

The Long-Term Effect of Demographic Shocks on the Evolution of Gender Roles: Evidence from the Trans-Atlantic Slave Trade*

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Abstract

I study the long-run effect of the trans-Atlantic slave trade on the evolution of gender norms. Since a majority of men were exported during the trans-Atlantic slave trade, skewed sex ratios emerged in the population of the African regions more severely affected. Historical accounts show that in these regions the shortage of men pushed women into the labor force and led women into taking up new areas of work. I hypothesize that this demographic shock, by altering the division of labor in society, affected cultural norms about the role of women, with long-run effects on female labor force participation. I provide evidence consistent with this hypothesis by documenting a long-run impact of this historical shock on female labor force participation, with a corresponding effect on general attitudes about gender roles. I show that women belonging to ethnic groups that were more severely affected by the trans-Atlantic slave trade are today more likely to be in the labor force, and that individuals belonging to these groups are characterized by more equal gender-role attitudes. Exploiting within-region and within-village variation, I provide evidence that culture continues to play a role even after controlling for any long-run impact of the slave trade on the external environment, including current labor market opportunities.

1 Introduction

A recent, growing literature links the degree of women's participation in the labor force to the prevailing cultural beliefs about the appropriate role of women in society (Fernandez 2007, Fernandez and Fogli, 2009, Alesina, Giuliano, and Nunn, 2013). In an effort to explain the emergence of these beliefs and why they vary across societies, this paper investigates how a demographic shock to sex ratios can lead to long-run consequences on gender norms and, consequently, on women's participation in the labor force. I hypothesize that a demographic shock that leads to the temporary emergence of a female biased sex

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ratio, altering the division of labor in society as women substitute for the missing men in the activities they used to perform, can affect the prevailing views about the natural role of women. If these cultural beliefs persist as they are transmitted from one generation to the other, this temporary shock can have long-run consequences, affecting women's labor force participation centuries after the end of the initial demographic shock.

To test this hypothesis, I look within the African continent, exploiting the demographic shock caused by the trans-Atlantic slave trade between the fifteenth and the nineteenth century. In the trans-Atlantic slave trade, by far the most important of the slave trades from a numerical viewpoint, male slaves outnumbered females, as they were preferred by plantation owners in the New World for their physical strength. This led to a shortage of men and to the emergence of abnormal sex ratios in the remaining African population (Lovejoy 1989): in the areas most affected, historical estimates suggest the presence of as few as 40-50 men per 100 women (Manning 1990, Thornton 1980). This demographic shock had an impact on the role of women in these regions. Given the shortage of men, women had to substitute for them in the activities they used to perform, taking up areas of work that were traditionally male prerogatives (Thornton 1983, Manning 1990, Lovejoy 2000).

Although sex ratios reverted back to natural levels shortly after the end of the slave trade, the impact of this historical event on the role of women could be long-lasting if cultural beliefs and societal norms were affected by this shock. A number of models have been proposed to explain how cultural beliefs can change and persist. Hazan and Maoz (2002) presents a model in which a woman who works incurs the cost of violating the social norms, which is decreasing in the number of women working in the previous generation. The model presents multiple equilibria, and a society can move from one equilibrium to the other as the initial conditions, namely the number of women working, are changed. Fernandez, Fogli, and Olivetti (2004) focus on the marriage market, suggesting that a man inherits from his mother the social norms about the appropriate role of women, which crucially depend on the working status of the mother. Once in the marriage market, men with working mothers will have more positive views about working women, increasing women's ex ante incentive to invest in market skills. Fernandez (2013) proposes yet another channel explaining cultural change, presenting a model in which beliefs evolve through a process of intergenerational learning.

Irrespective of the specific channel at work, all these models predict that an initial exogenous shock to the division of labor in society can have long run consequences as cultural beliefs about the appropriate role of women change and then persist over time. Examining the shock to the division of labor that followed the demographic shock brought about by the trans-Atlantic slave trade, I investigate whether this historical event has had long-lasting consequences and can explain current variation in women's participation in the labor force within the African continent.

To test my hypothesis I use individual-level data from the Demographic and Health Surveys (DHS) matched with Nunn and Wantchekon (2011)'s ethnicity-level data on the number of slaves taken during the slave trades. Exploiting variation in the degree to which different ethnic groups were affected by the trans-Atlantic slave trade, I show that women belonging to ethnic groups that were more exposed to the trans-Atlantic slave trade are today more likely to be in the labor force. In particular, these women are

more likely to have a high-ranking job. The results are confirmed in regressions focusing on within-region, and even on within-village variation, and thus controlling for any contemporaneous external factor that may be conducive to greater employment of women. These results emphasize the role played by cultural beliefs in explaining variation in women's participation in the labor force, as women belonging to different ethnicities but living today in the same region (village) have a probability of being employed that depend on the extent to which their ancestors were affected by the trans-Atlantic slave trade.

As a placebo test, I examine whether the same effects are found when we look at the number of slaves taken during the Indian Ocean slave trade. As traders during this slave trade did not have a preference for exporting more men, we would expect to find no evidence of an increase in female labor force participation among the descendants of those more exposed to the Indian Ocean slave trade. The results confirm this hypothesis, suggesting that, rather than being a general by-product of a history of slavery, the long-run effect on female labor force participation that I uncover can be rationalized by the demographic shock to sex ratios that was specific to the trans-Atlantic slave trade.

I show that the results are robust to the inclusion of a wide set of controls, including covariates capturing European influence during the colonial period and historical proxies for the initial prosperity and level of political complexity of an ethnic group's political institutions. In addition, following the approach in Nunn and Wantchekon (2011), I use the historical distance of an ethnic group from the coast as an instrument for the exposure to the trans-Atlantic slave trade. As traders purchased slaves at ports to ship them oversea, groups inhabiting areas closer to the coast were more likely to be exposed to the external demand for slaves. The estimates from the IV regressions confirm the OLS estimates. These results reduce possible concerns about the presence of unobserved historical factors that are correlated with both the severity of the trans-Atlantic slave trade and current levels of women's participation in the labor force.

Next, using data from the DHS and from the Afrobarometer Surveys, I analyze whether the long-run effect of the trans-Atlantic slave trade on a woman's likelihood of being employed is accompanied by a more general change in gender-role attitudes. I show that women belonging to ethnic groups that were more severely hit by the trans-Atlantic slave trade are today more likely to participate in household decisions. In addition, individuals belonging to these ethnic groups are less likely to accept domestic violence against women and they are more likely to hold beliefs supporting gender equality in the political sphere.

The findings of this paper are in line with Grosjean and Khattar (2014), which studies the long-run effect of the male biased sex ratio that emerged in Australia by the late eighteenth century as a consequence of the inflow of British convicts. Since the great majority of the convicts were men, in the areas where the convicts were transported sex ratios were more unbalanced and, in turn, individuals living today in these areas have more conservative attitudes towards women working. Interestingly, and contrary to the findings of my paper, the authors show that historical gender imbalance has no impact on general attitudes about the appropriate role of women, but only on outcomes and beliefs specific to women's participation in the labor market.

The hypothesis I put forth in this paper echoes the long literature that has studied the impact of

World War II on women's labor supply. Given the high mobilization rate of men, female labor force participation in the US dramatically increased from 1940 to 1945. Many historians have suggested that this represented a "watershed event" that permanently redefined the role of women in society (William H. Chafe, 1972, p.195). However, a revisionist literature has criticized this view, neglecting the role of World War II in affecting long-run gender roles and women's participation in the labor force¹. The empirical findings concerning these hypotheses are mixed. While Goldin (1991) finds that the effect of WWII on women's labor supply was modest, Goldin and Olivetti (2013) use exogenous variation in mobilization rates across states to uncover a persistent impact on more educated women. Exploiting the same source of variation, Fernandez, Fogli and Olivetti (2004) find a long term effect on women's participation in the labor force operating through the labor market.

This paper contributes also to the literature on the effects of the Africa's slave trade. A growing list of studies have looked at the effect of this historical event on long term development (Nunn 2008), interpersonal trust (Nunn and Wantchekon 2011), the evolution of political authority (Whatley 2012a), ethnic stratification (Whatley and Gillezeau 2011), polygyny (Dalton and Cheuk Leung, 2014, Fenske, 2013, Edlund and Ku, 2013), and conflict (Fenske and Kala 2014), and at the determinants of the supply of slaves (Whatley, 2012b, Fenske and Kala, 2013).

Last, this paper speaks to the empirical literature on the effects of demographic shocks on the marriage market (Abramitzky, Delavande, and Vasconcelos, 2011, Francis, 2011) and on female labor supply (Grossbard-Schechtman and Neideffer 1997, Angrist 2002, Chiappori, Fortin and Lacroix 2002).

The rest of the paper is organized as follows. In Section 2 I discuss the historical background and theoretical framework that motivate my hypothesis. Section 3 describes the data. The empirical results on the relationship between the trans-Atlantic slave trade and women's labor force participation are presented in Section 4. In Section 5, I look at the impact of the trans-Atlantic slave trade on general attitudes about gender roles. Section 6 concludes.

