Ca' Foscari University of Venice

Department of Economics

Working Paper

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ISSN: 1827-3580
No. 08/WP/2024

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Keywords
Family ties, gender roles, STEM occupations, women

JEL Codes
D03, J16, N30

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Historical roots of women's sorting into STEM occupations

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Abstract

Women continue to be underrepresented in the fields of science, technology, engineering, and mathematics (STEM), which represent an important and well-remunerated set of occupations that are expected to grow in significance in the future. In this paper, we show that this phenomenon is deeply rooted in historical processes that have contributed to the emergence and persistence of gender roles and stereotypes transmitted down to children by their parents or society at large. Using a sub-population of second-generation immigrants from the European Social Survey (ESS), we find that the pre-1500 ancestral factors related to stronger family ties and gender norms significantly reduce the probability of women sorting into STEM occupations. The causal link between norms and occupation is both direct and indirect, passing through contemporary cultural traits. Ancestral factors do not have any effect on men's occupational choices as well as on preferences for STEM professional careers. The results are robust to a rich set of potential confounding factors at the country of origin level and a battery of sensitivity checks.

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Declarations

Funding: Open access funding can be provided by European Commission under a Creative Commons License (CC BY 4.0).

Conflicts of interest/Competing interests: None of the authors have actual or potential conflict of interest. The scientific output expressed does not imply a policy position of the European Commission. Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of this publication.

Availability of data and material: Available upon reasonable request.

Code availability: Available upon reasonable request.

1 Introduction

Despite the fact that female labour force participation has significantly increased in the past century and legislation for equal opportunities for women and men has been put in place in most developed countries, women's overall participation in the labour market remains much lower than that of men. Among individuals aged 25 to 54, the gender gap in labour force participation stood at 29.2 percentage points in 2022, with female participation at 61.4% and male participation at 90.6% (Roger Gomis et al., 2023). Moreover, women continue to be underrepresented in many sectors, in particular in the fields of science, technology, engineering, and mathematics (STEM). Recent statistics indicate that in 2023, women represent only 28% of the STEM workforce globally. Specifically, women made up 18% of the STEM workforce in the United States, 17% in the European Union, 16% in Japan, and 14% in India.[1] In addition, women still remain vertically discriminated against within firms ("glass ceiling"), holding less decision-making positions than men.

Although extensive literature has explored the potential determinants of women's labour force participation (Alesina and Giuliano, 2010; Alesina et al., 2013; Alesina et al., 2015, among others), few economic studies have rigorously investigated the reasons behind gender disparities in STEM careers and, in general, in leading positions. This lack of evidence is concerning, since gender disparities in STEM may significantly contribute to the gender wage gap, as most of the STEM jobs pay higher salaries than non-STEM ones (Beede et al., 2011; Kahn and Ginther, 2017; Jiang, 2021). Reducing the gender gap in STEM occupations is acknowledged as pivotal in advancing general equity as well as in unlocking the full potential of the STEM workforce, which will represent an increasing share of the overall labour force in the coming decades.

Various factors can influence women's participation in STEM fields, including economic considerations, access to education, family and caregiving responsibilities, and gender norms. The latter may designate specific roles as more appropriate for women, thereby shaping their

[1]For more details, see: `https://professionalprograms.mit.edu/blog/leadership/the-gender-gap-in-stem/`

educational and professional choices. On one side, many individuals still associate STEM fields with masculine qualities, leading to stereotypes that can discourage girls and women from pursuing STEM education and careers. The sociological literature (e.g., Thébaud and Charles, 2018) suggests, indeed, that gender norms have the potential to shape individual abilities and preferences by becoming internalised in cognitive processes, thus reinforcing stereotypes. On the other side, STEM careers are, on average, more demanding than the other, usually more female-dominated sectors, and some women may opt out or choose occupations with a higher work-life balance to handle family responsibilities, which can significantly impact their education and professional career advancement.

While gender roles are often presumed to significantly influence women's STEM career choices, scant rigorous empirical evidence exists to substantiate this claim. The main challenge lies in the difficulty to find reliable measures of culturally embedded norms and stereotypes. Indeed, isolating the effect of gender roles internalised in individuals' beliefs and choices is very difficult when data are collected by surveys since the elicited attitudes are almost always endogenous to experience and economic incentives.

In this paper, we propose an innovative strategy to deal with the issue of the endogeneity of gender-based roles and beliefs. Our identification strategy relies on a set of ancestral characteristics that have contributed to the emergence and persistence of gender norms across generations, introduced by Schulz et al. (2019). More precisely, these historical measures are closely related to the intensity of kinship structures during the Middle Ages in the individuals ancestors' country of origin, which have significantly influenced the strength of family ties and the general enforcement of rules and norms at the societal level. Anthropological research suggests that kin-based institutions are among the most fundamental aspects of human societies, having historically served as the primary framework for organising social life across various cultures (Fox, 1983). Compared to ancestral measures of gender roles such as those based on agricultural characteristics (use of plough) as employed in Alesina et al. (2013), and the spread of distinct family types proposed by Todd (1982), kinship characteristics involve a broader range of informal institutional features, ranging from preferences for cousin

marriages to polygamy, co-residence of extended family, and lineage organization, providing a more comprehensive perspective on social and family practices in the pre-industrial period. Schulz et al. (2019) show that societies with stronger kin bonds are also more likely to enforce intense family ties and the respect of rules and discipline and are characterised by higher levels of cooperation and interdependence between family members. These family ties have been identified as significant determinants of gender roles (Alesina and Giuliano, 2010), affecting various economic outcomes, such as home production, labor force participation among women and young adults, and political engagement.

Our main hypothesis, therefore, is based on the premise that historical indicators of intensive kinship, linked with stronger family ties, have played a significant role in shaping and maintaining gender roles within contemporary societies, which represent one of the main factors influencing the gender-based sorting observed in the labour market. This phenomenon is particularly pronounced in STEM occupations, where traditional gender divides are more apparent. To isolate the effect of historically determined family ties and gender roles from other individual and country-specific factors, we employ the so-called "epidemiological approach", and focus on native individuals with one or both foreign-born parents (Giuliano, 2007, Fernández, 2011, Galor and Özak, 2016, Galor et al., 2020, Bernhofer et al., 2023). This approach allows us to link ancestral parental characteristics related to kinship to each respondent and exploit systematic variations in cultural values among individuals from diverse cultural backgrounds.

We first estimate a set of regressions at the individual level in order to isolate a direct effect of historical kinship institutions on the probability of women's sorting into STEM professional careers. In line with our expectations, we find that females with parents born in countries characterised by more intensive historical kinship institutions and, hence, stronger contemporary family ties and more unequal gender roles are less inclined to pursue STEM careers. To complement the analysis, we further show that the effect of historical proxies on women's occupational choices passes through contemporary cultural traits inherited by individuals from their parents. This represents another important element of novelty, indicating

that historical attributes linked to family ties and gender roles are assimilated into contemporary cultural values, ultimately influencing the likelihood of pursuing STEM careers. Following Schulz et al. (2019), we first show that the ancestral tightness of family ties significantly correlates with some contemporary cultural traits closely related to the importance attached to family ties and gender roles (e.g., individualism, obedience, proper behaviour, restraint, among others). We then take the predicted values from this set of regressions and use them as a proxy for the historically determined and inter-generationally transmitted gender roles in models estimating the probability of women sorting into STEM occupations. The results suggest that women with cultural backgrounds characterized by stronger individualistic attributes reflecting less intensive ancestral kinship legacies and looser family ties are, on average, more inclined to pursue STEM occupations. Conversely, cultures characterized by greater emphasis on obedience, embeddedness, tradition, and restraint tend to have fewer female members sorting into STEM occupations. The findings are robust to a rich set of parental and geographical controls and several potential confounding factors at the country of origin level.

The novelty of this research is threefold. First, we delve into the impact of gender roles on a less explored labour outcome, specifically the likelihood of women opting for STEM career paths. Second, we advance the existing research on the importance of informal institutions such as family organization serving as a means to perpetuate gender norms in shaping women's sorting into STEM occupations, by relying on a novel array of exogenous factors closely related to the intensity of kinship structures prevalent in pre-industrial eras that have been demonstrated to correlate with the strength of contemporary family ties (Schulz et al., 2019). Third, we show that the effect of historically embedded gender norms on women's STEM choices is both direct and indirect, passing through contemporary cultural values concerning gender roles and the intensity of family ties.

The rest of the paper is organised as follows. Section 2 delves into the literature on gender norms and STEM occupations, suggesting potential mechanisms to explain the linkage between them. Section 3 outlines ancestral variables related to family ties as used in existing

literature, with a specific focus on kinship variables by Schulz et al. (2019). Section 4 describes the data and variables utilised in this study. Section 5 presents the identification and empirical strategy, followed by Section 6, which presents the main results. Finally, Section 7 provides concluding remarks.

2 Gender roles and STEM occupations

As already mentioned in the introductory section, gender disparity is concerning, as it leads to a lack of diversity and inclusion, ultimately limits the potential of the STEM industry, and widens the existing gender pay gap. Various factors can influence women's participation in STEM fields, including economic considerations, access to education, family and caregiving responsibilities, and cultural factors. As regards the latter, sociological research suggests that culturally embedded gender norms may play a significant role in gender segregation in scientific and technical fields (Thébaud and Charles, 2018). More precisely, gender stereotypes associated with people and jobs contribute to occupational segregation by influencing both labour demand and labour supply. On the demand side, discrimination against workers and applicants whose gender does not align with the perceived gender of the job, gender-biased recruitment practices, and biased assessments of individuals' qualifications are the most obvious intermediary mechanisms (Foschi, 1996; Heilman, 2001). On the supply side, stereotyping reinforces segregation by encouraging people to make gender-conforming choices that reinforce their masculinity or femininity. In this context, gender norms play a prominent role in classifying individuals into binary sex categories at birth and in rewarding or sanctioning behaviours that conform to or deviate from these categorisations.

