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Marina Morales Catalan

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Essays in family economics and demographics: cultural/social norms, migration and gender stereotypes. International, national and regional (Aragón) evidence.[1]

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10 May 2021

[1] The author meets the requirements to get an "International Doctorate", since she was a visiting student for at least 3 months in an International University (University College London, United Kingdom), her thesis is written in English, one of the members of the Doctoral Thesis Tribunal will be an International Professor and it will be reported by two doctors from International Institutions. (https://escueladoctorado.unizar.es/es/menci%C3%B3n-doctorado-internacional).

Abstract

The aim of this thesis is to provide research in demographic and family economics. Intra-household decisions may have important consequences in several economic fields of study, such as the labor market. Motivated by these implications, this thesis advances in understanding of several individual choices related to social norms, which is the connecting thread throughout the thesis. This thesis is divided in three chapters. In Chapter 1, which consist of three empirical papers, we explore whether culture/social norms can have an effect on several family and demographic variables. Specifically, we examine the possible impact of culture on: women fertility decisions, couples' choice of living together (as a married or unmarried couple) as well as the home-ownership decisions. Chapter 2, which consist of two empirical papers, focuses on migration behavior studying the effect of culture and some legal factors. Chapter 3 is devoted to the analysis of gender stereotyping in sports and how parental investments shape boys and girls sport choices. All the empirical evidence described in the different chapters point to the importance of social and gender roles in determining the behavior of individuals.

Resumen

El objetivo de esta tesis es proporcionar investigación en el campo de estudio de la economía familiar y la demografía. Las decisiones tomadas dentro del hogar pueden tener consecuencias importantes en varios campos de estudio económicos, como el mercado laboral. Motivada por estas implicaciones, esta tesis avanza en la comprensión de las decisiones tomadas por los individuos que están relacionadas con las normas sociales, lo cual es el hilo conductor a lo largo de la tesis. La tesis se divide en tres capítulos. En el Capítulo 1, que a su vez está dividido en tres trabajos empíricos, exploramos si las normas sociales pueden afectar a varias decisiones familiares y demográficas. Específicamente, examinamos el posible impacto de la cultura en: las decisiones de tener hijos de las mujeres, la elección de las parejas de vivir juntas (como pareja casada o no casada), así como las decisiones de tener una vivienda en propiedad. El Capítulo 2, que consta de dos trabajos empíricos, se centra en el comportamiento migratorio estudiando el efecto que sobre este pueden tener la cultura y la introducción de algunas leyes. El Capítulo 3 está dedicado al análisis de los estereotipos de género en los deportes y cómo los padres pueden influir las elecciones deportivas de sus hijos. Toda la evidencia empírica descrita en los diferentes capítulos apunta a la importancia de los roles sociales y de género en la determinación del comportamiento de los individuos.

Declaration

I certify that the thesis I have presented for examination for the PhD degree of the University of Zaragoza is solely my own work other than where I have clearly indicated that it is the work of others (in which case the extent of any work carried out jointly by me and any other person is clearly identified in it). The copyright of this thesis rests with the author. This thesis may not be reproduced without my prior written consent. I warrant that this authorization does not, to the best of my belief, infringe the rights of any third party.

Statement of co-authored work

I confirm that all chapters were jointly co-authored with Dr. Miriam Marcén. I confirm that first empirical paper in Chapter 1 was also co-authored with Professor Alberto Molina and Chapter 3 with Professor Almudena Sevilla. I contributed 70 percent of this work and details of the contributions are provided in the table below.

Table of authorship contributions

	Contributing Author						
Aspect of research	Chapter 1			Chapter 2		Chapter 3	Supp. Analysis
	Part 1	Part 2	Part 3	Part 1	Part 2		
Research design	AMC MMP MMC	MMP MMC	MMP MMC	MMP MMC	MMP MMC	MMP MMC ASS	MMC
Empirical analyses	MMC	MMC	MMC	MMC	MMC	MMC	MMC
Writing of the manuscript	AMC MMP MMC	MMP MMC	MMP MMC	MM, MMC	MMP MMC	MMP MMC ASS	MMC

MMP: Miriam Marcén Pérez, AMC: José Alberto Molina Chueca, MMC: Marina Morales Catalán, ASS: Almudena Sevilla Sanz.

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Introduction

In Chapter 1, we analyze whether social norms (culture) play a role in three different outcomes. In the first part, we focus on the number of children born. To explore this issue, we use data on immigrant women living in the United States. Since all these women are living under the same laws, institutions, and economic conditions, then the differences between them in the fertility decisions may be due to cultural differences. We use the mean number of children born by country of origin, as our proxy of culture, using data from the Integrated Public Use Microdata Series International that allows us to measure more precisely the cultural proxy by age, education level, and employment status. Results show that culture has a positive and statistically significant relationship to the number of children born of immigrants living in the US. Our results are robust after running several robustness checks. Additionally, we extend this work to an analysis of both the decision to have children and the number of children born, finding again that culture appears to play a significant role.

In the second part, we analyze the role of culture in determining the decision to live together (as a married or unmarried couple). As in the previous part, we follow the epidemiological approach. Results show a positive and statistically significant relationship between the cultural proxy, that is, the proportion of individuals living together by country of origin, and the immigrant choice of living with a partner. We extend this analysis to an exploration of the formation of same- or different-origin couples, in addition to an examination of the effect of culture on other modes of household arrangement (such as living with an adult child, living with grandparents, same-gender couples, and family size, among others). In all cases, our findings suggest an important role of culture. The results are robust after controlling for several home-country, observable and unobservable characteristics, and to the use of different subsamples. Supplementary analysis shows a range of channels of transmission of culture.

The role of culture in determining whether, or not, an individual is a homeowner has been explored in the last part of this chapter. We use data on first-generation immigrants who arrived in the United States under 6 years old. Following the epidemiological approach, our estimates indicate that there is a positive and statistically significant relationship between the cultural proxy and the immigrants' choice of home-ownership. Additionally, we present evidence of different mechanisms of transmission of culture, which reinforces our results on the cultural effect.

Chapter 2 focuses on migration decisions. First, it is studied the role of cultural differences on the choice of migrants' destination country. In order to examine this issue, we run two separate analysis using data on international migration flow from the Organization for Economic Cooperation and Development statistics and data on international migration stock obtained from the Integrated Public Use Microdata Series International. Cultural differences between the home and host-countries are measured for observable characteristics that reveal fertility, marriage, and employment cultures among others. Results show a negative and statistically significant relationship between cultural differences and migration flow. This relationship varies when the physical distance is considered pointing to a non-statistically significant effect of cultural differences for migration flow among bordering (neighboring) countries. Interestingly enough, in the analysis of migration stock, we detect that cultural differences matter in the location decision depending on whether individuals reside in bordering (or quite close non-bordering countries) or non-bordering countries. Our findings suggest that cultural differences play a role in the destination country choice while trying to mitigate the cultural dilemma in migration.

Second, it is analyzed the impact of marriage regulation on the migratory behavior of individuals using the history of the liberalization of same-sex marriage across the United States. The approval of same-sex marriage allows homosexuals access to legal rights and social benefits, which can make marriage more attractive in comparison to singlehood or other forms of partnership. Results clearly show that that legal reform increased the migration flow of gay men moving to states that had legalized same-sex marriage. No statistically significant evidence was detected for women in the short term. Supplemental analysis, developed to explore whether the migration flow translated to a significant effect on the number of homosexuals by state, suggests that the increased after the approval of same-sex marriage was transitory. Legalization of same-sex marriage was also found to generate outflow migration of individuals originating from intolerant countries of same-sex relationships.

Chapter 3 contributes to the literature of gender differences in academic attainment by putting together several sources of data going back several decades to investigate how gender stereotypes and parental time investments shape sport choices of boys and girls during high school. Using data from the 2002-2019 National Federation of State High School Association, which provides information for every state on the total number of high school participants by gender in each sport, we document that states with more gender-equal norms are also states where boys and girls tend to break stereotypes when making sport choices in high school. We also identify parental time investments as being an important cultural-transmission mechanism.

Some parts of this thesis have been published in journals included in the *Journal Citation Reports (JCR)*.

Chapter 1

"The effect of culture/social norms on different family and demographic outcomes"

Chapter 1 has been entirely published in:

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Marcén, M., & Morales, M. (2019). Live together: does culture matter?. *Review of Economics of the Household*, 17(2), 671-713. https://doi.org/10.1007/s11150-018-9431-3

Marcén, M., & Morales, M. (2020). The effect of culture on home-ownership. *Journal of Regional Science*, 60(1), 56-87. https://doi.org/10.1111/jors.12433

Supplementary Analysis has been partly published in:

Morales, M. (2021). Intergenerational transmission of fertility outcomes in Spain. *The Manchester School*, forthcoming. https://doi.org/10.1111/manc.12366

1.1. The effect of culture on the fertility decisions of immigrant women in the United States.

1.1.1. Introduction

How many children would you like to have? According to the World Values Survey, the response should normally be between none and three, since around 80% of the individuals who responded to that survey during the period 1981-2004 chose that as their ideal number of children.[2] But how has the fertility rate evolved from the last decades of the 20th century? As shown in Figure 1.1.1, the total fertility rate, calculated for all the countries with information on that rate, from 1980 to 2014, has fallen significantly (World Bank Data 2014) and does not appear to be bottoming out.[3] In many countries, the total fertility rate has dropped to worrying levels, below the replacement rate, set at 2.1 children per woman. Even the media highlight the necessity to analyze these low levels of fertility (The Economist 2014). Several studies have explored the factors that may explain the progressive decline in the fertility rate, focusing on the increase in the participation of women in the labor market (Ahn and Mira 2002; Brewster and Rindfuss 2000; Engelhardt et al. 2004; Michael 1985), the increased opportunity cost of women's time (Becker 1981), technological progress (Galor and Weil 1996; Greenwood and Seshadri 2002), the decline in infant mortality rates (Doepke 2005; Sah 1991), the reform of the laws that have made birth control and abortion more accessible (Ananat et al. 2007; Goldin and Katz 2000, 2002; Guldi 2008), the public debt (Fanti and Spataro 2013), housing prices (Day and Guest 2016), and the introduction of reforms in divorce laws (Bellido and Marcén 2014), among others.

Although all of these factors, separately and together, can influence the evolution of fertility rates in the majority of countries, a global pattern of convergence of fertility behavior is not clearly observed (see Figure 1.1.2). Those countries with low fertility rates in 1980 maintain those low rates in 2014. The same occurs in most of the countries with high fertility rates during the1980s; their fertility rates remain high in 2014.[4] This leads

[2]In the subsequent waves of the World Values Survey, that question or a similar one has not been included.

[3] The total fertility rate is defined as the mean number of children that would be born alive to a woman during her life time if she were to pass through her childbearing years conforming to the fertility rates by age of a given year.

[4]For those countries having high fertility rates in 1980, there are more variations in the fertility rates observed in 2014, although, as we mention above, most of them have maintained high fertility rates through 2014.

us to ask whether there are social norms or cultural attitudes that affect the number of children that women decide to have, or are such economic and institutional differences the only things that matter. In this paper, we examine the possible effect of culture on the number of children being born.

Following the definition proposed by the United Nations Educational, Scientific and Cultural Organization (UNESCO 2001), we define culture as *the set of distinctive spiritual, material, intellectual, and emotional features of society or a social group. Not only does this encompass art and literature, but it also includes lifestyles, ways of living together, value systems, traditions, and beliefs*. Nearly all researchers would agree that culture is an important determinant of human behavior (Giuliano 2016), but it is not easy to measure. The interrelation among institutions, economic conditions, and social norms is one source of that difficulty (Fernández 2007; Sevilla 2010). In order to isolate the impact of culture from the effect of institutions and economic conditions, we follow the epidemiological approach (Fernández 2007), by exploring the behavior of immigrant women who arrived in the US before age 6, and whose ethnicity or country of origin is known. To document the importance of the impact of culture on the number of children that women decide to have, we use dissimilarities in the number of children born by country of origin, since women's attitudes are probably similar to the preferences of their parents, forebears, and ethnic communities.

There is a growing literature analyzing the impact of culture on socio-economic and demographic variables (Fernández 2011; Giuliano 2016). Utilizing empirical strategies analogous to ours, researchers have shown the substantial effect of culture on women's labor force participation and fertility (Bellido et al. 2016; Contreras and Plaza 2010; Fernández 2007; Fernández and Fogli 2006, 2009), self-employment (Marcén 2014), the search for a job (Eugster et al. 2017), on living arrangements (Giuliano 2007), divorce (Furtado et al. 2013), on the math gender gap (Nollenberger et al. 2016). We contribute to these lines of research by extending the analysis of the impact of culture on the number children born.

Our work is related to prior studies that examine the effect of culture on fertility decisions (Bellido et al. 2016; Fernández and Fogli 2006, 2009). As Adserà and Ferrer (2015) highlight, much work is still to be done to explore this relationship. They note the necessity of improving data availability. Fernández and Fogli (2009) use data from the 1970 US Census, whereas Fernández and Fogli (2006) employ the General Social Survey for the years 1977, 1978, 1980, and 1982 -1987, in both cases with almost all countries of origin being European countries. Bellido et al. (2016) include in the sample some developing countries, but using a final sample of 10 countries, using the NLSY79 and the NLSY97 to explore the relationship between culture and teen motherhood. In our case, we use data from the 5% Integrated Public Use Microdata Series (IPUMS) of the 1990 US Census (Ruggles et al. 2015), which is the last Census containing information on the number of children born per woman. Using this dataset, and following Blau et al. (2013), we expand the analysis to more recent data that allows us to incorporate more individuals originating from Latin America and Asia, who represent a substantial proportion of the immigrants arriving in the US in the latest waves of the 20th century, reducing the weight of those originating from Europe (which constitute the main sample of the prior literature). The incorporation of individuals from developing countries is interesting to check whether the cultural effect is maintained when we add those originating from countries with greater differences - not only cultural but also in markets and institutions - from the country of destination. It can be, arguably, that living in a more developed country, in our case, the US, could make the transmission of a fertility culture of a less developed country more problematic, which would decrease the importance of social norms in fertility decisions. Additionally, the utilization of more recent data permits us to examine whether the fertility culture is still observed after the changes in the participation of women in the labor force, which may affect the transmission of culture, making social norms less important than markets and institutions in the fertility decisions of women during the last decades of the 20th century. Heterogeneity within the countries of origin is also another relevant issue which, as Adserà and Ferrer (2015) claim, can also be more precisely considered in the more recent studies of fertility culture. Prior literature (Bellido et al. 2016; Fernández and Fogli 2006; 2009) utilizes the TFR of each country of origin as the fertility cultural proxy. They use only one measure of fertility culture for each country of origin, assuming that fertility culture does not differ within each country of origin, which is a strong supposition (Adserà and Ferrer 2015). In our case, to capture the effect of culture, we utilize data from the Integrated Public Use Microdata Series International (International IPUMS), Minnesota Population Center (2015). The International IPUMS provides rich information that, in contrast to prior research on the effect of culture on fertility decisions, permits us to measure the cultural variable by age, education level, and employment status, taking into account, at least in part, the heterogeneity of women's characteristics within countries of origin, which leads to better estimations of the effect of culture. The definition of the fertility culture also generates controversy since it is possible to suppose that not only differences in fertility culture across countries are captured by the cultural proxy, the total fertility rate (TFR), but also other dissimilarities across countries (Furtado et al. 2013). To tackle this issue, we introduce country of origin fixed effects. This is possible because of the way in which the cultural proxy is measured by age, education level, and employment status. As before, this improves the estimates on fertility culture. In addition, we contribute to the literature by exploring the effect of culture on both the decision to have a child and the number of children that women decide to have. To the best of our knowledge, this has not been previously studied in the literature. This is not a minor point, given the considerable increase in the number of women having no children (Abma and Martínez 2006). The search for the underlying factors, such as the fertility culture, of this recent phenomenon is of importance for both researchers and policy makers.

Our findings suggest that culture is an important factor in determining the behavior of women, even after including the socio-economic characteristics of women and measures of human capital, as in Fernández and Fogli (2009). We find that there is a positive and statistically significant relationship between the number of children born to immigrant women in the US, and the mean number of children of their counterparts in their respective countries of origin. The estimated coefficients are maintained when the husband's characteristics are incorporated, following Fernández and Fogli (2009). Our results are unaffected after controlling for unobservable characteristics of the countries of origin, including country of origin fixed effects, and using different subsamples, even after using data from different US Censuses (1970 to 1990). This provides additional evidence that our estimates are identifying the effects of culture, rather than the impact of unobserved individual characteristics that can be correlated within ethnic groups. The findings are invariant to a redefinition of culture using information from the World Values Survey. The effect of culture is also detected in the analysis of both the decision to have a child and the number of children that women decide to have, using double hurdle models.

In the final section, we study the horizontal transmission of culture, following Furtado et al. (2013). Culture is not only transmitted from parents to their children, but also within the communities in which women live (Fernández and Fogli, 2009). Unfortunately, we cannot directly analyze how the intergenerational transmission of culture operates from the information provided by the Census. Nevertheless, it is possible to explore the horizontal transmission, following a network approach. We can interpret a positive relationship between an increase in the concentration of individuals of the same ethnicity and the number of children born to immigrant women, as evidence of the existence of a horizontal transmission of culture. If the effect of this horizontal transmission is not quite significant, it could be suggested that the intergenerational transmission of culture does play a more important role.

The remainder of the paper is organized as follows. Section 1.1.2 describes the data, Section 1.1.3 presents the empirical strategy, our results are discussed in Section 1.1.4, and Section 1.1.5 concludes.

1.1.2. Data

We use data from the 5% IPUMS of the 1990 US Census, which is the last Census with information on the number of children born. Our sample selection consists of immigrant women living in the US, aged 16 to 46 years old, who arrived in the US aged 5 or younger, and who report their country of origin.[5] Since the preferences and attitudes of these immigrant women are likely to be similar to those of their parents and ethnic communities, it is possible to interpret any dissimilarity in the mean number of children born by country of origin as supporting evidence of the importance of culture. Our main sample contains 5,726 observations of immigrant women, originating from 26 countries.[6]

We have chosen first-generation immigrants, although most of the prior literature analyzing the effect of culture on several variables mainly uses information on second-generation immigrants who are unlikely to suffer language barriers or the immigration shock (Fernández 2007; Fernández and Fogli 2006, 2009; Furtado et al. 2013; Giuliano 2007). Unfortunately, second-generation immigrants cannot be incorporated in our sample, because the last year for which the Census provides information about the country of origin of parents is 1970. As explained above, we prefer to use more recent data, improving data availability, as Adserà and Ferrer (2015) suggest, to be able to study whether social norms are less important than markets and institutions in fertility decisions, when women from less-developed countries are added to the analysis, and whether the cultural effect is maintained after the extensive incorporation of women in the labor force

[5]We have eliminated those countries of origin with less than 10 observations per country, as in prior studies. It is also worth noting that the analysis has been repeated by selecting a sample of immigrant women who arrived in the US under age 11, and results are similar. We can only select women younger than 47 years old because the IPUMS USA only contains information on the number of children born to women younger than 47. Note that the sample is limited to those living in MSAs.

[6] We incorporate women who decide to have children. We revisit this issue below by repeating the analysis including those who do not have children.

during the last decades of the 20^{th} century. As Furtado et al. (2013) maintain, our sample of young immigrant women arrivals can be considered quite similar to a sample of second-generation immigrants because of their early migration process. The laws and institutions of their home country are unlikely to have influence on an individual younger than 6, and the language barriers and the shock of the immigration are not likely to be lasting (Furtado et al. 2013), as young migrants are capable of quickly adapting to a new place of residence.

The cultural proxy is defined as the home-country mean number of children born. The data come from the microdata of the Censuses (IPUMS International) (see Appendix). As mentioned above, our measure of culture differs from that utilized in prior literature where the total fertility rate is the cultural proxy. In that setting, it is implicitly assumed that all women originating from a specific country have the same fertility culture, regardless of their age, level of education, or employment status. So, for example, this would imply that having no children is equally acceptable for young women as for those at the end of their fertility years, or having few children is equally acceptable to society for those women with a high level of education, or who are employed, as for those with a low level of education, or those who are inactive in the labor market. As mentioned above, this is a strong assumption, since, even in a country in which the social norm is that women should have many children, it is possible to argue that the fertility culture differs depending on women's characteristics, as Bellido et al. (2016) show for the case of teen motherhood. For this reason, we prefer to build our cultural proxy using data from the country of origin Censuses, which allows us to consider possible fertility-cultural differences by age, education level, and employment status. Therefore, if culture varies depending on the specific characteristics of women, we should observe dissimilarities in our estimates, depending on the way in which that variable is measured.

Table 1.1.1 presents summary statistics for the relevant variables, ordered from the lowest to the highest home-country mean number of children born. As can be seen, there are considerable differences among countries of origin: from 2.14 children per woman in Hungary, to 4.84 children per woman in Morocco, which may point to the existence of cultural differences in fertility behavior.[7] The rest of the columns describe the main sample. Immigrant women have 2.03 children in the US on average, with those originating from China and Hungary having the highest number of children. Surprisingly,

[7] To calculate the mean number of children born by country of origin, we have excluded those women having no children.

comparing these two columns, we cannot deduce a clear relationship between the variable that measures the effect of culture and the number of children born to immigrant women in the US. Divergences in fertility behavior appear to be notable for those immigrant women having more than two children. However, for those immigrant women having fewer than two children, the relationship appears to be clearly positive: the greater the number of children in the home country, the more children immigrant women originating from that home country have in the US (see Figure 1.1.3). Although the differences detected in those summary statistics could be due to dissimilarities in the transmission of culture, or in the effects of culture, it should be noted that the composition of the immigrant women sample by country of origin can be driving the differences in their fertility decisions. Overall, the age of the women in our sample is around 30 years old, on average, with the youngest women originating from El Salvador and Thailand, 20 years old on average, and with the oldest being from Austria and China, more than 35 years old on average. This age gap in the structure of immigrant women by country of origin can be a little problematic in analyzing the effect of culture on the number of children born, since some of the women are at the beginning of their reproductive life, while others are near the end of that stage. Thus, the introduction of controls for the age of women is necessary to address this issue. There is an additional problem that the age gap can generate. It can be surmised that attitudes towards fertility behavior could vary, not only across countries but also across age groups within countries.[8] In one country, it may be socially acceptable to have children when women are young, while in others it may be less acceptable. To explore the potential cultural differences by age, we redefine the culture variable as the mean number of children born, by country of origin and age group, with the age groups being: 20 to 29, 30 to 39, and 40 to 46.[9] Within this framework, rather than calculating only one measure of the cultural proxy for each home country, we are able to incorporate three measures of fertility culture for each country of origin.