2 Historical Background and Conceptual Framework

2.1 Historical Background

Between the fifteenth and the nineteenth century approximately 12 million slaves were exported from Africa during the trans-Atlantic slave trade. The other three slave trades - the trans-Saharan, Red Sea and Indian Ocean slave trades - accounted for another 6 million slaves. These figures, together with the number of slaves who died during the raids and transportations to the ports of export, translated into severe demographic consequences. Estimates by Patrick Manning (1990, p.171) suggest that Africa's population in 1850 was half of what it would have been in the absence of slavery.

The main destinations of the slaves during the trans-Atlantic slave trade were the plantations of the New World. Given the physical strength necessary to perform work in the plantations, European traders had a preference for male slaves². Lovejoy (2000) writes that European traders had the goal of exporting

¹See Goldin (1991) for a review of these two literatures.

²A British politician, writing about the business of a plantation, pointed out that "the nature of the slave-service in

two males for every female. Consistent with these accounts, the ratio of male to female slaves during the trans-Atlantic trade was about 181:100 between the seventeenth and the end of the nineteenth century (Lovejoy 1989).

These demand considerations dramatically altered the sex ratio in the remaining African population, with the areas more affected by the trans-Atlantic slave trade experiencing a prolonged shortage of men. Figure 1 shows a simulation of the population trajectory in Western Africa - the region more heavily raided - built by Manning (1990) using available data on the size and gender composition of the slave population. The bottom panel shows the volume of exports and two estimates of the dynamics of the Western African population based on a low and a high estimate of population growth respectively, while the top panel presents the corresponding simulations for sex ratios. The estimates suggest that, at the peak of the trans-Atlantic trade at the end of the eighteenth century, there were less than 70 men per 100 women in West Africa. Besides being large in magnitude, the shock was also long-lasting, spanning more than two centuries.

In Angola, the hardest-hit area of the continent, the sex ratio was as low as 40-50 men per 100 women (Thornton 1983). Visitors of this area "would have gotten the impression of villages filled with women and children, with the pre-pubertal girls outnumbering the boys" (Miller 1988, p.163).

During the other slave trades, slaves were taken across the Saharan desert to Northern Africa and from Eastern Africa to the Middle East and India. Slaves buyers in these destinations had a preference for female slaves, who were then employed as concubines and domestic servants (Harris 1971)³. Manning (1990) reports that Eastern Africa, the area most severely hit by these trades, experienced a male biased sex ratio, although the impact was smaller in magnitude and shorter in time.

In the areas hit by the trans-Atlantic slave trade, the emergence of a female biased sex ratio coincided with a more general shock to the role of women. Given the shortage of men, women had to substitute for them in the activities they used to perform. This shock affected both free women and female slaves, for which African demand had increased following the external demand for male slaves. Manning (1990, p. 132) underlines that "in areas where women had traditionally participated in agriculture, their role expanded to that of near total domination of agricultural labor", while in areas where they traditionally did less agricultural labor "the shortage of men pushed women more into commerce than into cultivation". Lovejoy (2000, p.125) writes that in the coastal areas of West Africa female slaves "wove raffia cloth, a craft that traditionally belonged to males elsewhere in the interior. Apparently the shift from a male to a female occupation occurred because of the availability of women".

Thornton (1983) cites the notes taken by Lemos Coelho, a Portuguese resident of Guinea Bissau in those centuries, who writes that women "are the ones who work the fields, and plant the crops, and the houses in which they live, even though small, are clean and bright, and despite all this work they still go down to the sea each day to catch shellfish" (Lemos Coelho 1953, p.178).

A telling example of the activities that women were pushed to undertake is provided by the Army of the West Indies (being chiefly field labor) requires, for the immediate interest of the planter, a greater number of males" (Edwards 1801, p.118).

³An exception to this pattern is represented by the predominant export of males to the plantation islands of the Indian Ocean by French traders starting from the beginning of the eighteenth century.

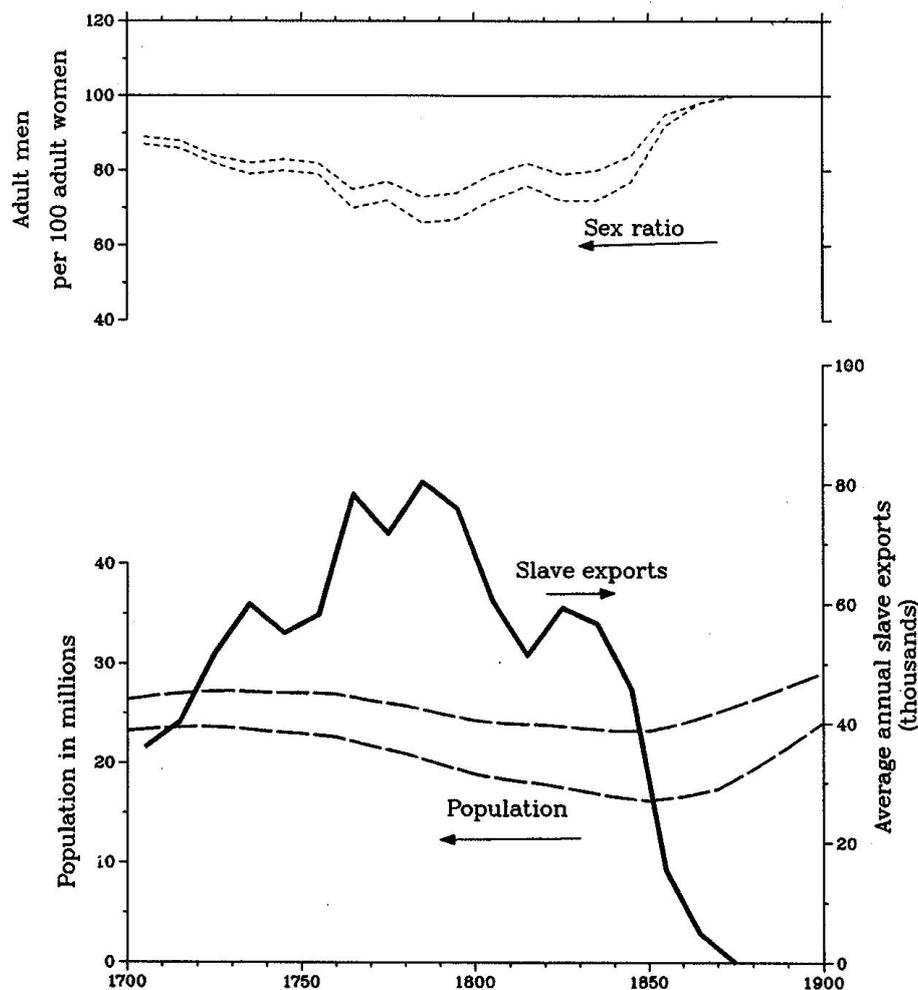


Figure 1: The Demographic Impact of the Trans-Atlantic Slave Trade. Source: Manning (1990)

the Dahomey Kingdom, which in 1727 was reinforced by a regiment made entirely by women. Rather than being a deliberate choice, Goldstein (2003, p.64) suggests that this was due to a severe military shortage, one of the causes of which was that the kingdom "depended on a slave trade that gave preference to selling-off able-bodied men".

Another implication of the relative abundance of women in these regions was the increased incidence of polygyny. Although the relevance of polygyny before the slave trades is not known, several authors have pointed out how the unbalanced sex ratio naturally strengthened this institution (Manning 1990, Lovejoy 1989). However, Fenske (2013) uses micro-level data to show that evidence on the long-run impact of the trans-Atlantic slave trade on polygyny is tenuous⁴.

The trans-Atlantic slave trade represented a severe and long-lasting shock to sex ratios, which in turn was conducive to an increase in the share of work and in the number of activities women had to perform. My analysis tests for the long-term impact of this shock, investigating whether areas that were more

⁴Using the same sample, Dalton and Cheuk Leung (2014) finds a positive long-run impact of the trans-Atlantic slave trade on polygyny, although the results are not robust to the inclusion of country-fixed effects. This is consistent with Fenske (2013), which shows that any long-run impact on polygyny is due to a comparison between Western and Eastern Africa.

severely affected by the trans-Atlantic slave trade are today characterized by a higher participation of women in the labor market.

2.2 Conceptual Framework

As underlined in the previous section, the female biased sex ratio brought about by the trans-Atlantic slave trade led to an increase in the share of work carried out by women. Besides a direct effect due to the need of substituting men in the activities they used to perform, the unbalanced sex ratio could have had an indirect effect through a reduction in the bargaining power of women in the marriage market. Becker (1973, 1974) suggests that the sex ratio prevailing in the marriage market influences intrahousehold decisions, with a rise in the number of women relative to men leading to an increase in women's labor force participation as the relative bargaining power of men increases, an hypothesis supported by empirical evidence (Grossbard-Schechtman and Neideffer 1997, Angrist 2002, Chiappori, Fortin and Lacroix 2002).

As Figure 1 makes clear, sex ratios in Western Africa quickly converged back to the natural level after the end of the slave trade. As a consequence, any evidence on the long-run impact of the trans-Atlantic slave trade on gender roles cannot be explained by a long-lasting effect on sex ratios. To rationalize the evidence on the long-run effects of this historical event, I hypothesize that the demographic shock to sex ratios - and the accompanying shock to women's participation in activities outside the domestic sphere - persistently affected cultural beliefs and norms about the appropriate role of women in society.