Gender norms influence individual aptitudes and preferences by becoming internalised in cognitive processes, enhancing expectations for adult women to gravitate towards roles (both in the workplace and in social settings) that align with feminine characteristics, while adult men are expected to favour roles associated with masculine traits (Thébaud and Charles, 2018). For instance, research shows that females tend to prioritize values such as helping others, contributing to society, and giving back to their communities, in contrast to males

who often prioritize values such as earning a high income (Lyson, 1984; Eccles, 1987; Dicke et al., 2019). This is consistent with the higher representation of females in human services occupations [2]. Conversely, males are more inclined to value working with tools and machines, earning a high income, and pursuing careers in traditional male-dominated STEM fields (Su et al., 2009; Wang and Degol, 2013). This evidence suggests that biases in individuals' perceptions regarding their abilities and preferences can lead them to opt for gender-conforming occupations, under the (perhaps) mistaken belief that they will excel more in such roles. In other words, the internalisation of such norms fosters gender-conforming choices linking STEM fields with masculine qualities, which in turn discourage girls and women from pursuing STEM education and careers.

Gender roles embedded in individuals' cultural backgrounds are closely related to the characteristics of family organisation. Historically, traditional family organisation has been characterised by distinct gender roles. Men were typically seen as the primary breadwinners and decision-makers, while women were responsible for domestic duties and caregiving. This division of labour often led to a hierarchical family structure where men held greater authority and power within the household. In patriarchal family structures where men are predominantly in charge, gender roles may be rigidly enforced, leading to limited autonomy and decision-making power for women. These family structures are characterised by intense ties among members, which facilitate the perpetuation of these norms. In line with this hypothesis, Alesina and Giuliano (2010) show that societies characterized by more intense family ties have more traditional beliefs about the role of women in society, are more reluctant to change in society and innovation, and show a lower level of trust. Other studies (Esping-Andersen, 1999; Ferrera, 1996; Castles, 1995) show that in societies with strong family ties, family solidarity is often based on an unequal division of family tasks between men and women, known as the "male-breadwinner hypothesis". Weak family ties, on the other hand, tend to foster an egalitarian gender role where men and women participate equally in employment and housework. In societies with stronger family ties and tradition,

[2]See, for instance: https://ilostat.ilo.org/where-women-work-female-dominated-occupations-and-sectors/

women are expected to fulfil family obligations, leading to their lesser participation in the job market. Recently, Schulz et al. (2019) demonstrate that historical characteristics associated with intense kin-based institutions related to cousin marriage, clans, and co-residence that fostered social tightness, interdependence, and in-group cooperation, are positively linked to contemporary cultural values that prioritise the preservation of traditional cultural norms and gender roles.

The organisation of the family, therefore, can serve as a reliable indicator of gender norms, reflecting either more equitable or unequal roles. Societies characterized by stronger family ties may have favored unequal gender norms. The internalization of these norms could, in turn, have contributed to the perpetuation of gender stereotypes regarding the roles of men and women in different areas of life, ultimately leading to gender segregation in scientific and technical fields. The next section provides a description of historical variables used as proxies for the intensity of family ties, with particular emphasis on the specific set of measures utilised in this study.

3 Historical measures of family ties and gender roles

Various measures of family ties exist in the literature. Some studies measure the strength of family ties by looking at survey variables capturing beliefs on the importance of the family in an individual's life, the duties and responsibilities of parents and children, and the love and respect for one's own parents, among other factors (see, for instance, Alesina and Giuliano, 2010 and Alesina et al., 2015). This information typically comes from the World Value Survey[3], enabling the creation of country-level indicators to gauge the strength of family ties. However, as discussed in the introductory section, utilising measures of family ties and gender norms elicited from survey data may give rise to issues related to endogeneity with respect to individual experiences and economic incentives. For this reason, attempts have been made to introduce historical measures that approximate the intensity of family ties and gender roles.

[3]For more information, see `https://www.worldvaluessurvey.org/wvs.jsp`

For instance, Duranton et al. (2009), Alesina et al. (2015), Galasso and Profeta (2018) used Todd (1985) medieval age family structures to explain differences in economic outcomes. Todd (1985, 1990) argues that different forms of family structures not only explain the diffusion of, or resistance to, social changes in Europe, such as secularism, but also correlate with the strength of familial bonds. Todd characterizes family types along two dimensions: vertical and horizontal. The vertical relationship between parents and children is either "liberal", if children become independent from their parents at an early age and leave their parental home as soon as they get married, or "authoritarian" if children continue to depend on their parents in adulthood and still live with them after marrying. The horizontal relationhip between siblings is either "egalitarian", when siblings receive an equal share of family wealth after their parents' death, or "nonegalitarian", when parents favour one offspring at the expense of the others and transmit family wealth only to one child. Todd's two dimensions yield four possible types of family organization: the absolute nuclear family (liberal vertical relationship; nonegalitarian horizontal relationship), the egalitarian nuclear family (liberal; egalitarian), the stem family (authoritarian; nonegalitarian), and the communitarian family (authoritarian; egalitarian). Stem and communitarian families are characterised by more intensive family bonds compared to other family types. Moreover, ancestral agricultural practices may contribute to shaping family ties and gender norms. According to Alesina et al. (2013), agricultural practices influenced the historical gender division of labor and the evolution of gender norms. In particular, they found that differences in gender roles have their origins in the form of agriculture traditionally practiced in the pre-industrial period (shifting cultivation - more labour intensive, which requires use of handheld tools like the hoe and the digging stick; and plough cultivation, more capital intensive, using the plough to prepare the soil.) Agricultural systems reliant on ploughing tended to favor men in farming tasks, while women specialized in domestic activities. This unequal distribution of gender roles has significant implications for economic outcomes, such as female labour force participation, involvement in politics, and engagement in entrepreneurial activities.

Our analysis relies on a novel set of historical measures of intensive kinship introduced

by Schulz et al. (2019), which are associated with the intensity of family ties. This set of measures involves five different dimensions common to intensive kin-based institutions, providing a more holistic view of familial bond strength in relation to Todd's classification of family structures. Moreover, with respect to the historical agricultural proxy for gender norms examined in Alesina et al. (2013), we employ a range of ancestral characteristics that pertain more closely to cultural practices, encompassing family structures and the division of gender-specific tasks. This approach allows us to consider various social aspects of informal institutions simultaneously.

First, we use the Kinship Intensity Index (KII), which relies on anthropological reports and offers a comprehensive measure considering various elements common to intensive kin-based institutions (Schulz et al., 2019). Specifically, this index comprises five sub-indicators that capture key dimensions of kin-based organizations: (1) cousin marriage preference, (2) polygamy, (3) co-residence of extended families, (4) lineage organisation, and (5) community organisation. Data is taken from the extended Ethnographic Atlas (EA), provided by the Database of Places, Language, Culture, and Environment (D-PLACE). In what follows, we provide a more detailed description of each sub-indicator.

- Cousin marriage preference. Preference for cousin marriage plays a pivotal role in shaping social structures. Marriage, as a central institution, extends beyond the union of individuals as spouses; it also facilitates alliances between families, clans, houses, and kindreds. Across diverse societies, cultural norms emerge that either endorse or prohibit specific kin-marriages. These practices wield a significant influence on social dynamics by fortifying familial bonds, grounded in both genetic relatedness and shared socialisation. The increased prevalence of cousin marriage impedes the development of broad connections between families and clans that were previously unconnected or distant. Instead, it fosters the establishment of additional family ties and amplifies genetic relatedness among families and households that were already interconnected.

- Polygamy. Polygamy fosters kinship intensity through two main channels. First,

through reproductive skew, fewer men reproduce, increasing the genetic group relatedness. Second, polygamous marriage favours the formation of a common extended household: a larger number of genetically-related individuals living together may plausibly increase the strength of family ties.

- Co-residence of extended families relates to how many generations of a family live in the same or adjacent houses. An extended family includes several generations of families living together (e.g., parents with their adult children, who are likewise married and have children), in contrast to a nuclear family that includes parents and their children. Cohabiting fosters strong family ties among its members.

- Lineage organisation. This variable encompasses rules of descent. In unilineal societies, descent is exclusive, and it is either traced through the mother's or the father's side. Consequently, an individual is affiliated with only one lineage. This principle plays a crucial role in delineating kin relations and non-conflicting obligations. For example, this specific rule dictates which side of the family an individual is obligated to support when conflicts arise. In contrast, bilateral rules of descent present a different scenario. Descent in this case is traced through both the mother's and father's side, and it is not exclusive. Consequently, everyone, excluding siblings, has a unique combination of relatives, unlike the exclusive affiliations seen in unilineal descent. This results in a more heterogeneous kin network with equal ties between both sides of the family, thereby reducing kinship intensity.