The differences in the level of education of immigrant women by home country may also provoke concerns on how, and on whom, the fertility culture may play a role. Averaged across countries of origin, 33% have completed High School, ranging from a

[8]For example, in Argentina and Colombia, women tend to have a similar number of children when they are young, but there are considerable dissimilarities between those two countries for women aged 40 to 46: those in Argentina have around 3 children on average, while those in Colombia have more than 4 children.

[9] We do not include in that analysis those immigrant women under age 20 because the number of observations is very small for that age group. For consistency, all our estimates have been repeated without those women and our results are similar. The effect of fertility culture on teen motherhood is examined in Bellido et al. (2016).

low of 13% for Iran and Venezuela, to a high of 40-42% for Ecuador and Spain. With respect to those who have some college education, that is, 1 to 3 years of degree studies, and more college, that is, 4 and more years of degree studies, the lowest percentages are observed among those originating from Mexico, Thailand, and El Salvador (less than 35%), and the highest among those from Iran, Peru, and Haiti (more than 70%). Since, normally, less-educated women tend to have more children than better-educated women (Barro and Becker 1988; Willis 1973), the incorporation in our work of controls on education is necessary. Nevertheless, we should remember that, in this setting, the attitudes to fertility may also vary, depending on the level of education of women within each country. For example, in one country it may be more socially acceptable for a woman to have few children if her education level is high, but this may be less acceptable for a woman with a low education level. Again, to tackle this issue, we redefine the cultural proxy as the mean number of children born by country of origin, age, and education level. As we do for the education level, we repeat the same analysis with the mean number of children calculated by country of origin, age, and employment status (employed, unemployed, and not in the labor force).

Regarding the number of observations, differences across countries of origin are detected in the last column of Table 1.1.1.[10] Those originating from Mexico and Germany represent a significant part of all our observations. With respect to the Mexican women, the existence of a large number of Mexican migrants living in the US is not surprising, because of proximity of those countries (Durand et al. 1999). However, the large number of German women in our sample is somewhat more striking. It is worth noting that this extensive German immigrant sample is also observed in other studies, using similar samples of early-arrival first-generation immigrants (see, for example, Furtado et al. 2013). A possible explanation for the German immigrant group could be the massive immigration of Germans to the US during the post-World War II period (Münz and Ulrich 1997; Tempo 2008). The Displaced Persons Act of 1948, which authorized the admission into the United States of certain European displaced persons for permanent residence, for victims of persecution by the Nazi regime, and for those fearing persecution based on race, religion, or political opinions, facilitated the migration of many Germans to the US. Bearing in mind the dissimilarities in the number of observations, this does not appear to be a major problem, since we repeat the analysis, removing Mexican and German women,

[10]Note that the number of observations presented in Table 1.1.1 come from the raw data, but that we use weights in all our estimates shown in the rest of the Tables.

to check whether this is driving our findings and our results do not vary as we explain in detail in Section 1.1.4.

1.1.3. Empirical Strategy

Following the epidemiological approach, our empirical strategy is based on the fact that immigrant women who arrived in the US when very young have all lived under the same US market conditions and institutions. Thus, if only institutions and markets are important in the fertility decisions of women, we would expect no effect of the home-country mean number of children of their counterparts on the number of children that those immigrant women have in the US. On the other hand, if culture does play a role in the decisions of immigrant women, we would expect to observe that the home-country mean number of children does have an effect on the number of children that immigrant women have in their host country, the US. Formally, we analyze this issue by estimating the following equation:

$$Y_{ijk} = \beta_0 + \beta_1 HCCEB_j + \boldsymbol{X_{ijk}}\beta_2 + \delta_k + \varepsilon_{ijk} \qquad (1)$$

where Y_{ijk} is the number of children born to woman i, whose country of origin is j and lives in state k. Our measure of culture, $HCCEB_j$, is the mean number of children born in the home country j. We revisit the definition of the cultural variable and its implications below. In any case, if culture really matters, women from countries whose counterparts have many children should maintain a similar behavior, having many children in their host country, whereas those women, whose counterparts in their home country have fewer children, should also have fewer children. Then, we would expect β_1 to be positive. $\boldsymbol{X_{ijk}}$ includes women's individual characteristics, which may have an impact on the number of children for reasons other than culture, such as age or education (Leon 2004). We control for the unobservable differences across US states by introducing state fixed effects, denoted by δ_k.[11] Standard errors are clustered at the home country level to account for any within-ethnicity correlation in the error terms.[12]

With this empirical strategy, we can only examine the impact of culture on the number of children born. We note that our work is not limited to the analysis of that

[11] We have re-run the entire analysis using Metropolitan statistical area (MSA) fixed effects, and we find no substantial differences in our results.
[12] All estimates have been repeated with/without weights and with/without clusters. Results do not vary.

relationship only, since we also focus on the decision to have children. To address this issue, we utilize double hurdle models that permit us to study the effect of culture on the decision whether or not to have children, and, for those who do decide to have children, we can analyze the impact of culture on the number of children born. This methodology is discussed in detail in Section 1.1.4.

1.1.4. Results

a) Baseline Model

Table 1.1.2 presents the estimated coefficients for our main specification, including age and education controls, equation (1), and with the cultural proxy defined as the home-country mean number of children born. As can be observed in column 1, a higher mean number of children born in an immigrant's home country is related to an increase in the number of children that the immigrant women decide to have. The cultural effect, although it is statistically significant, appears to be quite small, since if the home-country mean number of children born increases by one, there is an increase of almost 0.08 children born to the immigrant women. Comparing countries of origin, immigrant women from countries where their counterparts have few children (for example, Hungary, Germany, or Austria), would have 0.21 fewer children, because of the impact of culture, than those immigrants whose counterparts have a large number of children in their home countries (Morocco, Nicaragua, or Mexico). While the effect of culture would be around 0.16 children per woman in the first case, it would be approximately 0.37 in the second case.

As expected, the older the immigrant women, the more likely are those women to have a greater number of children. The impact of age appears to have an inverted U-shape, achieving the maximum at 47 years old. Note that our immigrant women are all aged below the age of 47. The estimates for the education level controls are consistent with the literature, since the higher the level of education, the lower the number of children that women decide to have. As the existing literature shows, this occurs because of the increase in the opportunity costs of time for those more educated individuals (Barro and Becker 1988; Willis 1973), and/or because of the negative effect that having a high level of education can have on the age at first marriage of women (Breierova and Duflo 2004), which, in turn, delays childbearing and reduces the possibilities of having a large number of children (Kalwij 2000). In the second column, state fixed effects are added to control for unobservable characteristics that may vary at the state level. Column 3 includes Metropolitan Statistical Areas (MSAs) fixed effects, rather than state fixed effects, to capture the unobservable characteristics.[13] In both cases, we still find a positive association between the home-country mean number of children born and the number of children that the immigrant women give birth to, but the effect of culture is even smaller than that obtained before, and it is only statistically significant at the 10% level. The minor role of culture in fertility may indicate that those estimates are not well-capturing the impact of culture on fertility. This may be due to the fact that the age structure of the sample of immigrant women is different from that of their counterparts in their respective countries of origin. To tackle this issue, we repeat the analysis, considering a sample of women aged 40 to 46 years old, in which we mitigate the concerns that a different age structure of the immigrant sample could generate. Those women aged 40 to 46 constitute an interesting sample in our analysis, since they are all near the end of their reproductive lives, so variations in the number of children born would be expected to be quite insignificant. In this situation, we can explore the effect of culture at the end of the reproductive period of women. Results are shown in Table 1.1.3, in column 1 (with the home-country mean number of children born measured as in Table 1.1.2) and column 2 (with the home-country mean number of children born calculated for women aged 40 to 46). We find that the impact of the cultural proxy, regardless of the measure utilized, remains statistically significant and positive, with the magnitude of the cultural effect being more than 60% greater, pointing to a more important role of culture in fertility decisions when the sample of older women is considered.

Another way to examine the potential age structure problem is by utilizing several measures of culture, one for each age group (20-29, 30-39, and 40-46) and country of origin. In this way, rather than calculating only one measure of the cultural proxy for each home country, we incorporate three measures of the fertility culture for each country of origin: one cultural proxy is used for those women aged 20 to 29, another is calculated for those women aged 30 to 39, and we use another for those women aged 40 to 46. This analysis is necessary to take heterogeneity within countries into consideration. Culture can vary not only by country of origin, but also depending on women's characteristics in each country of origin. For example, in countries with similar general fertility behavior (such as having fewer children), it is possible to argue that the effect of culture varies

[13]IPUMS USA defines a metropolitan area as a region formed by neighboring communities that have a high degree of economic and social integration with the urban core. The population threshold to identify an MSA is 100,000 inhabitants.

depending on the age of women, with some countries having more acceptable attitudes towards women having children when young, while, in certain other countries, young women having children may be ostracized. Columns 4 and 5 report the estimates with this new measure of culture, with the home-country mean number of children born being calculated by country of origin and age group (20-29, 30-39, 40-46). To run this analysis, we have excluded those individuals younger than age 20, because of the availability of observations. To easily compare the results, column 3 reports the estimates using the previous definition of culture, home-country mean number of children, but for the same sample as used in columns 4 and 5, individuals aged 20 to 46. We also note that the use of the new definition of culture, that includes three measures of fertility culture by country of origin, permits us to add country of origin fixed effects. This is important because one of the main problems found in prior papers on the impact of culture is that they do not incorporate those fixed effects by country of origin, without which there can be concerns about exactly what is being picked up by the estimated coefficient on the cultural proxy. That coefficient could be capturing the effect of culture on fertility in addition to, or instead of, the impact of other unobservable characteristics that vary at the home country level, and that also affect fertility decisions. It is comforting that, even after adding those home-country fixed effects, our findings are unaffected, the cultural proxy has a positive impact on the number of children born, and the magnitude of the effect has considerably improved, by almost 80% with respect to that presented in column 3 of Table 1.1.3. Then, these estimates provide additional evidence suggesting that we are, in fact, capturing the impact of culture on the number of children that women decide to have.

Apart from differences in the age structure, dissimilarities in the education and employment status may be important in determining the effect of culture on fertility. Within the same country of origin, for women with higher levels of education, it may be socially more acceptable to have fewer children than those who are less well-educated. We tackle this issue by redefining, again, our cultural proxy, taking into consideration the possible fertility-cultural differences by education level within the same country. The results are shown in the first column of Table 1.1.4, which corresponds to the specification of a model in which the culture variable is calculated as the mean number of children born in the country of origin, by age and education level. Twelve different measures of fertility culture for each country of origin are reckoned, depending on whether women are aged 20 to 29, 30 to 39 or 40 to 46, and on whether women have not completed High School, have completed High School, have studied 1 to 3 years of college studies, or 4 or more years of college studies. The estimated coefficient on the cultural proxy is positive and statistically significant, indicating that culture plays an important role in the decision of the number of children to have. Since the sample varies because of the availability of information on the education variable in some countries of origin, we re-run the analysis considering the same sample as in column 1, but using the cultural proxy of Table 1.1.2. The estimates are displayed in column 3, showing that the magnitude of the effect is greater after redefining the cultural proxy by age, education level, and country of origin. The effect of culture on the number of children born is maintained, even after adding the fixed effects at the country of origin level (see column 2).

In the specifications in columns 4 and 5 of Table 1.1.4, our variable of interest is defined as the home-country mean number of children born, by age and employment status, so we have nine different measures of fertility culture by country, depending on the age group (20-29, 30-39, 40-46) and the employment status (employed, unemployed, or inactive). As above, we run those specifications to account for possible dissimilarities in the fertility culture by age and employment status within each country of origin. We find that, with or without the country of origin fixed effects, there is a positive and statistically significant association between the cultural proxy and the number of children born to immigrant women. Again, the magnitude of the effect of culture on the number of children born is considerably higher than that obtained when the cultural proxy does not take into account the possible cultural differences within countries (see column 6). The same is observed when the sample is limited to those aged 40 to 46 years old, in columns 7 and 8.[14] After redefining the cultural proxy to incorporate the heterogeneity with respect to women's characteristics within countries, we observe an increase in the magnitude of the culture effect in all cases, suggesting that the differences within countries should be taken into account when analyzing the role that culture plays in fertility decisions.

In terms of robustness, we consider whether our findings are maintained when measuring the cultural proxy in different years, when utilizing different subsamples, and when incorporating additional observable characteristics at the country of origin level. Results are reported in Tables 1.1.5 and 1.1.6. In all previous specifications, we have

[14] Note that the sample of women aged 40 to 46 has considerably decreased compared to the estimates shown in Table 1.1.2. In any case, it should be remarked that this change in the number of observations does not drive our results. It is the variation in the definition of the cultural proxy (incorporating the heterogeneity within countries) which appears to improve the magnitude of the cultural effect on fertility decisions.

obtained the cultural proxy from the International IPUMS, using information on the country of origin for the year 1990, or the closest available, based on the notion that immigrant women living in the US in 1990 behave similarly to their counterparts in their country of origin in that year.[15] Nonetheless, since culture is transmitted from parents to their offspring when they are young, it can be argued that the behavior of immigrant women is quite similar to that of their parents when they had their children, so the cultural proxy should be measured some decades before. Since our women are 30 years old on average in 1990, we use information on the 1970s as a proxy of the culture that their parents transmitted. As Fernández (2007) explains, culture changes very slowly, so we should observe similar results by measuring the cultural proxy in different years. That is, in fact, what we find; our results do not change (see the first column of Table 1.1.5).[16] It is also possible to conjecture that the relationship between the cultural proxy and the number of children born depends on the US Census used. A change in the composition of respondents over time may lead to different conclusions. To address this issue, we incorporate earlier Censuses in our analysis. This gives us a larger sample of immigrant women and mitigates the cross-sectional concerns that the use of only the 1990 US Census may generate. We extend our sample to include information from the 1970, 1980, and 1990 US Censuses.[17] The estimates are presented in the second column of Table 1.1.5.[18] It is reassuring that, after adding several US Censuses, the effect of culture is still detected. The home-country mean number of children born by country of origin and year is positively related to the number of children born of immigrant women. Then, the possible changes in the composition of the immigrant women sample over time do not appear to lead to different findings. As simple robustness checks, we repeat the analysis without the two countries with the highest and the lowest home-country mean number of

[15] We also run the entire analysis without those immigrants with no information on their country of origin close to the year 1990 (for example, Iran 2006; see Appendix). Results are unaffected.

[16] The variation in the sample size is due to the availability of information for the 1970s. The home-country mean number of children born can only be calculated for 21 International Censuses of 1970 (those containing information in the 1970s) in column 1.

[17] Data come from the 1% microdata of the 1970 US Census (796 observations, 21 countries of origin), the 5% microdata of the 1980 US Census (1,718 observations, 32 countries of origin), and the 5% microdata sample of the 1990 US Census (5,726 observations, 26 countries of origin). In the case of the 1970 US Census, the number of observations is low, because we are using only the available 1% of the Census for that year. In the 1980 Census, it is possible to utilize 5% of the Census but, although the number of countries of origin is greater than in other Censuses, the observations available are not as numerous as those obtained with the 1990 US Census. The final sample consists of 8,240 observations. The measure of culture is defined by country of origin as in Table 1.1.2 (see Appendix).

[18] The measure of culture is defined by country of origin as in Table 1.1.2 using information on the country of origin for the corresponding year, or the closest available (see Appendix).

children born (Hungary and Morocco) to check whether this is driving our estimates. Results can be observed in columns 3 to 6 of Table 1.1.5, with all the definitions of the cultural proxy. Our findings do not vary. Furthermore, in column 7, we have removed those women originating from China, since that country has legislation that imposes limits on the number of children born per woman, which can affect the measure of the fertility culture of that country, for reasons independent of social norms. We have also eliminated those immigrant women from Mexico and Germany, that is, the countries with the largest number of observations, and without Chinese women, in the last column of Table 1.1.5.[19] Results remain similar regardless of the sample used. We can draw the same conclusions when we add additional controls for observable characteristics of the countries of origin in Table 1.1.6. We introduce GDP per capita (in constant 2005 US $), female labor force participation, the total fertility rate, and the unemployment rate. It is worth noting that the inclusion of the total fertility rate, which is a measure of fertility behavior in other studies, does not alter our estimates. Although all our results appear to be robust, there can still be a suspicion that unobserved human capital can be driving our conclusions. As Fernández and Fogli (2009) suggest, it can be argued that, even after controlling for a woman's education, if the unobserved human capital varies with the country of origin in a way that is correlated with the cultural proxy, this could explain the observed correlations. For example, the human capital embodied in an ethnic group may facilitate the use of contraception methods differentially, depending on the country of origin, which can affect the number of children born. To take this into account, we add to our analysis an index of human capital by country of origin and age group based on the average years of schooling, from Barro and Lee (2013), as a proxy of unobserved human capital.[20] As can be seen in Table 1.1.6, columns 1 to 4, regardless of the measure of the cultural proxy, the estimated coefficients do not change substantially after adding all those additional controls. To provide more empirical evidence that we are capturing the effect of culture, following Furtado et al. (2013), we have redefined the cultural proxy using a different dataset, the World Values Survey (WVS). This dataset includes questions related to the preferences and beliefs of the individuals that permits us to measure the attitudes towards fertility in each country of origin. Instead of using the home-country

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[19]We note that all the estimates in which the cultural proxy is defined by age and employment status exclude women originating from Germany, because the German Census does not contain information on that variable (as the rest of the International Censuses do). Without those individuals, results are maintained, as can be seen in our robustness checks.

[20]We are able to use seven different measures of unobserved human capital for each country of origin.

mean number of children born as cultural proxy, we propose the utilization of the home-country mean *ideal* number of children by country of origin, obtained from the WVS, since it can be considered as a measure of the preferences of the individuals with respect to the fertility culture. The estimated coefficients are displayed in columns 5 and 6 of Table 1.1.6. Even with this redefinition of the cultural proxy, our estimations appear to reveal the existence of a cultural effect on fertility. We find that a higher mean *ideal* number of children in an immigrant's home country is related to an increase in the number of children that the immigrant women decide to have, regardless of the controls included.

As explained above, the 1990 US Census (Ruggles et al. 2015) is the last Census containing information on the number of children born per woman, but it does not provide information on the characteristics of the father of those children. Then, we cannot include controls in our analysis for the father's characteristics. This can be problematic, since several studies suggest that there is an effect of fathers' characteristics on fertility outcomes (Doepke and Kindermann 2016, 2017; Sorenson 1989; Thomson et al. 1990). Prior literature suggests, from both theoretical and empirical approaches, that both parents desires, preferences, and characteristics may play a role in having a child. In this framework, it can be surmised that the omission of father's characteristics can affect our outcomes if they are correlated with our cultural proxy through, for example, the assortative matching in marriage (Fernández and Fogli 2009). To tackle this issue, following Fernández and Fogli (2009), we add to the analysis controls for the husband's characteristics of our sample of immigrant women. We recognize that this is not the best way to measure the fathers' characteristics, since those men who are living with our immigrant women in 1990 are not necessarily the fathers of the children of those women, but, as in prior literature (Fernández and Fogli 2009), there is no alternative. Being aware of this problem, to run this analysis we choose a sample of early-arrival immigrant women who live with a partner and whose characteristics are known.[21] The partner is a man who is denoted the woman's husband in Table 1.1.7. We incorporate in our analysis controls for his age, education level, and total income, as in Fernández and Fogli (2009). Results can be observed in the first column of Table 1.1.7. As in the case of the woman's characteristics, the higher the level of education of the husband, the lower the number of children born. The rest of the husband's characteristics (age and income) are not statistically significant. Although we should take all these estimates with caution, with

[21]In all our previous estimates, we include women with and without a partner.

respect to our variable of interest, the cultural proxy, our results are maintained even after controlling for husband's characteristics, which once again reinforces our findings.[22] Fernández and Fogli (2009) also suggest that women's fertility outcomes can be influenced not only by her husband's characteristics, but also by her husband's cultural beliefs. To check this, we include in the analysis two dummy variables: Same (for same culture of both members of the couple) and Not-same (for different cultures), and we interact those dummies with the cultural proxies, following Fernández and Fogli (2009). Note that, for the US-born husbands, we use a cultural proxy of US culture, but that we have also repeated the analysis without those couples in which the man is US-born and results are maintained, although the number of observations considerably decreases. Column 2 of Table 1.1.7 presents the results using only the women's cultural proxy. As expected, the coefficients are positive and statistically significant. Column 3 incorporates only the husband's cultural proxy, whose estimated coefficients are positive but not statistically significant in the case of Not-same culture, which, again, should be taken with caution, because it can be due to the fact that we are considering immigrant women's partner, but the 1990 US Census does not specify whether they are the actual fathers of the children of those immigrant women. Column 3 uses both cultural proxies. As in Fernández and Fogli (2009), the coefficient on the women's cultural proxy is larger and statistically significant, which is not the case for the husband's cultural proxy. Thus, it appears that women's beliefs and preferences play a more important role in fertility decisions. In any case, all the results described in this section suggest that fertility culture has an impact on the number of children born.

b) Having children or not and, if so, how many?

Up to now, the analysis has been carried out considering a sample of women who have children. Thus, our conclusions would only be applicable to women who decide to have children. However, the use of a truncated sample can be problematic, since the sample of excluded women, those who have no children, has not been selected randomly. In this setting, it may be suggested that the estimated effect of culture on the number of children

[22]The home-country number of children born measured by age group is used here as a cultural proxy since, as we have explained, our results improve when the cultural differences by age are considered. Results do not change substantially when we calculate the cultural proxy by age and education level, and by age and employment status.

born is confounding both the impact of the decision to have children, and that of the number of children born.

To explore both decisions, we propose other methodologies. We first consider a Tobit model (Tobin 1958) that allows us to take into account the decision to have children, and the number of children that women decide to have. Formally:

$$Y_{ijk}^* = \beta_0 + \beta_1 HCCEB_j + \boldsymbol{X_{ijk}}\beta_2 + \delta_k + u_{ijk} \quad (2)$$

$$Y_{ijk} = Y_{ijk}^* \quad if \quad Y_{ijk}^* > 0$$

$$Y_{ijk} = 0 \quad if \quad Y_{ijk}^* \leq 0$$

where Y_{ijk}^* is the unobservable latent variable. The rest of the variables are defined as before. Columns 1 and 2 in Table 1.1.8 show the regression results after defining the cultural proxy by age group, with/without state fixed effects, respectively.[23] In both columns, the effect of the home-country mean number of children born is positive and statistically significant. This finding again indicates that immigrant women from countries with a high mean number of children born tend to have many children, whereas those from countries with a low mean number of children born tend to have few children, because of fertility cultural differences.