A common problem when analyzing the role of culture in economics arises from the difficulty of providing a precise definition for this concept. Nunn (2012) proposes to use a definition taken from evolutionary anthropology, describing culture as a set of heuristics or rules-of-thumb in decision making that arise optimally in presence of costly information acquisition. These set of decision-making heuristics manifest themselves as values and social norms transmitted from one generation to the other.

A recent literature has turned attention to cultural norms as a crucial determinant of female labor force participation. Fernandez (2007) studies second-generation American women and provides evidence that cultural attitudes about the role of women in a woman's country of ancestry positively correlates with her participation in the labor force. Alesina, Giuliano and Nunn (2013) analyze a specific determinant of the emergence of cultural attitudes about gender roles, providing empirical evidence in favor of Boserup's hypothesis that the form of agriculture traditionally practiced in a society had a long-lasting effect on gender roles.

In the contest of my analysis, the effect of the trans-Atlantic slave trade on sex ratios could have had a long-lasting impact if its effect on the participation of women in the labor force translated into a shock to the cultural norms about the role of women in society. In this case, even as the shock to sex ratios died out with the end of the slave trade, social attitudes about women working could have persisted until today, affecting current female labor force participation among the descendants of the populations that were more severely affected by the trans-Atlantic slave trade.

A related question arising from this discussion concerns the mechanisms through which a temporary external factor can affect cultural norms and beliefs in a persistent way. One possible explanation is provided by the model by Guiso, Sapienza and Zingales (2007), where cultural norms can present multiple

equilibria. Hazan and Maoz (2002) propose a model in this spirit to explain the evolution of FLFP in the United States in the twentieth century: in their model, a woman who works incurs the cost of violating the social norms, which is decreasing in the number of women working in the previous generation; the model presents multiple equilibria and a switch from a low to a high level of initial participation leads to the convergence to an equilibrium characterized by high FLFP and equal gender norms. In the context of my hypothesis, the temporary shock to the role of women in the workforce may have led to the movement to a new equilibrium characterized by more equal gender norms.

Fernandez, Fogli and Olivetti (2004) propose another mechanism through which cultural beliefs about the role of women can vary over time. In their model, working mothers transmit to their sons a more positive view about working women, making them more likely to have a working wife later in life. In other words, a man inherits from his mother the social norms about the appropriate role of women, which crucially depend on the working status of the mother. Once in the marriage market, a man with a working mother will find working women more attractive, increasing in turn women's incentive to invest in market skills. A temporary shock to the working status of women during the centuries of the slave trade could therefore have translated into a long-lasting effect on social norms and FLFP through this mechanism.

Fernandez (2013) proposes yet another channel explaining cultural change. In her model, beliefs evolve through a process of intergenerational learning: women observe both a private and a public signal about the costs of working, with the latter being a linear function of the number of women working in the previous generation. The model delivers a coevolution of beliefs and FLFP. Every factor affecting the number of women working in one generation affects labor force participation choices also in the next generation.

The trans-Atlantic slave trade represents a unique historical case-study to analyze the long run consequences of an exogenous change to sex ratios and women's participation in activities outside the domestic sphere. The rest of the paper presents empirical evidence in support of the hypothesis that this temporary shock has led to long-lasting consequences within the African continent.

3 Data Description

To study the long-term impact of the trans-Atlantic slave trade on FLFP and gender roles, I match individual-level data from the DHS and Afrobarometer surveys with ethnic group-level data on the number of slaves exported during the slave trades. This section summarizes the data sources.

3.1 Contemporaneous Data

Data on participation of women in the labor force come from the DHS. I use data from 49 surveys covering 20 countries over the period 1992-2010. I include all the surveys that have data on women's employment status and on the ethnicity of the respondent, and having non missing information for a basic set of controls - namely age, religion, and a variable indicating whether the respondent lives in a urban location

The DHS asks the respondent three questions about her employment status that are of interest for my analysis: the respondent is asked whether she is currently employed, whether she has ever been employed in the last twelve months and, last, whether she works outside the house. I can construct two variables using the information provided by these questions. First, I can build an indicator variable, *FLFP*, that takes value one if the respondent is currently working or she has ever worked in the last twelve months. Since the DHS does not provide information on whether an unemployed woman is seeking a job, women who have been unemployed for more than a year are coded as not being in the labor force, even though standard definitions of labor force participation include unemployed individuals.

I build a second indicator variable, *Work Outside*, that takes value one if the respondent works outside the house and zero if she works at home or is unemployed. This variable provides a robustness check, since some women could report being employed since they carry out domestic work inside their own house, but we would like to list these respondents as not belonging to the labor force. A drawback of this variable is that the corresponding question is asked only to a subset of the respondents, resulting in a smaller sample size.

The DHS provides information on the occupation of the respondent. In order to investigate the effect of the slave trade on women's occupation, I build five indicator variables. The variable *Agriculture* takes value one if the woman is employed in the agricultural sector; the variable *Manual Work* considers manual occupations; the variable *Clerical* considers women performing clerical work; the variable *Household/Domestic* considers women working as domestic servants; finally, the variable *High Ranking* considers women having relatively higher ranking jobs, namely women working in the sales and service sectors, or as professionals or managers. I also investigate the effect on women's educational attainment: the variable *Education* has a categorical nature and takes values from 0 to 3, corresponding respectively to no education, primary, secondary, and higher education.

A subset of the DHS surveys presents questions that are useful measures of attitudes about gender roles. The questions capture women's participation in a set of household decisions, ranging from health care to large and daily household purchases. In addition, another set of questions asks respondents whether they think there are situations in which a husband is justified in beating his wife ⁶. A list of countries for each question is reported in Table A2.

The 2005 Afrobarometer surveys provide another useful measure of attitudes about gender roles, measuring the respondent's beliefs about the appropriate role of women in politics. These surveys cover 17 countries, which are listed in Table A2.

3.2 Historical Data

The data on the number of slaves taken from each African ethnic group are from Nunn and Wantchekon (2011) and cover the trans-Atlantic and the Indian Ocean slave trades - the only two slave trades for

⁵One additional survey - Rwanda 1992- responds to these criteria, but the country was not affected by the slave trade.

⁶For some of the surveys, corresponding male surveys were conducted: when I study the impact of the slave trade on the beliefs about domestic violence, I include also the male surveys in my analysis.

which historical sources provided detailed enough data to build reliable estimates. The dataset uses Peter Murdock (1959)'s classification of African ethnic groups and provides information for 841 ethnic groups. Figure 2 shows the spatial distribution of the number of slaves taken from each ethnic group during the trans-Atlantic slave trade. While Western Africa represented the greatest source of slaves, the Eastern coast and Madagascar were also affected⁷.

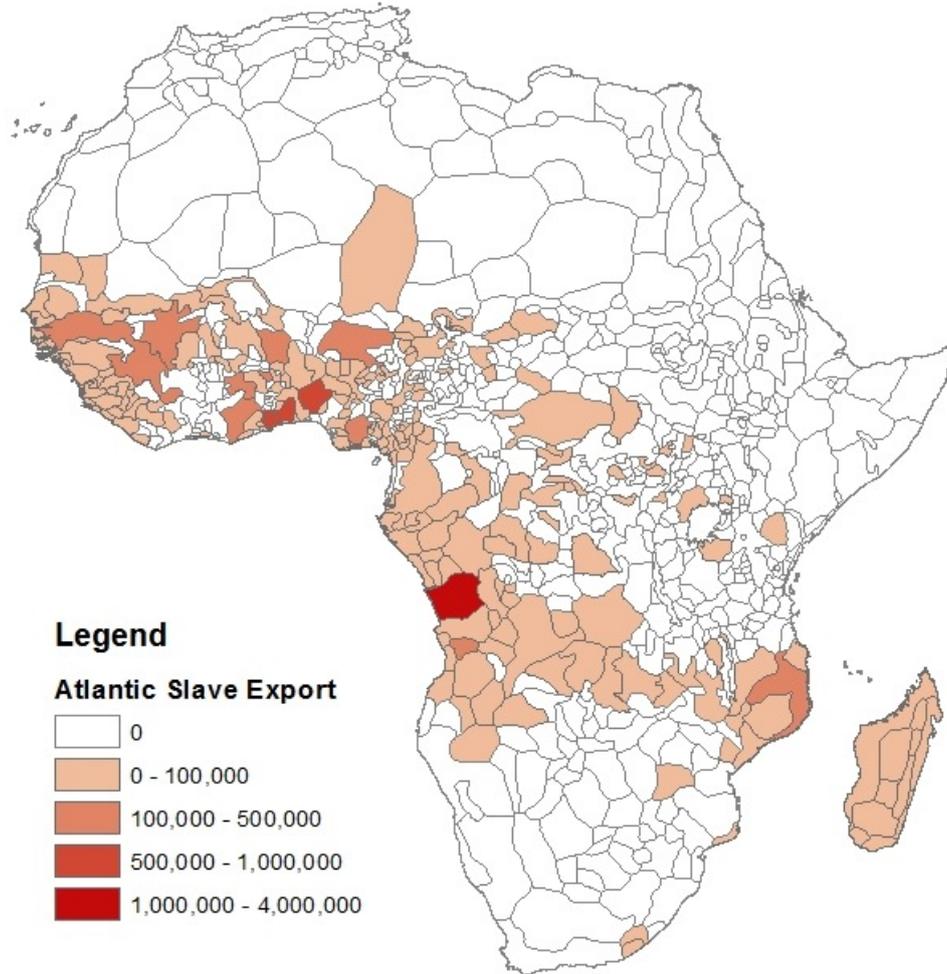


Figure 2: Trans-Atlantic Slave Trade

I follow Nunn and Wantchekon (2011) and, in absence of compelling population estimates for the period before the slave trade, I normalize the number of slaves taken from an ethnic group by the area of land historically inhabited by the group. In addition, I take the natural log of one plus these normalized measures to reduce the skewness in the slave trade variables.