- Community Organisation can be distinguished along two sub-dimensions. The first dimension involves whether members of extended family or clan live together in a specific area within the settlement. When residents are localised in this manner, interactions with outsiders decrease, consequently intensifying kinship bonds. This is especially noticeable when the entire community comprises only one clan. The second sub-dimension regards marriage patterns, specifically, whether there is community-wide endogamy. Communities practicing endogamy tend to form denser clusters as

there is no influx of outsiders from different villages through marriage.

4 Data and variables

Our empirical analysis relies on the European Social Survey (ESS, henceforth), a biennial cross-country survey covering a large set of European countries (plus Israel) since 2002.[4] The survey includes nationally representative samples of individuals aged 15 or older living in private households, irrespective of nationality, citizenship, or language. It gathers data on beliefs, attitudes, behavioural patterns, and a rich set of socio-economic characteristics. Respondents include natives (and third-plus generation immigrants) as well as first- and second-generation immigrants. Moreover, given the structure of ESS data, we are able to link the information on parental characteristics to each respondent, such as the parents' country of birth, type of occupation, and educational attainment.

4.1 Women's occupational variables

The ESS contains detailed information on the working careers of respondents. More precisely, by relying on the International Standard Classification of Occupations (ISCO), we can identify some relevant job characteristics based on the tasks and duties undertaken in a specific occupation. According to this classification and the list of STEM fields proposed by the International Labour Organization (ILO), we are able to distinguish occupations that can be considered STEM from other types of occupations.

Various definitions of STEM professions exist in the literature. Following a recent contribution by Jergins (2023), we employ a classification scheme that places individuals working in science (including physical, life, and the social sciences), engineering, and math or technology-intensive occupations as *STEM*; and those working in architecture or health occupations as *STEM-related*. In addition, we consider another classification proposed by

[4]The ESS survey selects new sample members each round (cross-sectional sampling) and does not contain a longitudinal component.

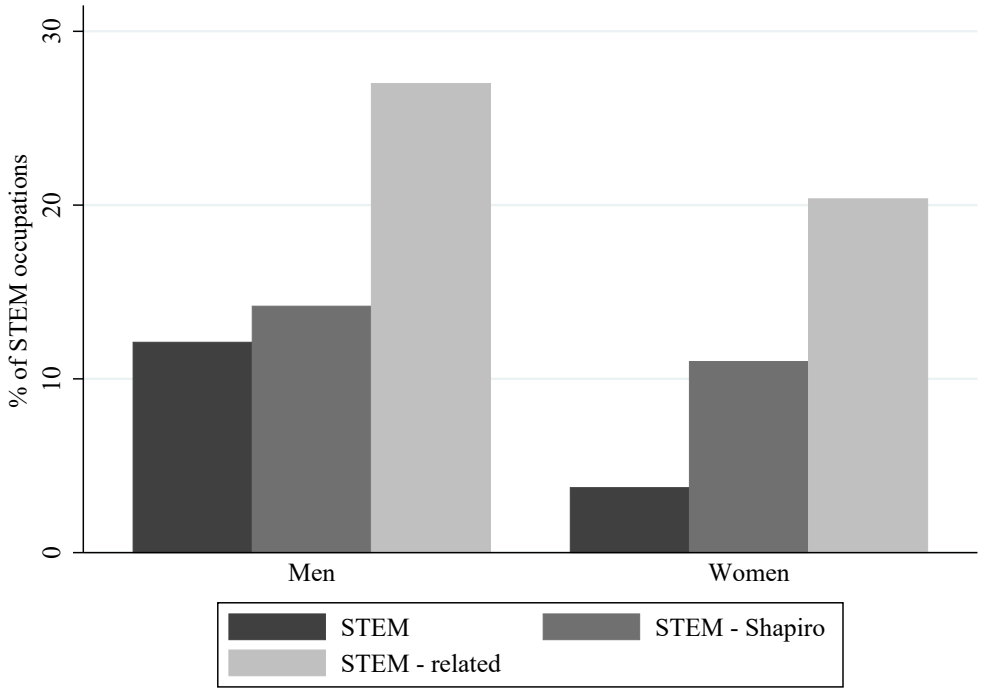
Shapiro et al. (2015) that aligns with Jergins (2023) but includes two more sub-categories, namely health professionals and health associate professionals (*STEM-Shapiro*).

Figure 1 illustrates the distribution of different STEM classifications by gender. About 20% of females declare having a STEM-related occupation, against 27% of males. The largest gender gap is observed with Jergins's classification, where only 4% of women are employed in STEM occupations, against approximately 12% of males. The narrowest gap relates to the STEM-Shapiro classification, with 11% of women compared to 14% of men following STEM professional careers. This is not surprising given that this classification extends to essential healthcare roles such as nurses and healthcare assistants, where women often represent the majority.

To complete the picture, we additionally employ a set of measures related to women's occupational choices, previously used in the literature. First, we consider three binary variables capturing whether a woman is in the labour force, is self-employed, and holds a professional position that involves the supervision of other workers. Second, we include a distinction between highly skilled white collar occupations and other professional careers, as well as two additional variables related to managerial positions. The first managerial indicator corresponds to jobs that fall into the first and second categories of ISCO (managers or professionals). The second indicator captures occupations that belong to the first three ISCO macro-categories (managers, professionals, and technicians and associate professionals) and that involve supervision of other workers.[5]

[5]Results using these additional occupational variables are included in the Appendix, Table 13.

Figure 1: Alternative definitions of STEM occupations, by gender (%).



Source: ESS, rounds 2-9

4.2 Kinship ancestral variables and contemporary cultural values

To explore the direct relationship between ancestral characteristics related to the intensity of family ties and women's sorting into STEM occupations, we make use of the kinship intensity index created by Schulz et al. (2019). The index involves five different sub-indicators, namely the cousin marriage preference, polygamy, co-residence of extended families, lineage organisation, and community organisation. Information on different sub-indicators is taken from the Ethnographic Atlas (EA), provided by the Database of Places, Language, Culture, and Environment (D-Place).

The EA database is ethnicity-based and includes the characteristics of 1291 pre-industrial ethnic groups. It contains information regarding whether a specific ethnicity favours cousin marriage and, if so, which type is preferred. Cousin marriage preference is represented as

a continuous variable ranging from 0 to 3, where higher values indicate a stronger preference. Concerning polygamy, the EA database classifies societies into three categories: monogamy, occasional or limited polygyny, and common polygyny.[6] Schulz et al. (2019) develop a continuous indicator ranging from 0 (representing monogamy) to 2 (indicating common polygyny/polygamy).

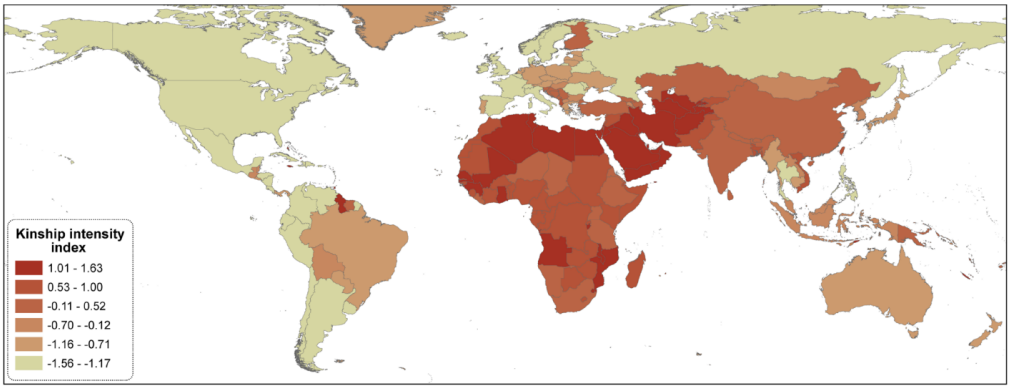
The co-residence of extended families is captured by two different variables. The first one concerns domestic organisation, while the other relates to marital residence. The extended family sub-indicator is obtained as the average value of the domestic organisation and marital residence. The higher the value, the greater the intensity of family ties.

Finally, Schulz et al. (2019) construct two continuous variables for lineage organisation and community organisation, ranging from 0 to 1. Lower values of lineage organisation denote bilateral descent, while higher values refer to other forms of descent rules (including duolateral, quasi-lineage, and ambilineal descent). Community organisation integrates two aspects (localization and community endogamy), taking value 1 if localised clans are present and/or if community endogamy is evident. If both are absent, the variable takes the value 0. A community organisation value of 0 denotes communities lacking localised groups and displaying no inclination towards local endogamy.

Based on these indicators, the authors compute two standardised kinship indices: one at the ethnicity level and another at the country level. For the purposes of our analysis, we make use of the country-level index, which represents the population-weighted kinship index of ethno-linguistic groups residing within the country. Figure 2 shows the kinship intensity index across countries. Higher values of the index correspond to more intense kinship norms.

[6]Polygny refers to the most common form of polygamy entailing the marriage of a man with several women.

Figure 2: Kinship intensity index across countries.



Source: Schulz et al., 2019.