One key limitation of the Tobit model is that the explanatory variables have the same effect on the probability of having children, or not having children, $P(Y_{ijk}^* > 0)$, and on the number of children, $E(Y_{ijk}|Y_{ijk}^* > 0)$, which appears to be unrealistic. To tackle this issue, we explore the use of alternative, double hurdle models. As in the Tobit model, both decisions, having children or not, and how many children to have, are taken into consideration in the double hurdle models. First, we analyze the decision of women to have children, or not, and, then, among those who do decide to have children, we examine the decision of how many children to have. The first stage is defined as follows:

$$D_{ijk}^* = \beta_0 + \beta_1 HCCEB_j + \boldsymbol{X_{ijk}}\beta_2 + \varepsilon_{ijk} \quad (3)$$

$$D_{ijk} = 1 \Leftrightarrow D_{ijk}^* > 0 \Leftrightarrow Woman \text{ i } decides\ to\ have\ children$$

$$D_{ijk} = 0 \Leftrightarrow D_{ijk}^* \leq 0 \Leftrightarrow Woman \text{ i } decides\ to\ have\ no\ children$$

[23]As before, the home-country number of children born measured by age group is used here as a cultural proxy. Results do not change substantially when we calculate the cultural proxy by age and education level, and by age and employment status.

where D_{ijk}^* is an unobservable latent variable. The second stage is defined as follows:

$$Y_{ijk}^* = \beta_0 + \beta_1 HCCEB_j + \boldsymbol{X_{ijk}}\beta_2 + u_{ijk} \qquad (4)$$

$$Y_{ijk} = Y_{ijk}^* \quad if \quad Y_{ijk}^* > 0 \ \ if \ D_{ijk} = 1$$

$$Y_{ijk} = 0 \Leftrightarrow Y_{ijk}^* \leq 0 \ \ or \ D_{ijk} = 0$$

This double hurdle model corresponds to a generalization of the Tobit model proposed by Cragg (Cragg 1971). Results are presented in columns 3 (first stage, having children, or not) and 4 (second stage, how many children). The cultural proxy is also defined by age group. Our results suggest that women from countries where the mean number of children is high are more likely to decide to have children than those whose counterparts in their country of origin decide to have few children. The higher the home-country mean number of children, the higher the probability of having children, and the higher the cultural proxy, the higher the number of children that women have. Then, the impact of culture on the decision to have children is not driving our findings, since there is an effect of culture on the decision to have children, but there is also an effect on the decision of how many children to have. These results reinforce our conclusions, suggesting that culture is an important factor in the fertility decisions of women.[24]

c) How can culture be transmitted?

The results described earlier suggest that culture affects the number of children that women decide to have, but with that analysis we cannot determine whether culture has been transmitted horizontally, through neighbors, friends, or the ethnic communities in which immigrant women live, or vertically, through parents (grandparents or other ancestors) who probably instill values in their children. This is of concern, since it can be hypothesized that the home-country mean number of children born has no effect on the decisions of immigrant women, but that immigrants simply behave as their parents do. Thus, it can be suggested that culture does not matter, because immigrant women simply replicate their parents' behavior, as Furtado et al. (2013) explain. Unfortunately, we cannot extend our work to the study of the vertical transmission of culture because we do not have information on the parents; however, we can examine whether immigrant

[24] Because of convergence problems in the estimations of the double hurdle models presented in columns 3 and 4, we could not include fixed effects. In any case, the Tobit model has been estimated incorporating fixed effects and our findings do not vary.

women's sensitivities to their home-country mean number of children differs depending on whether they live in predominantly same-ethnicity communities, as Furtado et al. (2013) suggest. This analysis is based on the idea that parents' behavior regarding fertility is the same, regardless of where they live. Under that assumption, we may interpret a stronger relationship between the cultural proxy and the own number of children born into predominantly same-ethnic communities, as empirical evidence that culture is horizontally transmitted.

The possibility that the culture can be transmitted horizontally is also mentioned in Fernández and Fogli (2009), who explain that local communities can maintain culture either by providing role models for acceptable family behavior, or by punishing deviance from the social norm. To identify that horizontal transmission of culture, we consider an empirical strategy similar to that followed by Bertrand et al. (2000), and used in Furtado et al. (2013), for the analysis of network effects. Formally, we estimate the following equation:

$$Y_{ijk} = \beta_0 + \beta_1 P_{jk} + \beta_2 P_{jk} * HCCEB_j + X_{ijk}\beta_3 + \delta_k + \gamma_j + \varepsilon_{ijk} \qquad (5)$$

where P_{jk} is the proportion of immigrant women from the same country of origin j in each metropolitan area k,γ_j represents the country of origin fixed effects, and ε_{ijk} is the error term. The remaining variables have been defined above. The country of origin fixed effects capture any unobservable determinant of fertility that varies by home country.

We are interested in the interaction between the proportion of immigrant women of the same country of origin and the home-country mean number of children. If culture is transmitted horizontally, we would expect that an increase in the concentration of same-ethnicity immigrants will increase the number of children more for immigrant women originating from countries with high mean numbers of children than for those from countries with low numbers of children born. Then, $\beta_2$should be positive.

Table 1.1.9 reports the regression estimates. In the first column, we observe that the ethnic concentration has a negative and statistically significant effect, suggesting that the greater the concentration of individuals of the same ethnicity, the lower the number of children born. The same is observed in column 2, after including the home-country mean number of children born. The coefficient that captures the impact of the fertility culture has a positive sign, and its magnitude almost coincides with that obtained in column 5 of Table 1.1.3. To explore whether the negative effect of the proportion of individuals of the same ethnicity is maintained, regardless of the home-country mean number of children, we analyze the interaction between those two variables. When including the interaction in column 3, the coefficient picking up its effect is positive and statistically significant, as expected, so the negative relationship is not maintained for all countries. We can easily examine the results of the last column, where we exclude the home-country mean number of children born and we include the country of origin fixed effects, which allows us to identify the role of culture variations in the interaction between ethnic concentration and home-country mean number of children, as Furtado et al. (2013) explain. As can be observed in column 4 of Table 1.1.9, our coefficient of interest increases from 0.17 to 0.23 and remains highly significant. Focusing on a comparison across countries, for example, an increase of 10 percentage points in the concentration of German women leads to a decrease of 0.03 in the number of children that each German immigrant woman has (the mean number of children in Germany is 2.18). However, the same increase in the concentration of Mexican and Moroccan women results in an increase of 0.02 children per Mexican immigrant woman (the home-country mean number of children born in Mexico is 4.40) and an increase of 0.03 children per woman in the case of Moroccan immigrant women (the home-country mean number of children born in Morocco is 4.84). Thus, an increase in the concentration of women of the same ethnic community results in a decrease in the number of children for women from countries where their counterparts have a low number of children, while an increase in the number of children of immigrant women is observed for those from countries of origin with high mean numbers of children. The increase is greater, the greater the home-country cultural proxy.

The magnitude of the effect of the horizontal transmission of culture is small, which may indicate that vertical transmission is more important in the transmission of culture. Of course, we recognize that this is not a full-proof method of identifying the transmission of culture, but it is comforting that our results suggest that immigrants are sensitive to their ethnic communities, which gives us additional empirical evidence that not only do laws and institutions affect women's decisions about how many children they have, but also that social norms may play an important role.

1.1.5. Conclusions

In recent decades, there has been a considerable decline in the fertility rates of many countries, with those rates reaching levels below the replacement rate in many developed countries (set at 2.1 children per woman), whereas in other countries, mainly developing countries, the fertility rate has remained quite high. This leads us to wonder whether economic conditions, laws, and institutions are the only factors affecting fertility behavior, or whether the fertility culture (social norms) may also be important. A cross-country analysis to explore this issue is not useful because of the interrelations between all these variables. Thus, in order to examine whether culture plays a role in fertility decisions, we have followed the epidemiological approach, using data on immigrant women arriving in the US when very young. All of these women grew up under the same US laws and institutions, so that the positive estimated relationship between the home-country mean number of children born and the number of children born to our sample may be interpreted as evidence that fertility culture plays a role in the fertility decision.

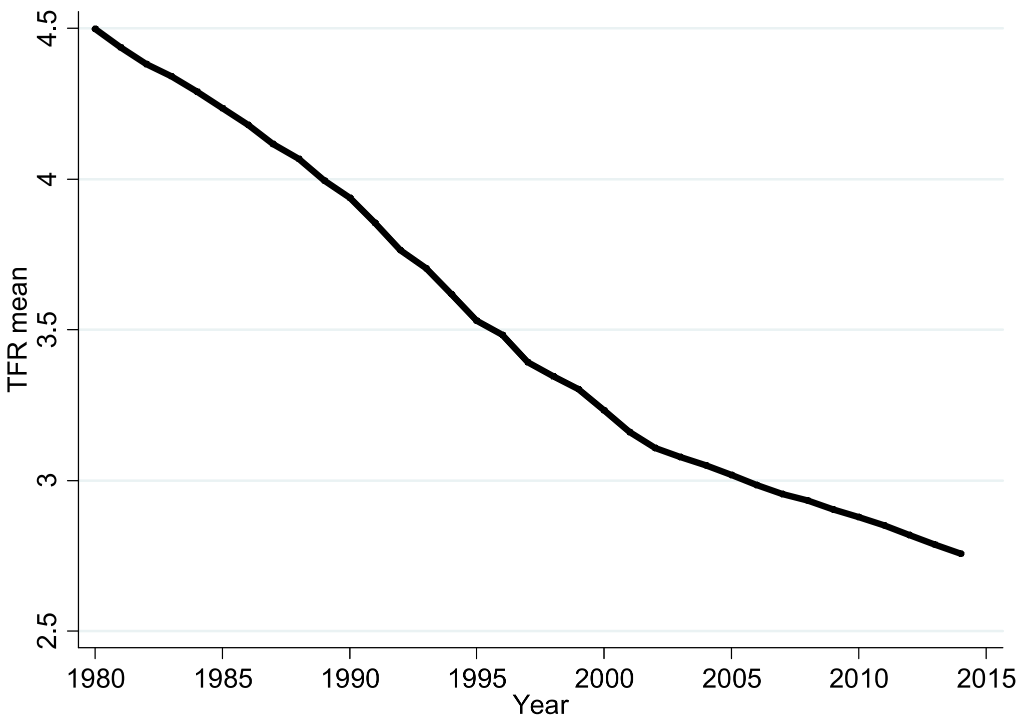
In contrast to prior works analyzing the effect of culture on fertility (Bellido et al. 2016; Fernández and Fogli 2006, 2009), our initial results suggest that the cultural effect can only explain a small part of the cross-country variations in the number of children born. This can be due to the fact that our sample of countries of origin has been considerably extended, including both developed and developing countries. If the epidemiological approach is appropriate in examining the cultural effect, this should not be an important issue, since our sample of women grew up under similar macroeconomic conditions in the US. In addition, other characteristics of the countries of origin (GDP per capita, FLFP, and unemployment rate) and the unobserved human capital that may vary between developed and developing countries do not appear to be driving our estimates. It could also be explained by the differences in the sample used, since earlier works focus on second-generation immigrants whereas we use information from young-arrival first-generation immigrants. However, the cultural impact decreases as generations pass, Marcén (2014), so by using a sample of first-generation immigrants, the cultural effect should be greater than that observed for second-generation immigrants. In any case, our sample of first-generation immigrants can be considered quite similar to a sample of second-generation immigrants, as Furtado et al. (2013) explain. A similar effect is detected when the cultural proxy is measured in different years, and by using several US Censuses (1970 to 1990), so this does not appear to be a factor in our estimated small cultural effect. The inclusion of husband's characteristics to the analysis, as in Fernández and Fogli (2009), does not substantially alter our findings, and does not appear to be a determinant of the small cultural effect. In our work, we show that the cause of the small cultural effect appears to be the way in which the cultural proxy is measured. One measure of culture for each country of origin appears not to be sufficient to measure fertility culture. The impact of culture considerably increases when the cultural proxy is more precisely measured within each country of origin, calculating the cultural proxy by age, education level, and employment status. This suggests that, depending on the women's characteristics, it is more or less socially acceptable to have more or fewer children, and that this may vary within and across countries. Thus, heterogeneity within countries should be considered as an important issue in studying the effect of culture on fertility decisions.

We also view our findings as evidence that cultural differences constitute a potential barrier to cross-country convergence in fertility rates. On the one hand, we find that fertility culture not only affects the number of children born, but also the decision to have children, or not. Our results show that the greater the home-country mean number of children born, the greater the number of women originating from those countries who will decide to have children, and among those who do decide to have children, the greater the home-country mean, the greater the number of children that women will have, whence it may be inferred that the fertility gap across countries may be maintained or even increased because of cultural differences. On the other hand, an examination of the horizontal transmission of culture appears to reveal that women living in the same ethnic communities, whose counterparts in their countries of origin have many children, tend to have more children in their host country, but this is not observed in the case of those immigrant women whose counterparts have few children. Thus, since women appear to be sensitive to the behavior of the communities in which they live, those living in countries where women have many children would be more likely to have many children and those living in countries with low fertility rates would be more likely to have few children, which may maintain the fertility gap across countries.

How can the fertility culture be changed? This is a tricky question. The special treatment (primarily economic) that families with 3 or more children enjoy, does not appear to encourage couples to have more children in developed countries. The ineffectiveness of pronatalist policies, Fanti and Gori (2011), has also been observed in the application of other policies, whose objective was also to reverse the negative trend of fertility rates, such as that enacted in Spain in 2007 (Law 35/2007), known as 'the baby check', but that only applied in a short period, from 2007 to 2010. In order to reduce population growth, policies of birth control were in effect in China between 1979 and 2015. Today, this policy has been partially removed, mainly because China has a significant need for workers. Nonetheless, the response of Chinese women to the change in the legislation does not appear to be what the Chinese government expected; indeed, the current fertility rates have not changed. After so many years of birth control, it could be expected that the social norms regarding fertility would have changed. Other measures have had unexpected impacts on the fertility decisions of women. Using the slogan "Do it for Mom!", a Danish travel agency encouraged parents who want to be grandparents to pay for a vacation period for their children and their partners. Surprisingly, nine months later, there has been a considerable increase in the number of births in Denmark. It is unlikely that this will be maintained in the long run if the social norms in Denmark do not also change. Therefore, since culture appears to play a role in the fertility behavior of women, policy-makers should consider carefully which measures have the potential to change social norms, and should remember that culture changes slowly, so policies should be applied for long periods of time in order to have the desired effect.

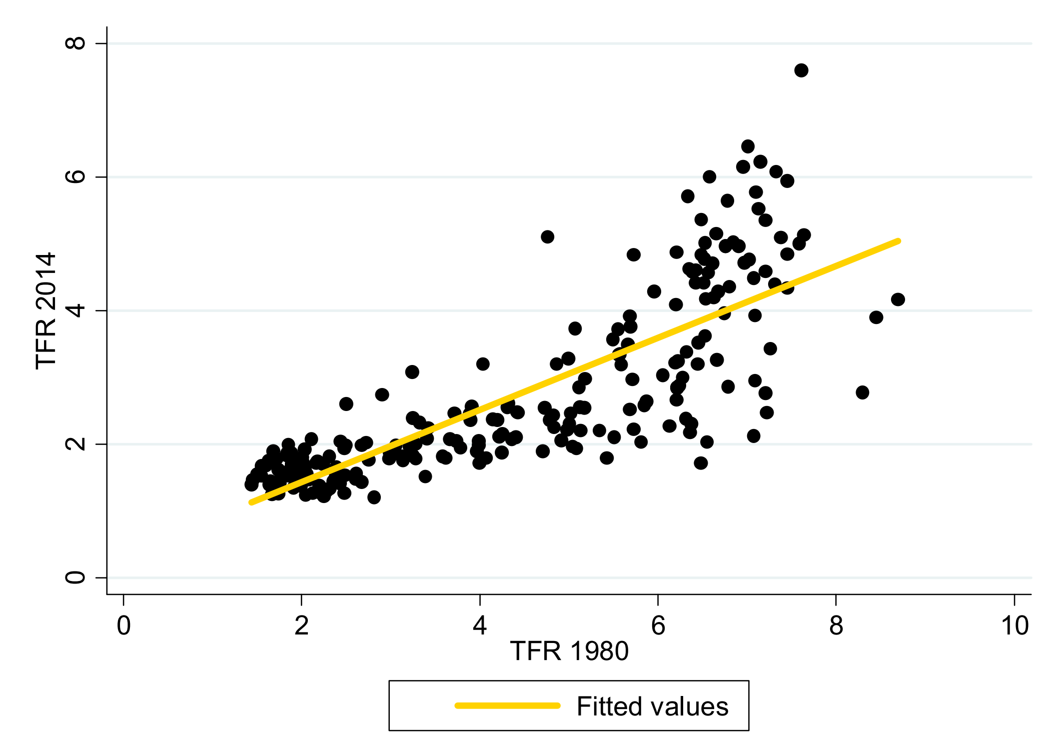
Figures and Tables

Figure 1.1.1: Evolution of the total fertility rate from 1980 to 2014



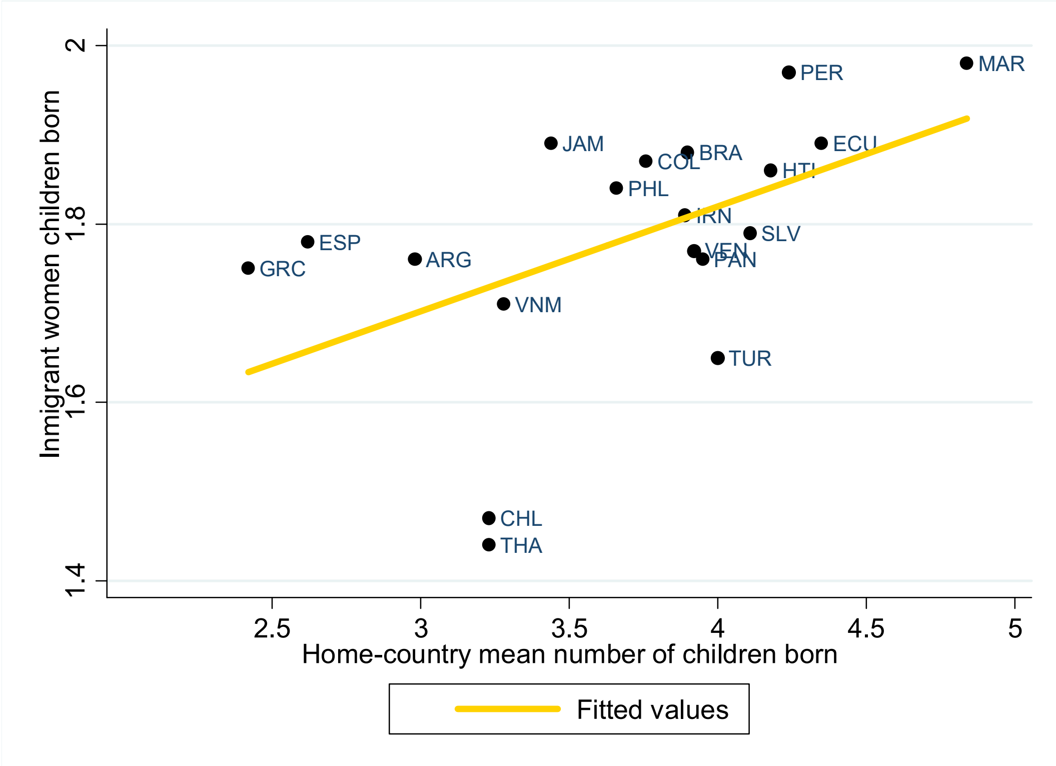
Notes: Data come from the World Bank. The mean TFR represented in this figure has been calculated using information on all countries with available data for the period considered.

Figure 1.1.2: Relationship between the TFR in 1980 and the TFR in 2014, by country



Notes: Data come from the World Bank.

Figure 1.1.3: The number of children that immigrant women have in the US and the mean number of children born in their respective countries of origin



Notes: The home-country mean number of children born, calculated using data from the International IPUMS, is plotted on the x-axis, while the mean number of children per immigrant woman of those countries of origin, calculated using data from the 5% IPUMS of the 1990 US Census, is plotted on the y-axis. Note that we include here only those countries of origin whose immigrant women living in the US have fewer than two children per woman, on average.

Table 1.1.1: Summary statistics by country of origin

Country of origin	Home-country mean number of children born	Immigrant women children born	Age	High School	Some college	More college	Observations
Hungary	2.14	2.28	35.52	0.31	0.28	0.31	29
Germany	2.18	2.01	31.82	0.35	0.38	0.18	1,799
Austria	2.28	2.07	38.19	0.24	0.35	0.37	68
Greece	2.42	1.75	32.66	0.32	0.33	0.29	73
Spain	2.62	1.78	27.69	0.42	0.30	0.19	108
Canada	2.66	2.11	33.62	0.28	0.42	0.25	710
China	2.91	2.57	35.73	0.14	0.29	0.39	51
Argentina	2.98	1.76	29.88	0.34	0.28	0.36	50
Chile	3.23	1.47	28.27	0.27	0.27	0.33	15
Thailand	3.23	1.44	22.39	0.28	0.39	0.00	18
Vietnam	3.28	1.71	26.83	0.29	0.42	0.08	24
Jamaica	3.44	1.89	29.51	0.31	0.47	0.13	45
Philippines	3.66	1.84	28.89	0.32	0.43	0.17	259
Colombia	3.76	1.87	28.06	0.29	0.51	0.14	86
Iran	3.89	1.81	34.06	0.13	0.31	0.50	16
Brazil	3.90	1.88	32.58	0.32	0.20	0.44	50
Venezuela	3.92	1.77	33.06	0.13	0.32	0.48	31
Panama	3.95	1.76	33.54	0.31	0.36	0.30	118
Turkey	4.00	1.65	27.35	0.32	0.29	0.26	34
El Salvador	4.11	1.79	25.83	0.28	0.28	0.07	29
Haiti	4.18	1.86	26.29	0.19	0.52	0.19	21
Peru	4.24	1.97	31.00	0.24	0.55	0.16	38
Ecuador	4.35	1.89	27.71	0.40	0.31	0.20	35
Mexico	4.40	2.12	27.92	0.36	0.23	0.04	1,949
Nicaragua	4.63	2.17	29.38	0.24	0.38	0.14	29
Morocco	4.84	1.98	32.20	0.29	0.46	0.22	41
Mean	3.28	2.03	30.40	0.33	0.33	0.16	
Std.dev	0.98	1.12	7.16	0.47	0.47	0.36	

Note: Countries of origin have been ordered from lowest to highest mean number of children born by country of origin, using data from the International IPUMS. The other descriptive statistics were constructed utilizing data from the 5% microdata sample of the 1990 US Census, IPUMS USA. The sample contains 5,726 observations of immigrant women, aged 16 to 46, originating from 26 different countries.