One important step was the matching between the ethnic groups from the slave trades dataset and the ethnicity of the respondents in the DHS. Of the 518 different ethnicities in the DHS, I was able to correctly match 409 of them with the ethnic groups in the slave trade dataset⁸. The matching was not

⁷The map with the geographic boundaries of the ethnic groups was drawn by Murdock (1959) and refer to the boundaries in the late nineteenth century.

⁸The matching was performed using online sources to correctly link the ethnicity indicated in the surveys with the name of the ethnic group following Murdock's classification. One of the most useful sources of information was the Joshua Project

successful for 109 ethnic groups, typically because the respondent lists her nationality as ethnicity: these individuals are therefore not included in my analysis.

For the Afrobarometer sample no matching procedure was required. I use the same dataset as Nunn and Wantchekon (2011), following their matching between the ethnicities in the surveys and the Murdock’s ones.

In my analysis, I use a wide array of historical and geographical controls varying at the ethnic group level: urbanization in 1400, average malaria presence in the land historically inhabited by the ethnic group, the number of jurisdictional hierarchies beyond the local community in precolonial period, precolonial settlement patterns, a measure of integration with the colonial railway network, a variable capturing the contact with European explorers in the precolonial period, the number of missions in the land of the ethnic group in the colonial period, the number of conflicts between 1400 and 1700 in the area inhabited by the ethnic group, historical intensity of agriculture and reliance on fishing. I describe these controls in greater details as they are introduced.

Table A1 in the appendix presents summary statistics for the main variables in the analysis.

4 The Long-Run Impact On Labor Force Participation: Empirical Results

In this section I explore the relationship between the trans-Atlantic slave trade and current female labor force participation in Africa. After discussing the empirical specifications, I present the OLS estimates. I then use an instrumental variable strategy to address the issue of potential selection of an ethnic group into the slave trade.

4.1 Empirical Specification

I begin my analysis by exploring the relationship between the number of slaves taken from the ethnic group of the respondent during the trans-Atlantic slave trade and her current employment status.

I estimate the following baseline equation:

$$y_{i,e,c} = \alpha_c + \beta \text{Trans-Atlantic Trade}_e + \gamma \text{Indian Ocean Trade}_e + X'_{i,e,c} \Delta + Z'_e \Omega + \varepsilon_{i,e,c} \quad (1)$$

where i indexes a female individual who belongs to ethnic group e and lives in location c .

$\text{Trans-Atlantic Trade}_e$ and $\text{Indian Ocean Trade}_e$ are the natural log of the number of slaves taken from an ethnic group during the trans-Atlantic and Indian Ocean slave trades respectively, normalized by the area of land historically inhabited by the group. The coefficient of interest is β , which captures the effect of the trans-Atlantic slave trade on the dependent variable. The inclusion of $\text{Indian Ocean Trade}_e$ is intended to provide a falsification test: if my hypothesis is correct, this measure should not have a positive impact on the outcome variables, since the Indian Ocean slave trade did not lead to a shortage of men in the areas affected⁹.

website (<http://www.joshuaproject.net/>).

⁹If anything, given that during the Indian Ocean slave trades the majority of slaves were females, we could find a

I control for a set of covariates at the individual level ($X_{i,e,c}$) and at the ethnic group level (Z_e). The individual-level controls are age, age squared, a dummy variable equal to one if the individual lives in an urban location, an indicator variable that equals one if the respondent is christian and an indicator variable taking value one if the respondent is muslim.

A crucial concern for the causal interpretation of the OLS estimates is that ethnic groups that were more severely affected by the trans-Atlantic slave trade may be different from other groups in terms of an omitted variable that is also correlated with current women’s employment status. If groups that had more equal gender norms were more likely to be affected by the Trans-Atlantic slave trade, this would translate in upward biased estimates of current female labor force participation. The ethnicity-level controls are meant to alleviate these concerns. The choice of the controls is inspired by Nunn and Wantchekon (2011). I include four variables capturing the initial prosperity of an ethnic group. First, to account for the initial disease environment, I control for the malaria ecology of the land that was inhabited by the ethnic group: the variable is built using data from Kiszewski et al. (2004) and measures the average Malaria Stability Index in the land of the ethnic group. Second, to account for precolonial level of urbanization, I include a dummy variable taking value one if, in 1400, there was a city with more than 20,000 inhabitants on the land inhabited by the ethnic group¹⁰. Third, using data from Murdock (1967)’s *Ethnographic Atlas*, I include a variable measuring the number of jurisdictional hierarchies beyond the local community, which captures the level of complexity of an ethnic group’s political institutions¹¹. Finally, I also control for an additional proxy for initial population density: using again data from the *Ethnographic Atlas*, I include a set of dummies for precolonial settlement patterns, ranging from fully nomadic to complex settlements.

Groups more affected by the slave trade could have been differentially influenced by the European colonizers and this influence could translate into a higher level of female labor force participation today. For this reason, I control for an indicator variable that equals one if a part of the railway network built by the Europeans was on the land of the ethnic group. I also include a dummy that takes value one if a European explorer traveled in the land of the ethnic group¹². Last, I control for a variable measuring the number of religious missions per square kilometer of an ethnic group’s land during the colonial period¹³.

Data from Besley and Reynal-Querol (2014) allow me to control for an additional potential omitted variable, namely historical warfare in the precolonial period. Looking within Africa, Besley and Reynal-Querol (2014) find that a history of precolonial conflict is associated with underdevelopment and lower levels of trust today, which could in turn be associated with women’s employment status and gender negative impact of the Indian Ocean slave trade on women’s participation in the labor force. If the same channels described in Grosjean and Khattar (2014) are at work, a shortage of females should lead to a long-run decline in women’s employment. However, historical records show that the Indian Ocean slave trade was dramatically less severe in comparison with the Trans-Atlantic slave trade, as it is also clear from the magnitudes of the two slave trade variables in Table A1.

¹⁰The data on the locations of the cities is from Chandler (1987).

¹¹The classification of ethnic groups in the *Ethnographic Atlas* does not always coincide with that in Murdock (1959)’s map, which is the one I use in my dataset. I therefore match the two datasets using the matching information provided by James Fenske (available at <http://www.jamesfenske.com/>). Some ethnic groups in Murdock (1959) correspond to more than one group in the *Ethnographic Atlas*: for these cases I assign to the ethnic group the median value among those of the groups in the *Ethnographic Atlas*.

¹²The data for these two variables come from Century Company (2011).

¹³Information on missions come from Roome (1924).

norms. To account for the possibility that ethnic groups that were involved in conflicts in the precolonial period were more severely affected by the slave trade, I include as control the number of conflicts between 1400 and 1700 in the area inhabited by the ethnic group.

Finally, I include two variables from the *Ethnographic Atlas* to account for an ethnic group’s historical structure of the economy, which may have affected the number of slaves taken from the group and could be correlated with current outcomes. Specifically, I control for a set of fixed effects capturing the intensity of agriculture in the precolonial period and for an ethnic group’s historical reliance on fishing.

In the baseline specification I include country fixed effects, α_c , to take into account country-level institutional factors that could potentially affect current labor force participation and also depend on the history of the slave trade. Additionally, in order to control for unobservable local characteristics, I employ two additional specifications, the first including region fixed effects and the second including enumeration area fixed effects¹⁴. This allows me to compare individuals of different ethnicities living in the same region or in the same village, exploiting the fact that individuals of different ethnic groups have relocated over the centuries and therefore today we find respondents of different ethnic origins living in the same region and even in the same village. These specifications have the additional advantage of isolating the mechanism of cultural persistence, since I am controlling, among other things, for any impact of the slave trade on the socio-economic characteristics of the respondent’s location. A location that experienced the slave trade could have developed markets and local institutions that in turn are conducive to a greater participation of women in the labor force, but relying on this finer variation allows one to isolate the impact of an individual’s ethnic origin while keeping constant the current external environment¹⁵.

Finally, in order to account for potential within-group correlation of the residuals, I cluster the standard errors at the ethnic group level.

4.2 OLS Results

Table 1 presents the OLS estimates of the effect of the trans-Atlantic slave trade on today’s women’s employment status. Columns 1 to 4 present the specifications with *FLFP* as dependent variable, while in columns 5 to 8 the dependent variable is *Work Outside*. The variable *Trans-Atlantic Trade* has a standard deviation of about one in all the specifications, therefore the corresponding coefficients can be interpreted as the percentage increase in the dependent variable for a one standard deviation increase in the trans-Atlantic slave trade measure.

The coefficients in columns 1 and 2, where I include country fixed effects, are in line with my hypothesis: a one standard deviation increase in the trans-Atlantic slave trade export measure translates into an increase in *FLFP* ranging from 1.8 to 2.8 percentage points, depending on the specification¹⁶. These

¹⁴An enumeration area is a unit created for the population census in a country. This corresponds to a village or a city. In the rest of the paper, I use the generic term village to indicate an enumeration area.