Regarding cultural traits that may serve as a bridge between historical attributes and individuals' contemporary choices in STEM occupations, we consider a set of cultural indicators originating from different sources. The first indicator suitable for our analysis is the index of individualism proposed by Hofstede et al. (2010). This indicator measures the extent to which individuals in a society prioritise their own interests over the interests of the group. It reflects the degree of independence and individuality valued within a culture. Higher individualism scores indicate societies where personal freedom, autonomy, and self-expression are highly esteemed, while lower scores suggest cultures where group harmony, interdependence, and loyalty to the community are prioritised. In line with our purposes, Davis and Williamson (2020) found that there is a close relationship between individualism and the intensity of family ties: a preference for individualism, indeed, is significantly associated with weaker family ties. The second trait is obedience, which is a psychological outcome derived from specific variables in the World Values Survey (WVS). It relies on questions concerning the virtues that children should be taught at home, among which obedience is included. Alesina and Giuliano (2010) found that individuals with strong family ties also think that children should be obedient. Like in Schulz et al. (2019), we employ the percentage of individuals within a country who consider "obedience" as an essential quality in children. Another community trait derived from WVS that, from our point of view, may

reflect the intensity of family ties and gender roles is proper behavior. This specific trait is obtained as the average of the responses (expressed on a six-point scale) to the question asking individuals to declare the importance they attach to proper and socially acceptable behaviour.

The last four psychological outcomes considered in this study are embeddedness, tradition, restraint, and family ties. Embeddedness reflects the notion that cultural practices and beliefs are deeply rooted within social structures, institutions, and historical contexts (Schwartz, 2006). In other words, cultures characterised by embeddedness prioritise the preservation of the status quo and exercise restraint against actions that could disrupt the traditional order. Tradition is based on the WVS, in which respondents are asked to rate on a six-point scale how much they think an individual described as follows is like them: "Tradition is important to this person; to follow the customs handed down by one's religion or family." Schulz et al. (2019) construct an indicator for the importance of tradition by computing the mean values of scores across countries. The index of restraint, as individualism, originates from Hofstede et al. (2010). Individuals originating from indulgent societies tend to prioritise enjoyment and have fewer social constraints limiting their freedom of choice and desired behavioural paths. These societies often engage in leisure activities, adopt more relaxed sexual norms, and have more equal gender norms. Restrained societies, on the other hand, are characterised by stricter social norms and regulations. Individuals with more restrained cultural backgrounds have less freedom to choose their optimal behavior, are more subject to collectivity rules, and are often judged whenever their behaviour deviates from what is considered socially acceptable. Finally, we include a contemporary measure for the strength of family ties employed in Schulz et al. (2019), which stems from the work of Alesina and Giuliano (2010). They focus on three variables from the WVS that gauge beliefs regarding the significance of family in respondents' lives, the obligations and duties of parents and children, and the affection and respect for one's parents.[7] Societies characterized by intense

[7]Using a Principal Component Analysis (PCA), they extract the first principal component from the whole data set with all individual responses for the original variables, and construct a measure of the strength of family ties (expressed using the first principal component) at the country level.

family ties tend to have more traditional beliefs about the role of women in society, are more reluctant to change in society and innovation, and show a lower level of trust.

4.3 Other Controls

Concerning individual-level characteristics, we consider a rich set of demographic and socio-economic information regarding both respondents and their parents. Among the demographic characteristics of respondents, we include age, quadratic age, gender, marital status, and number of children. Marital status contains the following categories: married or in a civil partnership, single, separated, divorced, and widowed. We take the first relationship status (married) as a reference category. We also control for the respondents' self-assessed health (SAH), which is a binary variable with a value of 1 if individuals declare that their health is very good or good and 0 otherwise. The importance of religion and political involvement is used to control for other non-economic determinants of occupational choices (in addition to those potentially captured by ancestral controls regarding family ties and gender roles). As regards religion, we include a dummy indicator to capture the intensity of religious feelings. The degree of political interest is measured by individual responses to the following question: "How interested would you say you are in politics? Are you very interested, quite interested, hardly interested, or not interested at all?". We dichotomize responses into a binary variable, which has a value of 1 if the respondent is very interested or quite interested and 0 otherwise. As for the socio-economic characteristics of parents, we control for parental education and the type of last occupation (white or blue-collar). We also include a binary variable capturing whether one of the parents was absent during the respondent's childhood or adolescence.

5 Identification and empirical strategy

5.1 Identification

Our primary objective is to isolate the direct effect of historically determined and culturally embedded family ties and gender roles on the likelihood of women sorting into STEM occupations, net of the other individual and country-specific factors. Since gender roles represent a cultural trait endogenous to individuals' current environment as well as past experiences, any attempt to quantify their effect on individuals' attitudes and choices has to take into account the possibility of several confounding factors that may potentially influence both.

The identification of cultural traits raises two major concerns. First, given the fact that traditional estimation approaches fail to separate the effect of selected dimensions of culture from the other country-specific factors such as economic and institutional arrangements, the identification of specific cultural traits should compare individuals born and raised in the same economic and institutional environments but whose cultural values are potentially different. This strategy underlies the so-called "epidemiological approach" (Giuliano, 2007, Fernández, 2011, Galor and Özak, 2016, Galor et al., 2020, Bernhofer et al., 2023) and focuses on native individuals with one or both foreign-born parents (i.e. second-generation immigrants). In our specific context, for the cultural hypothesis to be consistent, female second-generation immigrants who are identical in all aspects except for their cultural backgrounds should have different propensities to opt for STEM professional careers.[8] Considering second-generation immigrants, therefore, allows us to exploit the exogenous variation in parental cultural backgrounds while keeping the other country-specific factors invariant.

Second, contemporary cultural traits (commonly measured by means of self-reported beliefs, attitudes and preferences) are, to some extent, endogenous. In order to overcome this

[8]Generally, the epidemiological approach relies on the following assumptions: i) cultural values and beliefs are vertically transmitted from parents to children, ii) cultural heritage is long-lasting, meaning that it affects individual's beliefs, emotions and choices throughout their life, iii) cultural values systematically vary across individuals having different cultural backgrounds; and iv) despite the heterogeneity in their cultural backgrounds, individuals living in the same country (or region) face identical economic and institutional arrangements.

particular concern, we exploit the historical processes in the respondents ancestors' country of origin that may have contributed to the emergence and transmission of family ties and gender roles across generation. In order to account for potentially omitted geographical, social and institutional characteristics related to individuals' ancestors that may have influenced the formation and transmission of these specific community traits, we include a large set of geographical and historical controls for the parental country of origin, such as agricultural suitability, absolute latitude, mean distance to waterways, and average terrain ruggedness. Moreover, we also control for GDP per capita and human capital at the parental country of origin level, along with a set of confounding individual demographic and socio-economic characteristics.

Our final sample includes 7135 women older than 25, residing in 28 countries, and interviewed in eight consecutive rounds carried out every two years, starting from 2004 (round 2) to 2018 (round 9).[9] Moreover, we include 59 countries of origin for foreign-born mothers and 80 countries of origin for foreign-born fathers.[10]

5.2 Empirical Strategy

Our main hypothesis is based on the assumption that historical measures of intensive kinship associated with stronger family ties have contributed to the evolution and persistence of gender roles in contemporary societies, which, in turn, contribute to the gender-based sorting in the labor market. This phenomenon is particularly evident in the case of STEM occupations, where traditional divides between males and females are more pronounced.

In order to investigate the relationship between women's choices of pursuing STEM jobs and gender roles, we empirically validate the following hypotheses:

Hypothesis 1 ***Ancestral characteristics and women's occupational choices***

Women whose origins are characterized by more intensive ancestral kin-based institutions,

[9]Round 1 is not included in the analysis since it does not contain information on the parents of the respondents.

[10]Countries with less than 100 second-generation immigrants and parental origins with less than 20 observations are excluded from the analysis.

strong family ties, and more enforced gender roles are, on average, less likely to sort into STEM professions.

Hypothesis 2 ***Ancestral characteristics, contemporary cultural values and women's occupational choices***

The effect of ancestral kin-based institutions is indirect and passes through parental contemporary cultural traits closely related to the intensity of family ties and gender roles.

The empirical strategy consists in estimating two separate blocks of equations. We first estimate a set of regressions at the individual level in order to isolate a direct and independent effect of historical kinship institutions on the probability of women's sorting into STEM professional careers:

$$STEM_{i,cr} = c_1 + \alpha_1 KIN_{i,cp} + \lambda_1 \mathbf{X}_{i,cr} + \omega_1 \mathbf{Z}_{i,cr} + \epsilon_{i,cr}, \tag{1}$$

where $STEM_{i,cr}$ is a dummy indicator with value 1 whether respondents declare to have a STEM job, and 0 otherwise, while $KIN_{i,cp}$ is a vector of kinship intensity norms (kinship index, preference for cousin marriage, polygamy, extended family, lineage organisation, community organisation) associated with the respondent parents' country of origin. $\{X_{i,cr}\}$ includes a full set of individual characteristics, and $Z_{i,cr}$ is a vector of parental socio-economic controls (education and type of occupation of both parents). Robust standard errors are clustered at the parental country of origin level.

Second, to show that historical proxies for stronger family ties and gender roles affect occupational choices through their impact on the inherited component of parental culture, the second block of models follows a two-stage estimation approach. In the first stage, we estimate a linear regression model at the country level that quantifies the associations between the historical measures of kinship intensity and different cultural values that reflect the intensity of family ties and gender roles in contemporary societies:

$$TRAIT_{cp} = c_2 + \alpha_2 KIN_{cp} + \lambda_2 \mathbf{X}_{cp} + \epsilon_{cp}, \tag{2}$$

where $TRAIT_{cp}$ are a set of standardised variables capturing psychological outcomes at the parental country of origin level (cp). KIN_{cp} includes the kinship intensity index and its sub-component describing preferences for cousin marriage in the parental country of origin, and $\{X_{cp}\}$ includes historical geographical controls at the parental country of origin. In line with Schulz et al. (2019), a positive effect of KIN_{cp} would indicate the presence of stronger family ties in contemporary cultures, which, according to Alesina and Giuliano (2010), translates into more intensive gender norms.

