Witchcraft Beliefs as a Cultural Legacy of the Atlantic Slave Trade: Evidence from Two Continents*

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Abstract

This paper formally examines the hypothesis that the historic slave trade contributed to the propagation of persistent witchcraft beliefs on both sides of the Atlantic. As documented in archival records and case studies, the Atlantic slave trade, a source of hardship for millions of people in Sub-Saharan Africa, was commonly perceived by the locals as a form of witchcraft, and its perpetrators were viewed as witches and cannibals. Furthermore, in response to the rising demand for slaves, witch trials became a common vehicle of supplying captives by condemning the accused individuals and their families to slavery. Consistent with these narratives, we find that representatives of ethnic groups which were more heavily exposed to the Atlantic slave trade in the past are more likely to believe in witchcraft today, thus establishing a link between historical trauma and contemporary culture. Exploring the role of the slave trade in cultural transmission across continents, we further show that Afro-descendants in Latin America are substantially more likely to believe in witchcraft relative to other racial groups. Moreover, accounting for race and other relevant factors, people residing in regions historically more reliant on African slave labor are also more likely to be witchcraft believers.

Keywords: Culture, Persistence, Slave trade, Superstition, Witchcraft

JEL Classification Numbers: O10, Z10, Z12, Z13

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1 Introduction

Beliefs in witchcraft, broadly defined as the ability of certain people to use supernatural techniques to cause harm or acquire wealth at the expense of others, are highly widespread in the modern world. According to recent surveys, conducted in dozens of countries and multiple continents over the past decade, many millions of individuals across the globe claim to believe in witchcraft.[1] Such beliefs are not simply an innocuous relic of the past, but a cultural phenomenon that has been argued to have very real ramifications, from impeding wealth accumulation and restricting economic mobility to eroding social relations and inciting violence (Gershman, 2016; Forsyth, 2016).

Yet, despite the growing evidence on the heavy burden of witchcraft beliefs within communities around the world, particularly in developing countries, our understanding of their origins and factors contributing to their persistence remains quite limited. This paper highlights the deep historical roots of contemporary witchcraft beliefs by showing that the observed variation in their prevalence across Sub-Saharan Africa and Latin America can be traced back to the Atlantic slave trade, the backbone of an extractive economic system that was connecting these two continents for about four centuries.

The idea that the slave trade experience promoted witchcraft beliefs among affected societies in Sub-Saharan Africa is motivated by two striking patterns documented in archival records and elaborated upon in recent work by historians and cultural anthropologists. First, since the slave trade represented a major source of severe hardship for the majority of affected local population, it was readily interpreted as a form of witchcraft and its perpetrators were labeled as witches. That is, a preexisting cultural framework of understanding misfortune was adjusted and applied to explain the new source of evil. Importantly, the nature of the slave trade fit right into the "zero-sum" worldview typical of witchcraft believers: the European witches and cannibals, as well as their local accomplices, were literally enriching themselves at the expense of other people's lives. Second, historical accounts indicate that the rise of the Atlantic slave trade turned local witch trials into a common vehicle for meeting the growing demand for captives, as a result of which people accused of witchcraft were routinely sold into slavery. Naturally, such "confirmation" of the existence of witches through regular trials and related rituals was likely to reinforce local beliefs in witchcraft.

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[1]This rough estimate is based on simple extrapolation of nationally-representative survey data available from the Pew Research Center. These surveys are discussed in greater detail in the following sections.

In order to systematically explore the role of the Atlantic slave trade in strengthening witchcraft beliefs across Sub-Saharan Africa, we set up an empirical framework linking individual-level data on self-reported beliefs in witchcraft, collected by the Pew Forum of Religion and Public Life in 2008–2009, to the ethnicity-level estimates of historical slave exports from Nunn and Wantchekon (2011). Our analysis reveals that representatives of ethnic groups that were more severely raided during the Atlantic slave trade era are more likely to believe in witchcraft today. Consistent with the narrative on the direct impact of the slave trade on the propagation of witchcraft beliefs, this main finding continues to hold after explicitly accounting for possible indirect transmission channels and a myriad of potentially confounding characteristics at the individual, regional, and ethnic-group levels, such as educational attainment, local development, ethnic diversity, precolonial institutions, and interpersonal trust. Interestingly, no significant connection exists between the Atlantic slave trade and a whole array of other magico-religious beliefs, which points to the special place of witchcraft beliefs in this historical context.

Beyond directly accounting for a range of important factors in our empirical analysis, we also pursue an instrumental-variables strategy as an auxiliary way to mitigate the possible endogeneity problem. First, following the literature on the long-term effects of African slave trades, we employ distance to the coast from the historical ethnic homeland as a source of plausibly exogenous variation in the intensity of slave raids. Second, in an attempt to refine this instrument, we exploit the available data on the volume of slaves embarked by location to calculate the distance to the closest major slave port. Both strategies reinforce the main result and show that, if anything, our baseline estimates understate the impact of the Atlantic slave trade on witchcraft beliefs. Overall, the mid-range estimates imply that, other things equal, a one-standard-deviation increase in the slave exports measure is associated with an average increase in the likelihood of believing in witchcraft by roughly 0.13-0.15 standard deviations, a non-trivial magnitude comparable, for example, to that of the reported negative effect of the slave trade on trust (Nunn and Wantchekon, 2011). Importantly, the fact that we are still able to observe a significant relationship between the Atlantic slave trade, officially terminated in the nineteenth century, and *contemporary* witchcraft beliefs shows that a deep historical trauma can have a very persistent effect on people's beliefs.

Having established the instrumental role of the Atlantic slave trade in fostering witchcraft beliefs at the source, in Sub-Saharan Africa, the paper next turns to Latin America, the main destination of African captives. According to numerous historical records and ethnographic studies, witchcraft beliefs were not simply mechanically transported across

the ocean as part of the captives' cultural heritage. Just like at home, they were also actively used by the slaves to explain their unfortunate position in the unknown land and, along with related practices and rituals, became a powerful tool of cultural resistance against the slave owners, the newly identified witches. In a rigorous investigation of this matter, we use survey data collected by the Pew Research Center in 2013–2014 to demonstrate that the current distribution of witchcraft beliefs across individuals and regions in Latin America is indeed partly reflective of the population movements and the associated transatlantic cultural exchange during the slave trade era. Specifically, we show that Afro-descendants in Latin America, most of whom trace their ancestry back to the Africans brought to the continent as slaves, are substantially more likely to believe in witchcraft compared to other racial groups, even after accounting for individual socio-demographic characteristics, regional development, and country fixed effects. Furthermore, conditional on race and other relevant factors, the current residents of regions located in the tropical coastal lowlands, a geographic belt in which African slave labor was most heavily used, are also more likely to believe in witchcraft. These findings highlight the continuity of witchcraft beliefs across space, as well as their persistence over time through generations of Afro-descendants and, more generally, the population of regions historically most exposed to African slavery.

Finally, we exploit another wave of surveys, this time predominantly covering Muslim-majority nations in Asia and the Middle East, to conduct a placebo test of the relationship between the prevalence of witchcraft beliefs and geographic features that mattered in the context of our Atlantic slave trade analysis. We show that in this sample, outside the Atlantic World, the likelihood of believing in witchcraft is completely unrelated to either distance to the coast or elevation, suggesting that the importance of these factors in the African and Latin American cases, respectively, is indeed unique due to their connection to the historic slave trade.

This paper fits into multiple strands of research. First, it directly relates to the growing literature on the origins, persistence, and transmission of culture in general and long-standing traditional beliefs, customs, and practices, in particular.[2] It is the first formal empirical study investigating the deep determinants of contemporary witchcraft beliefs across two continents. Unlike earlier research that focused on the possible triggers of witch *trials* and killings, such as weather shocks (Oster, 2004; Miguel, 2005) or religious competition (Leeson and Russ, 2017), this paper searches for the roots of modern witchcraft *beliefs* in the long history of transatlantic slave trade. In this respect, our findings are in

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[2]Gershman (2017) provides a comprehensive review of recent studies in this field.

line with the studies that identify the deep factors of persistent cultural norms, attitudes, and preferences.[3] Importantly, we do not argue that witchcraft beliefs *originated* as a result of slave trades, but rather view the latter as an important factor that reinforced and contributed to the persistence of preexisting beliefs.[4]

Second, this paper contributes to the literature on historical development studying the persistent impact of events from distant past on contemporary socioeconomic outcomes (Nunn, 2014). More specifically, it adds to the subset of this literature that focuses on the long-term effects of African slave trades, one of the crucial episodes in global history that affected populations in multiple continents.[5] In the context of Sub-Saharan Africa, previous empirical studies have argued that, among other things, the slave trades had an adverse effect on economic development (Nunn, 2008a), eroded interpersonal trust (Nunn and Wantchekon, 2011), fostered the practice of polygamy (Dalton and Leung, 2014), shaped the gender division of labor (Teso, 2016), and reduced access to finance (Pierce and Snyder, 2017). This paper shows that the contemporary variation in the prevalence of witchcraft beliefs may also be partly traced back to the history of slave trades which, given the harmful implications of these beliefs for economic self-advancement and social relations, also points to a new cultural channel through which slave trades could have contributed to African underdevelopment.

Furthermore, this study contributes to the literature that examines the long-term consequences of the Atlantic slave trade *outside* Africa by looking at its impact on the cultural landscape of the New World, the main destination for captured slaves. While there is a large body of research focusing on the long-term consequences of slavery in the Americas on various socioeconomic outcomes including human capital accumulation, inequality, institutions, and political attitudes,[6] there is virtually no work within economics investigating the cultural exchange that resulted from the massive forced relocation of people from the African continent. This paper shows that the variation in the prevalence of witchcraft beliefs across Latin America partly represents the legacy of this transatlantic cultural exchange.

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[3]Recent examples include Galor and Özak (2016), Becker et al. (2016), and Lowes et al. (2017).

[4]For studies rationalizing the origins and purpose of various beliefs in the supernatural see, for example, Leeson (2014) on oracles, Gershman (2015) on the evil eye belief, and Nunn and Sanchez de la Sierra (2017) on bulletproofing spells.

[5]See Bertocchi (2016) and Nunn (2017) for a detailed overview of this literature.

[6]See, among many others, Nunn (2008b), Acemoglu et al. (2012), Bruhn and Gallego (2012), Bertocchi and Dimico (2014), and Acharya et al. (2016).

Finally, this paper builds on and contributes to a large body of literature in history and anthropology on the cultural impact of the Atlantic slave trade and the deep determinants of witchcraft beliefs. This literature, discussed in the following sections, provides case studies that help to understand the channels connecting slave trade experiences to local beliefs on both sides of the Atlantic. Our analysis instead represents a systematic empirical investigation of the hypotheses suggested in the literature.

The rest of the paper is organized as follows. The following section summarizes ethnographic and historical studies regarding the impact of slave trades on the propagation of witchcraft beliefs in Africa and pins down the two main mechanisms of this influence. Section 3 empirically explores the relationship of interest based on the data from Sub-Saharan Africa. Section 4 investigates the cultural transmission fostered by the slave trades by studying the prevalence of witchcraft beliefs in modern Latin America. Section 5 presents a placebo test of the relationship between witchcraft beliefs and geography outside the Atlantic world. Section 6 concludes.

2   Witchcraft and slave trade in African ethnography

In her detailed account of the Temne people in Northern Sierra Leone, Shaw (1997; 2002) argues that many aspects of their culture, including witchcraft beliefs and witchfinding practices, were shaped by the slave trade experience and may be viewed as collective "memories" of this unique historical trauma. Upon closer examination, these "memories" appear to have persisted not just among the Temne, but throughout the parts of Africa affected by the Atlantic slave trade.

Historical records and ethnographic studies reveal two common patterns that help understand this tight connection between witchcraft beliefs and the slave trade. First, many Africans perceived slave trade as a form of witchcraft through which European witches and their local collaborators were enriching themselves at the expense of less powerful individuals unable to protect themselves from being captured and sold across the ocean. Second, following the rising demand for slaves, witchcraft accusations and trials became an important tool for convicting and enslaving individuals across communities. Through both channels, the slave trade fostered witchcraft beliefs and related practices engendering a paranoid worldview that persisted over time among ethnic groups like the Temne in Shaw's analysis.

2.1 Slave trade as a form of witchcraft in a zero-sum world

One of the few well-established general facts about witchcraft beliefs is that their most direct purpose is to "explain" all sorts of misfortune including sickness, death, bad harvest, and business failure. As such, for millions of Africans, the Atlantic slave trade represented a major source of misfortune and suffering for over four centuries. Not surprisingly, enslavement came to be viewed as an act of witchcraft and slave traders as witches and cannibals. In the words of Sweet (2003), the Atlantic slave trade was "a new form of social and economic malevolence" introduced by Europeans which severely disrupted the life in local communities and led to wars, disease, forced migration, and other misfortunes (pp. 162–163). In response, the victims readily applied their traditional cultural framework for understanding evil: they interpreted the slave trade as an act of witchcraft and labeled its enablers as witches.

One of the earliest accounts of this link appears in the work of Wyatt MacGaffey on the Bakongo people of Central Africa who remembered the historical slave trade "as a form of witchcraft, whereby large numbers of Africans were improperly and prematurely transported to the other shore" (MacGaffey, 1972, pp. 54–55). The slave traders were viewed as witches who stole souls and transfered them to their homeland conceived as a single continent including both Europe and America (MacGaffey, 1968, pp. 174). Law (2011) argues that such equation of the slave trade with witchcraft was common throughout Africa, as was the stereotypical perception (reported as early as 1450s on the Gambia River) of the European slave traders as witches consuming the souls of their victims (pp. 10–11). As noticed by Argenti (2007), the cannibal discourse in the context of the Atlantic slave trade was fitting since slaves sold across the ocean never returned to their homeland and the "transshipment was every bit as terminal as death" (p. 112).