¹⁵For countries that have multiple rounds of surveys, I use country-survey, region-survey and village-survey fixed effects. For ease of exposition, I refer to country, region, and village fixed effects throughout the paper, but these should always be intended as country-survey, region-survey and village-survey pairs. In the main specifications, those with the variable *FLFP* as dependent variable, there are 323 region-survey pairs (with an average of 7 groups and a median of 6 groups per region-survey) and 17,344 village-survey pairs (with an average of 2.5 groups and a median of 2 groups per village-survey).

¹⁶As a comparison, Alesina, Giuliano and Nunn (2013)’s individual-level estimates imply an average impact of traditional

Table 1: OLS estimates, the effect of the slave trade on female labor force participation

	FLFP	FLFP	FLFP	FLFP	Work Outside	Work Outside	Work Outside	Work Outside
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trans-Atlantic trade	0.018** (0.008)	0.028*** (0.007)	0.020*** (0.006)	0.018*** (0.005)	0.028* (0.015)	0.055*** (0.012)	0.029*** (0.008)	0.018*** (0.006)
Indian Ocean trade	-0.038 (0.026)	-0.033 (0.030)	0.007 (0.016)	-0.010 (0.012)	-0.033 (0.036)	-0.023 (0.041)	-0.077** (0.037)	-0.030** (0.013)
Observations	425,757	353,061	275,033	353,061	307,427	260,221	189,579	260,221
Baseline controls	YES	YES	YES	YES	YES	YES	YES	YES
Historical controls	NO	YES	YES	YES	NO	YES	YES	YES
Fixed Effects	Country	Country	Region	Village	Country	Country	Region	Village
Number of ethnicities	200	150	142	150	171	132	108	132
R^2	0.160	0.176	0.214	0.332	0.113	0.138	0.182	0.301

OLS estimates. The unit of observation is a female respondent. Standard errors in parentheses, adjusted for clustering at the ethnicity level. Trans-Atlantic trade is the natural logarithm of one plus the number of slaves exported during the Trans-Atlantic slave trade normalized by the area of land historically inhabited by the ethnic group. Indian Ocean trade is the natural logarithm of one plus the number of slaves exported during the Indian Ocean slave trade normalized by the area of land historically inhabited by the ethnic group. The baseline controls are: age, age squared, an indicator for the respondent being Muslim, an indicator for the respondent being Christian, an indicator for the respondent living in an urban location (except in the specifications including village fixed effects). The historical controls are: an indicator for urbanization in 1400, average malaria presence, the number of jurisdictional hierarchies beyond the local community in precolonial period, fixed effects for precolonial settlement patterns, an indicator for integration with the colonial railway network, an indicator for a precolonial contact with European explorers, the number of missions per square kilometer during the colonial period, the number of conflicts between 1400 and 1700 in the area inhabited by the ethnic group, fixed effects for historical intensity of agriculture, historical reliance on fishing. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

effects correspond to 3.8%-5.8% of a standard deviation in the variable *FLFP*. The results are robust to the use of *Work Outside* as dependent variable in columns 5 and 6.

The magnitude of the coefficients gradually decreases in columns 3-4 and 7-8, as I include region fixed effects and village fixed effects, but the coefficients remain economically and statistically significant¹⁷. This is consistent with the trans-Atlantic slave trade having an effect on the values and beliefs of the individuals whose ethnic groups were more affected.

Finally, the results of Table 1 confirm that, in line with the history of the Indian Ocean slave trade, this slave trade did not have an effect on the long-run evolution of gender norms. The coefficients on the variable *Indian Ocean Trade* are generally statistically insignificant; if anything, a greater exposure of an ethnic group to the Indian Ocean slave trade is associated with a decrease in women's employment in some specifications, consistent with the fact that a majority of women were exported during this slave trade. The results suggest that, rather than being a general byproduct of an ethnic group's history of slavery, the long run increase in women's labor force participation in columns 1-4 of Table 1 is the effect of plough use on FLFP of 4 percentage points.

¹⁷The specifications with region fixed effects present a smaller number of observations, since around 78,000 observations have missing information on the region where the respondent lives. For these observations, I know which respondents live in the same village (enumeration area), but I do not know in which region that village is located.

the unbalanced sex ratio generated by the slavers' preference for female slaves during the trans-Atlantic slave trade.

As underlined in the previous sections, historians have pointed to the strengthening of polygyny as a further implication of the relative abundance of women in the regions most affected by the trans-Atlantic slave trade. While I do not include information on whether a woman is in a polygynous relation in the regressions, given the potential post-treatment nature of this control, as a robustness check I show in Table A3 in the appendix that the results are not affected by the inclusion of this variable¹⁸.

The specifications with region and village fixed effects control for potential contemporaneous external factors that might be conducive to a greater participation of women in the labor force, such as women's local employment opportunities. Women belonging to different ethnicities, but living today in the same location and thus facing the same opportunities in the labor market, have different probabilities of being employed that depend on the extent to which their ancestors experienced the trans-Atlantic slave trade.

While I can rule out current conditions in the labor market as the factor explaining the results of Table 1, several channels of persistence could be responsible for the effect I find. One potential interpretation is that regions that experienced the trans-Atlantic slave trade more severely remained predominantly agricultural-based. This would be consistent with Nunn (2008)'s finding that the slave trade led to economic underdevelopment and with Nunn and Wantchekon (2011)'s description of the culture of mistrust generated by slavery, which, in turn, could have hindered commerce in these areas. At the same time, the almost complete absence of plough agriculture in Sub-Saharan Africa has led to an involvement of women in the fields that has been historically greater than in other parts of the developing world¹⁹. One could then hypothesize that the increase in FLFP found in Table 1 can be rationalized by an increase in the likelihood that a woman is employed in the agricultural sector, since her female ancestors had traditionally worked more in the fields as a consequence of the greater reliance on agriculture in the ethnic groups that were most severely hit by the trans-Atlantic slave trade.

To investigate this hypothesis, in Table 2 I turn to the analysis of the impact of the slave trade on the likelihood that a woman is employed in a specific type of occupation. I focus on the specifications with village fixed effects, but Table A4 in the appendix presents the results with country and region fixed effects²⁰. Contrary to what hypothesized in the above discussion, the estimates suggest that the increase in a woman's probability of being employed can be entirely rationalized by an increase in the likelihood that she has a relatively higher ranking occupation, namely a job in the sales or service sector, or as professional or manager. Consistent with this result, column 6 shows that women belonging to ethnic groups that were more severely affected by the Trans-Atlantic slave trade have a higher level of education.

The results suggest that the demographic shock generated by the trans-Atlantic slave trade had deep and persistent effects on the role of women in society. The need of relying on women in order to carry

¹⁸The variable is a dummy that takes value one if the respondent has one or more co-wives.

¹⁹As of 2007, female employment in the agricultural sector as a share of total employment in agriculture was 43.7 percent in Sub-Saharan African, in comparison to 32.3 percent in Middle East and North Africa, 21 percent in Latin America and the Caribbean, 36.3 in South Asia, and 42.3 percent in South East Asia and the Pacific (ILO: Global Employment Trends Brief, January 2007).

²⁰To save on space, I do not present the specifications without historical controls or including an indicator for polygyny. These results are qualitatively identical, and they are available upon request.

Table 2: OLS estimates, the effect of the slave trade on occupations

	Agriculture	High Ranking	Manual Work	Clerical	Household/ Domestic	Education
	(1)	(2)	(3)	(4)	(5)	(6)
Trans-Atlantic trade	-0.005 (0.010)	0.029*** (0.006)	-0.003 (0.004)	0.001 (0.001)	-0.002 (0.002)	0.023* (0.013)
Indian Ocean trade	-0.018 (0.036)	0.007 (0.020)	0.020** (0.010)	0.007** (0.003)	-0.004 (0.006)	0.014 (0.040)
Observations	346,026	346,026	346,026	346,026	346,026	352,204
Baseline controls	YES	YES	YES	YES	YES	YES
Historical controls	YES	YES	YES	YES	YES	YES
Fixed effects	Village	Village	Village	Village	Village	Village
Number of ethnicities	150	150	150	150	150	150
R^2	0.501	0.268	0.203	0.104	0.148	0.539

OLS estimates. The unit of observation is a female respondent. Standard errors in parentheses, adjusted for clustering at the ethnicity level. Trans-Atlantic trade and Indian Ocean trade are described in Table 1. Baseline controls and historical controls are listed in Table 1. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

out activities that before the slave trade were performed by males had an impact on beliefs about the appropriate division of labor in society. As these beliefs were transmitted across generations, we find that the descendants of those most exposed to the trans-Atlantic slave trade are today more likely to be employed, in particular are more likely to have a higher-ranking job, consistently with the idea that women belonging to these ethnic groups face less cultural barriers in the labor market.

4.3 Instrumental Variable Strategy

While the previous section shows that the results are robust to the inclusion of a wide array of observable historical variables, there could still be unobservable omitted factors that are correlated with both an ethnic group's exposure to the slave trade and current women's labor force participation. A priori, the direction of the potential omitted variable bias is not clear. Consider for instance the possibility that ethnic groups that were historically characterized by higher involvement in warfare may have experienced the slave trade more severely. On the one side, as more powerful military societies were ex ante more likely to be male dominated, this could drive down the OLS estimates towards zero. On the other side, women belonging to these groups may have been historically more likely to work since they had to substitute for the men who were involved in conflicts, thus driving the results away from zero.