Table 1.1.2: The effect of culture on the number of children born

Dependent Variable: Children born	(1)	(2)	(3)
Home-country mean number of children born	0.078**	0.067*	0.068*
	(0.029)	(0.034)	(0.036)
Age	0.185***	0.186***	0.185***
	(0.031)	(0.030)	(0.030)
$Age^2/100$	-0.195***	-0.199***	-0.197***
	(0.036)	(0.034)	(0.033)
High School Graduate	-0.386***	-0.375***	-0.361***
	(0.048)	(0.048)	(0.047)
Some college	-0.651***	-0.647***	-0.637***
	(0.057)	(0.057)	(0.057)
More college	-0.965***	-0.949***	-0.947***
	(0.096)	(0.090)	(0.083)
State fixed effects	No	Yes	No
MSA fixed effects	No	No	Yes
Observations	5,726	5,726	5,726
R^2	0.151	0.160	0.189

Notes: The home-country mean number of children born is calculated using information on women having at least one child, from the International IPUMS. The sample, obtained from the 5% microdata sample of the 1990 US Census, consists of immigrant women aged 16 to 46 who arrived in the US at or below the age of 5, who report a country of origin, and who have at least one child. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.1.3: The effect of culture on fertility by age

Dependent Variable: Children born	(1)	(2)	(3)	(4)	(5)
Home-country mean number	0.194**	0.126**	0.075**	0.101***	0.135***
of children born	(0.075)	(0.050)	(0.034)	(0.032)	(0.024)
Age	-4.422***	-4.617***	0.199***	0.186***	0.186***
	(1.004)	(1.019)	(0.029)	(0.025)	(0.030)
$Age^2/100$	5.079***	5.310***	-0.216***	-0.209***	-0.215***
	(1.161)	(1.179)	(0.033)	(0.033)	(0.037)
High School Graduate	-0.769***	-0.763***	-0.434***	-0.434***	-0.406***
	(0.103)	(0.105)	(0.050)	(0.052)	(0.061)
Some college	-1.273***	-1.263***	-0.702***	-0.704***	-0.666***
	(0.155)	(0.157)	(0.056)	(0.061)	(0.069)
More college	-1.403***	-1.397***	-1.008***	-1.007***	-0.952***
	(0.101)	(0.103)	(0.079)	(0.082)	(0.084)
State fixed effects	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	No	No	No	No	Yes
Observations	823	823	5,399	5,399	5,399
R^2	0.194	0.194	0.154	0.156	0.165

Notes: In column 1, the cultural proxy is calculated as in Table 1.1.2, while in the second column, the home-country mean number of children born has been calculated for women aged 40 to 46 having at least one child. The cultural proxy in column 3 coincides with that included in Table 1.1.2. In columns 4 and 5, the home-country mean number of children born has been calculated by country of origin and age group (20-29, 30-39, 40-46). Columns 1 and 2 incorporate immigrant women aged 40 to 46. The sample consists of immigrant women aged 20 to 46 in columns 3 to 5. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.1.4: The impact of culture on fertility by age group, education level, and employment status

Dependent Variable: Children born	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Home-country mean number of	0.186***	0.206***	0.082**	0.211***	0.278***	0.112**	0.200***	0.362***
children born	(0.065)	(0.035)	(0.039)	(0.049)	(0.030)	(0.046)	(0.066)	(0.061)
Age	0.173***	0.177***	0.195***	0.199***	0.195***	0.223***	-5.264***	-5.528***
	(0.029)	(0.031)	(0.033)	(0.018)	(0.027)	(0.016)	(1.395)	(1.548)
$Age^2/100$	-0.192***	-0.200***	-0.206***	-0.237***	-0.242***	-0.245***	6.071***	6.368***
	(0.041)	(0.042)	(0.041)	(0.027)	(0.036)	(0.019)	(1.609)	(1.788)
High School Graduate	-0.266***	-0.209***	-0.434***	-0.428***	-0.394***	-0.447***	-0.703***	-0.630***
	(0.073)	(0.035)	(0.050)	(0.050)	(0.064)	(0.053)	(0.139)	(0.175)
Some college	-0.520***	-0.436***	-0.711***	-0.694***	-0.644***	-0.721***	-1.066***	-0.917***
	(0.076)	(0.048)	(0.064)	(0.057)	(0.070)	(0.056)	(0.201)	(0.280)
More college	-0.814***	-0.720***	-1.011***	-1.041***	-0.975***	-1.060***	-1.306***	-1.068***
	(0.068)	(0.031)	(0.073)	(0.063)	(0.077)	(0.065)	(0.148)	(0.227)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	No	Yes	No	No	Yes	No	No	Yes
Observations	4,635	4,635	4,635	3,634	3,634	3,634	540	540
R^2	0.164	0.174	0.162	0.191	0.203	0.179	0.230	0.266

Notes: The home-country mean number of children born is defined by age, education level, and country of origin in columns 1 and 2. Columns 3 and 6 use the same cultural proxy as in Table 1.1.2 for the sample of women of columns 1 and 2 and for the sample of women of columns 4 and 5, respectively. In columns 4 and 5, the home-country mean number of children born is calculated by age group, employment status, and country of origin. Columns 7 and 8 incorporate immigrant women aged 40 to 46 and the cultural proxy is measured by age, employment status, and country of origin. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.1.5: Simple robustness checks

Dependent Variable: Children born	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Home-country mean number of children	0.050**							
born 1970	(0.022)							
Home-country mean number of children		0.282***						
born 1970, 1980 and 1990		(0.088)						
Home-country mean number of children			0.066*	0.125***	0.196***	0.255***	0.254***	0.192***
born 1990			(0.036)	(0.023)	(0.036)	(0.028)	(0.029)	(0.065)
Age	0.192***	0.218***	0.186***	0.186***	0.177***	0.196***	0.198***	0.156***
	(0.028)	(0.028)	(0.030)	(0.030)	(0.031)	(0.026)	(0.024)	(0.042)
$Age^2/100$	-0.206***	-0.228***	-0.198***	-0.214***	-0.199***	-0.240***	-0.240***	-0.185***
	(0.031)	(0.027)	(0.034)	(0.036)	(0.042)	(0.033)	(0.031)	(0.057)
High School Graduate	-0.372***	-0.454***	-0.387***	-0.422***	-0.236***	-0.418***	-0.416***	-0.249
	(0.049)	(0.138)	(0.044)	(0.054)	(0.030)	(0.050)	(0.052)	(0.159)
Some college	-0.659***	-0.692***	-0.648***	-0.670***	-0.447***	-0.652***	-0.647***	-0.452***
	(0.057)	(0.149)	(0.054)	(0.065)	(0.047)	(0.064)	(0.068)	(0.121)
More college	-0.935***	-0.929***	-0.949***	-0.956***	-0.738***	-0.982***	-0.958***	-0.754***
	(0.090)	(0.149)	(0.086)	(0.080)	(0.027)	(0.071)	(0.071)	(0.126)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	No	No	No	Yes	Yes	Yes	Yes	Yes
Observations	5,533	8,240	5,656	5,329	4,573	3,564	3,516	1,782
R^2	0.165	0.233	0.175	0.203	0.207	0.149	0.165	0.175

Notes: The home-country mean number of children born is calculated for 21 International Censuses of 1970 (those containing information in the 1970s) in column 1. In column 2, the 1% microdata of the 1970 US Census (796 observations, 21 countries of origin) and 5% microdata of the 1980 US Census (1,718 observations, 32 countries of origin) , is included in addition to the 5% microdata sample of the 1990 US Census (5,726 observations, 26 countries of origin).In the rest of the columns, we use the sample obtained from the 5% microdata sample of the 1990 US Census.We have excluded those immigrant women from Hungary and Morocco in columns 3 to 6, in which the home-country mean number of children born is defined as in Table 1.1.2, by age group, by age group and education level, and by age group and employment status, respectively. Column 7 excludes immigrant women from China, and column 8 excludes those from China, Mexico, and Germany. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.1.6: More robustness checks, adding home-country observable characteristics, unobserved human capital, and redefining the cultural proxy using the World Values Survey

Dependent Variable: Children born	(1)	(2)	(3)	(4)	(5)	(6)
Home-country mean number of children	0.113***	0.139***	0.189***	0.266***		
born	(0.029)	(0.023)	(0.045)	(0.030)		
Home-country *ideal* number of children					1.400***	0.684***
					(0.303)	(0.218)
Age	0.192***	0.181***	0.173***	0.193***	0.172***	0.184***
	(0.027)	(0.030)	(0.033)	(0.026)	(0.019)	(0.021)
Age2/100	-0.212***	-0.210***	-0.198***	-0.241***	-0.193***	-0.194***
	(0.031)	(0.038)	(0.045)	(0.035)	(0.014)	(0.020)
High School Graduate	-0.358***	-0.421***	-0.246***	-0.409***	-0.402***	-0.437***
	(0.054)	(0.053)	(0.046)	(0.054)	(0.056)	(0.042)
Some college	-0.627***	-0.686***	-0.467***	-0.666***	-0.662***	-0.711***
	(0.064)	(0.061)	(0.055)	(0.058)	(0.066)	(0.050)
More college	-0.920***	-0.982***	-0.780***	-1.013***	-0.945***	-1.002***
	(0.094)	(0.081)	(0.049)	(0.068)	(0.085)	(0.076)
GDP pc	0.008	0.007	0.004	0.008		0.004
	(0.005)	(0.005)	(0.006)	(0.006)		(0.008)
Female labor force participation	0.370	1.939	1.215	1.802		-0.002
	(0.277)	(3.171)	(3.480)	(3.396)		(0.004)
Total fertility rate	0.018	0.024	-0.001	-0.051		0.042
	(0.047)	(0.055)	(0.062)	(0.063)		(0.100)
Unemployment rate	-0.011*	-0.014*	-0.015**	-0.015**		-0.012
	(0.006)	(0.007)	(0.007)	(0.006)		(0.009)
Human Capital	-0.025*	-0.005	-0.029*	-0.020		0.037
	(0.013)	(0.015)	(0.015)	(0.018)		(0.023)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No	Yes	No
Observations	5,726	5,399	4,635	3,634	5,008	5,008
R2	0.163	0.159	0.167	0.195	0.174	0.163

Notes: In column 1, the home-country mean number of children born is calculated as in Table 1.1.2. In column 2, that variable has been measured by country of origin and age group. In column 3, it has been measured by country of origin, age group and education level, and in column 4 the cultural proxy has been calculated by country of origin, age group and employment status. In columns 5 and 6, the home-country mean number of children born is replaced by the *ideal* number of children (WVS) as our proxy of culture. The number of observations of columns 5 and 6 changes because there is no available information for Austria, Ecuador, Greece, Haiti, Jamaica, Nicaragua and Panama in the WVS. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.1.7: More robustness checks, adding characteristics of women's husbands

Dependent Variable: Children born	(1)	(2)	(3)	(4)
Home-country mean number of children	0.125***			
born	(0.032)			
Same x HCCEB		0.116***	0.119**	0.136**
		(0.027)	(0.046)	(0.050)
Not same x wife's HCCEB		0.071**		0.066**
		(0.026)		(0.025)
Not same x husband's HCCEB			0.094	0.038
			(0.070)	(0.067)
Age	0.212***	0.214***	0.211***	0.211***
	(0.039)	(0.032)	(0.030)	(0.029)
$Age^2/100$	-0.245***	-0.240***	-0.234***	-0.238***
	(0.047)	(0.041)	(0.038)	(0.039)
High School Graduate	-0.385***	-0.390***	-0.395***	-0.390***
	(0.044)	(0.040)	(0.039)	(0.040)
Some college	-0.591***	-0.595***	-0.601***	-0.596***
	(0.040)	(0.037)	(0.036)	(0.037)
More college	-0.878***	-0.895***	-0.899***	-0.895***
	(0.057)	(0.052)	(0.053)	(0.052)
Husband High School Graduate	-0.204***	-0.190***	-0.199***	-0.191***
	(0.044)	(0.044)	(0.046)	(0.044)
Husband Some college	-0.214***	-0.192***	-0.197***	-0.193***
	(0.056)	(0.039)	(0.042)	(0.041)
Husband More college	-0.264***	-0.247***	-0.256***	-0.249***
	(0.040)	(0.040)	(0.040)	(0.040)
Husband Total Income	0.057	0.065	0.057	0.066
	(0.066)	(0.064)	(0.068)	(0.064)
Husband Age	-0.002	-0.002	-0.002	-0.002
	(0.008)	(0.008)	(0.008)	(0.008)
Husband $Age^2/100$	-0.005	-0.005	-0.005	-0.005
	(0.011)	(0.010)	(0.010)	(0.010)
State fixed effects	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	No	No	No
Observations	4,198	4,198	4,198	4,198
R^2	0.182	0.176	0.175	0.176

Notes: The home-country mean number of children born is defined by age, and country of origin. All columns include characteristics of women's husbands such as age, level of education, and total income. The variation in the sample size is due to the availability of information for women's partners. In column 2, 3, and 4 we study the effect of husband's culture. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.1.8: The effect of culture on the decision to have children, and if so, how many

	(1)	(2)	(3)	(4)
	Tobit model	Tobit model	Cragg's double hurdle model	
			First Stage	Second Stage
Home-country mean number of children born	0.146***	0.130***	0.085**	0.121***
	(0.041)	(0.032)	(0.035)	(0.031)
Age	0.659***	0.655***	0.399***	0.252***
	(0.055)	(0.053)	(0.031)	(0.043)
$Age^2/100$	-0.809***	-0.802***	-0.492***	-0.291***
	(0.070)	(0.071)	(0.041)	(0.058)
High School Graduate	-1.088***	-1.059***	-0.748***	-0.541***
	(0.072)	(0.062)	(0.053)	(0.069)
Some college	-1.850***	-1.823***	-1.231***	-0.871***
	(0.130)	(0.111)	(0.105)	(0.091)
More college	-2.797***	-2.731***	-1.804***	-1.273***
	(0.168)	(0.138)	(0.113)	(0.137)
State fixed effects	No	Yes	No	No
Observations	9,817	9,817	9,817	9,817

Notes: The home-country mean number of children born has been defined by age group as in Table 1.1.3. In contrast to previous estimates, the sample selection includes immigrant women having no children. Columns 1 and 2 show the results of the estimation of a Tobit model, with and without fixed effects, respectively. Columns 3 and 4 report the estimates of a Cragg's double hurdle model. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.1.9: Horizontal transmission of culture and the number of children born

Dependent Variable: Children born	(1)	(2)	(3)	(4)
Proportion of women of the same origin by MSA	-0.132***	-0.138***	-0.654***	-0.856***
	(0.028)	(0.032)	(0.207)	(0.152)
Home-country mean number of children born		0.136***	0.065	
		(0.024)	(0.041)	
Proportion of women of the same origin by MSA x			0.167**	0.233***
Home-country mean number of children born			(0.070)	(0.058)
Age	0.204***	0.185***	0.185***	0.190***
	(0.028)	(0.030)	(0.030)	(0.028)
$Age^2/100$	-0.225***	-0.215***	-0.212***	-0.214***
	(0.031)	(0.037)	(0.037)	(0.034)
High School Graduate	-0.408***	-0.407***	-0.409***	-0.409***
	(0.061)	(0.060)	(0.060)	(0.060)
Some college	-0.665***	-0.667***	-0.668***	-0.668***
	(0.066)	(0.068)	(0.067)	(0.066)
More college	-0.955***	-0.955***	-0.950***	-0.948***
	(0.084)	(0.084)	(0.082)	(0.081)
State fixed effects	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes
Observations	5,399	5,399	5,399	5,399
R^2	0.162	0.165	0.166	0.165

Notes: The home-country mean number of children born has been calculated by country of origin and age group. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Appendix 1.1.A

Table 1.1A1: Census

Country	1990 Census Year (IPUMS International)	1980 Census Year (IPUMS International)	1970 Census Year (IPUMS International)
Argentina	1991	1980	1970
Armenia	-	2001	-
Austria	1991	1981	1981
Brazil	1991	1980	1970
Byelorussia	-	1990	-
Canada	1991	1981	1971
Chile	1992	1982	1970
China	1990	1982	1982
Colombia	1993	1985	-
Ecuador	1990	1982	1974
El Salvador	1992	1992	1992
Germany	1981	1981	1971
Greece	1991	1991	1991
Guinea	-	1996	-
Haiti	1982	1982	-
Hungary	1990	1980	1970
Indonesia	-	1980	-
Iran	2006	2006	2006
Iraq	-	1997	-
Jamaica	1991	1982	1982
Mexico	1990	1990	1970
Morocco	1994	1982	-
Nicaragua	1995	1971	-
Panama	1990	1980	1970
Peru	1993	1993	1993
Philippines	1990	1990	1990
Romania	-	1977	1977
Spain	1991	1981	1981
Thailand	1990	-	-
Turkey	1990	1985	1985
Ukraine	-	2001	2001
Venezuela	1990	1990	-
Vietnam	1989	1989	-

Notes: This table shows the sample of countries of origin utilized to build the cultural proxy of our analysis, that is, home-country mean number of children born.

1.2. Live Together: Does Culture Matter?

1.2.1. Introduction

Despite substantial differences across countries, living with a partner (especially married, or as an unmarried couple) still appears to be the preferred state for individuals in modern society, even with the current high divorce rates, and with the changing household roles as a consequence of the increase in women's wages and labor force participation (Browning et al., 2014). Why do individuals marry, or live together as married? From an economic point of view, both married and unmarried couples living together are modes of partnership that can have the goal of joint production and joint consumption in order to maximize the welfare of the individuals involved. Becker (1973) was one of the first researchers to focus on the gains of marriage versus remaining single. Following his work, an extensive body of theoretical and empirical literature explores the phenomenon from other perspectives, especially considering intra-household bargaining (Andaluz et al., 2017; Chiappori et al., 2002; Grossbard-Shechtman, 1993; Lundberg and Pollak, 1996). Very recently, Browning et al. (2014) review in detail the reasons why "*two are better than one*", which include the sharing of public goods, the division of labor to exploit comparative advantage and increasing returns to scale, extending credit and coordination of investment activities, risk pooling, and coordinating child care. There are other factors to be found in the literature, such as the improvement in the health status of the individuals living together as married or unmarried couples (Perelli-Harris et al., 2017; Waite, 1995), the impact on health-care (Marcén and Molina, 2012; Pylypchuk and Kirby, 2017; Simeonova, 2013), and the benefits of children living with their parents versus those living with a single mother, in terms, for example, of poverty and education (Mencarini et al., 2017; Waite, 1995).

The exploration of the determinants of the living-together decision has not lost its importance in the literature. Stevenson and Wolfers (2007) review the changes and the driving forces of marriage, divorce, and cohabitation, suggesting that the characteristics of individuals, such as their race, gender, and their educational level, appear to be related to the choice of marital status, in addition to outside-of-marriage options, social norms/culture, and legal factors that can affect the bargaining power in determining household arrangements (Angrist, 2002; Browning et al., 2014; Chiappori et al., 2002; Grossbard-Shechtman, 1993; Negrusa and Oreffice, 2010). Economic conditions (Ahituv and Lerman, 2011; Bellido and Marcén, 2020; González-Val and Marcén, 2017, 2018), family laws (González-Val and Marcén, 2012a, 2012b, 2017; Bellido and Marcén, 2020; Stevenson and Wolfers 2007), parenthood (Bellido et al., 2016; Steele et al., 2005) and welfare reforms (Bitler et al., 2004) all appear to affect the transitions into and out of marriage. We add to this literature by exploring empirically whether culture is a factor in the decision to live together (as a married or unmarried couple).

The importance of culture is a pertinent question for many researchers, but it is not easy to measure. Culture is normally defined as a set of beliefs and preferences that varies across space, time, and social groups (Fernández, 2007). Similarly, culture is described by UNESCO (2001) as *the set of distinctive spiritual, material, intellectual and emotional features of society or a social group. Not only does this encompass art and literature, but it also includes lifestyles, ways of living together, value systems, traditions, and beliefs*. This definition is interesting for our work, since it suggests that ways of living are part of the culture or social norms of a society. Individuals form their own attitudes based on what their parents instill in them, but their preferences and beliefs may be influenced by the role models within their communities (Furtado et al., 2013). Those who remain without a partner as single or divorced can be ostracized in some countries, because that life-style is different from the one(s) established by the prevailing social norms (Furtado et al., 2013; Kalmijn and Groenou, 2005; Kalmijn and Uunk, 2007). Then, it is not beyond the bounds of possibility that, if an individual does not want to be ostracized, they will follow the social norms (or culture) and will decide to live with a partner, pointing to the culture as a potential factor in the way-of-life decision. Additionally, social norms may affect the way in which individuals search for a matching partner. In a theoretical framework, Ishida (2003) suggests that social norms may force individuals to commit more cost to the search process. Culture can also be important in the intra-household bargaining in labor and leisure supply (Datta Gupta and Stratton, 2010; Oreffice, 2014).

To analyze the cultural effect on the decision to live together (as married or unmarried couples), we follow the epidemiological approach (Fernández, 2007) by exploring the behavior of immigrants who arrived in the US at or before the age of 5, and whose ethnicity or country of origin is known. In order to capture the effect of culture, we exploit the variation in the proportion of individuals living with a partner (as married or unmarried couples) by country of origin. As the epidemiological approach establishes, since immigrant attitudes are probably similar to the preferences and beliefs of their parents, forbears, and ethnic communities, differences in the proportion of individuals living with a partner (married or unmarried) by home country can be interpreted as evidence of the existence of a cultural effect.

Our work contributes to the literature on the effect of culture on socio-economic and demographic variables, which is becoming more and more common (Fernández, 2011; Giuliano, 2016). Related to our research are those studies that examine the impact of culture on living arrangements (Giuliano, 2007), and divorce (Furtado et al., 2013). Giuliano (2007) finds that individuals originating from countries whose counterparts leave the nest later in life are more likely to delay the decision to live without their parents. Furtado et al. (2013) show a positive relationship between the home-country divorce rates and the probability that the immigrants from those countries report being divorced. Utilizing methodologies quite analogous to ours, there are several papers showing the role of culture in women's labor force participation and fertility (Bellido et al., 2016; Contreras and Plaza, 2010; Fernández, 2007; Fernández and Fogli, 2006; Fernández and Fogli, 2009; Marcén et al., 2018), self-employment (Marcén, 2014), the search for a job (Eugster et al., 2017), and even on the math gender gap (Nollenberger et al., 2016).