Thornton (2003) provides an interesting perspective from the viewpoint of slaves arriving in the Americas from Central Africa, citing their own testimonies as well as those of the Jesuit priest Alonso de Sandoval. Based on years of experience meeting slaves on ships disembarking in the port of Cartagena in the seventeenth century, the missionary could see a clear pattern: the slaves believed that the ocean voyage was "a type of witchcraft" in which upon arrival, "they would be made into oil and eaten" (p. 281–282). Similarly, according to Sweet (2003), it was "widely understood that Europeans carried away black bodies in order to "eat" them" (p. 162). The witnesses and victims of the slave trade developed vivid images of the different stages of this deeply disturbing practice in which "Europeans used their hidden powers to enslave Africans and commodify their bodies for their own enrichment" (p. 162):

For Central Africans, crossing *kalunga* (the Atlantic Ocean) in slave ships represented a premature death at the hands of witches, who nourished themselves on black bodies in the land of the dead (the Americas). The "profits" from these black bodies were then returned to Africa in a variety of trade goods. Cooking oil was believed to be pressed from African flesh. The red wines that Portuguese traders sold were said to be the blood of their African victims. European cheeses were African brains. And gunpowder was thought to be the ashen residue of African bones that were burned by Europeans.

Hawthorne (2010) echoes this narrative in his study of Upper Guinea adding that, although coastal communities widely viewed slave traders as witches or cannibals, they were compelled to cooperate since those who "failed to sate the hunger of white witches for black bodies risked being consumed" (p. 96).

Interestingly, it is not just the Europeans, but also local chiefs involved in and profiting from the slave trade who were commonly seen as witches and cannibals. According to Thornton (2003), in seventeenth-century West Central Africa witches were commonly found and were particularly dangerous among those in a position of power including European and African rulers, slave traders, and merchants in general. Likewise, Argenti (2007) points out that, in the Cameroon Grassfields, even though the elite class was unlikely to be subject to direct witchcraft accusations, the "whole social stratum of slave traders and labor recruiters" could nevertheless be identified as the "true source of cannibalism in the polity" (p. 116–117). De Rosny (1985), a French Jesuit priest who also conducted fieldwork in Cameroon, explains that suspicions of witchcraft were commonly directed at the local leaders during the slave trade era, since in the "anguished times of the slave traffic, certain chiefs had served as intermediaries, entering into negotiations to supply whites with compatriots and reap a profit" (p. 61). He directly links the experience of slave trade to the most popular type of sorcery beliefs (*ekong*) in his area of study which essentially refers to enslavement via an act of witchcraft.

Austen (1993) places the relationship between the slave trade and witchcraft beliefs into a broader discourse on the economic and social setting of which such beliefs are symptomatic. In his words, the export of slaves from Africa "provides the major historical reference for the equation of capital accumulation, zero-sum economics, and witchcraft" (p. 100). Indeed, the view of slave traders as cannibals and witches enriching themselves at the expense of the majority of local population fits perfectly the zero-sum worldview typical for witchcraft believers. As succinctly formulated by Hawthorne (2010), "Europeans and

Eurafricans turned people into profit – slaves into tobacco, alcohol, cloth, and other things – which was witchcraft par excellence" (p. 88).

Warnier (1995) puts the connections between the slave trade and witchcraft beliefs among the Duala and the Bamileke of Cameroon in a broader context of African history. According to him, witchcraft beliefs, known as *kong* and *famla'*, respectively, among these two peoples, are "based on and developed by the disappearances due to the slave trade, the wealth of the slave-traders and their agents during the period of the slave trade, on the mortality in the plantations and the wealth of recruiting agents and chiefs during the colonial period, on the inequalities experienced in illness and death, and the ostentatious fortunes of the big men in the public service and in business in the independent state" (p. 269). Similarly, Shaw (2002) underscores the continuity of the idea of "cannibalistic trade" into the colonial era and argues that "in the Sierra Leone hinterland, Atlantic stories that Europeans devoured slaves and sacrificed them to their God were reconfigured during the legitimate trade through accusations that chiefs and traders devoured, sacrificed, and made their dependents into medicines" (p. 246). Thus, the "memories" of cannibalism during the Atlantic slave trade era "formed a lens through which the predatory and extractive relationships of the legitimate trade could be evaluated."

2.2   Witchcraft trials and accusations as tools of enslavement

Ironically, those same people who viewed the slave trade as an act of witchcraft were themselves in danger of being accused of witchcraft and sold into slavery as a punishment. As the abundant historical evidence indicates, the rising demand for slaves turned witch trials into a ubiquitous tool of "producing" new captives.

There were several ways to capture and sell people into slavery during the era of the Atlantic slave trade (Nunn, 2017). The two major channels included, first, wars or slave raids resulting in kidnappings and, second, trials that determined guilt for various offenses including theft, murder, inability to pay back debts, adultery, treason, and, importantly, witchcraft. Hawthorne (2010) paints a detailed picture of how witchcraft trials played a crucial role in producing slaves in the coastal areas of Upper Guinea. He points out that, in contrast to raids and wars aimed at outside communities, trials were recognized as legitimate internal affairs and "resulted in community members condemning one of their own to enslavement" (p. 81). Among all the transgressions for which a person could be charged, witchcraft was one the most serious crimes. Hawthorne cites available historical records of the Europeans in Upper Guinea regarding practices of enslaving the accused witches and their relatives. The latter were very common, as, in the words of Francisco

de Lemos Coelho, a Portuguese observer writing in 1684, there was "no lack of witches in the land" (p. 83). Manuel Álvares, a Portuguese missionary writing in the early 17th century describes a typical trial by poison ordeal as a result of which convicted witches and their immediate kin were sold to slave traders as punishment. Hawthorne speculates that "as the number of ships arriving in Bissau and Cacheu increased and as coastal groups stepped up the production of slaves to garner imports after 1750, the frequency of witchcraft accusations and trials increased as well" (p. 87).

Further south on West Africa's Atlantic coast, in Northern Sierra Leone, witchcraft trials were similarly a common method of enslaving local population (Shaw, 2002). Shaw cites the late 18th century records of John Matthews, an agent for an English slave-trading firm, who notes that slaves, apart from those taken as prisoners of war, were often "sold for witchcraft, and other real, or imputed, crimes" and "purchased in the country with European goods and salt" (p. 215). Matthews provides the details of witchfinding practices in Sierra Leone via the divinatory interrogation of the corpse pointing out that witchcraft trials frequently resulted in the enslavement of both the accused and their family if the "deceased were a great man, and the accused poor" (p. 216). Shaw goes beyond by pointing out that witchcraft trials blossomed during the era of the Atlantic slave trade and the associated ritual practices persisted over time, despite their gradual "decoupling" from enslavement, following the Anti-Slave-Trade Act of 1807.[7] Finally, Shaw emphasizes that the "development of witchfinding as the ritual production of slaves for the Atlantic trade" was only one part of the nexus between witchcraft and slave trade. In line with the discussion in the preceding section, she reminds of the other side of the story: "the very imagery of witchcraft as the wrongful "eating" of people provided counterrepresentations through which those who profited from the ritual conviction of witches were implicitly recognized as the biggest witches of all" (p. 223).

Moving even further south, witchcraft accusations in Angola were effectively used in supplying slaves. Ferreira (2012) cites several specific examples of Africans sold to slave traders following such accusations. Interestingly, he also cites the local authorities in the 18th century Benguela that acknowledged the widespread use of witchcraft accusations following someone's death as "a way of robbing and enslaving one another" (p. 75). Vansina (2005), also based on Angolan experience, offers similar description and suggests that trial by ordeal was often involved since death was commonly attributed to witchcraft and the

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[7]Shaw cites a diary of a nineteenth-century English traveler who witnessed an investigation into the sudden death of a young girl. He comments that a possibility was raised regarding the death resulting from witchcraft and "had the slave trade existed, some unfortunate individual might have been accused and sold into captivity" (p. 218).

culpable witch was detected through divination. Astonishingly, he argues that enslavement was essentially an inevitable outcome of a witchcraft trial by ordeal: "If the accused died, a number of his relatives were enslaved and sold, and if the accused was innocent, the same number of the 'family' of the accuser underwent this fate" (p. 12). Gustafsson (2005) relies on the observations from the Finnish missionary Rautanen in the late-nineteenth-century Ovamboland, split between today's Angola and Namibia, where de facto slave trade was monopolized by the local kings and continued well after its *de jure* abolition by the Portuguese. Rautanen remarked that "witchcraft accusations were the most common vehicle used by King Kambonde and Chief Nehale for seizing people" (p. 46). Furthermore, Gustafsson argues that the increased intensity of witch trials was directly linked to the increasing demand for slaves and the growth of trade with Europeans which reinforced the system of extracting slaves from local communities via "continuous witchcraft accusations" (p. 58).

Further historical evidence on the active use of witch trials and accusations as a way to generate slaves also comes from other African regions exposed to the Atlantic slave trade including Cameroon (Warnier, 1995; Argenti, 2007), Calabar (Fyfe, 1960), the Cross River area (Röschenthaler, 2006), Guinea (Hair, 1998), the Bight of Biafra (Nwokeji, 2010), the kingdom of Kongo (Harms, 1981; Young, 2007; Heywood, 2009), and Zambia (Hinfelaar, 2007).[8] Thus, clearly, witch trials were a common vehicle for supplying slaves across Sub-Saharan Africa, and their expansion in response to the rising demand for captives could have been a prominent factor reinforcing witchcraft beliefs among affected populations.

The historical narrative paints a rather convincing picture linking the rise of the Atlantic slave trade to the propagation of witchcraft beliefs. In fact, if culture is persistent and transmitted relatively intact across generations, the consequences of the slave trade shock could still be seen in contemporary data. The following section provides a rigorous empirical investigation of this proposition.

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[8]In her study on slave settlements in the Cross River area, Röschenthaler (2006) notes that the slaves were feared by the free villagers because they "were known for their knowledge of strong 'medicines' and powerful magic" (p. 78). In their view, since slaves had been sold by their own people, they must have committed crimes or possessed destructive witchcraft powers. This observation suggests that witchcraft convictions were taken seriously by the local population. As will be discussed in section 4, the same was also true for some of the slave owners in the New World.

3 Evidence from Sub-Saharan Africa

Our investigation begins in Sub-Saharan Africa, where millions of people were captured, sold into slavery, and transported to the Americas between the 15th and 19th centuries. As argued in the previous section, this experience likely reinforced local beliefs in witchcraft and contributed to their persistence. Hence, we link the variation in contemporary prevalence of witchcraft beliefs across Africa to the differential historical exposure of various ethnic groups to the slave trade.

3.1 Data

The baseline dataset employed in this first part of our analysis relies largely on a series of surveys conducted by the Pew Forum on Religion and Public Life between December 2008 and April 2009 in nineteen countries of Sub-Saharan Africa.[9] Although the original intent of these surveys was to investigate the religious landscape of Sub-Saharan Africa with specific focus on Islam and Christianity, the questionnaires covered a wide range of issues including people's adherence to traditional beliefs and practices and their views on social and political issues.

Among other things, the surveys contain information on witchcraft beliefs. Following Gershman (2016), we combine two (yes or no) questions to construct the baseline indicator of witchcraft beliefs corresponding to the broad definition used in the introduction. The first question simply asks whether a respondent believes in "witchcraft," without any clarification, whereas the second question features the belief that "certain people can cast curses or spells that cause bad things to happen to someone." Thus, the former question leaves the notion of witchcraft vague and open to interpretation, while the latter captures more precisely the relevant concept of causing harm via supernatural means.[10] To minimize potential for measurement error, we thus define self-proclaimed witchcraft believers as individuals who reply "yes" to at least one of the above questions. Such believers con-

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[9]These are: Botswana, Cameroon, Chad, Democratic Republic of the Congo (DRC), Djibouti, Ethiopia, Ghana, Guinea-Bissau, Kenya, Liberia, Mali, Mozambique, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Uganda, and Zambia. Rwanda and South Africa effectively drop out from the main empirical analysis since the key data on the ethnicity of respondents are absent in these two cases. See `http://www.pewforum.org/datasets` for more details.

[10]As discussed in Gershman (2016), the survey inaccurately refers to the description in the second question as the "evil eye" belief which is actually a very different cultural phenomenon reflecting the fear of the uncontrollable supernatural destructive power of envious glances (Gershman, 2015).

stitute 57% of the full sample of 19 countries, with national-level prevalence rate ranging from 32% in Ethiopia to over 96% in Tanzania.

The Pew Forum surveys also contain information on basic sociodemographic characteristics, as well as the region of residence and self-reported ethnicity of respondents.[11] The latter is particularly important since estimates of slave exports, our main explanatory variable capturing the exposure to historical slave trades, are available at the ethnic-group level (Nunn and Wantchekon, 2011). Our matching of respondents' ethnicities in the baseline survey to the slave exports dataset, which adopts the classification from Murdock's (1959) map of African ethnic homelands, resulted in more than 300 unique groups.[12] Nunn and Wantchekon (2011) provide estimates of slave exports by century and distinguish between the Atlantic and Indian Ocean trades. As a starting point, we use their preferred measure, defined as $\log(1 + \text{exports/area})$, which normalizes the total number of slaves exported between 1400 and 1900 by the area of respective ethnic homelands as shown on Murdock's map.