To address these concerns, in this section I rely on the instrumental variable strategy suggested by Nunn and Wantchekon (2011). Traders purchased slaves at ports to ship them to the New World, making groups inhabiting areas closer to the coast more likely to be exposed to the external demand for slaves. Therefore I use an ethnic group's historical distance from the coast as instrument for the exposure to

the trans-Atlantic slave trade²¹. One possible caveat is that the historical distance from the coast of a respondent's ethnic group can be correlated with her current distance from the coast, which in turn could affect labor force participation today, thus violating the exclusion restriction. For this reason, I include region or village fixed effects in the IV specifications. The identification assumption is that, after controlling for a set of observable historical variables and focusing on within-region (or within-village) variation, the historical distance from the coast of a respondent's ethnic group affects women's labor force participation today only through its effect on the exposure to the trans-Atlantic slave trade of the respondent's ancestors.

Table 3 presents the IV estimates for the impact of the slave trade on female labor force participation. I continue to present also the coefficients on the Indian Ocean slave trade variable, but this variable is not instrumented, as I have only one instrument for two endogenous variables. Therefore, in this section we can no longer interpret the results for the Indian Ocean slave trade measure as a falsification test for the hypothesis under study. The Kleibergen-Paap F statistic on the excluded instrument confirms that the instrument is a strong predictor of the exposure to the trans-Atlantic slave trade, as places further from the coast were less likely to be affected. Most importantly, the second stage estimates confirm the OLS results: women belonging to groups that were more severely targeted by the trans-Atlantic slave trade are today more likely to be employed.

The IV estimates are very similar to the OLS estimates, a feature that is shared by the results in Nunn and Wantchekon (2011). This is reassuring, suggesting that selection into the slave trade was likely not a major factor during the trans-Atlantic slave trade, which instead crucially depended on external demand considerations.

When we turn to the results on the likelihood that a woman has a specific occupation (Table A5 in the appendix), the IV estimates on the occupational dummies are in line with the OLS estimates, although the coefficients on the dummy *High Ranking* are no longer statistically significant at conventional confidence level.

²¹Data on ethnic groups' distance from the coast are from Nunn and Wantchekon (2011). The variable is built using Murdock (1959)'s map of the historical borders of African ethnic groups, and it measures the distance of an ethnic group's centroid to the closest point on the coast.

Table 3: IV estimates, the effect of the slave trade on female labor force participation

	FLFP	FLFP	Work Outside	Work Outside
	(1)	(2)	(3)	(4)
<i>Second stage: dependent variable is FLFP or Work Outside</i>				
Trans-Atlantic Trade	0.033*** (0.011)	0.018* (0.010)	0.070*** (0.017)	0.021** (0.011)
Indian Ocean Trade	0.006 (0.015)	-0.010 (0.012)	-0.078** (0.032)	-0.031** (0.013)
R^2	0.092	0.093	0.046	0.040
<i>First stage: dependent variable is Trans-Atlantic Trade</i>				
Historical distance from coast	-0.0019*** (0.0003)	-0.0019*** (0.0003)	-0.0021*** (0.0004)	-0.0020*** (0.0003)
Observations	275,033	352,548	189,579	259,834
Baseline controls	YES	YES	YES	YES
Historical controls	YES	YES	YES	YES
Fixed effects	Region	Village	Region	Village
Number of ethnicities	142	150	108	132
K-P F-stat	45.15	47.84	35.23	42.74
R^2	0.355	0.361	0.373	0.380

IV estimates. Second stage estimates in the top panel, and first stage estimates in the bottom panel. The unit of observation is a female respondent. Standard errors in parentheses, adjusted for clustering at the ethnicity level. Trans-Atlantic trade and Indian Ocean trade are described in Table 1. Baseline controls and historical controls are listed in Table 1.

*** p<0.01, ** p<0.05, * p<0.1

5 The effect of the Trans-Atlantic Slave Trade on Gender-Role Attitudes

In the last section I have presented evidence that women belonging to ethnic groups that were more severely affected by the trans-Atlantic slave trade are today more likely to be part of the labor force. In this section I present evidence consistent with the fact that this historical shock has affected not only attitudes about the role of women in the labor market but also general individual values and beliefs about gender roles.

The DHS does not ask a specific question to directly assess an individual's belief about the role of women in the labor market²². However, the respondents are asked a set of questions that capture their degree of acceptance of unequal gender norms. In particular, the respondent is asked whether a husband is justified in beating his wife in the case she goes out without telling him, if she neglects the children, if she argues with the partner, if she refuses to have sex, or if she burns the food. I summarize this set of questions building a variable capturing the share of questions for which the respondent answers that, in that specific case, violence against a wife is justified²³. For a subset of the countries, a corresponding male survey was carried out and male respondents were asked the same set of questions. I include also these observations in the analysis and I add an indicator variable for whether the respondent is a female to control for potential differential effect across genders.

I additionally analyze a woman's degree of participation to household decisions, looking at a group of questions asking the respondent whether she participates in a set of household decisions, namely her own health care, large household purchases, daily household purchases, and visits to family and friends²⁴. I summarize these questions building a variable that records the share of questions for which the respondent answers that she has a say in the decision²⁵.

Last, I use data from the 2005 Afrobarometer Surveys to analyze whether we find a long run impact of the trans-Atlantic slave trade on beliefs about the ability of women in politics. The surveys ask the respondent to indicate, between two statements, which one is closest to his/her view. The two statements are "Men make better political leaders than women, and should be elected rather than women" and "Women should have the same chance of being elected to political office as men". For both questions, the respondent could choose between four possible answers: agree very strongly with statement 1, agree with statement 1, agree with statement 2, agree very strongly with statement 2. A number from 1 to

²²For instance, in the *World Value Survey*, respondents are asked to express their view about the statement "When jobs are scarce, men should have more right to a job than a woman".

²³Since the answer to some of these questions can be missing for some respondent, this variable should be intended as the share of questions, among the questions for which an answer was provided, for which the respondent said violence is justified.

²⁴An additional question asks whether the woman participates in the decision about what to cook. However, this question is arguably not relevant to capture women empowerment, as this decision traditionally pertains to women in societies where women's role is confined within the house.

²⁵For each question, the respondent has a say in the decision either if she takes the decision alone, or if she takes it together with her partner or another member of the household. Since the answer to some of these questions can be missing for some respondent, this variable should be intended as the share of decisions for which the woman has a say among the decisions for which we have non-missing information.

Table 4: OLS estimates, the effect of the slave trade on gender-role attitudes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Share	Share	Share	Share	Share	Share	Women
	Decisions	Decisions	Decisions	Violence	Violence	Violence	Leaders
Trans-Atlantic Trade	0.031*** (0.008)	0.008* (0.004)	0.008** (0.003)	-0.019*** (0.007)	-0.010* (0.006)	-0.005** (0.003)	0.097*** (0.026)
Indian Ocean Trade	0.026 (0.024)	0.014 (0.015)	-0.006 (0.012)	-0.018 (0.025)	-0.015 (0.015)	0.001 (0.010)	0.228*** (0.067)
Observations	199,428	171,597	199,428	303,679	275,927	303,679	18,085
Baseline controls	YES	YES	YES	YES	YES	YES	YES
Historical controls	YES	YES	YES	YES	YES	YES	YES
Fixed effects	Country	Region	Village	Country	Region	Village	Country
Number of ethnicities	132	130	132	138	136	138	160
R^2	0.226	0.262	0.364	0.207	0.239	0.353	0.114

OLS estimates. The unit of observation is a female respondent in columns 1-3, and a respondent (both females and males) in columns 4-7. Standard errors in parentheses, adjusted for clustering at the ethnicity level. Trans-Atlantic trade and Indian Ocean trade are described in Table 1. Baseline controls and historical controls are listed in Table 1.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

4 is attached to the four answers, therefore a higher value of the variable *Women Leaders* corresponds to a belief reflecting an attitude towards more gender equality in the political sphere. Since the sample is composed of both female and male respondents, besides the usual individual and historical controls, I include a gender dummy²⁶. I focus only on within-country variation, as the much more limited sample size does not allow to estimate regressions with region or village fixed effects with sufficient statistical power.

This group of measures provides a comprehensive overview of women’s empowerment and of attitudes about gender roles. If the degree of women’s participation in the labor force evolve together with cultural beliefs reflecting gender equality, we should expect a long-run impact of the trans-Atlantic slave trade on these variables.

The hypothesis is confirmed by the results of Table 4, where we find a statistically significant impact of the trans-Atlantic slave trade export measure across all specifications. Once again, the magnitude of the coefficients decreases as region and village fixed effects are introduced. However, even when we restrict the analysis to individuals facing the same external environment, the trans-Atlantic slave trade continues to have an effect, suggesting an impact on the cultural beliefs of the descendants of the individuals that experienced the more severe demographic shock.

In particular, a greater impact of the trans-Atlantic slave trade among the respondent’s ancestors translates into an increase in the share of household decisions to which a woman participates, into a decrease in the share of circumstances for which domestic violence is deemed acceptable, and into an

²⁶The Afrobarometer dataset includes a comprehensive set of religion fixed effects, which I include in lieu of the Christian and Muslim indicators.

increase in the likelihood that a respondent agrees with the statement that women should have the same chance of being elected to political office as men.