Our sample is obtained from the 2015 American Community Survey (ACS) of the Integrated Public Use Microdata Series (IPUMS) (Ruggles et al., 2017). The cultural proxy is calculated by utilizing data from the Integrated Public Use Microdata Series International (IPUMS International), Minnesota Population Center (2017), which allows us to measure the variable of interest more precisely by age and education, as in Marcén et al. (2018). Results point to culture as an important factor in the living-together decision. This is maintained after adding controls for unobservable characteristics (including country of origin fixed effects and year of immigration fixed effects), and carrying out several robustness checks.

Since we only consider the ethnic origin of heads of household in the main sample, we have re-examined the effect of culture, taking into account the fact that individuals can live together with a partner of the same or different country of origin.[25] It is worth noting that a separate gender analysis has been considered including heads and non-heads of household, to mitigate the concerns that the use of a sample of heads of household, who have traditionally been men (Hobbs and Stoops, 2002), may generate. Our findings do not vary.

[25] In this analysis, the US native partners have also been considered.

In our main analysis, living together includes both married and unmarried couples. However, there are other modes of household arrangements in which culture may play a role. Furtado et al. (2013) point to the existence of a divorce culture. Here, we show evidence in favor of a living-together culture jointly for married and unmarried couples, but also when we separate those kinds of couples. This finding should reduce the potential concerns that social norms regarding marriage can differ from those of unmarried cohabitation, which can generate doubts as to whether we are capturing the social norms affecting marriage decisions or those affecting unmarried cohabitation. With respect to other household arrangements of individuals living together, culture appears to be a determinant of the decision to live with an adult child or with a grandparent, of the choice of same-gender couples, of the family size, of the age differences between the members of the couple, and of the decision to remain single.

We cannot study whether culture is transmitted vertically, that is, from parents to their children, since there is no data on parents' characteristics, but we can examine whether an increase in the concentration of individuals of the same country of origin has an effect on the number of individuals who choose to live with a partner. As Furtado el al. (2013) and Marcén et al. (2018) show, that relationship may reflect the sensitivity of immigrants to the community in which they live, providing empirical evidence of a possible horizontal transmission of culture. Following the same strategy, we also study whether immigrants respond to the concentration of elderly individuals of the same ethnicity which can be considered as a channel of how culture operates. Similarly, the possible impact on our analysis of the US cultural-assimilation process is included in our study. Differences in the way a culture can be classified (individualism, or collectivism) and in gender roles, measured through the native language of the immigrants, are added to the work as potential determinants of how culture operates. Our findings reinforce the idea that culture is important in the decision to live with a partner.

The remainder of the paper is organized as follows. Section 1.2.2 presents the empirical strategy. Section 1.2.3 describes the data. Baseline results and robustness checks are discussed in Section 1.2.4. Finally, Section 1.2.5 sets out our main conclusions.

1.2.2. Data

In our main analysis, we use data from the 2015 American Community Survey (ACS) of the Integrated Public Use Microdata Sample (IPUMS) (Ruggles et al., 2017).[26] Our sample consists of first-generation immigrants, who arrived in the US when they were 5 years old or younger and whose country of origin is reported.[27] These children all grew up under US laws, institutions, and markets, but their attitudes are likely to reflect the attitudes of their parents and ethnic communities. We include individuals aged 18 to 50 because everyone in this sample can legally live with a partner. The 2015 ACS data allows us to identify unmarried couples, legally-married couples, and those not living with a partner.[28] In the main sample, we select those immigrants who are heads of household, or householders, in order to have just one observation per household.[29] Our main sample contains 7,052 observations of heads of household who are first-generation immigrants, originating from 38 different countries.[30]

We cannot use a sample of second-generation immigrants, as other papers do, because there is no information on parents' birth place in the 2015 ACS. Nonetheless, our sample of young arrivals can be considered quite similar to a sample of second-generation immigrants. In both cases, those individuals (young-arrival first-generation immigrants and second-generation immigrants) have been exposed to US markets and institutions almost their entire lives. They are unlikely to suffer language barriers or the immigration shock (Fernández, 2007; Fernández and Fogli, 2006, 2009; Furtado et al., 2013; Giuliano, 2007; Marcén et al., 2018). Then, as Furtado et al. (2013) indicate, a sample of young-arrival first-generation immigrants can be useful in examining whether a cultural effect exists. It is true that there are other US Censuses containing information on second-

[26]With this dataset, we have enough observations for 38 countries of origin, which allows us to obtain reliable results with all our sample selection requirements.

[27] Countries of origin with less than 20 observations per country have been removed from our analysis, following the example of the existing literature, since with only a few observations it is difficult to assume that the immigrants represent the population composition of their country of origin. It is also worth noting that the analysis has been repeated by selecting a sample of immigrants who arrived in the US under age 8 and results are similar (see Table 1.2.A2 in the Appendix).

[28]We only include heterosexual couples since same-gender couples were not allowed to marry in all countries during the period considered. There are only 84 heads of household who can be classified as having a same-gender partner.

[29]Among those household-head first-generation immigrants, we include those living in an identifiable statistical metropolitan area in order to maintain the same sample as in the cultural transmission analysis (see below).

[30]We use all the observations from countries where we have information on the cultural proxy in the IPUMS International. We include those immigrants originating from countries of origin where married and unmarried couples are identified in the Census data.

generation immigrants, but the most recent of those was the 1970 US Census. Because marriage patterns have changed in recent decades (Thornton and Young-DeMarco, 2001; Stevenson and Wolfers, 2007), we prefer to use more up-to-date data.

The cultural proxy is measured as the home-country proportion of individuals living with their partners, utilizing data from the Integrated Public Use Microdata Series International (IPUMS International).[31] To calculate this variable, we have chosen country-of-origin Censuses as close as possible to the year 2015 (see Table 1.2.A3 in the Appendix). In this setting, it is assumed that the behavior of those immigrants who respond to the 2015 ACS is similar to the behavior of their counterparts in their country of origin in that same period of time.[32] The IPUMS International allows us to construct the cultural variable by age and education level. This is important, since most of the conclusions of prior studies on the effects of culture are based on the assumption that culture does not differ within each country of origin, which generates some concerns over the validity of the results. The composition of immigrants living in the US can be different from that of individuals living in their country of origin. For example, immigrants living in the US can be younger and more educated than individuals living in their country of origin. Then, their behavior can vary from that captured by the cultural proxy. In addition, if the attitudes toward living together also change by age group and education, the use of just one measure of culture by country does not take into account that heterogeneity. To tackle these potential problems, we follow the proposal of Marcén et al. (2018) and calculate the cultural proxy by country of origin, age, and education level.

Table 1.2.1 presents the summary statistics for the main variables by country of origin. The first column shows large variations in the proportion of immigrants living together, across home countries: from around 40 % in Jamaica, to 70% in Poland and Portugal. Since they all live under the same laws, institutions, and economic conditions, these large differences may indicate the presence of different social norms regarding how individuals should live, with or without a partner. By looking at the home-country proportion of individuals living together in each country of origin, column 2, we cannot deduce a clear relationship between the behavior of the immigrants and that of their counterparts. Although, for example, the lowest proportion of immigrants living with a partner originate from Jamaica, and the country of origin with the lowest proportion of

[31] As before, this has been calculated using a sample of heads of household aged 18 to 50.
[32]This strategy is followed in the rest of the literature. As Fernández (2007) explains, culture adjusts very slowly and our results do not vary when we measure the cultural proxy in different years.

individuals living together (as married or unmarried couples) is also Jamaica, for other countries this is not so clear. The raw data also reveals dissimilarities across countries in gender composition, level of education, and the age of the immigrants; 48% of immigrants are men, with this varying from just 33% in the case of immigrants from Ecuador and Costa Rica, to almost 70% in the case of those from Iraq. The average age of the immigrants in our sample is around 37 years old, with the youngest originating from Armenia, at 31 years old, and the oldest from Greece, at 43 years old. Overall, 26% of the immigrants have completed high school, with the lowest percentage being from India, Iran, and Pakistan (5%), and the highest from Mexico (42%). Regarding those who have completed at least a college degree, the lowest percentages are observed among those from Mexico (41%), and the highest among those from Iran and Pakistan (95%). Fewer differences are observed in terms of race: 60% of the immigrants are white, with the immigrants originating from 10 of the 38 countries being predominantly non-white. Since there are differences across countries for all these variables, we consider that their incorporation in our analysis is necessary.

Attitudes to the living-together decision can vary within each home country and across age groups. For example, in some countries, individuals who decide to live with a partner when they are young can be stigmatized, whereas, in other countries, living together when young may be socially accepted. If this is transmitted to the behavior of our sample of immigrants, the incorporation of more controls cannot help us to take into account the cultural differences within each country. We propose a more precise measure of culture, redefining the cultural proxy by country of origin and age group. The home-country proportion of individuals living together, by country of origin and age interval, is reported in Table 1.2.2, where three age intervals are considered: 18 to 28, 29 to 39, and 40 to 50. The differences across countries and age intervals are not limited to developing countries but, as Stevenson and Wolfers (2007) indicate, family ways of life vary widely across developed countries. Among those aged 18 to 28, 66% live with a partner, ranging from less than 20% for France, Jamaica and United Kingdom, to a high of 91% for Iran. In both cases, the minimum proportion of individuals living together corresponds to that age group (18-28), but this pattern of behavior is different in other countries. Of the 29 countries having more than 70% of individuals living with a partner in the second age interval (29-39), 25 achieve their maximum at that age group. However, all the countries with less than 70% of individuals living together in the second age group achieve their maximum when they are aged 40 to 50. In the latest age interval (40-50), the lowest proportions are for those residing in France, Jamaica and United Kingdom (less than 52%) and the highest for China, Iran, Pakistan and Turkey (more than 91%). We recognize that, although some of those countries are the same as those observed in the first age group, the rest of the countries do not behave in a similar way. There are countries with low proportions of individuals living with a partner in the first age group but with a high proportion of individuals in the latest age group (see the case of the Netherlands).

Is that pattern of behavior mimicked by the immigrants living in the US? Figures 1.2.1, 1.2.2 and 1.2.3 show the relationship between the proportion of immigrants living with their partners in the US, and the home-country proportion of individuals living with their partners, by country of origin and age interval. For those aged 29-39 and 40-50 there is a positive relationship between the two variables: the higher the home-country proportion of individuals living with their partner, the greater the proportion of immigrants living with their partners in the US. This is not so clear for the first age group, which may indicate that cultural differences within the countries of origin may flow from other characteristics of the individuals.

Social norms can differ depending on education level. It may be more socially acceptable for an individual to live without a partner if she/he is more educated, but it can be less acceptable for an individual with a low education level. This can also vary by age group. Then, as before, to address this issue, we measure the cultural proxy by country of origin, education level, and age group, with the education groups being: not completed high school, completed high school, some college (1 to 3 years of degree studies), and more college (4 and more years of degree studies).[33] The culture of each country of origin includes 12 different measures. In the results section, we show whether the redefinition of the cultural proxy is useful in better determining whether culture does, in fact, play a role in the decision to live with a partner.

1.2.3. Empirical Strategy

Measuring culture can be tricky, because of the interrelations among economic conditions, institutions, and social norms (Fernández, 2007; Sevilla, 2010), but Fernández (2007) proposes an empirical strategy to disentangle the effect of culture from that of markets and institutions, maintaining that the epidemiological approach is a useful

[33]For those countries that do not distinguish between some college and more college, we have measured the cultural proxy for the tertiary level of education. Results are maintained without the immigrants originating from those particular countries of origin.

instrument in determining whether culture is an important factor in human behavior. Following that approach, we use data on immigrants who arrived in the US as children, and whose country of origin or ethnicity is known. Those immigrant children have all grown up in the same country, so that, if only institutions and markets are important to the decision to live together, the home-country proportion of their counterparts living together (as married or unmarried couples) should have no impact on the decisions of those now residing in the US. On the other hand, if culture does play a role in the decision to live together, as married or unmarried couple, we would expect to detect a relationship between the behavior of the immigrants living in the US and that of their counterparts in their countries of origin. To test this issue, we estimate the following equation:[34]

$$Y_{ijtk} = \beta_0 + \beta_1 HCLT_j + \boldsymbol{X_{ijkt}\beta_2} + \boldsymbol{\delta_k} + \boldsymbol{\eta_j} + \boldsymbol{\theta_t} + \varepsilon_{ijkt} \qquad (1)$$

where Y_{ijtk} is a dummy variable that takes value 1 when immigrant i of cultural origin j and year of arrival to the US t reports living together (as married or unmarried couple) in state k, and 0 otherwise.[35] Our measure of culture, $HCLT_j$, is the proportion of individuals of country of origin j living with their partners. If culture plays a role here, immigrants from countries whose counterparts tend to choose to live together as married or unmarried couples in a high proportion, should maintain similar behavior in the US. Then, β_1 should be positive. This is based on the notion that immigrants form their own attitudes based on perceptions of role models within their ethnic communities (Furtado et al. 2013), as well as through family socialization (Bisin and Verdier 2000; Bisin et al. 2004). Parents may instill in their children beliefs and preferences about the predominant or customary way of living in their home countries. The vector $\boldsymbol{X_{ijkt}}$ includes individual characteristics, such as gender, race, age, and education level. As Stevenson and Wolfers (2007) show, racial differences in marital status do exist (see, also, Brien, 1997). Blacks normally enter into marriage later in life and even, sometimes, never marry. Since our sample includes individuals of different races, the coefficient picking up the impact of culture could be capturing racial differences, in addition to, or rather than, a cultural effect. To address this issue, we have incorporated three dummies to control for the race of the individuals

[34]As in Furtado et al. (2013), we use a linear probability model for simplicity. Our conclusions are maintained when applying a probit model; see Table 1.2.A1 in the Appendix.
[35]We have repeated the whole analysis with/without those individuals reporting being married with their partner absent. Our results do not vary. All our robustness checks are available upon request.

(White, Black, and Asian).[36] The inclusion of gender is also necessary because we select those first-generation immigrants who are heads of household and, as the literature suggests, women who are more financially independent are more likely to divorce (Jalovaara, 2003; Weiss and Willis, 1997) and women who divorce are less likely to remarry (Buckle et al. 1996; Gierveld, 2004).[37] Other research indicates that the age of the individuals and their level of education can have an effect on marital status, for reasons independent of culture (Goldstein and Kenney, 2001; Stevenson and Wolfers, 2007). As before, these factors must be incorporated in our specifications. Controls for unobserved characteristics of the areas where our first-generation immigrants live are added by using state fixed effects, denoted by $\boldsymbol{\delta_k}$, for the country of origin unobserved characteristics, by introducing country of origin fixed effects, $\boldsymbol{\eta_j}$, and for the time-varying unobserved characteristics by adding year of immigration fixed effects, $\boldsymbol{\theta_t}$.[38] Standard errors are clustered at the home country level, in order to account for any within-ethnicity correlation in the error terms.[39]

We have extended our work by using alternative methodologies in order to explore the choice of living with a partner of the same ethnicity, or not. This is explained in detail in Section 1.2.4. The analysis of how culture operates over time, and the possible mechanisms of transmission, are presented in Section 1.2.4.e.

1.2.4. Results

a) Main Results and Robustness checks

Table 1.2.3 presents the estimates for our main specification. As can be seen in column 1, our results are consistent with the literature. Men are more likely to report being married or living as an unmarried couple, since, for example, they are more likely to

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[36]The omitted race is *other races*. Those with more than one race have been eliminated from the analysis. The entire analysis has been re-estimated with/without race controls and results do not vary. We have also considered a sample of White individuals and our findings are unchanged, reinforcing that it is the cultural effect that we are observing. Our sample has been extended to incorporate those who report mixed race and results are similar, see Table 1.2.A2 in the Appendix.

[37]The IPUMS USA and the IPUMS International define the head of household as any household member in whose name the property is owned or rented. We revisit the choice of the head of household below.

[38]The inclusion of the country of origin fixed effects is not possible in all specifications (see below). We have re-run the analysis replacing the state fixed effects with Metropolitan Statistical Areas (MSA) fixed effects, and we do not find substantial differences. Results do not change when including/excluding the country of origin fixed effects and the year of immigration fixed effects. In the same vein, our findings are invariant after the inclusion of interactions between the time-varying fixed effects and the country of origin fixed effects (see results section).

[39]All estimates have been repeated with/without weights and with/without clusters and we find no differences.

remarry when they divorce (Furtado et al., 2013).[40] Also, as prior studies suggest, black individuals are much more likely to live without a partner than individuals of other races (Stevenson and Wolfers, 2007). The impact of age follows an inverted U-shape, achieving the maximum at almost 41 years old, which is in line with the literature suggesting that older individuals are more likely to be divorced, and thus, to live without a partner (Furtado et al., 2013). The effect of the level of education is not so clear, since it does not appear to be statistically significant in several regressions, regardless of the measure of culture used (with/without taking the education issue into consideration in the home country proxy of culture). This could be due to the fact that the level of education is a potential factor in the choice of a different ethnic partner (Stevenson and Wolfers, 2007), which can affect the probability of couple dissolution. We revisit the choice of a same or different ethnic partner in subsection 4.d.

With respect to our variable of interest, the estimated coefficient on the cultural proxy (HCLT) indicates that a higher proportion of individuals living together as married or unmarried couples in an immigrant's country of origin is associated with an increase in the probability that that immigrant reports living with a partner (see column 1). Taking the epidemiological approach into account, this empirical evidence can be interpreted as a cultural effect. We must clarify that the cultural proxy is defined as the home-country proportion of individuals living together (as married or unmarried couples) in column 1. In that specification, there is only one measure of culture for each country of origin, which is a common strategy in the research on the impact of culture. Nevertheless, as explained above, with this approach we are not considering the possible cultural differences within each home country, which is also a common problem in the literature on cultural issues. Since the preferences and beliefs of individuals can vary depending on their age and education level, and this can also vary across countries, we have re-estimated the equation (1), by redefining the cultural proxy by age interval and country of origin, and by measuring the cultural proxy by age, education level, and country of origin. In this setting, there are 4 and 12 different measures of the culture for each home country, respectively. Estimates are in columns 2 and 3 of Table 1.2.3. In both cases, the redefinition of the cultural proxy in several categories for each country of origin permits us to include country-of-origin fixed effects in order to pick up the unobserved heterogeneity across countries. As in column 1, we detect a positive relationship between the home-country

[40]Note that our sample only incorporates heads of household. The analysis by gender is described below.

proportion of individuals living together (regardless of the categories included in the cultural proxy) and the probability that an immigrant lives with a partner in the US. The estimated coefficient is considerably greater in columns 2 and 3 than in the first column, even after including the country-of-origin fixed effects, which suggests that we are measuring the cultural impact more precisely after considering the cultural differences within countries by age and education level. [41] Then, their inclusion is also necessary. [42]

Our findings point to culture being an important factor. We find that when the cultural proxy (HCLT) increases by 1 percentage point, there is an increase of around 0.373 percentage points in the probability that an immigrant reports living with a partner in the US. Thus, because of the cultural effect, immigrants from the country with the highest HCLT, Iran, are about 24.24 percentage points more likely to be living with a partner in the US than immigrants from Jamaica, the country of origin with the lowest HCLT. Adding Metropolitan Statistical Areas (MSAs) fixed effects rather than state fixed effects does not alter our conclusions (see column 4).[43]

Variations in the sample selection regarding age also do not affect our conclusions. Culture appears to be an important factor when we restrict our sample to young individuals aged 18 to 35 (see column 5), as well as when we enlarge our sample to those aged 25 to 64 (see column 6).[44] It is remarkable that the magnitude of the effect is quite similar in all age groups (see columns 3, 5, and 6). Unobserved characteristics at the time of migration could also have an effect on our estimates which, as explained in the

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[41]It is also possible that controlling for education may be over-controlling since we are also considering those same categories of education in our cultural proxy. For this reason, the effect of education on the living-together decision may be captured by the cultural proxy. To examine this issue, we have repeated the regressions without education controls and our findings do not change (see an example in Table 1.2.A2 of the Appendix). Also, it could be that the choice of education level is affected by culture. Thus, there could be an indirect effect of culture on the living-together decision via education choice. To check this, we have redefined the dependent variable as a dummy variable that takes the value 1 if an individual has at least some college, and 0 otherwise. The explanatory variables are our first cultural proxy (without incorporating the education differences) in addition to the rest of the controls, excluding education. Estimates are presented in Table 1.2.A2 of the Appendix. We find no effect of the cultural proxy on the education choice. Following the rest of the literature exploring the effect of culture on several variables, such as divorce and fertility (Furtado et al. 2013; Marcén et al. 2018), we maintain the education controls in the rest of the paper.

[42]The rest of the regressions shown in the paper only include the cultural proxy measured by age, education level, and country of origin, since this variable allows us to better capture the culture of each country of origin. As can be seen, the R^2 is higher when we use this measure of culture rather than the rest of the cultural proxies. For consistency, we have repeated the analysis with the previous measures of culture and our conclusions on the impact of culture are maintained, although there are small variations in the magnitude of the effect.

[43]IPUMS USA defines a metropolitan area as a region formed by neighboring communities that have a high degree of economic and social integration with the urban core. The population threshold to identify an MSA is 100,000 inhabitants.

[44]We have repeated the analysis using the 2000 US Census and our results are the same.

methodology section, has been addressed by including year of immigration fixed effects, but even in this scenario it could be surmised that those time-varying unobserved factors vary at the country of origin level. To tackle this issue, we have incorporated interactions between the country of origin fixed effects and the period of migration fixed effects. Results are maintained, see column 7.[45]

Although the ACS reports other individual characteristics, such as employment status, or whether couples have children, we have not considered these in our analysis because of endogeneity concerns, following Furtado et al. (2013). It is comforting that adding dummy variables to control for whether individuals were previously married, for whether the individuals live with children in the household, and for whether they are employed or not, does not alter our findings on the existence of a cultural effect (see column 8 of Table 1.2.3, where we have added a dummy variable for whether English is the main language spoken by the individual). Speaking English is an individual characteristic that may affect the probability of living together, as a proxy of the degree of integration of the immigrant in the US. In our analysis, this can be important, since it may reduce the costs of integration into the host society, resulting in a greater influence of the host country culture.[46] Our estimates show that the cultural influence of the home country is still there, even when adding or subtracting the language control.