3.2   Empirical framework

Our baseline specification relates individual-level beliefs in witchcraft to the ethnicity-level measure of slave exports, conditional on a range of potentially confounding characteristics:

$$\text{witch}_{i,e,r,c} = \alpha_c + \beta \text{ slave exp}_e + \mathbf{X}'_{\mathbf{e}}\text{B} + \mathbf{X}'_{\mathbf{i,e,r,c}}\Gamma + \mathbf{X}'_{\mathbf{r,c}}\Omega + \varepsilon_{i,e,r,c}.$$

Here, the binary outcome variable $\text{witch}_{i,e,r,c}$ captures whether individual i belonging to an ethnic group e and residing in region r of country c believes in witchcraft or not, and slave exp_e reflects the intensity of slave exports for ethnic group e. Control variables at the ethnic, individual, and regional levels are represented by vectors $\mathbf{X}'_{\mathbf{e}}$, $\mathbf{X}'_{\mathbf{i,e,r,c}}$, and $\mathbf{X}'_{\mathbf{r,c}}$, respectively. Finally, α_c reflects the presence of country fixed effects and $\varepsilon_{i,e,r,c}$ is the individual-level idiosyncratic component. The model is estimated via ordinary least squares (OLS), with standard errors clustered at both ethnic and regional levels.[13]

We start with the most parsimonious specification which includes the main variables of interest, country fixed effects, as well as individual's gender, age and its square. We then supplement the model with further sociodemographic characteristics, namely religion, ed-

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[11]Regions of residence mostly correspond to the first-level subnational administrative units, with 188 of them in the original sample of nineteen countries and 174 after excluding South Africa and Rwanda.

[12]With a few adjustments, this matching also connects our dataset to the *Ethnographic Atlas* (Murdock, 1967) containing useful information on precolonial characteristics of ethnic groups.

[13]Maximum likelihood estimation of equivalent probit specifications yields very similar results.

ueation, poverty indicator, household size, and urban location dummy.[14] These additional individual-level controls are endogenous and may in fact represent some of the channels through which the history of slave trades affected the current prevalence of witchcraft beliefs. For instance, previous studies linked the slave trade experience to both lower incomes (Nunn, 2008a) and lower levels of human capital (Obikili, 2016). Despite this issue, we include these "bad controls" in our analysis to see whether slave trades still matter after conditioning on the respective transmission channels.

Since data on slave exports are available for ethnic groups, control variables at this level of analysis are particularly important. We largely follow Nunn and Wantchekon (2011) in specifying the list of potential confounders. Most crucially, the intensity of slave trades is plausibly correlated with the subsequent colonial rule experience and its determinants. In particular, European influence during the relevant time frame could have affected the prevalence and persistence of witchcraft beliefs through channels other than slave trade. To address these issues, we first control for historical characteristics that arguably affected the colonization process and resulting institutions, namely measures of early development and disease environment (Acemoglu et al., 2005).

In order to capture precolonial prosperity, we employ two variables from the *Ethnographic Atlas*, namely historical settlement pattern (an ordinal scale, ranging from nomadic to sophisticated permanent settlements) and an index of political centralization (jurisdictional hierarchy beyond local community), both of which have been viewed as measures of early societal complexity (Murdock and Provost, 1973).[15] Furthermore, we introduce an indicator for predominant reliance on agriculture as a mode of subsistence, which has been argued to have long-term beneficial impact on individual welfare (Michalopoulos et al., 2016). In addition, we control for the historical presence of slavery in society, which could have facilitated slave exports and has also been linked to important local environmental characteristics (Fenske, 2013). Disease environment is proxied by the average value of the malaria stability index within the relevant ethnic homeland based on the data from

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[14]Religion is represented by four aggregate categories: Christian, Muslim, traditional, and unaffiliated. An overwhelming majority of respondents identify themselves as either Muslims or Christians, with 1.78% of the sample claiming to follow traditional/animist religion and 2.21% unaffiliated. There are three educational categories: completed primary or less, some secondary or completed secondary, post-secondary and higher. Poverty indicator is equal to zero, if the respondent reports insufficient money to buy food, health care, or clothing. See Appendix A for detailed definitions of all variables.

[15]Hawthorne (2010) argues that the level of political centralization directly affected the susceptibility of societies to slave trade, based on his research on Upper Guinea. On the other hand, Whatley (2014) argues that the direction of causality goes the other way, that is, the slave trade experience affected precolonial African institutions as measured by the structure of political authority.

Kiszewski et al. (2004). Beyond affecting the choice of the colonizers to settle in a particular area, susceptibility to malaria could have also affected the prevalence of witchcraft beliefs since these are often invoked to explain illness, including malaria (Muela et al., 1998). Furthermore, as recently shown by Esposito (2016), captives from malaria-ridden regions of Africa were more valued by slave traders, which could have differentially affected the exposure of ethnic groups to slave raids.

In addition to these determinants of colonial rule, we also use three ethnic-homeland-level variables to directly measure some of the European influence beyond the slave trades: an indicator for the presence of a colonial railway line, an indicator for the intersection with a historical travel route of major European explorers, and the number of early-twentieth-century Christian missions per square kilometer.

Our final set of control variables are constructed at the region-of-residence level. First, we control for the average land suitability for agriculture as an important exogenous factor of early development and a contributor to current prosperity level. An additional measure of regional development is nighttime luminosity per capita, with the recognition, as earlier, that this a "bad control" potentially reflecting a channel through which historical slave trade may have affected the prevalence of witchcraft beliefs. Second, we control for regional index of ethnolinguistic fractionalization using the subnational diversity dataset of Gershman and Rivera (2016b).[16] As argued by Nunn (2008a) and Whatley and Gillezeau (2011), slave trades may have contributed to increased ethnic fractionalization, yet another possible factor influencing cultural beliefs in African regions. Finally, motivated by the studies connecting weather shocks to witch trials (Oster, 2004; Miguel, 2005), we introduce two additional regional controls: a measure of rainfall anomaly in the two-year period preceding the surveys and a measure of spatial variability in temperature.

3.2.1 Baseline results

Table 1 shows the estimation results, from the most parsimonious specification in column 1 to those including groups of individual, ethnic, and regional controls in columns 2–5.[17] Column 6 includes region-of-residence rather than country fixed effects and, obviously, omits regional controls. The top row of the table displays the estimates of interest suggesting that, across specifications, our measure of the overall intensity of slave exports at

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[16]We use the standard ELF index based on the most detailed list of ethnolinguistic groups. Picking diversity indices constructed for larger linguistic families does not qualitatively affect the reported results.

[17]Specification in column 3 is identical to that in column 2, but is estimated on a restricted sample corresponding to columns 4–6.

the ethnic-group level is positively and significantly related to contemporary prevalence of witchcraft beliefs. In addition, column 2 reveals significant sociodemographic correlates of witchcraft beliefs. As expected, more educated and wealthy individuals are less likely to believe in witchcraft. On the other hand, people who claim to follow traditional/animist religion are more likely to be witchcraft believers than Christians, Muslims, or unaffiliated. The coefficient estimate on slave exports is somewhat diminished after inclusion of additional individual-level controls in column 2, which is consistent with the idea that religion, education, and wealth may represent specific channels through which slave trades may have affected witchcraft beliefs.[18] Note also that people living in urban areas are more likely to believe in witchcraft, although the coefficient loses statistical significance after controlling for regional-level characteristics. Finally, age and gender are only significant in the simplest specification in column 1, perhaps reflecting their correlation with more immediately relevant factors, such as educational attainment and wealth.

Interestingly, none of the control variables at the ethnic group or regional levels, introduced in columns 4 and 5, are statistically significant, while the coefficient on slave exports remains virtually unchanged relative to its value in column 2. In other words, it does not appear that these characteristics bias the relationship of interest. This result supports the notion that slave trades may have directly contributed to the prevalence and persistence of witchcraft beliefs through channels pinpointed in section 2 based on historical and ethnographic evidence. Column 6 represents perhaps the most stringent specification which includes fixed effects corresponding to 171 subnational regions in the sample. Here, the estimates of interests are based on within-region cross-ethnicity variation in the exposure to historical slave trade. This, in particular, alleviates the concern that our previous estimates reflect the impact of slave trades on regions and point to intergenerationally transmitted cultural influence of this historic shock at the ethnic group level.

As is well-established in the literature, there were substantial differences between Atlantic and Indian Ocean slave trades. Importantly, although the latter was in place earlier than the former, the overall scale of the Atlantic slave trade was much greater. Nunn (2008a) cites the estimates, according to which approximately 12 million (surviving) slaves were exported from Africa during the Atlantic slave trade, whereas the Indian, Red Sea, and trans-Saharan trades altogether involved 6 million individuals.[19] These distinctions

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[18]The decline in the coefficient estimate in column 2 is almost entirely due to the introduction of controls rather than reduced sample size relative to column 1.

[19]For ethnicities in our baseline sample, the estimates from Nunn and Wantchekon (2011) suggest the totals of around 9.2 and 0.68 million slaves exported during Atlantic and Indian Ocean slave trades, respectively, between 1400 and 1900.

Table 1: Witchcraft beliefs and total slave exports

	(1)	(2)	(3)	(4)	(5)	(6)
Slave exports (total)	0.041***	0.038**	0.040**	0.038**	0.039***	0.041***
	(0.015)	(0.015)	(0.017)	(0.015)	(0.015)	(0.010)
Religion: Muslim		−0.013	−0.016	−0.025	−0.021	−0.001
		(0.017)	(0.018)	(0.019)	(0.018)	(0.019)
Religion: traditional		0.405***	0.412***	0.412***	0.412***	0.420***
		(0.060)	(0.061)	(0.061)	(0.060)	(0.056)
Religion: unaffiliated		0.142***	0.172***	0.172***	0.175***	0.147***
		(0.039)	(0.038)	(0.038)	(0.037)	(0.036)
Education: secondary		−0.035***	−0.037***	−0.036***	−0.036***	−0.035***
		(0.012)	(0.013)	(0.013)	(0.013)	(0.012)
Education: post-secondary		−0.054***	−0.056***	−0.056***	−0.058***	−0.062***
		(0.020)	(0.022)	(0.022)	(0.022)	(0.020)
Money for basic needs		−0.035***	−0.037***	−0.037***	−0.039***	−0.032**
		(0.013)	(0.014)	(0.014)	(0.014)	(0.014)
Urban location		0.033**	0.037**	0.035*	0.028	0.000
		(0.016)	(0.017)	(0.018)	(0.018)	(0.017)
Basic individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Add. individual controls	No	Yes	Yes	Yes	Yes	Yes
Ethnic controls	No	No	No	Yes	Yes	Yes
Regional controls	No	No	No	No	Yes	No
Region FE	No	No	No	No	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	No
Observations	19819	18714	17123	17123	17123	17123
Adjusted R^2	0.15	0.17	0.17	0.17	0.17	0.22
Ethnic clusters	319	318	287	287	287	287
Regional clusters	174	174	171	171	171	171

Notes. a) OLS estimates in all columns. b) Standard errors shown in parentheses are clustered at both ethnic and regional levels. c) ***, **, and * denote statistical significance at the 1, 5, and 10 percent level, respectively. d) Basic individual-level controls are age, age squared, and gender (estimates omitted). e) The set of additional individual-level controls also includes household size (ten categories, estimates omitted). The reference categories for religion and education are "Christian" and "completed primary of less." f) Ethnicity-level controls include settlement pattern, political centralization, historical presence of slavery, predominant reliance on agriculture, mean malaria stability index, indicators of colonial railways and European explorer routes, and the density of Christian missions. g) Regional-level controls include nighttime lights per capita, mean land suitability for agriculture, spatial variability of temperature, recent precipitation anomaly, and ELF. h) Specification in column 3 is identical to that in column 2, but is estimated on a restricted sample corresponding to columns 4–6.

may have important implications for the results, as shown in previous studies. For instance, only Atlantic slave trades appear to affect both the rates of polygamy and attitudes to gender roles in contemporary Africa (Teso, 2016), consistent with the biased preferences for male versus female slaves in the two trades.[20]

We re-estimate the specifications from Table 1, but now decompose the overall slave exports into two categories and include them simultaneously in the regression equation. Table 2 reveals that, while the estimates in the top row corresponding to the Atlantic slave exports are all positive, significant, and slightly larger in magnitude than those in Table 1, the estimates in the second row corresponding to the Indian Ocean trade are all tiny and statistically insignificant. Hence, consistent with previous studies, the apparent influence of the slave trade is only reflective of the Atlantic Ocean trade. In out particular case, this could reflect some of the differences between the two trades pointed out in the literature. First, naturally, because of its larger scale, the Atlantic trade was simply a shock of a much larger magnitude, with deeper and more persistent effects. Second, it is possible that witchcraft trials were not actively used as a means of extracting slaves during the Indian Ocean trade. Specifically, we were unable to find any historical evidence of such sort, in sharp contrast to the overwhelming number of case studies cited in 2. Similarly, the popular narratives identifying slave traders with cannibals and witches reported above come exclusively from the Atlantic trade experience. [21] Motivated by the findings in Table 2, in what follows we focus on the Atlantic slave trade, while keeping the Indian Ocean slave exports as a control variable in all specifications.