The only coefficient that is not in line with the hypothesis is that on the Indian Ocean slave trade measure in column (7). We find a positive and significant impact on the variable *Women Leaders*. The reasons for this result remain unclear, especially since the limited sample does not allow to convincingly test whether the relationship maintains its significance when we exploit within region or within village variation.

These results are confirmed when I instrument the trans-Atlantic slave trade export measure with an ethnic group's historical distance from the coast (see Table 5).

The analysis of this section provides evidence that the trans-Atlantic slave trade had a long-run effect not only on the level of female participation in the labor force, but also on cultural beliefs about gender roles. Taken together, these results suggest a coevolution of cultural beliefs and women's participation in the labor force, both of which were affected by the historical shock to sex ratios brought about by the trans-Atlantic slave trade.

Table 5: IV estimates, the effect of the slave trade on gender-role attitudes

	(1)	(2)	(3)	(4)	(5)
	Share	Share	Share	Share	Women
	Decisions	Decisions	Violence	Violence	Leaders
<i>Second stage: dependent variable is an individual values measure</i>					
Trans-Atlantic Trade	0.030**	0.018***	-0.017	-0.020***	0.137**
	(0.014)	(0.006)	(0.010)	(0.007)	(0.058)
Indian Ocean Trade	0.014	-0.006	-0.015	0.002	0.226***
	(0.018)	(0.012)	(0.015)	(0.010)	(0.069)
R^2	0.074	0.084	0.039	0.027	0.041
<i>First stage: dependent variable is Trans-Atlantic Trade</i>					
Historical distance	-0.0019***	-0.0022***	-0.0017***	-0.0020***	-0.0015***
from coast	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Observations	171,597	199,058	275,927	303,375	18,085
Baseline controls	YES	YES	YES	YES	YES
Historical controls	YES	YES	YES	YES	YES
Fixed effects	Region	Village	Region	Village	Country
Number of ethnicities	130	132	136	138	160
K-P F-stat	54.84	53.22	39.39	43.65	20.55
R^2	0.446	0.435	0.383	0.370	0.431

IV estimates. Second stage estimates in the top panel, and first stage estimates in the bottom panel. The unit of observation is a female respondent in columns 1-3, and a respondent (both females and males) in columns 4-7. Standard errors in parentheses, adjusted for clustering at the ethnicity level. Trans-Atlantic trade and Indian Ocean trade are described in Table 1. Baseline controls and historical controls are listed in Table 1.

*** p<0.01, ** p<0.05, * p<0.1

6 Conclusions

The Africa's slave trade was a crucial event in African history. Among the many effects of the slave trade, I have focused on its demographic impact on sex ratios. Since a great majority of men were taken during the trans-Atlantic slave trade, skewed sex ratios emerged in the population of the regions more severely affected by that slave trade. Historical accounts show that the shortage of men pushed women into the labor force and led women into taking up new areas of work. I document a long-run impact of this historical shock on female labor force participation, with a corresponding effect on general attitudes about gender roles.

Using individual-level data, I show that women belonging to ethnic groups that experienced the trans-Atlantic slave trade more severely are today more likely to be employed. In particular, they are more likely to have a high-ranking occupation. Additionally, I provide evidence that this long-lasting effect is accompanied by more equal gender norms, as measured by women's participation in household decisions and by beliefs about the acceptability of domestic violence and about the appropriate role of women in the political sphere. These results are present even when we restrict attention to within-region and within-village variation, suggesting that culture continues to play a role even after controlling for any long-run impact of the slave trade on the external environment, including current labor market opportunities.

A recent literature has documented the importance of culture in explaining women's participation in the labor force. This paper provides evidence in favor of one particular channel through which these cultural beliefs can be affected, documenting how a demographic shock can have persistent effects on gender-role attitudes that are tangible centuries after the end of the initial shock.

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7 Data Appendix

Table A1: Summary statistics

	Mean	Std. Dev.	Min	Max	N
<i>DHS, females only sample:</i>					
Trans-Atlantic trade	0.556	0.991	0	3.656	425,942
Indian Ocean trade	0.036	0.156	0	0.999	425,942
FLFP	0.644	0.479	0	1	425,757
Work Outside	0.436	0.496	0	1	307,427
Agriculture	0.306	0.461	0	1	417,888
High Ranking	0.25	0.433	0	1	417,888
Manual Work	0.071	0.256	0	1	417,888
Clerical	0.01	0.098	0	1	417,888
Household/domestic	0.012	0.111	0	1	417,888
Education	0.778	0.825	0	3	425,933
Share Decisions	0.404	0.399	0	1	244,552
<i>DHS, females and males sample:</i>					
Trans-Atlantic trade	0.568	0.99	0	3.656	551,781
Indian Ocean trade	0.035	0.153	0	0.999	551,781
Share Violence	0.295	0.361	0	1	372,556
<i>Afrobarometer, females and males sample:</i>					
Trans-Atlantic trade	0.5	0.952	0	3.656	21,353
Indian Ocean trade	0.04	0.131	0	0.999	21,353
Women Leaders	3.122	1.059	1	4	20,957

Table A2: List of Surveys for each question

FLFP	Benin 1996, Benin 2001, Benin 2006, Burkina 1993, Burkina 1998, Burkina 2003, Burkina 2010, Cameroon 1998, Cameroon 2004, Cameroon 2011, CAR 1994 Cote Ivoire 1998, Cote Ivoire 2005, Cote Ivoire 2011, DRC, Ghana 1993, Ghana 1998, Ghana 2003, Ghana 2008, Guinea 1999, Guinea 2005, Kenya 1993, Kenya 1998 Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 1995, Mali 2001, Mali 2006, Mozambique 1997, Mozambique 2011, Namibia 1992, Namibia 2000, Niger 1992, Niger 1998, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Togo 1998, Uganda 1995, Uganda 2011, Zambia 1992, Zambia 1996, Zambia 2001, Zambia 2007
Work Outside	Benin 1996, Benin 2001, Benin 2006, Burkina 1993, Burkina 1998, Burkina 2003, Burkina 2010, Cameroon 1998, Cameroon 2004, Cameroon 2011, CAR 1994 Cote Ivoire 1998, Cote Ivoire 2005, Cote Ivoire 2011, DRC, Ghana 1993, Ghana 1998, Ghana 2003, Ghana 2008, Guinea 1999, Guinea 2005, Kenya 1993, Kenya 1998 Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 1995, Mali 2001, Mali 2006, Mozambique 1997, Mozambique 2011, Namibia 1992, Namibia 2000, Niger 1992, Niger 1998, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Togo 1998, Uganda 1995, Uganda 2011, Zambia 1992, Zambia 1996, Zambia 2001, Zambia 2007
Occupation	Benin 1996, Benin 2001, Benin 2006, Burkina 1993, Burkina 1998, Burkina 2003, Burkina 2010, Cameroon 1998, Cameroon 2004, Cameroon 2011, CAR 1994 Cote Ivoire 1998, Cote Ivoire 2011, DRC, Ghana 1993, Ghana 1998, Ghana 2003, Ghana 2008, Guinea 1999, Guinea 2005, Kenya 1993, Kenya 1998 Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 1995, Mali 2001, Mali 2006, Mozambique 1997, Mozambique 2011, Namibia 1992, Namibia 2000, Niger 1992, Niger 1998, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Togo 1998, Uganda 1995, Uganda 2011, Zambia 1992, Zambia 1996, Zambia 2001, Zambia 2007
Household Decisions (Health care)	Benin 2001, Benin 2006, Burkina 2003, Burkina 2010, Cameroon 2004, Cameroon 2011, Cote Ivoire 2011, DRC, Ghana 2003, Ghana 2008, Guinea 2005, Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 2001, Mali 2006, Mozambique 2011, Namibia 2000, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Uganda 2011, Zambia 2001, Zambia 2007
Household Decisions (Large purchases)	Benin 2001, Benin 2006, Burkina 2003, Burkina 2010, Cameroon 2004, Cameroon 2011, Cote Ivoire 2011, DRC, Ghana 2003, Ghana 2008, Guinea 2005, Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 2001, Mali 2006, Mozambique 2011, Namibia 2000, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Uganda 2011, Zambia 2001, Zambia 2007
Household Decisions (Daily purchases)	Benin 2001, Benin 2006, Burkina 2003, Burkina 2010, Cameroon 2004, Cameroon 2011, Cote Ivoire 2011, DRC, Ghana 2003, Ghana 2008, Guinea 2005, Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 2001, Mali 2006, Mozambique 2011, Namibia 2000, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Uganda 2011, Zambia 2001, Zambia 2007
Household Decisions (Visit to family/friends)	Benin 2001, Benin 2006, Burkina 2003, Burkina 2010, Cameroon 2004, Cameroon 2011, Cote Ivoire 2011, DRC, Ghana 2003, Ghana 2008, Guinea 2005, Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 2001, Mali 2006, Mozambique 2011, Namibia 2000, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Uganda 2011, Zambia 2001, Zambia 2007
Domestic Violence (Goes out)	Benin 2001, Benin 2006, Burkina 2003, Burkina 2010, Cameroon 2004, Cameroon 2011, Cote Ivoire 2011, DRC, Ghana 2003, Ghana 2008, Guinea 2005, Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 2001, Mali 2006, Mozambique 2011, Namibia 2000, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Uganda 2011, Zambia 2001, Zambia 2007 (All Surveys include both females and males)