The last column of Table 1.2.3 incorporates interaction terms between race and our cultural proxy variable. This analysis allows us to examine how the cultural effect varies depending on the race of the individual. We observe some differences, with a more significant effect for those who report Asian as their race, and a lower effect for those who report being White. In all cases, the effect of culture appears to be statistically significant. It is worth noting that immigrants from all but 6 countries of origin (3 for Asian and 3 for Black) report being White in almost 90% of the sample, which can be an important factor in the estimated coefficients obtained in this regression. In any case, we have maintained the race controls in the rest of the specifications. Results do not vary with/without these controls.

[45]Because of the large number of interactions that this generates, to run this regression we had to redefine the time of migration fixed effects, using dummies for the decade in which the immigrants arrived in the US.

[46]Almost all the countries considered in this analysis have a greater proportion of individuals living together than that of the US, which is around 0.51. Then, the assimilation of the US living together culture, if this happens, in the case of immigrants would result in a lower preference for living together as married or as an unmarried couple. We explore this issue below.

Simple robustness checks, including and excluding those immigrants from countries of origin with the highest number of observations and with the highest and lowest HCLT, are presented in Table 1.2.4. In column 1, we drop Mexicans and Germans from our sample of first-generation immigrants, because they are the largest immigrant groups. In column 2, we repeat the analysis without those from Jamaica, which presents the lowest HCLT, and without those from Iran, who have the highest HCLT. Our findings do not vary. For further evidence that our findings are not affected by heterogeneity across countries, we have repeated the analysis by including controls for observable characteristics of the home countries (see column 4 of Table 1.2.5). We include the total fertility rate, the unemployment rate, GDP per capita (in constant 2010 $US), the crude marriage rate, three dummy variables for whether the predominant religion in a country of origin is Catholicism, Islam, and Protestantism, and the proportion of religious practitioners in the home country.[47] We do not have information on all these controls for the entire sample of countries of origin. Results are the same when we run the analysis with that reduced sample (see column 3 of Table 1.2.4). Cross-country differences in fertility behavior may be driving the marital decisions if, for example, those countries with greater preferences for having children (with high fertility rates) are also more likely to have their children when the parents are living together (as married or unmarried couples), influencing the marital decision. Similarly, dissimilarities in economic conditions (unemployment and GDP) across countries may have a different impact on marital behavior if, for example, those countries with worse economic conditions also have a greater necessity for more traditional families, where a single mother has more difficulty living without a partner. The crude marriage rate can be considered as an alternative measure of culture with respect to the immigrants' decision to marry. Unfortunately, it is not useful for capturing the decision of living together as an unmarried couple. Then, we incorporate that rate in the analysis in order to show that cross-country variations in the crude marriage rate have no effect on our estimates. To check whether our estimates are, in fact, capturing the effect of our proxy of culture rather than

[47]The total fertility rate is defined as the mean number of children that would be born alive to a woman during her lifetime if she were to pass through her childbearing years conforming to the fertility rates by age of a given year. Unemployment rate is the percentage of the total labor force, that is without work but available for and seeking employment. GDP per capita is gross domestic product divided by mid-year population. Crude marriage rates are the annual number of marriages per 1,000 mid-year population. Data are collected for the year 2015 (or for the closer year if no data is available for that year) and come from the World Bank Data and from the UN Demographic Yearbooks. The information to elaborate the religion variable came from The World Fact Book of the Central Intelligence Agency.

differences of religion, which has also been suggested in the literature as a measure of culture (Lehrer, 2004; Lehrer and Chiswick, 1993), we have added controls for whether the country of origin has Catholicism, Islam, or Protestantism as the predominant religion. As explained in Furtado et al. (2013), religions may affect living-together decisions since some belief systems often stigmatize divorced or single individuals. (For instance, those who divorce are not permitted to remarry in certain religions.) In the same vein, we have included the proportion of religious practitioners, using data from the World Values Survey (wave 2010-2014).[48] As shown in the fourth column, the estimated coefficient capturing the effect of culture is positive and statistically significant after adding all those controls, providing additional evidence that we are capturing the effect of culture, rather than heterogeneity across countries, or other possible cultural proxies (the crude marriage rate or religion in the home country).[49]

Another possible concern with respect to how culture is measured can be the fact that our cultural proxy has been calculated using the most recent Census data available for each country, throughout the paper. Nevertheless, since individuals in our sample may be influenced by the home-country culture to which their parents were exposed – which may change over time - it is possible to argue that we are not capturing the real social norms affecting our individuals. We address this issue by measuring the cultural variable using data from the 1980 Censuses, since our sample of immigrants are 36 years old on average, then their parents could have transmitted their culture when they were children in the 1980s. It is reassuring that, after using older home-country Census data (see column 5 of Table 1.2.4), the effect of culture is still detected and is similar to that observed in Table 1.2.3. Then, the possible changes in the home-country culture over time do not appear to lead to different findings, which is not surprising since cultures adjust very slowly (Fernández, 2007, Furtado et al., 2013, Marcén 2014, Marcén et al. 2018). It is also possible to conjecture that the relationship between the cultural proxy and the proportion of individuals living together depends on the US data used.[50] To address this issue, we extend our sample to include information from the 2010 ACS to the 2015 ACS. This gives us a larger sample of immigrants. As can be seen in Table 1.2.A2 of the

[48]We checked whether our estimates are similar if we exclude the variable controlling for religious practitioners, since the number of observations considerably decreases after its inclusion. Results are invariant.

[49]We re-run the analysis including each of these observable characteristics, one at a time, and our results do not change.

[50]Results are unchanged when the 2000 US Census is considered.

Appendix, the change in the composition of respondents over time does not lead to different conclusions, since the effect of culture is still detected. All the results described in this subsection suggest that culture plays an important role in the living-together decision.

b) The analysis of gender differences

Given that the sample selection of immigrants only includes heads of household, in order to have one observation per household, we have also explored the possibility that gender issues could be driving our results. Although the number of men and women in our sample is quite balanced, as can be seen in Table 1.2.1, householders have traditionally been men, normally the breadwinners in many traditional societies. If that traditional behavior, in which women form their identities based on wife and mother gender roles, and men on worker and breadwinner gender roles (Akerlof and Kranton, 2000), is transmitted to the sample of immigrants, we would expect to observe a greater impact of culture on the male sample than on the female sample of householders, simply because women householders are less likely to follow that traditional social norm (Furtado et al., 2013). To examine this issue, we have divided the sample by gender. Results are shown in columns 2 and 3 of Table 1.2.5, for men and women, respectively. Column 1 includes the entire sample for comparison proposals. The estimated points indicate that an increase in the home-country proportion of individuals living together increases the probability of living together for immigrants (men and women, separately) of those countries of origin. The magnitude of the coefficient is almost 8% greater in the case of the male sample than in the female sample, in line with our predictions. What is remarkable in this analysis is that, even with a sample of *less*-traditional individuals (the sample of women householders) with respect to gender issues, we still observe that culture matters in determining the decision to live with a partner.

To provide additional results in favor of our cultural approach, we have also re-run our analysis excluding those heads of household in the living-together sample. Then, we incorporate a sample of immigrant non-heads of household for those living with a partner and, for those without a partner at home, we have maintained the same sample requirements. In that way, since non-heads of household are more likely to be women in the non-head-of-household sample who follow the traditional social norms, we would expect a greater impact of the living-together culture in the sample of women than in the sample of men. As before, column 4 of Table 1.2.5 includes all individuals (men and women heads) for easy comparison. The cultural effect is observed in that column and the magnitude of the effect does not vary substantially. Columns 5 and 6 present the results for the men and women sample, respectively.[51] In all cases, we find a positive impact of our cultural proxy on the probability of living together, with this impact being greater for women, as we have predicted above. To reinforce our findings, we extend our sample by including heads of household and their immigrant partners in those living together, and only the heads of household for those without a partner in the seventh column, and we estimate the results separately for men and women in columns 8 and 9, respectively. Results remain the same after the extension of the sample. The magnitude of the coefficient is slightly greater in the case of the male sample than in the female sample. Thus, our results do not appear to depend on gender differences.

c) The effect of culture on other household arrangements

Up to now, we have focused on the decision to live together as married or unmarried couples. Nevertheless, during recent decades, there have been changes in the demographics of marriage in many countries. As is shown in Figure 1.2.4, the crude marriage rate has decreased, especially since the early 1990s. That rate has been calculated for all countries, with the information available in the UN Demographic Yearbooks (several issues). The age at first marriage has also increased and more couples choose to cohabit rather than to marry (Bumpass and Lu, 2000; Cherlin 2002; Manning et al., 2014). For individuals aged 20 to 30, this is more remarkable, since the proportion of married individuals is almost the same as those who, in 2011, live with a partner as an unmarried couple (see Figure 1.2.5; data from the IPUMS International). At least in part, the differential behavior of young individuals is being taken into consideration in our analysis, defining the cultural variable by age group and exploring the cultural effect on a sample of young individuals aged 18 to 35 (see Table 1.2.3). In this setting, it can be surmised that our estimates may be capturing cross-country differences in traditional laws regarding marriage, rather than the effect of culture on the living-together decision. For example, it is possible to argue that those countries having a high proportion of individuals living together are also those having more traditional social norms concerning marriage, and those countries having a low proportion of individuals living together are those where unmarried couples and the decision to remain single is more widely accepted.

[51] The change in the number of observations is due to the fact that the non-heads-of-household are not all immigrants, so those who are native born have been excluded.

To tackle this issue, we have re-run the analysis, separating the sample between married and unmarried individuals.

Table 1.2.6 reports our results. The cultural proxy is defined as the home-country proportion of individuals who report being married, by age and education level, in column 1. Our variable of interest is calculated as the proportion of individuals who report living as an unmarried couple, by age and education level, in column 2.[52] The estimated coefficients on the cultural effect are, in both columns, positive and statistically significant, suggesting that culture plays a role. We find that when the home-country proportion of married individuals increases by 1 percentage point, there is a rise of around 0.18 percentage points in the probability that an immigrant reports living with a partner in the US, whereas when the home-country proportion of unmarried couples increases by 1 percentage point, the probability of reporting living as an unmarried couple increases by 0.22 percentage points.[53] These results reinforce our previous findings, since it appears that the behavior of married or unmarried couples is not driving our results. In any case, we recognize that the estimates of the effect of culture on unmarried couples should be taken with caution, since the number of unmarried couples is quite low in several countries represented in the IPUMS International.

In this subsection, we expand the analysis to other household arrangements that have attracted attention in the literature (Stevenson and Wolfers, 2007), but, to our knowledge, no researcher has examined whether culture is important in those different household arrangements. We consider: same-gender couples, two different kinds of families with several generations living together (living with an adult child and living with a grandparent), remaining single, family size, and age differences between the members of the couple.[54] The divorce culture has been thoroughly examined by Furtado et al. (2013), and the decision to leave the nest has been studied by Giuliano (2007) - although, in this latter case, with a less-recent dataset, so we can re-examine this issue here. Columns 3 to 8 of Table 1.2.6 display the estimates.[55] Estimates in Column 3 show that when the cultural proxy increases by 1 percentage point, there is a rise of around

[52]We exclude those immigrants from countries where married and unmarried couples, separately, are not identified in the home-country Census data. Thus, India, China, Portugal, Vietnam, Pakistan, Thailand and Turkey have been removed from our sample.

[53]The same is observed after controlling for observable characteristics by country of origin, rather than the country of origin fixed effects.

[54] An adult child is a child older than 25.

[55]As before, we construct the cultural variable by age and education level. The variation in the sample size is due to the availability of information.

0.231 percentage points in the probability that an immigrant reports living with a same-gender partner in the US. Our results also point to culture as an important factor when we focus on living with an adult child and living with a grandparent (see Columns 4 and 5). Because of the cultural effect, immigrants from Iran are about 6.5 percentage points more likely to be living with an adult child in the US, and 20.06 percentage points more likely to be living with a grandparent in the US, than immigrants from Jamaica. In Column 6, focusing on the remain-single decision, social norms or cultural factors regarding being single increase the probability of reporting being single by 0.313 percentage points, when the proportion of single individuals in the country of origin increases by 1 percentage point. The effect of culture is also found when we examine family size and age differences between partners. However, our cultural proxy is only statistically significant at the 10% level. Therefore, we show evidence pointing to culture being an important factor in all the living arrangements mentioned above. Our findings suggest that, when individuals choose how they want to live in their home, at least in part, their culture is a factor in their decision.

d) Same-or different origin couples: Cultural effect

In the previous analysis, we have only considered the country of origin of our householder first-generation immigrants as the indicator of culture.[56] The decision to live with a partner is attributed to the preference of one of the members of the couple (the householder) and not to the beliefs and preferences of the other member, which may also be a determinant. In these circumstances, rather than having two alternatives - living together or not - immigrants have three possibilities: they can live without a partner, live with a partner of the same origin, or live with a partner of different origin. To check this, we propose the use of a model for nominal outcomes, specifically a Multinominal Logit Model (MNL) in which we calculate a separate binary logit for each pair of outcome categories (Nervole and Press 1973). Formally, we estimate the following equation:

$$\ln \phi_{m|b} = \ln \frac{\Pr(y=m|\mathbf{x})}{\Pr(y=b|\mathbf{x})} = \mathbf{x}'\boldsymbol{\beta}_{m|b} \text{ for } m = 1 \text{ to } J \qquad (2)$$

In Equation (2), b is the base category and m varies from 1 to J, with J being the total number of outcome categories, in our case, three (living without a partner, living

[56]With the exception of the gender analysis - although, in that case, we have considered a different analysis.

with a partner of the same origin, or living with a partner of different origin). The vector $\boldsymbol{x}$ includes all the variables defined in equation (1). Results are presented in columns 1 and 2 of Table 1.2.7. In order to analyze the dynamics among the outcome categories, we prefer the use of odds ratios, which is an intuitive method of interpreting the estimates (Greene, 2008; Long and Freese, 2006). Holding other variables constant, the changed factor in the odds of outcome category *m* versus outcome category *n*, when x_i increases by δ, equals:

$$\frac{\phi_{m|n}(\mathbf{x}, x_i + \delta)}{\phi_{m|n}(\mathbf{x}, x_i)} = e^{\beta_{i,m|n}\delta}$$

For a unit change in x_i, $\delta = 1$, the odds of *m* versus *n* are expected to change by a factor of $\exp(\beta_{i,m|n})$, holding all other variables constant. For a standard deviation change in x_i, $\delta = s_{x_i}$, the odds of *m* versus *n* are expected to change by a factor of $\exp(\beta_{i,m|n} \times s_{x_i})$. To simplify the odds analysis, the odds ratios can be presented in an odds-ratio plot (Long and Freese 2006). Figure 1.2.6 shows the odds ratios for the estimates presented in Table 1.2.7. The independent variables are represented in separate rows. The horizontal axis indicates the relative magnitude of the coefficients associated with each outcome category. The numbers correspond to the outcome categories: "1" denotes living without a partner, which is the base category in that figure, "2" living with a partner of the same origin, and "3" living with a partner of different origin. The distance between a given pair of outcome categories indicates the magnitude of the effect, and the statistical significance is shown by drawing a line between categories for which there is no statistically significant coefficient at the 10% level of significance. Results suggest that the cultural proxy is important in the choice of the living status of immigrants. In the case of the HCLT, categories 2 and 3 are to the right of category 1, then the greater the home-country proportion of individuals living together in an immigrant's country of origin, the more likely it is that that immigrant chooses to live with a partner of the same (outcome category 2) or of different origin (outcome category 3).[57] The greater the HCLT, the more likely are individuals to choose living with a partner of the same ethnicity, since outcome category 2 is to the right of outcome category 3. Those are interesting results because, in the literature, papers can be found that use ethnic intermarriage as a measure

[57]As before, the cultural proxy is measured in this case by age, education level, and country of origin.

of the intergenerational assimilation rates of immigrants, (Card et al., 2000; Furtado, 2015): the greater the extent of ethnic intermarriage, the greater the scope of the intergenerational assimilation process. However, we cannot dismiss the possibility that parents, or the ethnic communities where immigrants live, instill in those immigrants the preferences for not living with a partner. Then, ethnic intermarriage may not well capture the intergenerational assimilation process, or even the social distance between ethnic groups. Another noticeable result that the odds-ratio plot reveals is that of the education controls; the higher the level of education, the more likely are individuals to choose living with a partner of a different country of origin, then the category chosen is not living with a partner, and the less likely category is living with a partner of the same country of origin. More educated individuals may be better able at adapting to different cultures, making them more likely to live with a partner outside of their ethnicity (Furtado and Theodoropoulos, 2011). In addition, the more educated are less likely to reside in ethnic enclaves, which makes it difficult to find potential spouses of the same ethnicity (Furtado and Theodoropoulos, 2011). This can explain the results for the education variables presented in the paper.

Furthermore, it is possible that the effect of culture varies depending on whether individuals marry a native partner or an immigrant from a different country of origin. To address this issue, we repeat the analysis to include four different categories: "1" denotes living without a partner, which is the base category in Figure 1.2.7, "2" denotes living with a partner of the same origin, "3" denotes living with a native partner of different origin, and "4" denotes living with a non-native partner of different origin. As in the previous analysis, our results show that the stronger the home-country cultural proxy, the less likely is the category of living without a partner. The magnitude of the cultural effect is greater in same-origin couples than in different-origin couples (native or non-native), although there are no statistically significant differences. All the empirical evidence presented here provides additional support for the existence of a living-together cultural effect.

e) The mechanisms through which culture operates

To provide supplemental evidence that we are capturing the effect of culture, the exploration of the possible transmission of culture, and how culture may operate, can be useful. It could be suggested that culture has no effect on the decisions of couples, because immigrants simply reproduce their own parents' behavior, living together if they live with a partner, and not living together if their parents do not do that. To tackle this point, we would have liked to control for whether the immigrant's parents were living together, but this information is not available in the ACS data.[58] We can analyze whether culture has been transmitted horizontally, through neighbors, friends, or the ethnic communities in which immigrants live, but not the vertical transmission of culture; that is, the transmission of culture through parents, grandparents, or other ancestors. Local communities can sustain culture either by providing role models for acceptable family actions, or by punishing conduct outside the norm (Fernández and Fogli, 2009). In this framework, we can study whether immigrants are sensitive to the ethnic communities. As Furtado et al. (2013) suggest, the stronger relationship between the cultural proxy and the decision to live together in predominantly same-ethnic communities, may be interpreted as empirical evidence that culture is horizontally transmitted. Following Bertrand et al. (2000), we consider the possible existence of network effects with this model:

$$Y_{ijtk} = \beta_0 + \beta_1 P_{jk} + \beta_2 P_{jk} * HCLT_j + X_{ijtk}\beta_3 + \boldsymbol{\delta_k} + \boldsymbol{\gamma_j} + \boldsymbol{\theta_t} + \varepsilon_{ijtk} \quad (3)$$

where P_{jk} is the proportion of immigrants from the same country of origin j in each metropolitan area *k*, γ_j represents the country of origin fixed effects, and ε_{ijtk} is the error term. The remaining variables are as defined above. The country of origin fixed effects capture any unobservable determinant of couple's behavior that varies by home country. Our variable of interest is the interaction between ethnic concentration and the home-country proportion of immigrants living with a partner (as married or unmarried couples). If there is a horizontal transmission of culture, an increase in the concentration of same-ethnicity individuals should increase the probability of living with a married or unmarried partner, more for immigrants originating from countries with a high proportion of couples living together than for those from countries with a low proportion of couples living together (as married or unmarried couples). Then, we would expect β_2 to be positive.

Table 1.2.8 presents our results. As seen in the first column, the coefficient capturing the effect of ethnic concentration is not statistically significant (see column 1). The same occurs after adding the cultural proxy in column 2. The estimated coefficient on the HCLT remains similar. It is positive and statistically significant in column 2. The interaction between both variables (the ethnic concentration and the HCLT) is introduced in column 3. In that case, the coefficient on the ethnic concentration is negative and

[58]There is no information on parents' characteristics.

statistically significant, and the interaction term is positive and statistically significant, which may indicate that, depending on the HCLT level, the effect of the ethnic concentration varies from positive to negative. The results indicate that an increase of 10 percentage points in the concentration of immigrants from Jamaica, for example, leads to a decrease of 0.11 in the probability of living with a partner (married or unmarried) for Jamaicans in the US (the home-country proportion of couples living together in Jamaica is 0.28). However, the same 10 percentage-point increase in the concentration of Iranians results in a 0.04 increase in the probability of living with a married or unmarried partner for Iranian immigrants (the home-country proportion of couples living together in Iran is 0.93). According to this finding, only for those immigrants originating from countries where the proportion of couples living together is greater than 0.76, is it found that an increase in the concentration of individuals of the same ethnic community appears to increase the probability of living with a partner (married or unmarried). In addition, the higher the home-country proportion, the greater is the increase. For the rest, an increase in the concentration of individuals of the same ethnic community appears to decrease the probability of living with a partner (married or unmarried). These results appear to suggest the existence of a horizontal transmission of culture. We observe that, for high levels of HCLT, immigrants are sensitive to the behavior of their ethnic communities, increasing the probability of living with a partner. However, for low levels of HCLT, the concentration of same-ethnic individuals clearly discourages immigrants from choosing to live with a partner.

Similarly, we extend our work to the study of the possible assimilation process of US culture. Although this is a tricky issue, and there is an extensive literature focusing on the assimilation process, we simply examine whether the immigrant's sensitivities to their home-country culture differ depending on whether they live in predominantly native communities.[59] No effect can be discerned in this case, since both the native concentration and the interaction between the native concentration and the HCLT are not statistically significant (see column 4). This result suggests that the cultural effect does not vary depending on the native concentration of individuals.

In addition to the immigrant's parents' influence, elder individuals of the same ethnicity may instill in our sample of immigrants a family pattern. Many societies are characterized by the importance of respecting older individuals, and parents lay a great

[59]The native concentration has been defined as the proportion of native individuals in each metropolitan area.

deal of emphasis on their parenting practices, on family bonds, and on obedience (Jambunathan et al., 2000; Wakil et al., 1981). Thus, here we have another channel through which culture may operate. Taking into account the scarcity of information, we can use the same strategy as before to analyze whether immigrants' sensitivities to the cultural proxy change, depending on whether they live in predominantly older same-ethnicity communities. Results are shown in column 5 of Table 1.2.8. The interaction between the HCLT and the ethnic concentration of elders is positive and statistically significant. Results can be interpreted as in the case of the concentration of individuals of the same ethnicity; the coefficient on the proportion of elders of the same origin is negative and statistically significant, whereas that of the interaction term is positive and statistically significant, indicating that the effect of the concentration of same-ethnicity elders varies from positive to negative depending on the HCLT level, which may point to the culture operating through respect for older members of the community. It is worth noting that the concentration of individuals of the same ethnicity and that of elders is not highly correlated (44%), which may indicate that both the horizontal transmission of culture and the respect for elders may be acting as a mechanism.