As a second step, we take the predicted values of cultural values, $\widehat{TRAIT}$, and use it as a proxy for historically determined cultural traits related to family ties and gender roles in the equation for $STEM$:

$$STEM_{i,cr} = c_3 + \alpha_3 \widehat{TRAIT}_{i,cp} + \lambda_3 \mathbf{X}_{i,cr} + \omega_3 \mathbf{Z}_{i,cr} + \epsilon_{i,cr}. \tag{3}$$

A negative coefficient of $TRAIT$ would indicate that part of contemporary cultures reflecting historically determined strength of family ties and gender roles reduces the likelihood of women sorting into STEM occupations. As in equation (1), we cluster the robust standard errors at the country of residence and the parental country of origin level. Moreover, since contemporary cultural traits predicted by historical factors originates from a different distribution, in all model specifications we bootstrapped standard errors in order to obtain correct estimates.

6 Results

This section shows our main results. We first display the findings for a direct relationship between ancestral proxies of family ties and gender roles and the probability of women sorting into STEM occupations. As a second step, we estimate the indirect effect of historical proxies on women's sorting in STEM by means of a two-stage empirical model.

6.1 Family ties, gender roles and STEM choices

Tables 1 and 2 report the results of the direct effects of historical kinship institutions on STEM occupational choices. In Table 1, we focus on our main STEM categorisation, while Table 2 examines the two alternative classifications, namely a broader measure of STEM and another categorisation based on Shapiro et al. (2015). We consider native individuals with either one or both foreign-born parents.

Regarding Table 1, column 1 includes the kinship index, while columns 2 through 6 consider each component of the index separately. Overall, female respondents with at least one parent born in countries characterized by more intensive family ties are less inclined to pursue a career in STEM fields. The estimated effect of the kinship index is negative and statistically significant at the one percent level. In other words, women whose ancestors belonged to societies with more pronounced kinship structures tend to be, on average, 0.8% less inclined to pursue a STEM career. Notably, among the sub-indicators, preference for cousin marriage and extended family show stronger associations with the probability of opting for a STEM occupation.

These findings are in line with our expectations. The historical characteristics considered here are significantly correlated with strong family ties, which favour more traditional beliefs about the role of women within the family and in the society. Our findings indicate that women are less inclined to opt for careers in scientific and technical fields, which typically offer more demanding and lucrative opportunities, thus leading to their under-representation in STEM occupations. This evidence may be attributed to the persistent influence of unequal gender roles passed down through generations and internalised by individuals through cognitive processes. The internalisation of unequal gender norms may cause women to perceive themselves as unsuitable for scientific roles, thereby exacerbating gender segregation in the labour market.

Table 2 reports the results for the other two definitions of STEM careers. The first two columns refer to STEM-related jobs, and the final two include Shapiro et al. (2015) clas-

sification. For the sake of space, we only report coefficients for the kinship index and the sub-indicator associated with preference for cousin marriage. Kinship intensity continues to be a reliable predictor, with a stronger effect compared to the one obtained for our main STEM classification. Compared to STEM-related fields, the effect of the kinship index is somewhat reduced for Shapiro's categorisation. This is not surprising considering that the classification includes essential healthcare roles, such as nurses and healthcare assistants, where women are often over-represented. Concerning preferences for cousin marriage, their impact remains negative and statistically significant, which is in line with the main specification in Table 1.

Table 1: Kinship intensity and STEM occupational choices. Female second-generation immigrants with either one or both foreign-born parents.

	STEM	STEM	STEM	STEM	STEM	STEM
Kinship index	-0.008**					
	(0.004)					
Cousin preference		-0.006**				
		(0.003)				
Polygamy			-0.004			
			(0.005)			
Extended Fam				-0.023**		
				(0.009)		
Lineage					-0.010	
					(0.008)	
Clan						-0.013*
						(0.007)
Age	0.002	0.002	0.002	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Low Educ.	-0.015	-0.015	-0.015	-0.016	-0.015	-0.015
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
High Educ.	0.029***	0.030***	0.030***	0.030***	0.030***	0.030***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Urban	0.007	0.007	0.006	0.007	0.007	0.006
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Atheism	0.008	0.008	0.009*	0.009*	0.008*	0.009*
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Other controls:						
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls	Yes	Yes	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes	Yes	Yes
N. Observations	7135	7135	7135	7135	7135	7135

Notes: *The table shows the direct effect of the main proxies for family ties and gender roles on the probability of opting for a STEM job. All specifications include country of residence, year (survey round), and year of birth controls. Additional individual characteristics (not reported for the sake of space) include marital status, household size, good overall health, parental education and occupation. The method of estimation is Logit. The reported coefficients are marginal effects. Robust standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Kinship Intensity, STEM-related and Shapiro STEM classifications. Female Second Generation Immigrants - either or both parents born abroad

	STEM-r	STEM-r	STEM-S	STEM-S
Kinship index	-0.017**		-0.012*	
	(0.008)		(0.007)	
Cousin preference		-0.016**		-0.012**
		(0.008)		(0.006)
Age	-0.000	-0.000	0.001	0.001
	(0.004)	(0.004)	(0.003)	(0.003)
Low Educ.	-0.170***	-0.170***	-0.123***	-0.123***
	(0.020)	(0.020)	(0.018)	(0.018)
High Educ.	0.153***	0.153***	0.055***	0.055***
	(0.010)	(0.010)	(0.008)	(0.008)
Urban	0.021*	0.021*	0.018*	0.018*
	(0.012)	(0.012)	(0.011)	(0.011)
Atheism	0.018	0.017	0.000	-0.000
	(0.011)	(0.011)	(0.009)	(0.009)
Other controls:				
Individual controls	Yes	Yes	Yes	Yes
Parental controls	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes
N. Observations	7173	7173	7173	7173

Notes: *The table shows the direct effect of the main proxies for family ties and gender roles on the probability of opting for a STEM job (two additional classifications). M1 and M2 refer to STEM-related jobs (STEM-r) while M3-M4 refer to Shapiro STEM classification (STEM-S). All specifications include country of residence, year (survey round), and year of birth controls. Additional individual characteristics (not reported for the sake of space) include marital status, household size, good overall health, parental education and occupation. The method of estimation is Logit. The reported coefficients are marginal effects. Robust standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

In addition to the results in Tables 1 and Table 2, in Table 3 we consider alternative definitions of second-generation immigrants, *i.e.*, female second-generation immigrants whose mother is born abroad (and whose father is either native or foreign-born), and those whose father is born abroad (and whose mother is either native or foreign-born). Columns 1 and 2 identify a woman's ancestry by her mother's country of origin, while columns 3 and 4 use the father's country of birth. Interestingly, we find that ancestral traits linked to the mother's country of origin significantly account for the likelihood of choosing a STEM profession,

whereas this is not observed for historical traits associated with the father's country of origin. Similarly, when we consider the sub-sample of female second-generation immigrants with both foreign-born parents (Table 11, in the appendix), the maternal cultural heritage result exerts a relatively stronger effect on women's occupational choices. This evidence is in line with the established empirical findings regarding the intergenerational transmission of attitudes and behaviours, underscoring the significance of the maternal role in shaping the identity of their offspring (Fernández et al., 2004; Cipriani et al., 2013; Dohmen et al., 2011; Farré and Vella, 2013; Bernhofer et al., 2023).

Table 3: Kinship Intensity and STEM jobs. Female Second Generation Immigrants: foreign-born mother and foreign-born father.

	STEM	STEM	STEM	STEM
Kinship intensity (mother)	-0.013***			
	(0.004)			
Cousin preference (mother)		-0.010***		
		(0.003)		
Kinship index (father)			-0.007	
			(0.005)	
Cousin preference (father)				-0.005
				(0.004)
Age	0.001	0.001	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Low Educ.	-0.004	-0.004	-0.020*	-0.020*
	(0.011)	(0.011)	(0.012)	(0.012)
High Educ.	0.025***	0.025***	0.030***	0.030***
	(0.007)	(0.007)	(0.006)	(0.006)
Urban	0.004	0.004	0.011	0.011
	(0.008)	(0.008)	(0.007)	(0.007)
Atheism	0.003	0.003	0.011**	0.011**
	(0.007)	(0.007)	(0.005)	(0.005)
Other controls:				
Individual's controls	Yes	Yes	Yes	Yes
Parental's controls	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes
N. Observations	4595	4595	4891	4891

Notes: *The table shows the direct effect of the main proxies for family ties and gender roles on the probability of opting for a STEM job All specifications include country of residence, year (survey round), and year of birth controls. Additional individual characteristics (not reported for the sake of space) include marital status, household size, good overall health, parental education and occupation. The method of estimation is Logit. The reported coefficients are marginal effects. Robust standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

As discussed previously, potentially omitted geographical, institutional, and cultural characteristics related to individuals' ancestors may have influenced the formation and transmission of family ties across generations. To address this concern, we re-run the previous models while controlling for a set of geographical confounding characteristics of the parental coun-

try of origin, such as absolute latitude, terrain roughness, distance to the coast or navigable rivers, as well as caloric suitability country variables. Additionally, to capture some potentially omitted aspects related to unobserved human capital and development, we include a set of historical economic measures. Specifically, we include the logarithm of GDP per capita (measured in 1913), and human capital (measured as the percentage of the population 16-64 with completed tertiary education). As demonstrated in Ashraf and Galor (2011)'s study, these characteristics could have exerted a lasting impact on contemporary development, indirectly influencing occupational decisions.