3.2.2 Other beliefs in the supernatural

As follows from historical and ethnographic studies, the slave trade era left a massive imprint on culture across Sub-Saharan Africa. Existing beliefs and values had to be reconsidered in light of the gruesome reality of the "cannibalistic trade." Reinforcement of witchcraft beliefs appears to have been one of such cultural responses, but one may also wonder whether the slave trade experience had a similarly persistent impact on other beliefs in the supernatural. For instance, according to Law (2011), enslaved individuals commonly believed that after death their souls would return to Africa, which sometimes lead to suicide in attempt to get back home. Bay (2001), based on her research on Dahomey, hypothesizes

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[20]Similarly, the negative estimates of the impact of slave trades on trust in Nunn and Wantchekon (2011) are driven by the Atlantic slave trade and are rendered insignificant if the sample is limited to the Indian Ocean trade alone.

[21]Naturally, this could simply reflect the fact that in general the research on Atlantic slave trade is far more voluminous.

Table 2: Decoupling the slave trades

	(1)	(2)	(3)	(4)	(5)	(6)
Slave exports (Atlantic)	0.045***	0.041**	0.043**	0.042***	0.043***	0.043***
	(0.016)	(0.016)	(0.018)	(0.016)	(0.016)	(0.011)
Slave exports (Indian)	−0.017	−0.007	0.000	−0.017	−0.017	−0.007
	(0.016)	(0.020)	(0.018)	(0.022)	(0.022)	(0.026)
Basic individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Add. individual controls	No	Yes	Yes	Yes	Yes	Yes
Ethnic controls	No	No	No	Yes	Yes	Yes
Regional controls	No	No	No	No	Yes	No
Region FE	No	No	No	No	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	No
Observations	19819	18714	17123	17123	17123	17123
Adjusted R^2	0.15	0.17	0.17	0.17	0.17	0.22
Ethnic clusters	319	318	287	287	287	287
Regional clusters	174	174	171	171	171	171

Notes. a) Apart from decoupling the slave trades, model specifications are identical to those in Table 1, see the corresponding notes for details.

that *bo*, special protective charms still used in the region today, became popular during the slave trade era as a means of reducing the likelihood of capture and dealing with the associated insecurity and anxiety.

To address this question, we exploit the information on other beliefs available in the Pew Forum survey. Specifically, along with the two responses used to construct our baseline measure of witchcraft beliefs, the relevant module of the survey starting with a common preamble "Which, if any, of the following do you believe in?" contains the following items: 1) heaven, where people who have led good lives are eternally rewarded; 2) hell, where people who have led bad lives and die without being sorry are eternally punished; 3) reincarnation – that people will be reborn in this world again and again; 4) angels; 5) miracles; 6) evil spirits; 7) that sacrifices to spirits of ancestors can protect you from bad things happening; 8) that certain spiritual people can protect you from bad things happening; 9) that juju, shrines, or other sacred objects can protect you from bad things happening. We thus estimate the relationship between these beliefs and the Atlantic slave trade using the same specifications as earlier for the witchcraft beliefs.

Table 3 reveals the estimation results, also repeating the earlier estimates for witchcraft beliefs in the bottom right corner for reference. It is clear that, with the exception of

Table 3: Atlantic slave trade and various beliefs in the supernatural

	Heaven			Hell		
Slave exports (Atlantic)	0.003	0.004	−0.003	0.011	0.007	0.006
	(0.004)	(0.003)	(0.005)	(0.008)	(0.007)	(0.009)
Observations	18756	17190	17190	18630	17071	17071
Ethnic clusters	317	286	286	317	286	286
Regional clusters	174	171	171	174	171	171
	Reincarnation			Angels		
Slave exports (Atlantic)	0.020	0.025*	0.014	0.007	0.004	0.006
	(0.013)	(0.013)	(0.011)	(0.007)	(0.009)	(0.010)
Observations	17520	16058	16058	18457	16906	16906
Ethnic clusters	317	286	286	318	287	287
Regional clusters	174	170	170	174	170	170
	Miracles			Sacrifices		
Slave exports (Atlantic)	0.017**	0.013	0.008	0.003	0.001	0.006
	(0.008)	(0.008)	(0.010)	(0.011)	(0.012)	(0.013)
Observations	18429	16863	16863	18294	16774	16774
Ethnic clusters	318	287	287	317	286	286
Regional clusters	174	171	171	174	171	171
	Shamans			Juju		
Slave exports (Atlantic)	0.014	0.013	0.020*	0.003	0.001	0.014
	(0.012)	(0.012)	(0.011)	(0.010)	(0.012)	(0.015)
Observations	18311	16798	16798	18069	16581	16581
Ethnic clusters	318	287	287	317	287	287
Regional clusters	174	170	170	174	170	170
	Evil spirits			Witchcraft		
Slave exports (Atlantic)	0.034**	0.032**	0.039***	0.041**	0.043***	0.043***
	(0.015)	(0.015)	(0.009)	(0.016)	(0.016)	(0.011)
Observations	18351	16782	16782	18714	17123	17123
Ethnic clusters	317	286	286	318	287	287
Regional clusters	174	171	171	174	171	171
Ethnic controls	No	Yes	Yes	No	Yes	Yes
Regional controls	No	Yes	No	No	Yes	No
Region FE	No	No	Yes	No	No	Yes
Country FE	Yes	Yes	No	Yes	Yes	No

Notes. Apart from the outcome variables, specifications are identical to those in columns 2, 5, and 6 of Table 2.

witchcraft beliefs and beliefs in evil spirits in the bottom panel of the table, none of the superstitions listed in Table 3 is robustly related to historical slave exports.[22] Thus, it appears that witchcraft beliefs (and the tightly related beliefs in evil spirits) are a special element of local culture in terms of being related to the slave trade experience. This is consistent with the narratives about the special role of witchcraft trials as a vehicle of producing slaves and the reliance of local populations on witchcraft beliefs as a framework to interpret misfortunes resulting from the slave trade.

3.3   Witchcraft, mistrust, and the slave trade

In their seminal study, Nunn and Wantchekon (2011) have shown that higher intensity of historical slave trades directly contributed to persistently lower levels of trust across ethnic groups in Sub-Saharan Africa, consistent with the idea that mistrust was a useful norm which permitted to stay relatively safe during the dangerous times of slave raids. More recently, Gershman (2016) demonstrates that the local prevalence of witchcraft beliefs in Sub-Saharan Africa is negatively associated with trust and various indicators of prosocial behavior, possibly reflecting the formation of antisocial attitudes due to the fears of bewitchment and witchcraft accusations. The present investigation has so far argued that contemporary variation in the prevalence of witchcraft beliefs in Sub-Saharan Africa represents in part a cultural legacy of the Atlantic slave trade. This triad of interrelated results raises two natural questions. First, is trust a yet-unaccounted-for important omitted variable that could explain the connection between witchcraft beliefs and slave trade? Second, is the propagation of witchcraft beliefs a possible transmission channel in the relationship between mistrust and slave trade? In other words, to what extent are witchcraft beliefs and mistrust two distinct outcomes of the slave trades rather than mediating channels?

To address the first question, we introduce trust as an additional individual-level control variable. The are two relevant items in the Pew Forum survey, one of which is the standard "generalized trust" question while the other captures trust in people of other religion. The first trust indicator equals unity, if a respondent believes that "most people can be trusted," and the second indicators equals unity, if the respondent "generally trusts people who have different religious values." Table 4 demonstrates that the inclusion of either measure of trust (top and bottom panels, respectively) does not have any noticeable impact on the coefficient of interest relating Atlantic slave trade and witchcraft beliefs. Thus, it does not

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[22]Significant results for beliefs in evil spirits are not surprising since these are strongly related to witchcraft beliefs. The correlation coefficient is equal to 0.61 for individual responses and goes up to 0.88 for the regional prevalence of these beliefs in the relevant sample.

Table 4: Witchcraft beliefs and the Atlantic slave trade: controlling for trust

	(1)	(2)	(3)	(4)	(5)	(6)
Slave exports (Atlantic)	0.038[**]	0.038[**]	0.035[**]	0.035[**]	0.034[***]	0.034[***]
	(0.017)	(0.017)	(0.016)	(0.016)	(0.012)	(0.012)
Trust (generalized)		−0.014		−0.007		0.004
		(0.014)		(0.015)		(0.014)
Observations	17674	17674	15364	15364	15364	15364
Ethnic clusters	316	316	285	285	285	285
Regional clusters	174	174	171	171	171	171
	(7)	(8)	(9)	(10)	(11)	(12)
Slave exports (Atlantic)	0.043[***]	0.043[***]	0.039[**]	0.039[**]	0.040[***]	0.039[***]
	(0.016)	(0.016)	(0.016)	(0.016)	(0.011)	(0.011)
Trust (other religion)		−0.031[**]		−0.031[**]		−0.019[*]
		(0.013)		(0.013)		(0.012)
Observations	18715	18715	16268	16268	16268	16268
Ethnic clusters	319	319	287	287	287	287
Regional clusters	174	174	171	171	171	171
Basic individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Add. individual controls	No	No	Yes	Yes	Yes	Yes
Ethnic controls	No	No	Yes	Yes	Yes	Yes
Regional controls	No	No	Yes	Yes	No	No
Region FE	No	No	No	No	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	No	No

Notes. Apart from controlling for individual trust, specifications in even-numbered columns are identical to those in columns 1, 5, and 6 of Table 2. Specifications in odd-numbered columns provide reference estimates for cases when individual trust is not accounted for.

seem to be the case that the depletion of trust due to the slave trade experience explains our main result so far.

Next, we mimic the setup in Nunn and Wantchekon (2011) to see whether it is the prevalence of witchcraft beliefs that mediates the relationship between trust and slave trades.[23] We expand the dataset used in their study, namely the third round of the Afro-

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[23]Note that such an exercise can be done based solely on the Pew Forum data using the two available trust questions as outcome variables. In that analysis, slave exports are insignificant, although the point estimates have the "correct" negative sign. This contrast with the original results could be due, among other things, to the differences in trust measures and the lists of countries covered by the Pew Forum and Afrobarometer surveys.

barometer (2005–2006), to include two subsequent rounds, the fourth (2008–2009) and the fifth (2011–2013), in order to increase both the sample size and the number of regions, for which the data on the prevalence of witchcraft beliefs are available from the Pew Forum surveys. The latter is especially important since the data on individual-level witchcraft beliefs are absent in the Afrobarometer surveys.

We explore three questions that capture interpersonal trust (in relatives, neighbors, and acquaintances) and three questions capturing trust in institutions (police, courts, and local council). Unlike binary measures from the Pew Forum surveys, the Afrobarometer codes the responses to each trust question on the ordinal 0–3 scale, from "not at all" to "a lot." We set up the regression equations the same way as earlier and use the sociodemographic individual-level controls that are closest to the metrics used above: age, age squared, gender, religion (5 categories), education (10 categories), urban location dummy, and two proxies for wealth, namely employment status (four categories) and living conditions (five categories). In addition to country fixed effects, the Afrobarometer regressions also include dummies for survey rounds.

The results are reported in Table 5. First, consistent with Nunn and Wantchekon (2011) and Gershman (2016), trust is negatively related both to slave exports (with the exception of trust in acquaintances) and the regional prevalence of witchcraft beliefs. Second, in all six cases, controlling for regional witchcraft beliefs has only a minuscule impact on the coefficient estimates on slave exports.

Overall, the findings in this section imply that, rather than being mediating channels, mistrust and witchcraft beliefs largely represent distinct parts of the long-term cultural legacy of the Atlantic slave trade, a bundle of mutually reinforcing antisocial beliefs and attitudes.

3.3.1 The IV strategy

Earlier analysis shows that the positive relationship between exposure to the Atlantic slave trade and witchcraft beliefs is quite robust to the inclusion of plausibly relevant control variables at different levels of observation. Still, there could be certain unobservable omitted characteristics that bias our results. In addition, if extracting slaves from societies with widespread witchcraft beliefs was easier, a variation of a reverse-causality argument could be made under the assumption of long-term cultural persistence.[24] Finally, it is

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[24]For example, higher historical prevalence of witchcraft beliefs could have facilitated slave extraction via witch trials. Note, however, that, if witchcraft beliefs reinforce mistrust (Gershman, 2016), the opposite is likely to be true, that is, cautious mistrustful societies should be less susceptible to raids.

Table 5: Trust and the Atlantic slave trade: controlling for witchcraft beliefs

	Relatives		Neighbors		Acquaintances	
	(1)	(2)	(3)	(4)	(5)	(6)
Slave exports (Atlantic)	−0.044***	−0.041**	−0.048**	−0.045**	−0.012	−0.007
	(0.017)	(0.016)	(0.019)	(0.018)	(0.021)	(0.019)
Witchcraft (region)		−0.393***		−0.458***		−0.449**
		(0.096)		(0.147)		(0.185)
Observations	41454	41454	28806	28806	29393	29393
Adjusted R^2	0.12	0.12	0.17	0.17	0.15	0.15
Ethnic clusters	193	193	185	185	186	186
Regional clusters	136	136	133	133	136	136
	Police		Courts		Local council	
	(7)	(8)	(9)	(10)	(11)	(12)
Slave exports (Atlantic)	−0.033**	−0.030**	−0.048***	−0.045***	−0.060***	−0.057***
	(0.015)	(0.015)	(0.014)	(0.014)	(0.012)	(0.011)
Witchcraft (region)		−0.404***		−0.378***		−0.344***
		(0.145)		(0.120)		(0.101)
Observations	40690	40690	39816	39816	39790	39790
Adjusted R^2	0.19	0.19	0.10	0.10	0.14	0.14
Ethnic clusters	193	193	193	193	193	193
Regional clusters	136	136	136	136	136	136

Notes. a) OLS estimates in all columns. b) Standard errors shown in parentheses are clustered at both ethnic and regional levels. c) ***, **, and * denote statistical significance at the 1, 5, and 10 percent level, respectively. d) All specifications include the full set of individual, ethnic, and regional controls, along with country and survey round fixed effects. Basic individual-level controls are age, age squared, gender, education, employment status, religion, and living conditions. Slave exports in the Indian Ocean trade are controlled for in all specifications. The other controls are exactly the same as the ones listed in the notes to Table 1. e) The outcome variables are measured on the ordinal 0–3 scale.

important to keep in mind that the estimates of slave exports are likely to be imprecise, and this measurement error could bias our baseline estimates downward. In order to address these issues, in this section we use an instrumental variables strategy suggesting two possible sources of conditionally exogenous variation in the intensity of slave trade.