Table A2: List of Surveys for each question (continued)

Domestic Violence (Neglects children)	Benin 2001, Benin 2006, Burkina 2003, Burkina 2010, Cameroon 2004, Cameroon 2011, Cote Ivoire 2011, DRC, Ghana 2003, Ghana 2008, Guinea 2005, Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 2001, Mali 2006, Mozambique 2011, Namibia 2000, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Uganda 2011, Zambia 2001, Zambia 2007 (All Surveys include both females and males)
Domestic Violence (Argues with partner)	Benin 2001, Benin 2006, Burkina 2003, Burkina 2010, Cameroon 2004, Cameroon 2011, Cote Ivoire 2011, DRC, Ghana 2003, Ghana 2008, Guinea 2005, Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 2001, Mali 2006, Mozambique 2011, Namibia 2000, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Uganda 2011, Zambia 2001, Zambia 2007 (All Surveys include both females and males)
Domestic Violence (Refuses to have sex)	Benin 2001, Benin 2006, Burkina 2003, Burkina 2010, Cameroon 2004, Cameroon 2011, Cote Ivoire 2011, DRC, Ghana 2003, Ghana 2008, Guinea 2005, Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 2001, Mali 2006, Mozambique 2011, Namibia 2000, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Uganda 2011, Zambia 2001, Zambia 2007 (All Surveys include both females and males)
Domestic Violence (Burns food)	Benin 2001, Benin 2006, Burkina 2003, Burkina 2010, Cameroon 2004, Cameroon 2011, Cote Ivoire 2011, DRC, Ghana 2003, Ghana 2008, Guinea 2005, Kenya2003, Kenya 2008, Malawi 2000, Malawi 2004, Malawi 2010, Mali 2001, Mali 2006, Mozambique 2011, Namibia 2000, Niger 2006, Nigeria 2008, Senegal 2005, Senegal 2010, Sierra Leone2008, Uganda 2011, Zambia 2001, Zambia 2007 (All Surveys include both females and males)
Women Leaders	Benin, Botswana, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Namibia, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia, Zimbabwe. (All surveys were carried out in 2005 and include both females and males)

Country and year of the Surveys available for each variable. All variables are from the DHS Surveys except *Women Leaders*, which is from the Afrobarometer Surveys.

Table A3: OLS estimates, the effect on female labor force participation, controlling for polygyny

	FLFP	FLFP	FLFP	FLFP	Work Outside	Work Outside	Work Outside	Work Outside
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trans-Atlantic trade	0.031*** (0.011)	0.041*** (0.008)	0.026*** (0.007)	0.023*** (0.006)	0.039** (0.018)	0.070*** (0.014)	0.035*** (0.010)	0.023*** (0.007)
Indian Ocean trade	-0.030 (0.034)	-0.024 (0.035)	0.021 (0.016)	-0.004 (0.013)	-0.030 (0.043)	-0.020 (0.046)	-0.071* (0.038)	-0.025* (0.014)
Observations	294,771	243,595	192,952	243,595	215,231	180,706	134,339	180,706
Baseline controls	YES	YES	YES	YES	YES	YES	YES	YES
Historical controls	NO	YES	YES	YES	NO	YES	YES	YES
Polygyny	YES	YES	YES	YES	YES	YES	YES	YES
Fixed Effects	Country	Country	Region	Village	Country	Country	Region	Village
Number of ethnicities	200	150	142	150	171	132	108	132
R^2	0.134	0.155	0.205	0.355	0.116	0.151	0.204	0.350

OLS estimates. The unit of observation is a female respondent. Standard errors in parentheses, adjusted for clustering at the ethnicity level. Trans-Atlantic trade and Indian Ocean trade are described in Table 1. Baseline controls and historical controls are listed in Table 1. Polygyny is an indicator variable taking value one if the woman has co-wives. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A4: OLS estimates, the effect of the slave trade on occupations, additional results

PANEL A						
	Agriculture	Agriculture	High Ranking	High Ranking	Manual Work	Manual Work
	(1)	(2)	(3)	(4)	(5)	(6)
Trans-Atlantic trade	-0.007 (0.013)	0.010 (0.012)	0.032*** (0.007)	0.036*** (0.007)	-0.006* (0.004)	-0.016*** (0.005)
Indian Ocean trade	-0.043 (0.032)	-0.050 (0.039)	-0.003 (0.019)	-0.002 (0.025)	0.013 (0.008)	0.023 (0.015)
Observations	346,026	271,438	346,026	271,438	346,026	271,438
Baseline controls	YES	YES	YES	YES	YES	YES
Historical controls	YES	YES	YES	YES	YES	YES
Fixed effects	Country	Region	Country	Region	Country	Region
Number of ethnicities	150	142	150	142	150	142
R^2	0.241	0.308	0.133	0.148	0.049	0.083

PANEL B						
	Clerical	Clerical	Household/ Domestic	Household/ Domestic	Education	Education
	(1)	(2)	(3)	(4)	(5)	(6)
Trans-Atlantic trade	0.000 (0.000)	0.001** (0.000)	-0.001 (0.001)	-0.001 (0.001)	0.066** (0.026)	0.042*** (0.016)
Indian Ocean trade	0.005** (0.002)	0.006*** (0.002)	-0.003 (0.005)	-0.010** (0.005)	0.013 (0.076)	0.021 (0.055)
Observations	346,026	271,438	346,026	271,438	353,204	275,138
Baseline controls	YES	YES	YES	YES	YES	YES
Historical controls	YES	YES	YES	YES	YES	YES
Fixed effects	Country	Region	Country	Region	Country	Region
Number of ethnicities	150	142	150	142	150	142
R^2	0.021	0.021	0.040	0.052	0.405	0.457

OLS estimates. The unit of observation is a female respondent. Standard errors in parentheses, adjusted for clustering at the ethnicity level. Trans-Atlantic trade and Indian Ocean trade are described in Table 1. Baseline controls and historical controls are listed in Table 1. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A5: IV estimates, the effect of the slave trade on occupations

PANEL A						
	Agriculture	Agriculture	High Ranking	High Ranking	Manual Work	Manual Work
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Second stage: dependent variable is Occupation</i>						
Trans-Atlantic Trade	0.009 (0.019)	-0.008 (0.011)	0.019 (0.014)	0.013 (0.009)	-0.001 (0.007)	0.004 (0.004)
Indian Ocean Trade	-0.019 (0.035)	-0.008 (0.011)	0.008 (0.020)	-0.016 (0.010)	0.020** (0.010)	0.013** (0.006)
R^2	0.109	0.022	0.060	0.034	0.006	0.004
<i>First stage: dependent variable is Trans-Atlantic Trade</i>						
Historical distance from coast	-0.0019*** (0.0003)	-0.0019*** (0.0003)	-0.0019*** (0.0003)	-0.0019*** (0.0003)	-0.0019*** (0.0003)	-0.0019*** (0.0003)
Observations	271,438	345,485	271,438	345,485	271,438	345,485
Baseline controls	YES	YES	YES	YES	YES	YES
Historical controls	YES	YES	YES	YES	YES	YES
Fixed effects	Region	Village	Region	Village	Region	Village
Number of ethnicities	142	150	142	150	142	150
K-P F-stat	45.87	49.51	45.87	49.51	45.87	49.51
R^2	0.358	0.367	0.358	0.367	0.358	0.367
PANEL B						
	Clerical	Clerical	Household/ Domestic	Household/ Domestic	Education	Education
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Second stage: dependent variable is Occupation/Education</i>						
Trans-Atlantic Trade	0.002* (0.001)	0.003** (0.002)	0.003 (0.003)	0.004 (0.004)	0.108*** (0.040)	0.088*** (0.027)
Indian Ocean Trade	0.006*** (0.002)	0.007** (0.003)	-0.010** (0.005)	-0.005 (0.006)	0.019 (0.062)	0.010 (0.042)
R^2	0.007	0.003	0.006	0.003	0.150	0.060
<i>First stage: dependent variable is Trans-Atlantic Trade</i>						
Historical distance from coast	-0.0019*** (0.0003)	-0.0019*** (0.0003)	-0.0019*** (0.0003)	-0.0019*** (0.0003)	-0.0019*** (0.0003)	-0.0019*** (0.0003)
Observations	271,438	345,485	271,438	345,485	275,138	352,692
Baseline controls	YES	YES	YES	YES	YES	YES
Historical controls	YES	YES	YES	YES	YES	YES
Fixed effects	Region	Village	Region	Village	Region	Village
Number of ethnicities	142	150	142	150	142	150
K-P F-stat	45.87	49.51	45.87	49.51	45.15	47.86
R^2	0.358	0.367	0.358	0.367	0.355	0.362

IV estimates. Second stage estimates in the top panel, and first stage estimates in the bottom panel. The unit of observation is a female respondent. Standard errors in parentheses, adjusted for clustering at the ethnicity level. Trans-Atlantic trade and Indian Ocean trade are described in Table 1. Baseline controls and historical controls are listed in Table 1. *** p<0.01, ** p<0.05, * p<0.1