Table 4 shows the main findings. Results are displayed for the subset of female second-generation immigrants with either one or both foreign-born parents (Panel A), and for those with foreign-born mothers (Panel B). Even after including these controls, kinship intensity continues to significantly influence the likelihood of opting for STEM jobs, especially when accounting for the ancestral characteristics linked to the mother's country of origin (Panel B, columns 1-3).

Table 4: Kinship Intensity and Historical Economic and Geographical Controls. Female second-generation immigrants with either one or both foreign-born parents (Panel A) and with foreign-born mothers (Panel B).

Panel A: Either or both	STEM	STEM	STEM	STEM	STEM
Kinship index	-0.009*	-0.005	-0.007*	-0.008**	-0.008**
	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Ruggedness	-0.000				
	(0.003)				
Distance waterways	-0.004				
	(0.006)				
Caloric suitability	-0.000				
	(0.000)				
Absolute Latitude	0.000				
	(0.000)				
GDP per capita (1913)		0.000			
		(0.000)			
Human Capital (15-64)			-0.000		
			(0.002)		
Socialism (respondent)				0.022**	
				(0.011)	
Socialism (parents)					0.007
					(0.006)
N. of obs.	7134	5948	6444	7135	7135
Panel B: Foreign-born mother	STEM	STEM	STEM	STEM	STEM
Kinship index	-0.017***	-0.014***	-0.017***	-0.013***	-0.012***
	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)
Ruggedness	-0.001				
	(0.003)				
Distance waterways	-2.518				
	(1.877)				
Caloric suitability	-0.000				
	(0.000)				
Absolute Latitude	-0.000*				
	(0.000)				
GDP per capita (1913)		-0.000			
		(0.000)			
Human capital (15-64)			-0.002		
			(0.002)		
Socialism (respondent)				0.020*	
				(0.011)	
Socialism (mother)					0.005
					(0.008)
N. of obs.	4572	3551	3855	4595	4595
Individual controls	Yes	Yes	Yes	Yes	Yes
Parental controls	Yes	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes	Yes

Notes: *The table shows the effects of kinship index on the probability of sorting into STEM occupations. The method of estimation is Logit. Robust standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* ***** $p < 0.1$, ****** $p < 0.05$, ******* $p < 0.01$.

Besides the potentially confounding role of past economic conditions, some specific characteristics of the political systems in which individuals have grown up may significantly shape the attitudes and professional success of women. Indeed, the existing research finds substantial differences between women in former socialist and western capitalist countries. For instance, Lippmann and Senik (2018) analyzed academic grades in mathematics using the former division of Germany as a natural experiment to isolate the historical effects of capitalist versus state socialist education while controlling for differences in economic conditions and teaching styles. The authors find that girls in Eastern Germany outperform their peers in the western part in terms of math test scores, are less anxious and more confident about their aptitude in math, and result more competitive when compared to their western counterparts. This, however, is not an isolated evidence. According to Eurostat, for instance, the European Union's top five most gender balanced tech workforce in 2022 were in former socialist countries: Bulgaria, Estonia, Lithuania, Latvia and Poland. These countries also register the highest female shares of graduates from STEM. In addition, when comparing the percent of women in the overall labour force employed in science and technology with the European Union's average, post-socialist societies tend to perform better.[11]

In order to account for this important potential confounders, in columns 4 and 5, Table 4, we add an additional control for individuals who were aged 16 or older during the historical period in which their current countries of residence were characterized by socialist/communist political systems (column 4),[12] as well as whether their parents originate from a country with socialist/communist political background (column 5). The results show that women raised in the socialist or communist political systems are, on average, 2.2% more likely to sort into STEM occupations. The reason for which post-socialist societies perform better are twofold. First, state investments in STEM education and training for women were much higher and

[11]For more info, see `https://ec.europa.eu/eurostat/web/products-eurostat-news/w/DDN-20230602-1`.

[12]The reference period is 1945-1990. Individuals born between 1929 and 1974 were aged 16 or older during the reference period. Post-socialist countries in our dataset are the following: Bulgaria, Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Poland, Russia, Slovakia, Slovenia and Ukraine. Three countries were excluded due to very low number of second-generation immigrants (Albania, Montenegro and Romania).

were put in place well before Western capitalist societies. Second, family responsibilities that traditionally force women out of the labour force were less binding because the state had socialised many of the domestic tasks carried out by women in Western capitalist countries, such as intensive public childcare, public cafeterias and laundries, as well as an extensive network of services aimed at offering formal care for older and impaired individuals. These gender-equal policies influenced the work values of women and shaped the conception of gender roles (Campa and Serafinelli, 2018; Lippmann and Senik, 2018; Lippmann et al., 2020). The effect of historical kinship institutions, on the other hand, remains unaltered, providing additional evidence for the robustness of our previous findings. Similarly, the effects remain robust even when we control for the socialist or communist backgrounds of individuals' parents, which, however, do not significantly differ from zero.

We also consider a set of additional occupational outcomes to further test the relationship between historical measures of family ties and gender roles and women's general professional situation. In particular, we employ the following occupational indicators: females' participation in the labour force, being employed, being self-employed, holding a professional position that involves the supervision of other workers, being a highly skilled white collar, and two different managerial positions (with and without supervision of other workers). Table 13 (in the appendix) reports the results. For the sake of space and clarity, we consider only the overall kinship intensity index. For all model specifications, except for women's participation in the labour force (column 1), the effect of gender-based norms is negative and statistically different from zero. This result suggests that women are less likely to break the glass ceiling that prevents them (voluntarily or involuntarily) from reaching high-level career prospects, regardless of the type of occupation.

Finally, we reproduce the analysis employing Todd's historical indicators of strong family ties (stem and communitarian families) and historical proxies for agricultural methods (ploughing cultivation versus shifting cultivation systems - Alesina et al., 2013) instead of the kinship intensity measures. As discussed on Section 3, Todd's family types and agricultural practice of ploughing may contribute to shaping family ties and gender norms, thereby influ-

encing the historical division of labour between genders and the evolution of gender norms. Table 12 (in the appendix) shows the results. Women who are the descendants of societies that traditionally practiced plough agriculture today have a lower probability of having STEM occupations (Column 1). The effect of historical gender division of labour is not significantly different from zero for alternative definitions of STEM occupations. Similarly, females with descendants from cultures characterised by more intensive family bonds (stem and communitarian families) are less likely to be engaged in STEM occupations (Columns 4-6).

6.2 Additional tests on gender roles

In addition to the above robustness check, we perform a set of additional tests to validate our main findings, focusing on the male subsample of second-generation immigrants. Specifically, we first show that historical kinship institutions do not have any considerable effect on males' sorting in STEM. Second, we show that historical proxies for gender roles significantly increase the likelihood of male individuals having a gender-biased opinion about the role of women in the labour market. These additional results further support the idea that ancestral kinship ties related to gender norms influence contemporary women's occupational choices by becoming internalised in cognitive processes. This perpetuates stereotypes that contribute to gender segregation in scientific and technical fields.

Table 14 (in the appendix) replicates Table 1 but considers the sub-sample of male second-generation immigrants. The results suggest that the strength of historical kinship ties does not significantly affect men's occupational choices. All the components of the kinship index are not significantly different from zero, except for clan organisations, whose effect is significant and negative. This latter evidence probably does not capture the effect of gender roles; rather, it passes through some other cultural trait that makes male individuals less prone to sorting into STEM professions. Interestingly, the historical presence of clan organisations count relatively less for women's choosing an occupation in STEM-related fields (Table 1). At the same time, however, higher historical kinship intensity positively influences

the likelihood of men having biased attitudes regarding who should have the priority to work when jobs are scarce. Indeed, men originating from cultures with more pronounced gender roles are significantly more likely to report that men should have priority over women in the labour market. This is clear evidence for gender-biased preferences influenced by social norms and beliefs.

6.3 Indirect effects of ancestral factors through cultural traits

In this section, we show that the effect of historical proxies of family ties and gender roles on women's occupational choices passes through cultural traits inherited by individuals from their parents. We proceed in two steps. First, we replicate the main findings from Schulz et al. (2019) to demonstrate that the ancestral tightness of family ties significantly correlates with some contemporary cultural traits closely related to the importance attached to family ties and gender roles. Second, we take the predicted values from this set of regressions and use them as a proxy for the historically determined and inter-generationally transmitted gender roles in models estimating the probability of women sorting into STEM occupations. In all model specifications we control for country's geographic characteristics, agricultural suitability, absolute latitude, mean distance to waterways, and average terrain ruggedness. As stated by Schulz et al. (2019), these country-specific characteristics represent important factors associated with economic development, colonial expansion, or productivity.

Tables 5 and 6 show the results. The kinship intensity index and the presence of cousin-marriage preferences are associated with lower individualism and stronger embeddedness, traditions, and restraint in contemporary cultures. This result suggests that societies that have been exposed to more intensive kin-based institutions and/or the presence of cousin-marriage preferences in the past are characterised by lower degrees of individualism and independence, stronger individual's commitment to stable social relationships and the existing social order, and more pronounced social norms and traditions.