First, following the literature on slave trades going back to Nunn and Wantchekon (2011), we measure the distance from the centroid of each ethnic group's historical homeland to the coastline and use this variable as an instrument for slave exports. As widely documented in historical narratives, slave raids generally proceeded from the coast toward the inland part of the continent, in order to minimize transportation and other costs for

slave traders. Second, as an alternative, we exploit a related source of variation, namely distance to the closest major slave trade port in Africa, arguably a more relevant predictor of exposure to slave raids. We follow several steps to construct this instrument. We begin by identifying the geographic coordinates of all relevant embarkation ports in Africa according to the latest version of *Voyages: The Trans-Atlantic Slave Trade Database* (2016), a process yielding 122 unique well-defined locations.[25] We then look at the imputed total number of slaves embarked in each of these ports over the relevant time period. The volume of exports varies dramatically across ports, from 13 slaves in Trade Town to 1.4 *million* in Luanda. To take into account this obvious difference in the importance of ports and thus increase the strength of our instrument, we only select the ports in the first quartile of the slave exports distribution, a set including 32 locations with total number of slaves exceeding 42000 people. Finally, we measure the distance from each ethnic homeland to the closest major port.

The two panels of Table 6 show the IV estimates for the same model specifications as in Table 2 using the two alternative instruments for slave exports. Across specifications, the coefficient of interest is positive and statistically significant. Compared to baseline OLS values in Table 2, the magnitude of estimates is always substantially larger. This increase is much larger for the distance to the coast instrument, in which case, for the most stringent specifications in columns 4 and 5, the coefficient of interest goes up by a factor of 3.2 and 4.5, respectively. For our second instrument, the IV estimates exceed their OLS counterparts by a factor of 1.9 and 2.5, respectively. In both cases, larger IV estimates suggest that, if the exclusion restriction holds, the baseline estimates understate the true impact of the Atlantic slave trade on contemporary witchcraft beliefs. This is consistent with the notion that estimates for ethnicity-level volumes of exports are noisy. Considering that our second instrument is more likely to satisfy the exclusion restriction, being more slave-trade specific, the underestimate in the OLS analysis is roughly by a factor of 2. Comparison of the first-stage F-statistics in Table 6 shows that, consistent with our priors, our second instrument, capturing distance to major embarkation ports is always stronger than simple raw distance to the coast.[26]

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[25]The dataset and its detailed description are available at `http://slavevoyages.org`.

[26]As expected, limiting the set of ports to the top quartile substantially raises the strength of the instrument. For instance, the first-stage F-statistic falls to 12.33 for specification in column 4 of Table 6, if we define relevant ports as those with above-median volume of exports, and further to 10.72, if all ports, no matter how small, are included. Reducing the set of ports to even larger ones, namely the top decile, makes the instrument less strong compared to the baseline, with an F-statistic of 15.67. The qualitative results, in terms of the size and significance of the coefficient of interest, remain similar regardless of the chosen set of ports.

Table 6: Witchcraft beliefs and slave exports: IV estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	IV: Distance to the coast					
Slave exports (Atlantic)	0.124***	0.149***	0.147***	0.169***	0.177***	0.136**
	(0.045)	(0.055)	(0.054)	(0.056)	(0.058)	(0.054)
Kleibergen-Paap F	13.48	13.05	13.84	16.16	15.59	14.50
	IV: Distance to the closest major Atlantic slave trade port					
Slave exports (Atlantic)	0.087***	0.093**	0.093**	0.097**	0.091**	0.079*
	(0.033)	(0.039)	(0.039)	(0.041)	(0.041)	(0.042)
Kleibergen-Paap F	16.68	16.62	17.72	21.74	23.52	18.10
Basic individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Add. individual controls	No	Yes	Yes	Yes	Yes	Yes
Ethnic controls	No	No	No	Yes	Yes	Yes
Regional controls	No	No	No	No	Yes	No
Region FE	No	No	No	No	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	No
Observations	19819	18714	17123	17123	17123	17123
Ethnic clusters	319	318	287	287	287	287
Regional clusters	174	174	171	171	171	171

Notes. a) IV/2SLS estimates in all columns. b) Standard errors shown in parentheses are clustered at both ethnic and regional levels. c) ***, **, and * denote statistical significance at the 1, 5, and 10 percent level, respectively. d) The sets of control variables are identical to those in Table 1, see the corresponding notes for details. e) Slave exports in the Indian ocean trade are controlled for in all specifications. f) First-stage regression estimates are reported in Table B.1 in appendix B.

4 Evidence from Latin America

According to the *Trans-Atlantic Slave Trade Database*, 96.3% out of roughly 10.5 million African captives disembarked in the New World landed in Latin America and the Caribbean, with close to 5 million people arriving in Brazil alone.[27] This forced relocation of Africans had a massive impact on the economy and society of Latin America and, along with European migrations, transformed the population structure of the continent.[28] Without a doubt, the Atlantic slave trade shaped not only the socioeconomic, but also the cultural landscape of the continent, although the extent to which the original ele-

ments of African culture were preserved or recreated in the New World is being debated (Morgan, 1997).

4.1 Witchcraft beliefs in the transatlantic cultural exchange

The cultural legacy of the Atlantic slave trade in Latin America and the Caribbean is perhaps most visible in the popular syncretic religions combining elements of African beliefs and Christianity. Santería, Candomblé, Voodoo, and Obeah are the well-known examples of such mixed religious traditions. Here, we focus more narrowly on the possible transmission of witchcraft beliefs across the Atlantic Ocean. Indeed, historical evidence implies that such beliefs did represent an important element of the transatlantic cultural exchange that had a peculiar relationship with the slave trade experience. Sweet (2003) and Hawthorne (2010) provide detailed accounts of how certain core spiritual beliefs and rituals, common to the cultures of various ethnic groups, were transferred from the Atlantic coast of Africa to Brazil. Among these, beliefs in witchcraft, sorcery, or *fetiçaria*, as it was known to the Portuguese, were instrumental in providing a framework for understanding evil and misfortune. As the following discussion shows, witchcraft beliefs were not just brought to the Americas, but also reconfigured to fit the realities of slavery.

The evidence presented so far shows that the slave trade experience appears to have intensified witchcraft beliefs among the affected groups in Sub-Saharan Africa. Thus, it comes as no surprise that the captives held on to the perception of their ordeal as a form of witchcraft during the middle passage, as already documented above in a quote from Alonso de Sandoval, a Jesuit priest observing the newly arrived slaves in the 17th-century Cartagena. Schuler (1979) further argues that the common circumstances in which enslaved Africans found themselves and the "shipmate" experience in particular created a "fictive kinship" among them based on shared cultural norms. One manifestation of this solidarity was "the common conviction that malicious sorcery played a part in their misfortune" (p. 124). Similarly, Paton (2012) remarks that "on forced marches to the African coast, on board slave ships, and in their new Atlantic settings, enslaved people were likely to interpret what had happened and was happening to them as the result of

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[27]Thus, destinations in mainland North America, including ports in the United States and Canada, only account for about 3.7% of all arrivals. The original estimates are available at `http://slavevoyages.org/assessment` (accessed in June 2017).

[28]According to one recent estimate, as of 2010, the Afro-descendant population of Latin America exceeded 130 million people constituting almost a quarter of the regional total (Andrews, 2016). This includes an estimated 97 million Afro-descendants in Brazil, 15 million in Venezuela, and 8 million in the Dominican Republic. The sample does not cover Belize, Guatemala, the Guianas, and smaller Caribbean islands.

religious malevolence" (pp. 248–249). In addition, Christian rituals applied to slaves, such as baptism, were typically understood by them as a "means of further ensuring European "enchantment" or power over Africans" (Sweet, 2003, p. 197).

Just like at the source, in Africa, and during the middle passage, at their destination in Latin America, the captives applied a familiar cultural framework to interpret their position in slavery-based societies. In this system of coordinates, their miserable lives were the direct result of witchcraft, and the witches they had to deal with now were their masters and aligned elites. As pointed out by several authors, this view reflects the reliance of slaves on their culture as a form of resistance. Schuler (1979) explains how the perception of slave owners as sorcerers helped to define slave resistance in the context of Myalism, an "Afro-Jamaican religious movement with a sorcery-eradication focus" which viewed Europeans and assimilated African elites as ultimate sorcerers (p. 131). Among the forms of resistance, self-protection through charms and "ritual confrontation" with masters-sorcerers complemented strikes, revolts, and other efforts to build a united slave community. Similarly, in the context of Brazil, Sweet (2003) describes vividly how witchcraft beliefs and related practices among the slaves were both a common way to deal with their hardships and a powerful tool of cultural resistance, "a stealthy, silent killer of the hated master, and a very real threat to the colonial status quo" (p. 160). Palmié (2002) recites an account by Esteban Montejo, a former slave who worked on the Cuban plantation of Flor de Sagua in the early 1870s, of a "mayombe" ritual in which slaves "engaged in a kind of mystical warfare against abusive owners" (p. 177). Echoing other historians, Palmié concludes that witchcraft beliefs provided the slaves with both an explanation of their predicament and a tool of resistance, and "countering witchcraft with violent sorcery became a political means of restoring moral balance" (p. 181).

In many cases, slave resistance based on performing traditional rituals actually worked. In a remarkable inversion, the African slaves were often viewed by their masters and church officials as witches, and their practices were feared. As Sweet (2003) puts it, the masters "were acutely aware of the "diabolical" power of African religions, and many lived in constant fear of the "witchcraft" that their slaves might cast upon them" (p. 159). He goes on to describe a number of cases from the 17th- and 18th-century Brazil of black slaves engaging in various rituals in order to protect themselves from their masters or even directly harm them via supernatural means. Interestingly, Sweet cites Father André João Antonil warning those masters who administered excessive punishments that they risked revenge from their slaves in the form of witchcraft or poison (pp. 165–166). Olwig (1995) recounts the view of Johan Lorentz Carstens, a prominent 18th-century plantation owner

and slave holder from St. Thomas, who apparently believed that some of his slaves were the masters of witchcraft and were able to "project such things as a lump of hair, cut-off nails, and sharp, thin pieces of rusty iron into the bodies of human beings, causing them to die in a short time" (p. 34). The fears of such supernatural abilities may even have been behind a 1701 act making it mandatory that slaves receive instruction in Christianity so that "their wild souls, old bad habits, idolatry, witchcraft, murder and evil would be weakened and broken."

Hawthorne (2010) shares multiple cases documented by priests in the 18th-century Maranhão, in which African slaves were either accused of *fetiçaria* or described as trying to counteract it by using protective charms identical to those found across the ocean in their Upper Guinean homeland.[29] Recall that, as described in detail in section 2, witchcraft trials were commonly used to "produce" slaves in Sub-Saharan Africa. Indeed, Hawthorne notes ironically that, since Upper Guineans often sold witches as slaves, one should expect to find a considerable number of skilled practitioners of witchcraft in Maranhão (p. 239). Similarly, Sweet (2003) points out that both Africans and the Catholic Church in Central Africa were known to condemn suspected witches to slavery, as a result of which "a disproportionate number of African diviners/healers probably found their way into the slave population of Brazil, thereby exaggerating their influence among Brazil's slaves" (p. 198). Sweet summarizes this odd witchcraft-based confrontation between African slaves and their European masters as a "witch versus witch" battle: "Africans, who understood their enslavement to be the result of Portuguese religious malevolence, countered with their most powerful religious antidotes, which were recognized and feared by the Portuguese as "witchcraft." In their attempts to counter the slings and arrows of slavery – mistreatment, malnutrition, disease, kinship instability, and so on – African slaves (and freed Africans) mounted a steady religious assault against the white witches who were causing them such grave misfortune" (p. 164).

Thus, historical evidence indicates that witchcraft beliefs clearly found their place in slavery-based colonies of Latin America. To African slaves, these beliefs apparently served as both a framework for identifying the sources of their suffering and as a tool of cultural resistance against the powerful masters. The latter, in turn, often saw their slaves' actions as witchcraft and even borrowed some of the African supernatural protection practices in response. It is also entirely plausible that, over time, witchcraft beliefs were transmitted

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[29]Interestingly, some of the Europeans in Brazil also wore protective "Mandinga pouches" and consulted with black healers in Amazonia, borrowing African practices that were actually not that different from those still present in Portugal at that time (p. 243).

across generations of slaves and their descendants, as well as Europeans and other residents of the continent who were likely to acquire or reinforce such beliefs via their interactions with African culture. The following section formally investigates whether the consequences of this cultural import can be detected in the contemporary data on witchcraft beliefs in Latin America.