The way in which culture operates through may depend on whether the countries of origin belong to individualistic cultures (people tend to have an independent view of themselves) or collectivistic cultures (people are more likely to have an interdependent view of themselves). To explore this issue, we follow Tabellini (2008) including in our analysis a variable that captures whether the language spoken by each immigrant makes use of subject pronouns obligatory, or not.[60] Since languages that forbid dropping the first-person pronoun give more emphasis to the individual relative to the social norm (Kashima and Kashima 1998), this linguistic rule can be a signal of individualism or collectivist societies. Results are reported in column 6 of Table 1.2.8. For those individuals originating from more individualistic cultures (using the pronouns) it is detected a lower impact of the home country cultural proxy. When the cultural proxy (HCLT) increases by 1 percentage point in individualistic cultures (collectivistic cultures), there is a rise of around 0.338 (0.452) percentage points in the probability that an immigrant reports living with a partner in the US.

Lastly, the gender roles followed by societies may lead to different levels of living-together culture assimilation. To capture traditional gender roles, we follow the proposal

[60] The information on the language spoken by each immigrant is obtained from the ACS. This is used in the estimations presented in columns 6 and 7 of Table 1.2.8.

of Gay et al. (2017), by controlling whether a language employs a grammatical gender system based on biological gender or not. Information is compiled by linguists in the World Atlas of Language Structures (WALS, Dryer and Haspelmath, 2011).[61] We add to our analysis a variable that considers languages with gender-based distinctions, as well as an interaction between this variable and our cultural proxy, in order to examine whether its effect on the probability of living together changes. Strikingly, our estimates suggest that the living-together cultural effect appears to be slightly lower in those cases of gender-based language systems, which is supposed to be a more traditional framework. This result is tricky to interpret, since we focus on the cultural effect on the decision to live together as married or unmarried couples (the less traditional approach). Thus, it is not clear how this channel of transmission of culture operates in this setting. In any case, the rest of the results described in this section provide evidence of some of the channels through which culture may be transmitted and may operate.[62]

1.2.5. Conclusions

Why is the decision to live together as married or unmarried of such interest? In the literature, economists, sociologists, and other researchers have given many alternative responses to that question, primarily focusing on reproductive reasons (having children), on children's outcomes, on legal issues, and on economic incentives. Although these various responses are common in the majority of countries, there are still considerable differences across countries in the number of individuals who decide to live with a partner. In addition, living together is not always the best option, since in some cases, individuals – occasionally men, but much more often, women - are trapped in problematic and even violent relationships (Lehrer and Son, 2017). Then, we wonder why the numbers of individuals living together vary so much from one country to another. In our work, we show that social norms (culture) may be an important factor in the decision to live together as a married or unmarried couple.

To isolate the effects of culture from those of markets and institutions in determining the individuals' decisions about living with a partner (as married or unmarried), we have followed an epidemiological approach (Fernández, 2007). We have

[61]The variation in the sample size is due to the availability of information for the gender-based system in WALS.

[62]Religion as a potential mechanism through which culture may operate is not considered here, since we do not have information on the religious persuasion of the immigrants. In any case, the incorporation of information of the home country relative to the religion presented above does not alter our findings.

based our work on US data on young-arrival immigrants who subsequently grew up under the same laws and institutions. Since immigrants' attitudes are probably similar to the preferences of their parents, forebears, and ethnic communities, we use dissimilarities in the proportion of couples living together by country of origin to document the extent of the impact of culture.

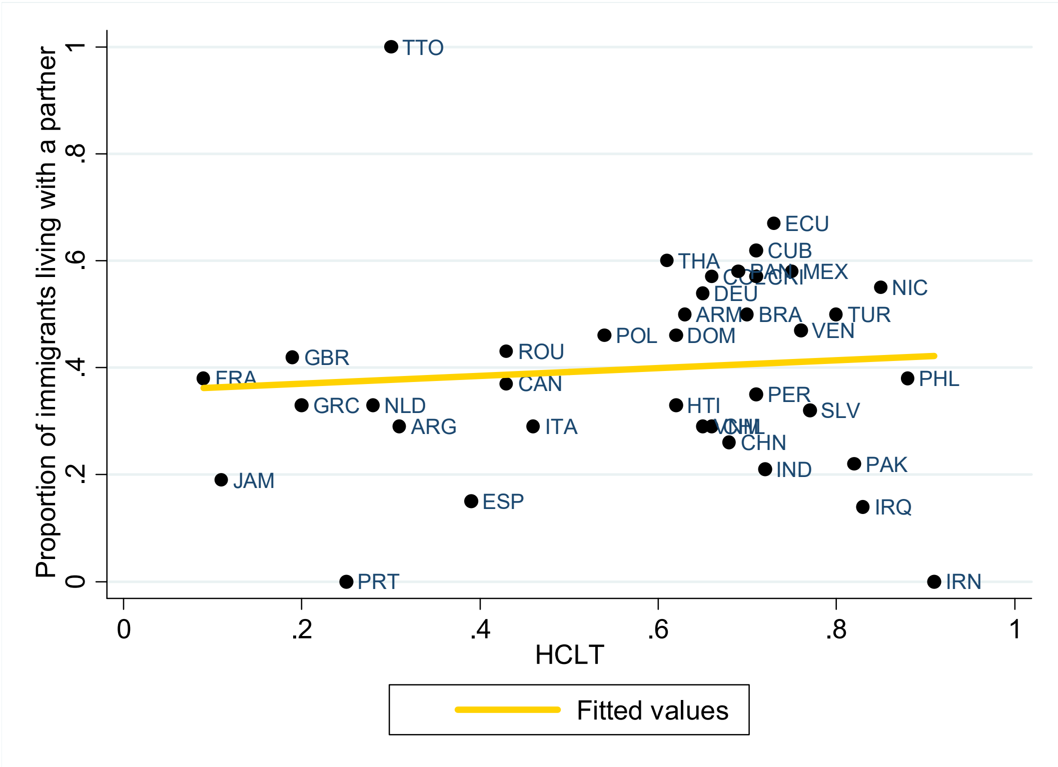
Results show a positive and statistically significant effect of our proxy of culture on the likelihood that an immigrant chooses to live with a partner (married or unmarried). We see our findings as evidence that cross-country variations in laws and institutions cannot entirely explain the observed variations in the proportion of immigrants living with their partners in the US. This is in line with the work of Furtado et al. (2013), who find that culture also appears to be a determinant in divorce decisions. Our estimates are robust to controls for observable and unobservable characteristics by country of origin, to the use of different subsamples, and to the redefinition of the cultural proxy. Empirical evidence also suggests that differences in attitudes regarding unmarried cohabitation do not drive our results. Separately, culture affects both married and unmarried cohabitation, but also other modes of household arrangement, such as living with an adult child, with a grandparent, in a same-gender couple, or variations in family size, among others.

The exploration of the formation of same- or different-origin couples provides supplemental empirical evidence in favor of the effect of culture on the living-together decision. Clearly, the greater the home-country proportion of individuals living together, the more likely are the immigrants from that country of origin to choose living together as married or unmarried couples, regardless of their partners' ethnicity. This is interesting for the literature that uses ethnic intermarriage as a measure of intergenerational assimilation rates of immigrants, (Card et al., 2000; Furtado, 2015) since our estimates suggest that parents' preferences relative to the choice of living without a partner can also be transmitted to their children, which in turn raises doubts about the utilization of ethnic intermarriage as a proxy of intergenerational assimilation.

The ways in which culture is transmitted and operates have also been explored. We provide additional evidence to reinforce the notion that our estimates are capturing the effects of culture. Because of data restrictions, we can only examine the horizontal transmission of culture. Results appear to reveal a marked sensitivity of immigrants to the behavior of their communities, and in this way, our findings provide evidence that culture plays an important role in couples' decisions. Other possible mechanisms through which culture may be operating have been considered. We find evidence of a plausible respect-for-elders channel, since immigrants appear to be sensitive to a concentration of elders of the same ethnicity. Results also point to possible differences in the transmission of culture in individualistic and collectivistic societies.

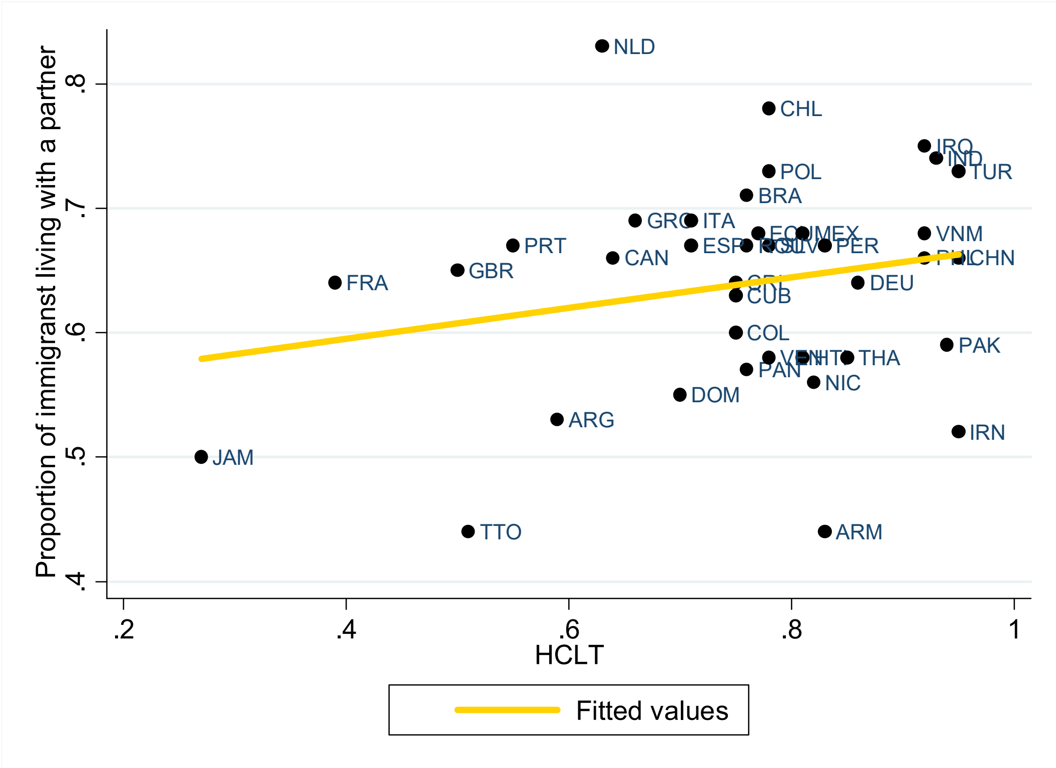
Figures and Tables

Figure 1.2.1: The proportion of immigrants living with a partner in the US, and the proportion of individuals living with a partner in their respective countries of origin. All aged 18 to 28.



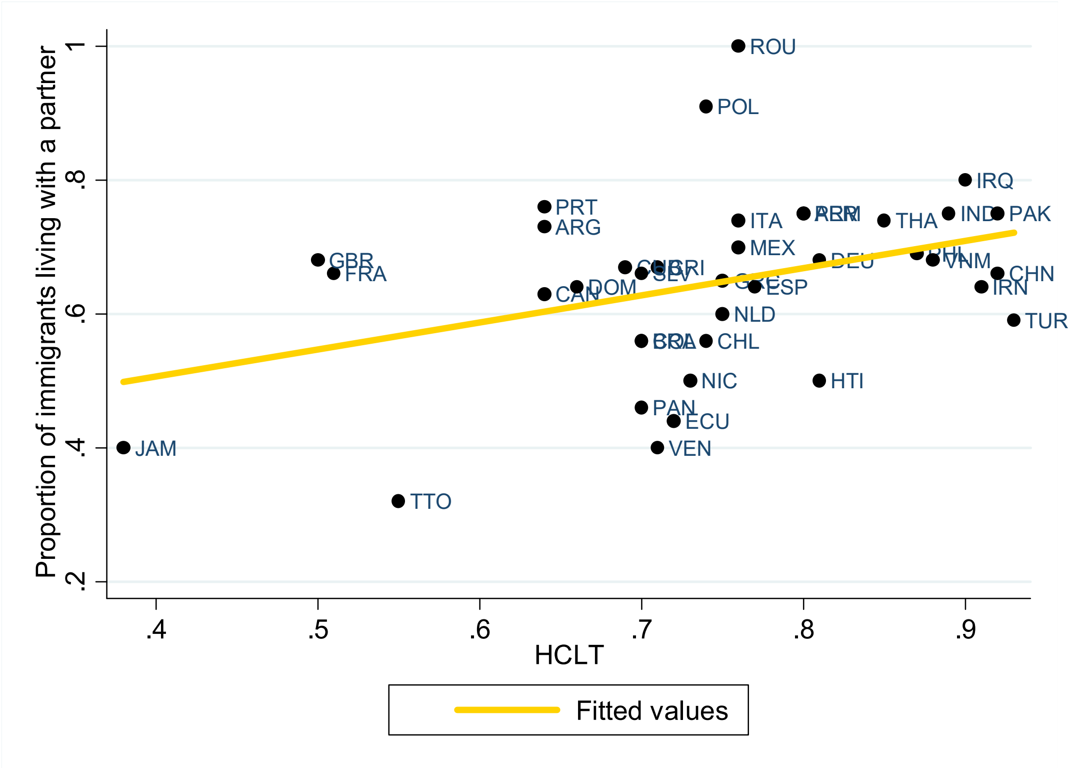
Notes: The home-country proportion of individuals living with a partner (married or unmarried), calculated using data from the IPUMS International, is plotted on the x-axis, while the proportion of immigrants living with a partner of those countries of origin, calculated using data from the 2015 American Community Survey (ACS) of IPUMS is plotted on the y-axis. In both cases, individuals aged 18 to 28 are considered

Figure 1.2.2: The proportion of immigrants living with a partner in the US, and the proportion of individuals living with a partner in their respective countries of origin. All aged 29 to 39.



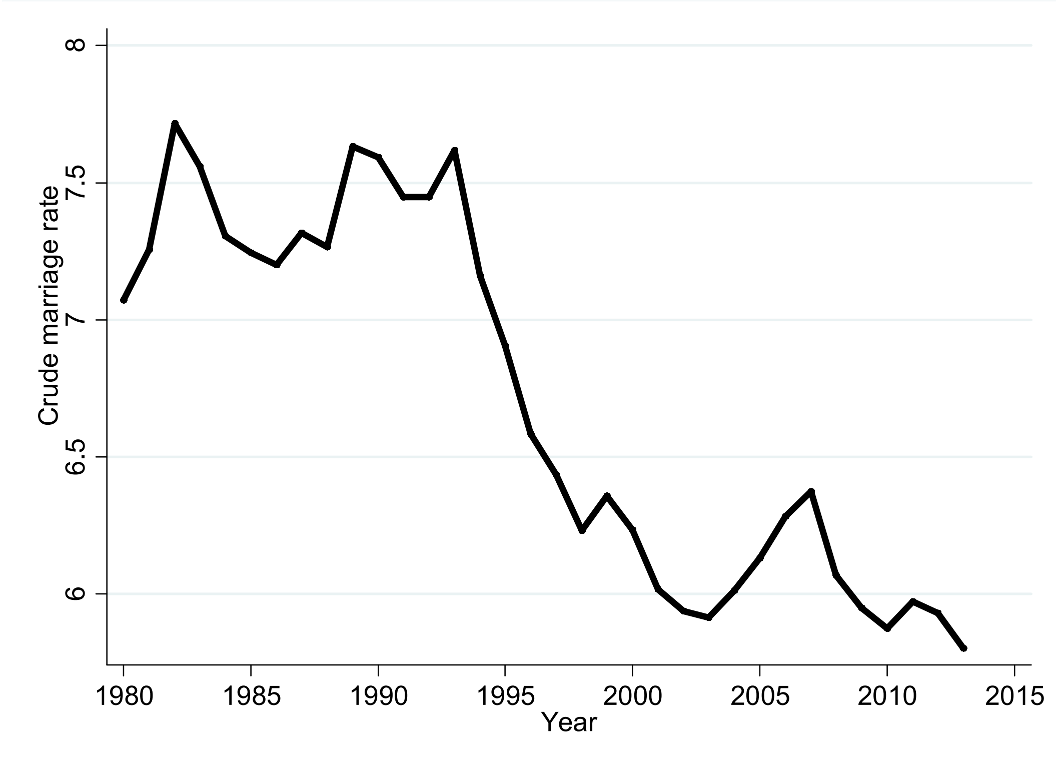
Notes: The home-country proportion of individuals living with a partner (married or unmarried), calculated using data from the IPUMS International, is plotted on the x-axis, while the proportion of immigrants living with a partner of those countries of origin, calculated using data from the 2015 ACS is plotted on the y-axis. In both cases, individuals aged 29 to 39 are considered.

Figure 1.2.3: The proportion of immigrants living with a partner in the US, and the proportion of individuals living with a partner in their respective countries of origin. All aged 40 to 50.



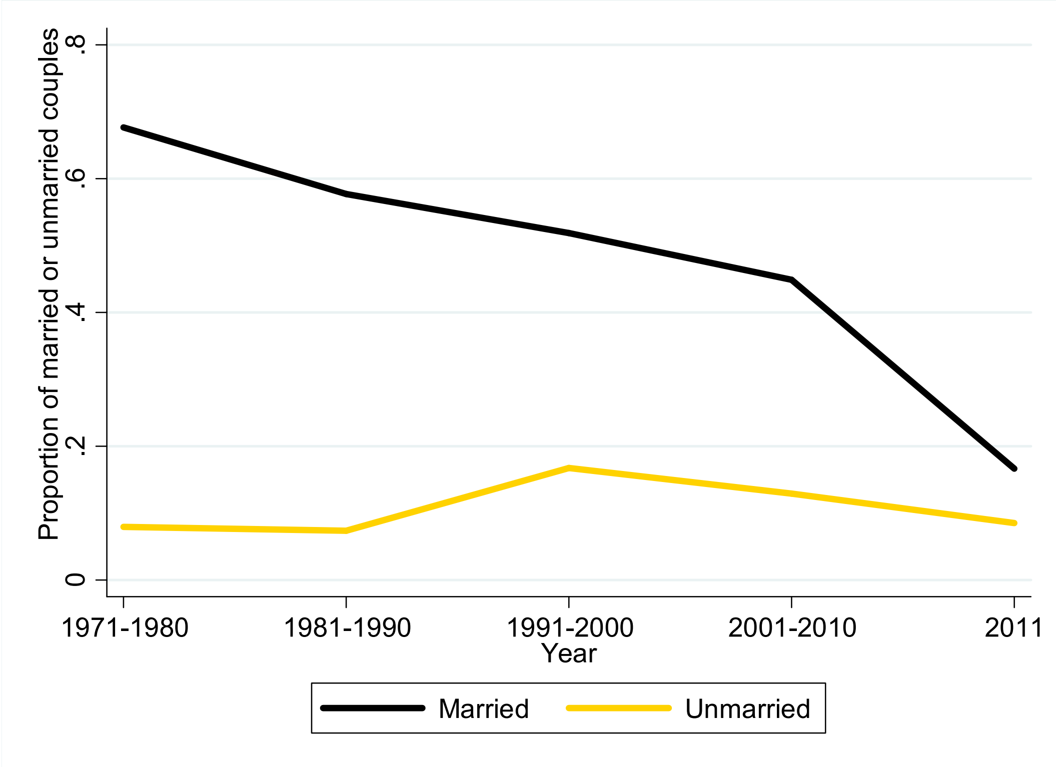
Notes: The home-country proportion of individuals living with a partner (married or unmarried), calculated using data from the IPUMS International, is plotted on the x-axis, while the proportion of immigrants living with a partner of those countries of origin, calculated using data from the 2015 ACS, is plotted on the y-axis. In both cases, individuals aged 40 to 50 are considered

Figure 1.2.4: Evolution of the crude marriage rate from 1980 to 2014.



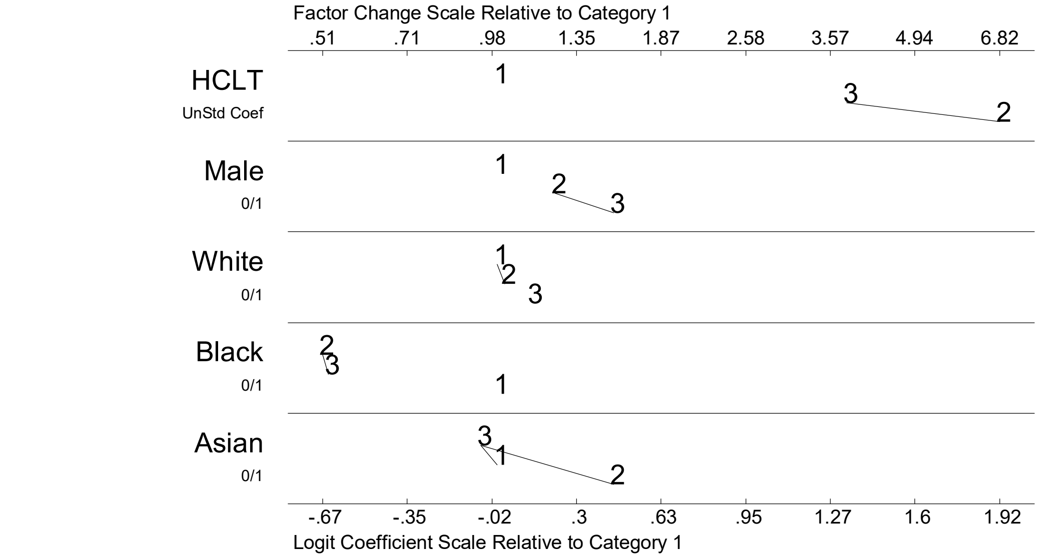
Notes: Data come from the UN Demographic Yearbooks (several issues). The crude marriage rate represented in this figure has been calculated using information on all countries with available data for the period considered.