Table 5: Cultural traits and historical proxies for family ties (I)

	Individ.	Obedience	Pr. behav.	Fam. ties	Individ.	Obedience	Pr. behav.	Fam. ties
Kinship index	-0.185**	1.680	0.144	0.220**				
	(0.086)	(1.579)	(0.135)	(0.087)				
Cousin preference					-0.155*	2.323	0.319**	0.341***
					(0.086)	(1.896)	(0.147)	(0.091)
Ruggedness	-0.122	-3.142***	-0.090	0.116	-0.116	-2.953**	-0.061	0.149*
	(0.083)	(1.101)	(0.119)	(0.085)	(0.085)	(1.131)	(0.119)	(0.083)
Distance waterways	-0.375	-0.021	0.365	0.135	-0.415	1.362	0.543**	0.273
	(0.276)	(2.609)	(0.251)	(0.215)	(0.261)	(2.732)	(0.253)	(0.197)
Caloric suitability	-0.000	-0.005**	0.000**	-0.000	-0.000	-0.003	0.001***	0.000
	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)
Absolute latitude	0.037***	-0.568***	-0.008	-0.045***	0.038***	-0.579***	-0.010	-0.046***
	(0.004)	(0.080)	(0.007)	(0.005)	(0.004)	(0.082)	(0.006)	(0.004)
N. of obs	74	80	61	65	74	80	61	65
R squared	0.530	0.509	0.124	0.614	0.520	0.516	0.183	0.641

Notes: *The table shows the association between historical proxies for family ties and contemporary psychological (cultural) traits. The method of estimation is OLS. Robust standard errors clustered at the country level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Cultural traits and historical proxies for family ties (II)

	Embeddedness	Tradition	Restraint	Embeddedness	Tradition	Restraint
Kinship index	0.586***	0.321***	0.692***			
	(0.084)	(0.120)	(0.170)			
Cousin preference				0.553***	0.454***	0.857***
				(0.140)	(0.127)	(0.159)
Ruggedness	-0.038	-0.064	-0.084	-0.017	-0.013	0.011
	(0.078)	(0.121)	(0.107)	(0.087)	(0.127)	(0.097)
Distance waterways	0.489***	0.098	0.447	0.685***	0.387**	0.892***
	(0.171)	(0.188)	(0.331)	(0.141)	(0.190)	(0.232)
Caloric suitability	0.000	0.000	0.001***	0.000**	0.000	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Absolute latitude	-0.031***	0.004	0.024**	-0.038***	-0.000	0.018**
	(0.005)	(0.007)	(0.009)	(0.005)	(0.007)	(0.009)
N. of obs	60	61	70	60	61	70
R squared	0.714	0.109	0.309	0.637	0.180	0.357

Notes: *The table shows the association between historical proxies for family ties and contemporary psychological (cultural) traits. The method of estimation is OLS. Robust standard errors clustered at the country level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

If our conjectures are correct, then women with ancestral origins characterized by stronger kinship institutions and cousin preferences, and, therefore, lower individualism and higher embeddedness, should be less likely to sort into STEM occupations, *ceteris paribus*. In Tables 7 and 9, we regress the respondents' occupation (STEM) on the predicted values of each of the above-reported cultural traits and the full set of individual-specific characteristics.

The results are in line with our intuition. Women originating from more individualistic cultures are, on average, more likely to have a STEM occupation. Cultural backgrounds characterised by more pronounced obedience, embeddedness, tradition, and restraint, on the other hand, are less likely to see their female members sort into STEM occupations. The results do not change significantly whether we capture the family ties -intensive component of contemporary cultures (Tables 5 and 6) by means of the kinship index (KII) or cousin preferences (CP). Moreover, restricting the sample to second-generation immigrants with foreign-born mother (Panel B) does not change the results. In most cases, though, the effects of culture become even stronger.

It is interesting to note that the effect of the predicted embeddedness and, to some extent, individualism is almost identical to the direct effects of the kinship index on the probability of sorting into STEM occupations (Table 1). This result goes in line with the evidence in Tables 5 and 6. Indeed, the goodness of fit of models regressing individualism and embeddedness on the kinship index is the highest among all the cultural traits considered (0.71 and 0.53).

Table 7: Predicted cultural traits and STEM occupational choices (I). Female second-generation immigrants with either one or both foreign-born parents (Panel A) and with foreign-born mothers (Panel B).

Panel A: Either or both	STEM	STEM	STEM	STEM	STEM	STEM	STEM	STEM
Individualism (pred, KII)	0.011**							
	(0.005)							
Obedience (pred, KII)		-0.001**						
		(0.000)						
Pr. behav. (pred, KII)			-0.015*					
			(0.008)					
Fam. ties (pred, KII)				-0.010**				
				(0.004)				
Individualism (pred, CP)					0.011**			
					(0.005)			
Obedience (pred, CP)						-0.001**		
						(0.000)		
Pr. behav. (pred, CP)							-0.018**	
							(0.009)	
Fam. ties (pred, CP)								-0.009**
								(0.004)
N. of observations	7134	7134	7134	7134	7134	7134	7134	7134
Panel B: Foreign-born mother	STEM	STEM	STEM	STEM	STEM	STEM	STEM	STEM
Individualism (pred, KII)	0.012**							
	(0.006)							
Obedience (pred, KII)		-0.001**						
		(0.000)						
Pr. behav. (pred, KII)			-0.009					
			(0.012)					
Fam. ties (pred, KII)				-0.013***				
				(0.004)				
Individualism (pred, CP)					0.011*			
					(0.006)			
Obedience (pred, CP)						-0.001**		
						(0.000)		
Pr. behav. (pred, CP)							-0.015*	
							(0.008)	
Fam. ties (pred, CP)								-0.011***
								(0.004)
N. of observations	4595	4595	4595	4595	4595	4595	4595	4595
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *The table shows the marginal effects of the predicted psychological (cultural) traits on the probability of sorting into STEM occupations. The method of estimation is Logit. Bootstrapped standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Predicted cultural traits and STEM occupational choices (Ia). Female second-generation immigrants with either one or both foreign-born parents. Alternative classifications of STEM.

	STEM-r	STEM-r	STEM-r	STEM-r	STEM-S	STEM-S	STEM-S	STEM-S
Individualism (pred, KII)	0.026**				0.015			
	(0.013)				(0.010)			
Obedience (pred, KII)		-0.001				-0.001		
		(0.001)				(0.001)		
Pr. behav. (pred, KII)			0.009				-0.008	
			(0.026)				(0.019)	
Fam. ties (pred, KII)				-0.020*				-0.011
				(0.011)				(0.008)
N. of obs	7173	7173	7173	7173	7173	7173	7173	7173
	STEM-r	STEM-r	STEM-r	STEM-r	STEM-S	STEM-S	STEM-S	STEM-S
Individualism (pred, CP)	0.025*				0.014			
	(0.013)				(0.010)			
Obedience (pred, CP)		-0.001*				-0.001		
		(0.001)				(0.001)		
Pr. behav. (pred, CP)			-0.009				-0.020	
			(0.021)				(0.016)	
Fam. ties (pred, CP)				-0.019*				-0.012
				(0.010)				(0.007)
N. of obs	7173	7173	7173	7173	7173	7173	7173	7173
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *The table shows the marginal effects of the predicted psychological (cultural) traits on the probability of sorting into STEM occupations. The method of estimation is Logit. Bootstrapped standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Predicted cultural traits and STEM occupational choices (II). Female second-generation immigrants with either one or both foreign-born parents (Panel A) and with foreign-born mothers (Panel B).

Panel A: Either or both	STEM	STEM	STEM	STEM	STEM	STEM
Embeddedness (pred, KII)	-0.008**					
	(0.004)					
Tradition (pred, KII)		-0.026**				
		(0.010)				
Restraint (pred, KII)			-0.010*			
			(0.006)			
Embeddedness (pred, CP)				-0.008*		
				(0.004)		
Tradition (pred, CP)					-0.019*	
					(0.011)	
Restraint (pred, CP)						-0.009
						(0.008)
N. of obs	7135	7135	7135	7135	7135	7135
Panel B: Foreign-born mother	STEM	STEM	STEM	STEM	STEM	STEM
Embeddedness (pred, KII)	-0.011***					
	(0.004)					
Tradition (pred, KII)		-0.040***				
		(0.015)				
Restraint (pred, KII)			-0.014*			
			(0.008)			
Embeddedness (pred, CP)				-0.009**		
				(0.004)		
Tradition (pred, CP)					-0.024**	
					(0.010)	
Restraint (pred, CP)						-0.010
						(0.007)
N. of obs	4596	4596	4596	4596	4596	4596
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls	Yes	Yes	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *The table shows the marginal effects of the predicted psychological (cultural) traits on the probability of sorting into STEM occupations. The method of estimation is Logit. Bootstrapped standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* ***** $p < 0.1$, ****** $p < 0.05$, ******* $p < 0.01$.

Table 10: Predicted cultural traits and STEM occupational choices (IIa). Female second-generation immigrants with either one or both foreign-born parents. Alternative classifications of STEM.