4.2 Data and empirical analysis

Between October 2013 and February 2014, the Pew Research Center conducted a wave of public opinion surveys, similar to those used in the analysis of section 3, in 18 countries across Latin America and the Caribbean (plus Puerto Rico).[30] These surveys involved over 30000 face-to-face interviews and focused on religious beliefs and practices, as well as social and political views. Just like in the African wave of surveys, the standard questionnaire contained a module on traditional beliefs which allows us to construct individual-level measure of witchcraft beliefs in a rather consistent way.[31] According to the baseline definition, witchcraft believers constitute 59% of the full Latin American sample and their prevalence rate ranges from roughly 47% in Bolivia, Paraguay, and Puerto Rico to about 77% in Honduras and Panama.

If witchcraft beliefs were indeed of particular importance to African slaves in Latin America and represented a unique part of their cultural heritage, given vertical cultural transmission, one may expect to observe a higher prevalence of believers among Afro-descendants relative to other racial groups in the survey sample. To address this channel of persistence, we first classify the respondents by race, identifying in the process the crucial group of Afro-descendants.[32] The other three categories are white, indigenous, and mestizo. Whites largely represent the descendants of Europeans, the "indigenous"

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[30]These include Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela. Both Chile and Puerto Rico drop out from our analysis since the key information on race/ethnicity is missing in these two cases. The "Religion in Latin America" dataset is available at http://www.pewforum.org/datasets.

[31]Rather than asking directly about belief in "witchcraft" the Latin American surveys ask whether respondents believe that "magic, sorcery or witchcraft can influence peoples lives." Since this question adds a broad notion of "magic" into the mix, we conduct a robustness check in which witchcraft believers are defined only as those who believe that "certain people can cast curses or spells that cause bad things to happen to someone."

[32]This group includes people self-identifying as black, of African descent, mulatto, or giving similar responses.
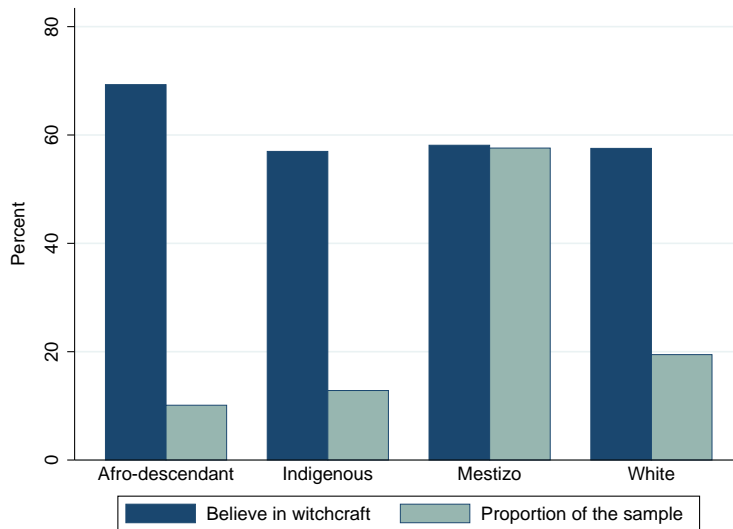
Figure 1: Racial composition and witchcraft beliefs in the Latin American sample.

group combines all the numerous Amerindian populations of the continent, while mestizos represents mixed-race people of European, African, and Native American origins. Although none of the four categories are homogeneous, the mestizo group is perhaps the trickiest to characterize, not just because it is by definition a mixed category, but also because the proportions of different ancestries among mestizos vary across countries and regions in Latin America.[33] Having this caveat in mind, it is reasonable to expect a fair share of African ancestry among the mestizo populations, particularly in countries like Brazil and Venezuela.

In the main sample of 17 countries for which the information on race or ethnicity is available, 10.1% of respondents self-identify as Afro-descendants, close to 13% are indigenous, 19.5% are white, and over 57% are part of the mestizo group. As Figure 1 shows, the prevalence of witchcraft beliefs among Afro-descendants (69.3%) is higher relative to other racial groups (57-58%), consistent with the idea of intergenerational cultural transmission of historically relevant beliefs among black population. Naturally, given the long history or racial discrimination and persistent racial inequality in Latin America in poverty, literacy rates, and access to infrastructure (Andrews, 2016), it is very important to control for potentially confounding sociodemographic characteristics of the respondents rather than making inference based on the raw percentages. Thus, we compile a set of such characteristics similar to the one used in section 3 for the African sample, including education, poverty indicator, and urban location dummy, on top of the basic age, gender, and house-

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[33]See Adhikari et al. (2016) for an overview of genetic studies on admixture in Latin America.

hold size measures.[34] We also control for the overall level of economic development at the regional level as measured by nighttime lights per capita. Note that in the Latin American sample, data on the region of residence are available at a highly disaggregated level for most countries, adding up to more than 1000 subnational units.[35]

Our baseline estimating equation is

$$\text{witch}_{i,r,c} = \alpha_c + \beta\,\text{ancestry}_{i,r,c} + \mathbf{X}'_{\mathbf{i,r,c}}\Gamma + \mathbf{X}'_{\mathbf{r,c}}\Omega + \varepsilon_{i,r,c},$$

The binary outcome variable $\text{witch}_{i,r,c}$ captures whether individual i residing in region r of country c believes in witchcraft or not, and $\text{ancestry}_{i,r,c}$ is race, which is either a categorical variable reflecting the four-way classification introduced above or an Afro-descendant dummy. Control variables at the individual and regional levels are represented by vectors $\mathbf{X}'_{\mathbf{i,r,c}}$ and $\mathbf{X}'_{\mathbf{r,c}}$, respectively. Finally, α_c represents country fixed effects and $\varepsilon_{i,r,c}$ is the individual-level idiosyncratic component. The model is estimated via OLS, with standard errors clustered at the regional level.[36]

The estimation results are shown in Table 7, where specifications in columns 1–3 and 4–6 employ, respectively, the four-way racial classification and the Afro-descendant indicator. The model in column 1 shows that, relative to the omitted category "white," Afro-descendants are, on average, 6.5 percentage points more likely to believe in witchcraft, an estimate that is highly statistically significant. Both indigenous and mestizo individuals are also more likely to be witchcraft believers than whites, but the relevant point estimates are about half the size of that for Afro-descendants. Furthermore, column 2 shows that part of this association is explained away by the omitted socio-demographic characteristics. After controlling for education, poverty indicator, and other relevant measures, the point estimate on indigenous drops dramatically and becomes statistically insignificant, whereas the estimates for Afro-descendants and mestizos remain significant, despite a notable reduction in size. Accounting for individual and regional characteristics, Afro-descendants and mestizos are, respectively, 5 and 2.7 percentage points more likely than whites to be witchcraft believers. This is consistent with a priori expectations, considering that mestizos often have partly African ancestry. Estimates in columns 4–6 show that Afro-descendants are, on average, 3.5 percentage points more likely to believe in witchcraft when compared

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[34]Due to regional differences, religion and education categories are somewhat different across the two continents, see appendix A for the detailed description of all variables.

[35]Still, for Mexico, Argentina, Ecuador, Paraguay, Bolivia, and Uruguay, regions represent first-level subnational administrative units. To take into account the difference in the size of regions in the sample, we additionally control for region area.

[36]Maximum likelihood estimation of equivalent probit specifications yields very similar results.

Table 7: Witchcraft beliefs and African ancestry in Latin America

	(1)	(2)	(3)	(4)	(5)	(6)
	Four-way classification			Afro-descendant indicator		
Afro-descendant	0.065***	0.050***	0.050***	0.039***	0.035***	0.034***
	(0.017)	(0.016)	(0.016)	(0.013)	(0.013)	(0.013)
Indigenous	0.031*	0.007	0.008			
	(0.018)	(0.017)	(0.017)			
Mestizo	0.035***	0.027**	0.027**			
	(0.012)	(0.012)	(0.012)			
Ed.: primary/mid. sch.		−0.015	−0.015		−0.014	−0.014
		(0.010)	(0.010)		(0.010)	(0.010)
Ed.: high school		−0.038***	−0.037***		−0.037***	−0.036***
		(0.012)	(0.012)		(0.012)	(0.012)
Ed.: tech. or some uni.		−0.087***	−0.087***		−0.086***	−0.086***
		(0.017)	(0.017)		(0.017)	(0.017)
Ed.: uni. or higher		−0.106***	−0.105***		−0.106***	−0.105***
		(0.019)	(0.019)		(0.019)	(0.019)
Money for basic needs		−0.067***	−0.067***		−0.067***	−0.067***
		(0.008)	(0.008)		(0.008)	(0.008)
Urban location		0.022**	0.024**		0.023**	0.025**
		0.010	0.010		0.010	0.010
Basic individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Add. individual controls	No	Yes	Yes	No	Yes	Yes
Regional controls	No	No	Yes	No	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	24511	24185	24165	24511	24185	24165
Regional clusters	1039	1039	1037	1039	1039	1037
Adjusted R^2	0.03	0.05	0.05	0.03	0.05	0.05

Notes. a) OLS estimates in all columns. b) Standard errors shown in parentheses are clustered at the regional level. c) ***, **, and * denote statistical significance at the 1, 5, and 10 percent level, respectively. d) Additional individual controls, not shown in the table, also include religion and household size variable (ten categories). The omitted category for education is "completed primary of less." e) Regional controls include nighttime lights per capita and region area.

to the rest of the sample pooled into one group. Note also that the estimates on included sociodemographic characteristics are largely consistent with those for the African sample. Higher education and wealth levels are associated with a smaller likelihood of believing

in witchcraft, whereas living in an urban area appears to increase that likelihood, other things equal.

In addition to their persistence across generations of Afro-descendants, witchcraft beliefs may have been more likely to survive in regions historically more exposed to African slavery, where, as shown above, such beliefs played a special role among both slaves and their masters, and where cultural exchange occurred most actively. Although reliable quantitative estimates of the historical spatial distribution of African slaves and their descendants in Latin America are not available, its qualitative patterns have been widely documented and are largely based on geographic factors that made the use of African slave labor more suitable than that of coerced or enslaved indigenous population. Specifically, the major belt of African slavery in Latin America was largely contained within tropical coastal lowlands (TCL).[37]

The key explanation for this geographic pattern has to do with the pre-Columbian population distribution in Latin America and the demographic shock caused by Old-World diseases.[38] Before the arrival of the Europeans, the densest sedentary settlements of Latin America were found in the temperate zones of the continent, such as the Andean highlands and the central Mexican plateau, known for their high agricultural suitability. High elevation was also instrumental in protecting the indigenous population against the new pathogens brought from across the Atlantic. In contrast, indigenous communities of the tropical lowlands had low population density and were directly exposed to the previously unknown diseases leading to the swift decimation of those tribes upon their contact with Europeans. The loss of this source of labor prompted attempts of a forced transfer of native populations to the tropical lowlands that was, however, unsustainable, due both to the high death rate it entailed and the opposition of European settlers in mountainous regions who needed their own local labor source, particularly in mining (Mellafe, 1975). Given the massive decline of the native population and inability to replace it with captives from other regions of the continent, the Europeans ultimately had to rely largely on African slave labor for agricultural production in tropical lowlands.

Hawthorne (2010) describes in detail the gradual replacement of enslaved indigenous labor by African slaves on the plantations of Maranhão, Brazil. His account provides two main reasons behind this process, namely the high death rates of the natives from the

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[37]Zelinsky (1949) made perhaps the most ambitious attempt to reconstruct, however crudely, the distribution of black population within Latin America at six points in time between 1570 and 1940. His maps clearly indicate the persistent predominant location of black communities in the tropical coastal lowlands of the continent, with only a few exceptions.

[38]See, for example, Zelinsky (1949), Mellafe (1975), and Gallup et al. (2003).

Old-World pathogens and the perception of the Europeans (clear from abundant historical records) that African slaves were more productive. That perception was shaped partly by the lower resistance of indigenous populations to tropical diseases, but also by their higher likelihood of escape, due to the knowledge of local terrain, and the fact that settled agricultural work was completely unknown and repugnant to Amazonian tribes which typically subsisted by foraging. In contrast, the African slaves arriving in Maranhão and Pará from Upper Guinea came from settled agricultural societies and knew very well how to grow crops in tropical environments (pp. 47–49).

The abundant supply of indigenous labor in the highlands also explains why African slave labor was not nearly as actively employed in the mining sector as it was in tropical agriculture. For instance, such large mining centers as Huancavelica in Peru or Zipaquira in Colombia were surrounded by dense local settlements and were thus worked by indigenous people (Mellafe, 1975). This is not to say that African slaves were entirely absent in the mining sector. Indeed, Lane (2005) notes that, although most silver mining was carried out by coerced indigenous labor, most gold mining was in fact done by African slaves and their descendants. This division is perfectly consistent with the geographic factors outlined above, since silver mines "tended to be located in the remote, dry, and often cold high-country interior of Spanish America, whereas gold mines were mostly distributed in lower, hotter, and wetter zones" (p. 162). The abundance of local indigenous labor, as well as the higher costs associated with the danger of losing expensive African slaves to mine-related disasters or a high-altitude sickness favored the use of coerced native labor in silver mines.[39] Overall, available estimates suggest that indigenous population accounted for roughly 80% of all workers in the mines of Potosi and Zacatecas at the peak of colonial activities (p. 173).

In addition to the fundamental role of geography in explaining the relative scarcity or abundance of indigenous labor, two other factors help explain the geographic distribution of African slaves and their descendants. First, slave-based agricultural production sites were often located in relative proximity to ports and the European settlements in Latin America that were predominantly found in coastal lowland areas (Zelinsky, 1949). Second, as explained in Mellafe (1975), independent black communities (*quilombos*) resulting from ship wrecks, individual or mass escapes of slaves, were always founded in tropical locations and typically concentrated "in the northern and coastal provinces of Colombia and

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[39]This is particularly true of Potosi, where extreme altitudes require a substantial acclimatization period for any worker not native to those areas, and partly explains why the use of African slave labor was more common in Zacatecas and other Mexican mining sites located at relatively low elevation.

