(15.39)
Local resistance			-22.58***			-0.320
			(7.941)			(7.551)
Year of colonial conquest			-10.95			2.472
			(16.01)			(14.05)
European trade counter			383.8			220.9
			(282.9)			(238.7)
Trade taxes per capita			-50.71			494.5
			(398.0)			(343.3)
Geography	No	Yes	Yes	No	Yes	Yes
Cities and Ports	No	Yes	Yes	No	Yes	Yes
Spatial Weights	No	No	No	Yes	Yes	Yes
Observations	123	123	123	123	123	123

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3-4: Regression Analysis of Military Recruitment in FWA

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ln(Slaves per land area)	0.113***	0.0914***	0.100***	0.0602**	0.0907***	0.102***
	(0.0316)	(0.0248)	(0.0237)	(0.0276)	(0.0220)	(0.0214)
Local resistance			0.00159			0.00285**
			(0.00140)			(0.00121)
Year of colonial conquest			-0.00586**			-0.00379
			(0.00270)			(0.00254)
European trade counter			-0.0358			-0.0825*
			(0.0514)			(0.0467)
Trade taxes per capita			0.244***			0.274***
			(0.0688)			(0.0608)
Geography	No	Yes	Yes	No	Yes	Yes
Cities and Ports	No	Yes	Yes	No	Yes	Yes
Spatial Weights	Yes	Yes	Yes	Yes	Yes	Yes
Observations	123	123	123	123	123	123

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

reduces the risk that the main finding results from constructing the ethnicity-level measure out of the district-level outcome variable. It does not perfectly address the unit mismatch between the recruitment and slave trade data, because I need to transform the slave trade data, which is originally measured at the level of an ethnic group.[22] Nonetheless, this additional analysis can show whether the finding remains similar if I address the mismatch differently.

A4. Supplementary tables

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[22] $Slave\_export_i = \sum_{j=1}^{n} \alpha_{ij} X_j$, where n is the number of ethnic groups in a circle i; α_{ij} refers to each ethnic group j's size in the district i; X_j refers to the number of slaves exported from each ethnic group j.

Table A3-5: Regression Analysis of Military Recruitment in FWA

	Model 1	Model 2	Model 3
ln(slave export+1)	0.147***	0.119***	0.104**
	(0.0355)	(0.0400)	(0.0430)
Local resistance			-0.00811
			(0.0130)
Year of colonial conquest			-0.0102
			(0.0244)
European trade counter			0.493
			(0.944)
Trade taxes per capita			-0.535
			(0.450)
Geography	No	Yes	Yes
Cities and Ports	No	Yes	Yes
Observations	96	96	96

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4: Origins and Prices of Slaves Purchased for the *Tirailleurs Sénégalais*

Date	Region	Price	Details
1820	Gorée	400 francs	30 garrison soldiers for duty at Gorée
1820	Galam	150 Fr	
1828	Bissagos	350 Fr	
1831	Bakel	325 Fr	Bought by Galam Company
1833	Bakel	335 Fr or less	Galam Company less and turned profit
1839	Bissao and Cacheo	300 Fr	Bought by le Sieur Marbeau
1853	Casamance	200 Fr	

Sources: Echenberg (1991, p.9).

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