	STEM-r	STEM-r	STEM-r	STEM-S	STEM-S	STEM-S
Embeddedness (pred, KII)	-0.022**			-0.013*		
	(0.010)			(0.007)		
Tradition (pred, KII)		-0.048			-0.039*	
		(0.032)			(0.023)	
Restraint (pred, KII)			-0.009			-0.014
			(0.015)			(0.010)
N. of obs	7174	7174	7174	7174	7174	7174
	STEM-r	STEM-r	STEM-r	STEM-S	STEM-S	STEM-S
Embeddedness (pred, CP)	-0.021**			-0.013*		
	(0.009)			(0.007)		
Tradition (pred, CP)		-0.043*			-0.037**	
		(0.023)			(0.017)	
Restraint (pred, CP)			-0.016			-0.019*
			(0.015)			(0.010)
N. of obs	7174	7174	7174	7174	7174	7174
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls	Yes	Yes	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *The table shows the marginal effects of the predicted psychological (cultural) traits on the probability of sorting into STEM occupations. The method of estimation is Logit. Bootstrapped standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

7 Conclusion

Women remain significantly underrepresented in both STEM college majors and STEM jobs. Despite obtaining STEM degrees, they are notably less likely than their male counterparts to pursue careers in STEM fields. This ongoing disparity is alarming as it contributes to a lack of diversity and inclusivity within the STEM sector, ultimately impeding its full potential and exacerbating the existing gender pay gap.

In this study, we have investigated, among the potential factors contributing to gender segregation into STEM professions, the role played by gender norms. Specifically, we have highlighted how gender norms, as gauged by the strength of family ties, can influence

women's likelihood of entering STEM professions. Firstly, we have explored how the set of ancestral kinship characteristics introduced by Schulz et al., 2019, related to the strength of family ties and gender roles, directly affect the likelihood of women choosing a STEM career. Secondly, assuming that gender norms are internalised in individuals' cognitive processes, we have tested how historical kin-based institutions indirectly influence women's decisions regarding STEM careers. This represents an important advancing of the paper, indicating that historical attributes linked to family ties and gender roles are assimilated into contemporary cultural values, ultimately influencing the likelihood of pursuing STEM careers.

Our findings indicate that in societies where family connections were stronger, reflected in historical intense kinship structures, women are less likely to enter STEM roles compared to those from societies with less intense kin-based structures. Results also suggest that the causal link between norms and occupation is both direct and indirect, passing through contemporary cultural traits. This evidence has relevant policy implications. Reducing the influence of unequal gender roles on women's choices in STEM fields is crucial for creating a more inclusive and diverse STEM workforce, and for reducing gender segregation in the labour market. Implementing education programs to challenge traditional gender stereotypes and promote gender equality in STEM fields from an early age, along with interventions such as mentorship programs where women in STEM fields can mentor and support young girls and women interested in pursuing STEM careers, may represent effective policy interventions in this regard.

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Appendix

Tables

Table 11: Kinship Intensity and STEM jobs. Female Second Generation Immigrants: both foreign-born parents.

	STEM	STEM	STEM	STEM
Kinship intensity (mother)	-0.019***			
	(0.006)			
Cousin preference (mother)		-0.013***		
		(0.004)		
Kinship intensity (father))			-0.014**	
			(0.005)	
Cousin preference (father)				-0.010**
				(0.005)
Age	0.002	0.002	0.002	0.002
	(0.003)	(0.003)	(0.003)	(0.003)
Low Educ.	-0.001	-0.001	-0.001	-0.001
	(0.013)	(0.013)	(0.013)	(0.013)
High Educ.	0.019	0.020*	0.018	0.019*
	(0.011)	(0.011)	(0.011)	(0.011)
Urban	0.010	0.009	0.007	0.007
	(0.012)	(0.012)	(0.011)	(0.011)
Atheism	0.007	0.008	0.005	0.005
	(0.010)	(0.010)	(0.010)	(0.010)
Other controls:				
Individual's controls	Yes	Yes	Yes	Yes
Parental's controls	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes
Round & Year of birth	Yes	Yes	Yes	Yes
N. Observations	2294	2294	2287	2287

Notes: *The table shows the direct effect of the main proxies for family ties and gender roles on the probability of opting for a STEM job All specifications include country of residence, year (survey round), and year of birth controls. Additional individual characteristics (not reported for the sake of space) include marital status, household size, good overall health, parental education and occupation. The method of estimation is Logit. The reported coefficients are marginal effects. Robust standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 12: Kinship intensity and STEM occupational choices. Female second-generation immigrants with either one or both foreign-born parents.

	STEM	STEM-r	STEM-S	STEM	STEM-r	STEM-S
Plough	-0.023**	0.013	-0.004			
	(0.011)	(0.028)	(0.019)			
Stem & Comm.				-0.015**	-0.042**	-0.038***
				(0.008)	(0.018)	(0.013)
Age	0.003	0.001	0.003	0.002	-0.001	0.002
	(0.002)	(0.004)	(0.004)	(0.002)	(0.005)	(0.004)
Low Education	-0.014	-0.173***	-0.130***	-0.016	-0.167***	-0.127***
	(0.010)	(0.024)	(0.019)	(0.010)	(0.023)	(0.019)
High Education	0.029***	0.160***	0.059***	0.027***	0.156***	0.054***
	(0.005)	(0.010)	(0.009)	(0.005)	(0.010)	(0.009)
Urban	0.007	0.012	0.014	0.005	0.014	0.017
	(0.006)	(0.013)	(0.012)	(0.007)	(0.014)	(0.013)
Atheism	0.007	0.037***	0.006	0.006	0.030**	0.005
	(0.005)	(0.013)	(0.010)	(0.006)	(0.013)	(0.010)
Other controls:						
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls	Yes	Yes	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes	Yes	Yes
Geographic	Yes	Yes	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes	Yes	Yes
N. Observations	5455	5520	5520	5117	5224	5224

Notes: *The table shows the direct effect of the main proxies for family ties and gender roles on the probability of opting for a STEM job. All specifications include country of residence, year (survey round), and year of birth controls. Additional individual characteristics (not reported for the sake of space) include marital status, household size, good overall health, parental education and occupation. The method of estimation is Logit. The reported coefficients are marginal effects. Robust standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 13: Kinship intensity and alternative occupational outcomes. Female second-generation immigrants with either one or both foreign-born parents.

	LF	Empl.	S-Empl.	Super.	H-S W.	Manag.	Manag.-S
Kinship index	-0.002	-0.015**	-0.012***	-0.019***	-0.026***	-0.015**	-0.014***
	(0.007)	(0.008)	(0.004)	(0.006)	(0.009)	(0.008)	(0.005)
Age	0.062***	0.064***	0.000	-0.000	-0.003	-0.001	-0.001
	(0.006)	(0.007)	(0.002)	(0.004)	(0.004)	(0.003)	(0.003)
Low Educ.	-0.084***	-0.107***	-0.013	-0.132***	-0.251***	-0.064***	-0.137***
	(0.017)	(0.020)	(0.011)	(0.018)	(0.021)	(0.019)	(0.020)
High Educ.	0.069***	0.101***	0.016**	0.105***	0.375***	0.175***	0.150***
	(0.012)	(0.014)	(0.007)	(0.014)	(0.010)	(0.009)	(0.011)
Urban	0.029***	0.007	0.001	-0.001	0.013	0.009	0.002
	(0.011)	(0.014)	(0.008)	(0.012)	(0.013)	(0.010)	(0.011)
Atheism	-0.008	0.013	0.007	-0.005	-0.005	0.022**	-0.010
	(0.012)	(0.014)	(0.008)	(0.011)	(0.014)	(0.009)	(0.010)
Other controls:							
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. Observations	5129	5129	7154	7151	7173	7173	7151

Notes: *The table shows the direct effect of the main proxies for family ties and gender roles on alternative occupational outcomes. All specifications include country of residence, year (survey round), and year of birth controls. Additional individual characteristics (not reported for the sake of space) include marital status, household size, good overall health, parental education and occupation. The method of estimation is Logit. The reported coefficients are marginal effects. Robust standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* ***** $p < 0.1$, ****** $p < 0.05$, ******* $p < 0.01$.

Table 14: Kinship intensity, STEM occupational choices, and rights to have a job when they are scarce. Male second-generation immigrants with either one or both foreign-born parents.

	STEM	STEM	STEM	STEM	STEM	STEM
Kinship index	-0.012*					
	(0.007)					
Cousin preference		-0.005				
		(0.006)				
Polygamy			-0.014			
			(0.010)			
Extended Fam.				-0.020		
				(0.014)		
Lineage					-0.019	
					(0.014)	
Clan						-0.030**
						(0.014)
N. Observations	5767	5767	5767	5767	5767	5767
	Rights	Rights	Rights	Rights	Rights	Rights
Kinship index	0.029**					
	(0.012)					
Cousin preference		0.023**				
		(0.011)				
Polygamy			0.042***			
			(0.014)			
Extended Fam.				0.011		
				(0.038)		
Lineage					0.038	
					(0.024)	
Clan						0.076***
						(0.027)
N. Observations	2569	2569	2569	2569	2569	2569
Other controls:						
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls	Yes	Yes	Yes	Yes	Yes	Yes
Country of residence	Yes	Yes	Yes	Yes	Yes	Yes
Round & Cohort	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *The table shows the direct effect of the main proxies for family ties and gender roles on the probability of opting for a STEM job, and to agree with the statement that men should have more right to job than women when jobs are scarce ("Rights"). All specifications include country of residence, year (survey round), and year of birth controls. Additional individual characteristics (not reported for the sake of space) include marital status, household size, good overall health, parental education and occupation. The method of estimation is Logit. The reported coefficients are marginal effects. Robust standard errors clustered at the country or residence and the parental country of origin level are reported in parenthesis. Significance levels:* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.