Venezuela, along the coasts of Central America, in the coastal belts and remote interior regions of the Portuguese possessions in Brazil, and particularly in some of the islands of the Caribbean" (p. 34), thus contributing to the tropical coastal lowland geography of the Afro-descendant population in Latin America.

Given this rather uniform evidence, we consider three proxies to capture a region's historical exposure to African slavery based on its geographic features. First, we calculate the distance from the centroid of each respondent's region of residence to the coastline. Although this measure should capture to some extent the "coastal" element of the distribution of Afro-descendants, it is a rather naive measure, particularly because of the coastal proximity of the Andes, which, as discussed before, hosted some of the most populous indigenous communities of the continent due to high altitudes. Second, we measure the region's average elevation, to capture the "lowland" element of the population geography in Latin America.[40] Finally, in attempt to mitigate the simplicity of the previous two "one-dimensional" measures, we build a proxy for the "tropical coastal lowlands" triad, based on the ecological maps of the Latin American continent.

We start off with a digital map of ecological regions of Central and South America produced as part of an effort by the U.S. Geological Survey Earth Resources Observation and Science Center and the U.S. Environmental Protection Agency to develop a consistent map of ecoregions for the Western Hemisphere (Griffith et al., 1998).[41] The boundaries of ecoregions, available at three levels of aggregation, are based on various environmental features of the continent including geology, physiography, soil type, potential and existing vegetation, climate, and land cover. For Central and South America and the Caribbean, the maps contain 12 ecoregions at level I, 35 at level II, and 121 at level III, where regions at finer levels are nested within upper-level classifications. We exploit the classification at levels II and III and flag all ecoregions roughly fitting in the "tropical coastal lowlands" category. This process leads to a baseline of 15 level-II regions and 9 additional level-III regions (listed in appendix A) with geographical features historically favoring the use of African slave labor, as shown in Figure 2. Finally, for each region in our survey sample, we measure the fraction of its area located in the tropical coastal lowlands.

We next rerun the regressions presented above, but now adding our regional geography measures, one by one and altogether. The results are presented in Table 8. The first column

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[40]We take the natural logarithm of both distance to the coast and elevation measures, due to extreme skewness of these variables.

[41]To cover Mexico, we combine this base layer with a similar map of North American ecoregions from the Commission for Environmental Cooperation. All of these digital maps are available online at `http://ecologicalregions.info`.
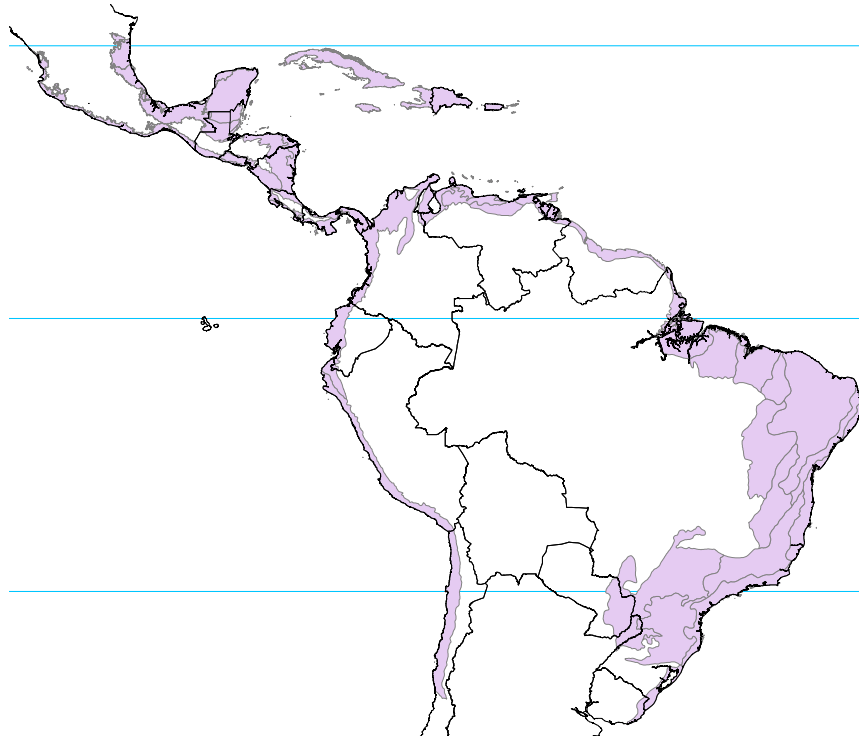
Figure 2: The ecological regions of the tropical coastal lowlands.

reproduces the baseline specification 3 in Table 7, while further columns add new variables to that equation. The geographic variables enter significantly and with expected signs in columns 2–4. Residents of the regions that are closer to the coast, not in the highlands, or fall deeper in the "appropriate" geographical belt, are more likely to believe in witchcraft, even after controlling directly for their ancestry and other sociodemographic characteristics. When added simultaneously, elevation and regional share in the tropical coastal lowlands remain statistically significant, whereas the most "naive" measure of distance to the coast becomes insignificant.[42] In addition, as expected, across specifications, adding geographic variables reduces the coefficient on Afro-descendant and mestizo dummies, since ancestry is naturally correlated with these regional geography measures. Overall, the results suggest that witchcraft beliefs persisted not just across generations of Afro-descendants, but also in geographic areas where the use of African slave labor was most profitable.

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[42]Naturally, the three geographic variables are pretty highly correlated. The pairwise across-region correlation coefficients are all around 0.58 in absolute value, with positive sign for distance to the coast and elevation.

Table 8: Witchcraft beliefs, ancestry, and geography in Latin America

	(1)	(2)	(3)	(4)	(5)
Afro-descendant	0.050***	0.043***	0.041**	0.042**	0.039**
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Indigenous	0.008	0.008	0.015	0.009	0.013
	(0.017)	(0.017)	(0.016)	(0.017)	(0.016)
Mestizo	0.027**	0.027**	0.025**	0.025**	0.025**
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
log(coast)		−0.019***			−0.002
		(0.005)			(0.007)
log(elevation)			−0.023***		−0.016***
			(0.005)		(0.006)
Share in TCL				0.075***	0.045***
				(0.016)	(0.016)
Observations	24165	24165	24165	24165	24165
Regional clusters	1037	1037	1037	1037	1037
Adjusted R^2	0.05	0.05	0.05	0.05	0.05

Notes. a) OLS estimates in all columns. b) Standard errors shown in parentheses are clustered at the regional level. c) ***, **, and * denote statistical significance at the 1, 5, and 10 percent level, respectively. d) All controls are included.

5   Witchcraft beliefs and geography: a placebo test

In sections 3 and 4, we established several connections between the prevalence of witchcraft beliefs and local geographic features in Sub-Saharan Africa and Latin America. In the former case, a negative reduced-form relationship between witchcraft beliefs and historical distance to the coast reflects the impact of the slave-trade exposure on beliefs.[43] In the latter case, a negative relationship between witchcraft beliefs with distance to the coast and especially elevation reflect the role of geography in the historical exposure to African slavery. Thus, in both cases, there are good reasons to expect these geographic patterns in the prevalence of witchcraft beliefs. Indeed, if these relationships are explained solely by the history of the Atlantic slave trade, one should not expect to find similar patterns outside the Atlantic world, that is, in regions that were not subjected to the same mechanisms as the ones explored above.

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[43]In fact, the exclusion restriction requires that distance to the coast *only* affects witchcraft beliefs via the intensity of slave trade.

In order to conduct such a placebo test, we exploit yet another set of surveys conducted by the Pew Forum on Religion and Public Life in 2011–2012 in 25 predominantly Muslim countries or regions outside Sub-Saharan Africa.[44] This wave concentrated on religious beliefs and socio-political views of Muslim populations and, like earlier surveys, contained a module on traditional beliefs, which allows us to construct a consistent indicator of witchcraft beliefs for each respondent. We further exploit the most detailed available data on the respondents' region of residence in order to define boundaries for calculating local geographic features, namely distance to the coast from the region's centroid and average elevation. Due to the absence of data on subnational regions of residence, four countries (Bosnia and Herzegovina, Egypt, Jordan, and Kosovo) drop out from the sample.

We set up an estimating similar to those in sections 3 and 4, in which the indicator of witchcraft beliefs is regressed on a set of individual-level sociodemographic controls, country fixed effects, and the regional-level geographic characteristics of interest, namely distance to the coastline and mean elevation (either in plain or logarithmic form). Our first specification includes only the geographic variables of interest, basic individual-level controls (age, age squared, and gender), and country fixed effects. Our second specification adds education, household size, and urban location dummy.[45] Finally, our third specification adds regional-level control variables, namely region area, luminosity per capita, and mean suitability of land for agriculture. Standard errors are clustered at the regional level.

As Table 9 makes clear, there is no significant relationship whatsoever between witchcraft beliefs and either distance to the coast or elevation.[46] The absence of such patterns in a sample of regions that were not directly involved in the Atlantic slave trade is reassuring for the validity and interpretation of our results in the African and Latin American samples.[47]

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[44]These include: Afghanistan, Albania, Algeria, Azerbaijan, Bangladesh, Bosnia and Herzegovina, Egypt, Indonesia, Iran, Iraq, Jordan, Kazakhstan, Kosovo, Kyrgyzstan, Lebanon, Malaysia, Morocco, Pakistan, Palestinian territories, Russia, Tajikistan, Thailand, Tunisia, Turkey, and Uzbekistan. We exclude Niger since, being part of Sub-Saharan Africa, it does not satisfy the basic placebo test requirement. The "World's Muslims" dataset is available at `http://www.pewforum.org/datasets`.

[45]Morocco drops out whenever education is included in the model since the corresponding country survey did not include this variable. In addition, three regions for which the centroids are located below the sea level are dropped when using the log transformation of elevation.

[46]Surprisingly, unlike in sections 3 and 4, in this sample, we do not find a clear relationship between educational attainment and witchcraft beliefs. In fact, it appears that people with no education at all are somewhat *less* likely to believe in witchcraft compared to individuals in other educational categories.

[47]As a robustness check, we reran the same specifications for a restricted "Asia sample" after dropping Albania, Algeria, Morocco, and Russia, with no change in qualitative results.

Table 9: Witchcraft beliefs and geography outside the Atlantic world

	(1)	(2)	(3)	(4)	(5)	(6)
Distance to the coast	0.018	0.016	0.029			
	(0.031)	(0.031)	(0.033)			
Elevation	0.021	0.023	0.014			
	(0.023)	(0.024)	(0.025)			
Log(distance)				0.001	0.002	0.000
				(0.009)	(0.010)	(0.010)
Log(elevation)				0.005	0.006	0.002
				(0.010)	(0.011)	(0.011)
Basic individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Add. individual controls	No	Yes	Yes	No	Yes	Yes
Regional controls	No	No	Yes	No	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25779	24194	24194	25709	24124	24124
Regional clusters	412	363	363	409	360	360
Adjusted R^2	0.16	0.14	0.15	0.16	0.14	0.15

Notes. a) OLS estimates in all columns. b) Standard errors shown in parentheses are clustered at the regional level. c) Basic individual controls are age, age squared, and gender. d) Additional individual controls include education, household size, and urban location dummy. e) Regional controls include nighttime lights per capita and region area.

6 Concluding remarks

This paper shows that the variation in contemporary witchcraft beliefs on both sides of the Atlantic ocean can be partly explained by the history of the slave trade. Witchcraft beliefs are more prevalent among African ethnic groups that were more heavily exposed to the Atlantic slave trade in the past. They are also more prevalent among Afro-descendants in Latin America, as well as in those regions of the continent where the use of African slave labor was historically more intense. These findings are consistent with historical and anthropological narrative about the role of the slave trade in propagation of witchcraft beliefs and demonstrate how big shocks can reinforce existing cultural beliefs and contribute to their persistence. They also shed light on the nature of these beliefs and related practices as a cultural framework for interpreting misfortune, understanding and resisting evil, and as a flexible mechanism for exerting power and punishing individuals in local communities.

Appendices

A Description of variables

Pew Forum individual-level variables in section 3 (Sub-Saharan Africa)

Raw data and documentation for "Tolerance and Tension: Islam and Christianity in Sub-Saharan Africa" are available at `http://www.pewforum.org/datasets`.

Personal belief in witchcraft. Dummy variable equal to 1, if the respondent claims to believe in witchcraft or the evil eye, i.e., that "certain people can cast curses or spells that cause bad things to happen to someone" (or both), and 0, otherwise.

Religion. Four categories: Christian, Muslim, traditional religion, unaffiliated.

Education. Level of educational attainment, three categories: completed primary or less, some secondary or completed secondary, post-secondary and higher.

Shortage of money. Dummy variable equal to zero, if the respondent reports insufficient money to buy food, health care, or clothing. The original question is: "Have there been times during the last year when you did not have enough money: 1) to buy food your family needed? 2) to pay for medical and health care your family needed? 3) to buy clothing your family needed?"

Household size. Eight categories: three or fewer, four, five, six, seven, eight, nine, ten or more.

Other beliefs. Measures of personal and regional beliefs are constructed in the same way as for witchcraft. Other beliefs include the following: heaven, where people who have led good lives are eternally rewarded; hell, where people who have led bad lives and die without being sorry are eternally punished; reincarnation – that people will be reborn in this world again and again; angels; miracles; evil spirits; that sacrifices to spirits of ancestors can protect you from bad things happening; that certain spiritual people can protect you from bad things happening; that juju, shrines, or other sacred objects can protect you from bad things happening.

Generalized trust. Dummy variable equal to 1, if the respondent replies that "most people can be trusted," and 0, otherwise.

Trust in people of other religion. Dummy variable equal to 1, if the respondent replies that she "generally trusts people who have different religious values," and 0, otherwise.

Ethnicity-level variables in section 3 (Sub-Saharan Africa)

Slave exports. Number of exported slaves of a given ethnicity normalized by the area of homeland historically inhabited by the respective ethnic group, available separately for the Atlantic and Indian ocean trades. The baseline variables are log-transformed, as described in the text. *Source:* Nunn and Wantchekon (2011), dataset available at `http://scholar.harvard.edu/nunn/pages/data-0`.

Settlement pattern. A measure of residence fixity, on the ordinal scale: nomadic or fully migratory (1); seminomadic (2); semisedentary (3); compact but impermanent settlements (4); neighborhoods of dispersed family homesteads (5); separated hamlets, forming a single community (6); compact and relatively permanent settlements (7); complex settlements (8). *Source:* Murdock (1967).

Jurisdictional hierarchy beyond local community. A measure of political centralization, on the ordinal scale: no levels, no political authority beyond community (1); one level, for example, petty chiefdoms (2), two levels, for example, larger chiefdoms (3); three levels, for example, states (4); four levels, for example, large states (5). *Source:* Murdock (1967).

Historical reliance on agriculture. Dummy variable equal to 1, if the contribution of agriculture to subsistence exceeds 50%, and 0, otherwise. *Source:* Murdock (1967).

Historical presence of slavery. Dummy variable equal to 1, if slavery within society is "absent or near absent," and 0, otherwise. *Source:* Murdock (1967).

Malaria stability index. Index measuring the stability of malaria transmission based on regionally dominant vector mosquitoes. Takes values from 0 to 39 and is available for cells at 0.5 degree resolution. The variable used in the analysis is the average value of the index across cells falling in each ethnic homeland. *Source:* Kiszewski et al. (2004).

Colonial railways. Dummy variable equal to 1, if a colonial railway line, as recorded for 1911 by the Century Company, was present anywhere within the ethnic homeland, and 0, otherwise. *Source:* own calculations using the shapefile downloaded at `http://scholar.harvard.edu/nunn/pages/data-0`.

European explorers. Dummy variable equal to 1, if a major route of European explorers during precolonial and early colonial periods, as recorded for 1911 by the Century Company, passed through the ethnic homeland, and 0, otherwise. *Source:* own calculations using the shapefile downloaded at `http://scholar.harvard.edu/nunn/pages/data-0`.

Christian missions. The total number of Catholic and Protestant missions, as recorded in 1924 by William Roome, located within the ethnic homeland, per square kilometer. *Source:* own calculations using the shapefile downloaded at `http://scholar.harvard.edu/nunn/pages/data-0`.

Distance to the coastline. Great circle distance from the ethnic homeland's centroid to the closest location on the coastline. Computed using the haversine formula and measured in km. *Source:* own calculations using the coastline shapefile downloaded at `http://www.naturalearthdata.com`.

Distance to major slave port. Great circle distance from the ethnic homeland's centroid to the closest major slave port. Computed using the haversine formula and measured in km. Major slave ports are defined as 32 ports in the first quartile of the distribution by the number of embarked slaves as recorded in the 2016 edition of the Transatlantic Slave Trade Database. *Source:* own calculations using the data on slave embarkations by port available at `http://slavevoyages.org`.

Region-level variables in section 3 (Sub-Saharan Africa)

Nighttime lights per capita. Data on luminosity come from the Defense Meteorological Satellite Program's Operational Linescan System (DMSP-OLS) that reports stable images of Earth at night captured between 20:00 and 21:30. The measure ranges from 0 to 63 and is available for cells at 30 arc-second resolution, see Henderson et al. (2012) for technical details. We aggregate luminosity data for 2008 and 2009 at the regional level and then take their average. The latter is then divided by the region's population size (see below) to obtain the final measure of lights per capita. *Source:* `http://ngdc.noaa.gov/eog/dmsp/downloadV4composites.html`.

Population size. Data on population counts come from LandScan Africa (2013) for cells at 30 arc-second resolution. We calculate the sum of all grid values in each region to find regional population counts. *Source:* `http://web.ornl.gov/sci/landscan`.

Mean suitability of land for agriculture. Index of suitability of land for rain-fed agriculture (maximizing technology mix). Coded on the scale from 1 (very high suitability) to 8 (not suitable) for cells at 5 arc-minute resolution. The variable used in the analysis is the average value of the suitability index across cells in each region. *Source:* FAO GAEZ dataset (plate 46) downloaded at `http://webarchive.iiasa.ac.at/Research/LUC/GAEZ/index.htm` and own calculations.

Spatial variability of temperature. Raw data on annual mean temperature and precipitation (1950–2000) are available for cells at 30 arc-second resolution. Spatial variability is calculated as the standard deviation of cell values for each region. *Source:* Hijmans et al. (2005) and own calculations, raw data available at `http://www.worldclim.org/current`.

Precipitation anomaly. Average monthly precipitation during the period 2006-2008 (two years before the survey wave) relative to the long-run average (1951-2000), censored at 100%. Raw pixel-level data are available at $0.5°$ resolution from the Global Precipitation Climatology Centre (full data reanalysis, version 7). The final measure is derived by spatial averaging over the pixels in each region. *Source:* Schneider et al. (2015) and own calculations, raw data available at `http://www.cgd.ucar.edu/cas/catalog/surface/precip/gpcc.html`.

Ethnolinguistic fractionalization. Standard ELF indices constructed at different levels of linguistic aggregation based on regional-level data on ethnolinguistic composition. For Nigeria, the indices were recalculated using the data from the 2013 Demographic and Health Survey at the level of geopolitical zones, to be consistent with the Pew Forum administrative division. *Source:* Gershman and Rivera (2016b), own calculations for Nigeria, and, for the Democratic Republic of the Congo, GIS-based indices constructed using the World Language Mapping System and disaggregated population data from LandScan, as described in Gershman and Rivera (2016a).

Afrobarometer individual-level variables in section 3 (Sub-Saharan Africa)

Raw survey data and codebooks are available at `http://www.afrobarometer.org/data`.

Trust questions. Measures of interpersonal trust are based on the following questions: "How much do you trust each of the following types of people: your relatives? your neighbors? other people you know?" Measures of trust in institutions are based on the following questions: "How much do you trust each of the following, or haven't you heard enough about them to say: police? courts of law? elected local government council?" The answers are coded on the scale from 0 (not at all) to 3 (a lot).

Employment status. The original question is: "Do you have a job that pays a cash income? Is it full-time or part-time? And are you presently looking for a job (even if you are presently working)?" Four categories: no (not looking); no (looking); yes, part-time; yes, full-time.

Religion. Five categories: Christian, Muslim, traditional religion, unaffiliated, other.

Living conditions. The original question is: "In general, how would you describe your own present living conditions?" Five categories: very bad; fairly bad; neither good nor bad; fairly good; very good.

Education. Ten categories: no formal schooling; informal schooling only (including Koranic schooling); some primary schooling; primary school completed; some secondary school/high school; secondary school completed/high school completed; post-secondary qualifications, other than university, e.g., a diploma or degree from polytechnic or college; some university; university completed; post-graduate.

Pew Forum individual-level data in section 4 (Latin America)

Raw data and documentation for "Religion in Latin America" are available at `http://www.pewforum.org/datasets`.

Personal belief in witchcraft. Dummy variable equal to 1, if the respondent claims to believe either that "magic, sorcery or witchcraft can influence peoples lives" or in the evil eye, i.e., that "certain people can cast curses or spells that cause bad things to happen to someone" (or both), and 0, otherwise.

Race/ancestry. Four categories: Afro-descendant, indigenous, mestizo, white. The Afro-descedant category includes the following responses: Afro-descedant, Afroboliviano, black, Garifuna, mulatto, negro, Palenquero of San Basilio, Raizal of San Andres and Providencia. The indigenous category includes the following responses: Amerindian, Andean indigenous, Aymara, Chiquitano, Guarani, indigenous, Lecos, Moxeño, native, Quechua, rain-forest indigenous, Tacana. The mestizo category includes the following responses: mestizo, mestizo (ladino), mestizo (creole), mixed (white and indigenous). The white category includes the following responses: white, blanco.

Afro-descendant dummy. Dummy variable equal to 1, if the respondent is classified as Afro-descendant, and 0, otherwise.

Religion. Four categories: Catholic, Protestant, unaffiliated, other.

Education. Level of educational attainment, five categories: less than elementary; complete primary or middle school; some or complete high school; technical or some university; complete university or higher.

Shortage of money. Identical to the definition in section 3 analysis, see above.

Household size. Identical to the definition in section 3 analysis, see above.

Region-level variables in section 4 (Latin America)

Nighttime lights per capita. Identical to the definition in section 3 analysis (see above), but uses 2014 LandScan data to calculate regional population size.

Distance to the coastline. Identical to the definition in section 3 analysis, see above.

Elevation. Elevation data at the pixel level are available from the USGS GTOPO30 digital dataset at 30 arc-second resolution. Mean elevation is calculated as the average value across pixels in each region and is measured in meters. *Source:* own calculations using the raster file downloaded at `http://www.fao.org/geonetwork/srv/en/main.home`.

Regional share in the tropical coastal lowlands. Share of region's area located in the zone defined as "tropical coastal lowlands" representing a set of level-II and level-III ecological regions of Latin America. Level-II regions are: Dry Gulf of Mexico Coastal Plains and Hills, Northwestern Plain of the Yucatan Peninsula, Southern Pacific Coastal Plains and Hills, Humid Gulf of Mexico Coastal Plains and Hills, Yucatan Peninsula Plains and Hills, Sierra Los Tuxtlas, Western Pacific Plain and Hills, Soconusco/Guatemalan Coastal Plains and Hills, Greater Antilles, Caribe/Pacific Lowland Plains and Hills, Venezuelan Coastal Andes, Peruvian/Atacaman Deserts, Amazon and Coastal Lowlands, Caatinga, and Atlantic Forests. The coastal area of the Amazon and Coastal Lowlands in the Amazon river mouth region is delineated using the boundary of the Marajó varzeá subregion as depicted in the World Wildlife Fund's map of terrestrial ecoregions. Level-III regions are: Pacific Volcanic Lowlands, Caribbean Coastal Plains and Hills, Miskito Lowland Pine Savanna, Costa Rica/Panama Pacific Plains and Hills, Gurupi Plains and Low Tablelands, Northern Maranhão Plains, Northern Piauí Plains, Espinhaço/Diamantina Hills and Low

Mountains, Brazil/Uruguay Coastal Pampa. *Source:* own calculations, original digital maps of ecoregions are available at `http://ecologicalregions.info`.

Pew Forum individual-level variables in section 5 (placebo test)

Raw data and documentation for "The World's Muslims" are available at `http://www.pewforum.org/datasets`.

Personal belief in witchcraft. Identical to the definition in section 3 analysis, see above.

Education. Level of educational attainment, six categories: no schooling; some/complete primary school; some/complete middle school; some/complete high school; technical or some university; university or higher.

Household size. Identical to the definition in section 3 analysis, see above.

Region-level variables in section 5 (placebo test)

Nighttime lights per capita. Identical to the definition in section 3 analysis (see above), but uses 2014 LandScan data to calculate regional population size.

Distance to the coastline. Identical to the definition in section 3 analysis, see above; measured in kilometers. Excludes the (inland) Caspian Sea and the Arctic ocean coastline.

Elevation. Identical to the definition in section 4 analysis (see above), but using GTOPO30 panels covering the countries of interest; measured in kilometers. *Source:* own calculations using the raster file downloaded at `https://webmap.ornl.gov/ogc/dataset.jsp?ds_id=10003`.

B Supplementary results

Table B.1: First-stage regressions for IV specifications in Table 6

	(1)	(2)	(3)	(4)	(5)	(6)
	IV: Distance to the coast					
Distance to the coast	-0.001^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R^2	0.59	0.59	0.60	0.62	0.63	0.75
Shea's partial R^2	0.16	0.14	0.15	0.14	0.13	0.09
	IV: Distance to the closest major Atlantic slave trade port					
Distance to the port	-0.001^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}	-0.001^{***}
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R^2	0.60	0.61	0.61	0.64	0.65	0.76
Shea's partial R^2	0.19	0.16	0.18	0.17	0.18	0.11
Basic individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Add. individual controls	No	Yes	Yes	Yes	Yes	Yes
Ethnic controls	No	No	No	Yes	Yes	Yes
Regional controls	No	No	No	No	Yes	No
Region FE	No	No	No	No	No	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	No
Observations	19819	18714	17123	17123	17123	17123
Ethnic clusters	319	318	287	287	287	287
Regional clusters	174	174	171	171	171	171

Notes. a) OLS estimates in all columns. b) Standard errors shown in parentheses are clustered at both ethnic and regional levels. c) ***, **, and * denote statistical significance at the 1, 5, and 10 percent level, respectively. d) Dependent variable in all specifications is the Atlantic slave trade exports. e) The sets of control variables are identical to those in Table 6. f) Shea's partial R^2 reflects the explanatory power of the respective instrument for the slave exports variable, after partialling out the influence of other included covariates.

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