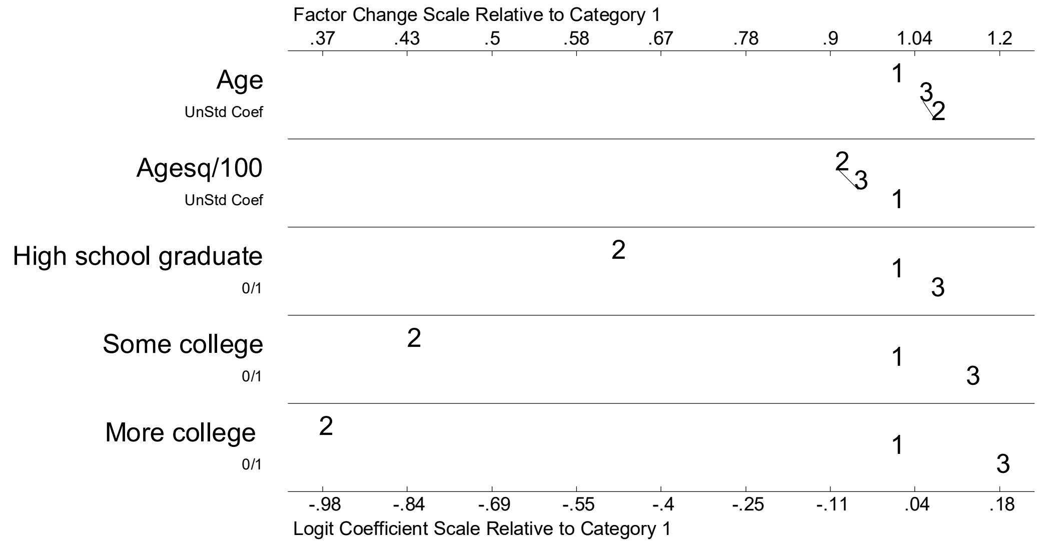
Figure 1.2.5: Evolution of married and unmarried couples from 1970 to 2011: individuals aged 20 to 30.



Notes: Data come from the IPUMS International

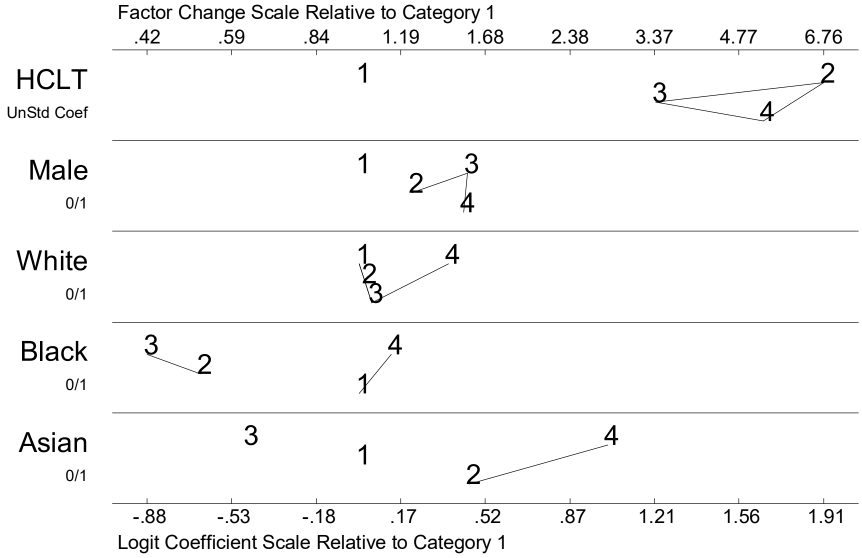
Figure 1.2.6: Remain single (outcome 1), live with a same-origin partner (outcome 2), or live with a different-origin partner (outcome 3): using a Multinomial Logit

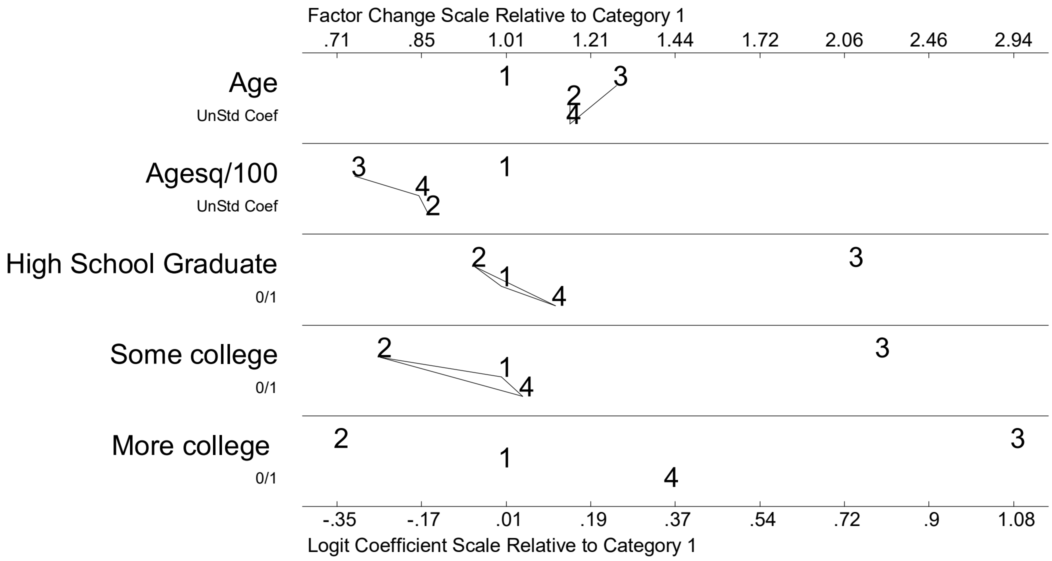




Notes: Robust standard errors. With respect to the sample, see notes to Table 1.2.3. The numbers correspond to the outcome categories: 1 indicates not living with a partner, 2 indicates living with a partner of the same country of origin, and 3 indicates living with a partner not having the same country of origin. The additive scale on the bottom axis measures the value of βi,m|nδ. The multiplicative scale on the top axis measures exp(βi,m|n)δ. The statistical significance is shown by drawing a line between categories for which there is no significant coefficient at the 10% level.

Figure 1.2.7: Remain single (outcome 1), live with a same-origin partner(outcome 2), live with a native different-origin partner (outcome 3), or live with a non-native different-origin partner (outcome 4),: using a Multinomial Logit





Notes: Robust standard errors. With respect to the sample, see notes to Table 1.2.3. The numbers correspond to the outcome categories: 1 indicates not living with a partner, 2 indicates living with a partner of the same country of origin, 3 indicates living with a partner not having the same country of origin who is from USA, and 4 indicates living with a partner not having the same country of origin who is not from USA. The additive scale on the bottom axis measures the value of βi,m|nδ. The multiplicative scale on the top axis measures exp(βi,m|n)δ. The statistical significance is shown by drawing a line between categories for which there is no significant coefficient at the10% level.

Table 1.2.1: Summary statistics by country of origin

Country of origin	Proportion of immigrants living together	Home-country cultural proxy	Man	White	Black	Asian	Age	High school graduate	Some college	More college	Observations
Argentina	0.56	0.56	0.46	0.83	0.00	0.07	36.68	0.22	0.24	0.49	41
Armenia	0.52	0.79	0.38	1.00	0.00	0.00	31.14	0.24	0.29	0.43	21
Brazil	0.60	0.72	0.60	0.74	0.02	0.07	36.23	0.23	0.26	0.51	43
Canada	0.60	0.61	0.43	0.89	0.03	0.08	38.92	0.17	0.20	0.62	343
Chile	0.56	0.75	0.52	0.88	0.00	0.00	35.28	0.08	0.40	0.52	25
China	0.57	0.90	0.54	0.06	0.00	0.94	35.87	0.07	0.14	0.78	343
Colombia	0.58	0.71	0.54	0.80	0.00	0.01	37.06	0.17	0.26	0.53	115
Costa Rica	0.62	0.73	0.33	0.62	0.10	0.00	33.00	0.33	0.24	0.38	21
Cuba	0.66	0.72	0.49	0.87	0.04	0.00	42.12	0.30	0.32	0.32	169
Dominican	0.55	0.67	0.41	0.37	0.17	0.02	34.36	0.26	0.34	0.32	158
Ecuador	0.59	0.74	0.33	0.61	0.00	0.00	37.76	0.22	0.30	0.43	46
El Salvador	0.61	0.75	0.50	0.67	0.01	0.00	34.57	0.39	0.25	0.20	145
France	0.60	0.38	0.52	0.96	0.04	0.00	40.06	0.25	0.21	0.52	48
Germany	0.64	0.80	0.51	0.86	0.12	0.01	38.29	0.19	0.28	0.51	946
Greece	0.64	0.65	0.47	1.00	0.00	0.00	42.74	0.21	0.25	0.55	53
Haiti	0.51	0.77	0.45	0.04	0.96	0.00	37.04	0.23	0.26	0.47	53
India	0.63	0.88	0.56	0.03	0.00	0.96	35.73	0.05	0.11	0.83	194
Iran	0.55	0.93	0.42	1.00	0.00	0.00	37.84	0.05	0.15	0.80	55
Iraq	0.62	0.90	0.69	0.96	0.00	0.04	38.46	0.38	0.38	0.19	26
Italy	0.66	0.70	0.52	0.95	0.03	0.02	38.35	0.21	0.26	0.50	133
Jamaica	0.40	0.28	0.41	0.08	0.89	0.01	37.43	0.25	0.36	0.38	99
Mexico	0.66	0.78	0.42	0.64	0.00	0.00	35.47	0.42	0.26	0.15	2,234
Netherlands	0.64	0.60	0.57	0.89	0.04	0.07	36.75	0.14	0.14	0.71	28
Nicaragua	0.55	0.79	0.48	0.65	0.03	0.00	33.79	0.23	0.45	0.30	66
Pakistan	0.55	0.91	0.68	0.11	0.00	0.89	34.87	0.05	0.16	0.79	38
Panama	0.53	0.72	0.54	0.65	0.24	0.01	36.63	0.22	0.24	0.54	68
Peru	0.60	0.79	0.38	0.67	0.00	0.02	34.10	0.21	0.30	0.48	63
Philippines	0.63	0.90	0.53	0.13	0.01	0.86	37.85	0.17	0.26	0.56	333
Poland	0.70	0.72	0.52	1.00	0.00	0.00	34.12	0.16	0.20	0.64	50
Portugal	0.70	0.56	0.48	0.97	0.03	0.00	41.22	0.31	0.24	0.33	67
Romania	0.65	0.71	0.61	1.00	0.00	0.00	32.03	0.06	0.32	0.61	31
Spain	0.57	0.70	0.49	0.90	0.05	0.98	37.47	0.18	0.28	0.53	79
Thailand	0.60	0.82	0.47	0.06	0.00	0.01	34.07	0.28	0.26	0.43	159
Trinidad and	0.41	0.51	0.41	0.00	0.86	0.94	39.05	0.24	0.32	0.38	37
Turkey	0.62	0.92	0.50	0.95	0.05	0.14	41.48	0.21	0.29	0.50	42
United Kingdom	0.62	0.42	0.54	0.87	0.07	0.00	38.20	0.13	0.23	0.64	320
Venezuela	0.49	0.75	0.49	0.89	0.03	0.07	33.54	0.14	0.32	0.54	37
Vietnam	0.63	0.86	0.52	0.01	0.01	0.00	37.21	0.12	0.19	0.65	323
Average	0.62	0.75	0.48	0.60	0.06	0.20	36.77	0.26	0.25	0.42	
Std. Dev.	0.48	0.13	0.50	0.49	0.23	0.40	8.27	0.44	0.43	0.49	

Notes: Data comes from the 2015 American Community Survey of IPUMS USA. The sample contains 7,052 observations of immigrants, aged 18 to 50, originating from 38 different countries

Table 1.2.2: Proportion of individuals living with a partner in each country of origin by age group

Country	18 to 28 years old	29 to 39 years old	40 to 50 years old
Argentina	0.31	0.59	0.64
Armenia	0.63	0.83	0.80
Brazil	0.70	0.76	0.70
Canada	0.43	0.64	0.64
Chile	0.66	0.78	0.74
China	0.68	0.95	0.92
Colombia	0.66	0.75	0.70
Costa Rica	0.71	0.75	0.71
Cuba	0.71	0.75	0.69
Dominican Republic	0.62	0.70	0.66
Ecuador	0.73	0.77	0.72
El Salvador	0.77	0.78	0.70
France	0.09	0.39	0.51
Germany	0.65	0.86	0.81
Greece	0.20	0.66	0.75
Haiti	0.62	0.81	0.81
India	0.72	0.93	0.89
Iran	0.91	0.95	0.91
Iraq	0.83	0.92	0.90
Italy	0.46	0.71	0.76
Jamaica	0.11	0.27	0.38
Mexico	0.75	0.81	0.76
Netherlands	0.28	0.63	0.75
Nicaragua	0.85	0.82	0.73
Pakistan	0.82	0.94	0.92
Panama	0.69	0.76	0.70
Peru	0.71	0.83	0.80
Philippines	0.88	0.92	0.87
Poland	0.54	0.78	0.74
Portugal	0.25	0.55	0.64
Romania	0.43	0.76	0.76
Spain	0.39	0.71	0.77
Thailand	0.61	0.85	0.85
Trinidad and Tobago	0.30	0.51	0.55
Turkey	0.80	0.95	0.93
United Kingdom	0.19	0.50	0.50
Venezuela	0.76	0.78	0.71
Vietnam	0.65	0.92	0.88
Average	0.66	0.80	0.75
Std. Dev.	0.17	0.12	0.11

Notes: The home-country proportion of individuals living together by country of origin and age interval has been calculated using information from the IPUMS International. See Table 1.2.A3 in the Appendix.

Table 1.2.3: The effect of culture on the living-together decision

Dependent Variable: Live together as married or unmarried couples	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Home-country proportion of	0.133***	0.535***	0.373***	0.397***	0.347***	0.389***	0.275**	0.204***	0.434***
individuals living together	(0.040)	(0.162)	(0.093)	(0.083)	(0.128)	(0.105)	(0.108)	(0.066)	(0.133)
Male	0.081***	0.085***	0.084***	0.081***	0.027*	0.121***	0.086***	0.083***	0.083***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.015)	(0.012)	(0.012)	(0.013)	(0.012)
White	0.003	0.021*	0.019*	0.028**	-0.001	0.030***	0.026**	0.027***	0.150
	(0.017)	(0.012)	(0.011)	(0.011)	(0.022)	(0.010)	(0.012)	(0.008)	(0.103)
Black	-0.194***	-0.151***	-0.155***	-0.149***	-0.275***	-0.113***	-0.144***	-0.130***	-0.082
	(0.020)	(0.027)	(0.025)	(0.020)	(0.034)	(0.029)	(0.025)	(0.023)	(0.127)
Asian	-0.066***	0.007	0.006	0.014	-0.033	0.024	0.025	-0.010	-0.014
	(0.020)	(0.035)	(0.035)	(0.036)	(0.072)	(0.031)	(0.035)	(0.023)	(0.128)
Age	0.076***	0.057***	0.052***	0.058***	0.131**	0.014	0.056***	0.033**	0.055***
	(0.015)	(0.016)	(0.014)	(0.012)	(0.059)	(0.013)	(0.009)	(0.015)	(0.012)
$Age^2/100$	-0.091***	-0.068***	-0.064***	-0.072***	-0.205*	-0.014	-0.070***	-0.038*	-0.068***
	(0.020)	(0.022)	(0.019)	(0.017)	(0.106)	(0.015)	(0.013)	(0.019)	(0.017)
High school graduate	0.013	0.024	0.039*	0.035*	0.059**	0.039	0.040*	0.028*	0.037*
	(0.018)	(0.021)	(0.021)	(0.020)	(0.029)	(0.024)	(0.020)	(0.016)	(0.020)
Some college	-0.031	-0.008	0.032	0.032	0.037	0.035	0.025	0.030	0.027
	(0.030)	(0.036)	(0.031)	(0.032)	(0.046)	(0.028)	(0.031)	(0.026)	(0.032)
More college	0.012	0.047	0.079**	0.078**	0.028	0.099***	0.074**	0.075***	0.075**
	(0.031)	(0.038)	(0.033)	(0.032)	(0.043)	(0.034)	(0.033)	(0.024)	(0.033)
Previously married								-0.566***	
								(0.023)	
Children at home								0.399***	
								(0.014)	
Employed								-0.005	
								(0.014)	

Table 1.2.3 continued

Main language: English								0.005	
								(0.015)	
White x Home-country proportion									-0.181
of individuals living together									(0.136)
Black x Home-country proportion									-0.100
of individuals living together									(0.174)
Asian x Home-country proportion									0.023
of individuals living together									(0.170)
State fixed effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
MSA fixed effects	No	No	No	Yes	No	No	No	No	No
Country of origin fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Decade of immigration fixed effects x Country of origin fixed effects	No	No	No	No	No	No	Yes	No	No
P-value (F-test of HCLT + White x HCLT=0)									0.0444
P-value (F-test of HCLT + Black x HCLT=0)									0.0536
P-value (F-test of HCLT + Asian x HCLT=0)									0.0011
Observations	7,052	7,052	7,052	7,052	3,128	9,736	7,052	7,052	7,052
R^2	0.078	0.089	0.091	0.122	0.130	0.063	0.108	0.391	0.092

Note: The home-country proportion of individuals living together as married and unmarried couples is calculated using information from the IPUMS International. The American Community Survey 2015 sample consists of immigrants aged 18 to 50 who arrived in the US at or before the age of 5 and who report a country of origin. In the first column, the home-country cultural proxy has been calculated by country of origin. The second column incorporates the cultural proxy measured by country of origin and age group (18-28, 29-39 and 40-50). In the rest of the columns, our variable of interest has been calculated by country of origin, age group, and education level. We change our sample in columns 5 and 6 including those individuals between 18 and 35 years old in column 5, and those between 25 and 64 in column 6. Column 7 includes terms of interaction between the decades of years of immigration and the country of origin fixed effects. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Table 1.2.4: Simple Robustness Checks: Different subsamples, Cross-country Heterogeneity, definition of the cultural proxy using 1980s International Censuses.

Dependent Variable: Live together as married or unmarried couples	(1)	(2)	(3)	(4)	(5)
Home-country proportion of	0.237**	0.393***	0.275**	0.298**	0.398***
individuals living together	(0.107)	(0.091)	(0.125)	(0.109)	(0.116)
Male	0.072***	0.083***	0.083***	0.082***	0.087***
	(0.021)	(0.013)	(0.013)	(0.013)	(0.014)
White	0.004	0.020*	0.019	0.013	0.020*
	(0.040)	(0.011)	(0.011)	(0.015)	(0.011)
Black	-0.146***	-0.156***	-0.142***	-0.153***	-0.121***
	(0.047)	(0.027)	(0.036)	(0.037)	(0.038)
Asian	-0.020	0.005	-0.000	-0.040	-0.004
	(0.047)	(0.035)	(0.037)	(0.040)	(0.044)
Age	0.054**	0.051***	0.054**	0.052**	0.059***
	(0.022)	(0.014)	(0.020)	(0.020)	(0.013)
$Age^2/100$	-0.070**	-0.061***	-0.059*	-0.057*	-0.069***
	(0.034)	(0.019)	(0.028)	(0.029)	(0.020)
High school graduate	0.095	0.039*	0.032***	0.031***	0.041*
	(0.082)	(0.020)	(0.009)	(0.008)	(0.020)
Some college	0.141*	0.035	-0.012	-0.014	0.053*
	(0.076)	(0.032)	(0.025)	(0.026)	(0.028)
More college	0.176**	0.084**	0.053**	0.049**	0.078**
	(0.080)	(0.033)	(0.021)	(0.019)	(0.035)
Total fertility rate				-0.060*	
				(0.034)	
Unemployment rate				-0.014***	
				(0.001)	
GDPpc				0.025	
				(0.016)	
Crude marriage rate				-0.011	
				(0.013)	
Catholic population				0.011	
				(0.048)	
Protestant population				-0.133*	
				(0.065)	
Muslim population				-0.049	
				(0.047)	
Religious practitioners				0.094	
				(0.074)	
State fixed effects	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	No	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	3,872	6,898	4,521	4,521	5,590
R^2	0.117	0.087	0.083	0.081	0.096

Note: The home-country cultural proxy has been calculated by country of origin, age group and education level in all estimations. We have excluded those immigrants originating from Mexico and Germany in column 1 and those originating from Jamaica and Iran in column 2. In the last column, the home-country has been calculated using International Censuses of 1980 (those containing information in the 1980s). Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.2.5: The effect of culture on the living-together decision: Gender differences

Dependent Variable: Live together as married or unmarried couples	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sample:	All	Men	Women	All	Men	Women	All	Men	Women
Home-country proportion of	0.373***	0.408***	0.379***	0.338***	0.282**	0.363***	0.372***	0.385***	0.373***
individuals living together	(0.093)	(0.082)	(0.112)	(0.101)	(0.106)	(0.120)	(0.075)	(0.087)	(0.088)
Male	0.084***			-0.073***			0.022		
	(0.012)			(0.016)			(0.013)		
White	0.019*	0.001	0.033	0.008	-0.029	0.031	0.012	-0.003	0.022
	(0.011)	(0.017)	(0.020)	(0.018)	(0.020)	(0.028)	(0.011)	(0.012)	(0.022)
Black	-0.155***	-0.093**	-0.208***	-0.204***	-0.135***	-0.240***	-0.170***	-0.095***	-0.226***
	(0.025)	(0.037)	(0.028)	(0.028)	(0.028)	(0.048)	(0.016)	(0.025)	(0.028)
Asian	0.006	0.000	0.021	0.042	-0.030	0.089	0.038	-0.013	0.085**
	(0.035)	(0.038)	(0.051)	(0.042)	(0.050)	(0.053)	(0.029)	(0.028)	(0.041)
Age	0.052***	0.054***	0.056**	0.037**	0.089***	0.006	0.035***	0.047***	0.026
	(0.014)	(0.019)	(0.021)	(0.016)	(0.020)	(0.026)	(0.010)	(0.014)	(0.016)
$Age^2/100$	-0.064***	-0.061**	-0.078**	-0.038*	-0.107***	0.006	-0.044***	-0.055***	-0.037*
	(0.019)	(0.023)	(0.032)	(0.022)	(0.027)	(0.035)	(0.013)	(0.017)	(0.022)
High school graduate	0.039*	0.008	0.062***	0.037***	-0.028	0.090***	0.048***	0.009	0.080***
	(0.021)	(0.032)	(0.023)	(0.013)	(0.022)	(0.020)	(0.016)	(0.023)	(0.017)
Some college	0.032	-0.002	0.067*	-0.025	-0.086*	0.045*	0.021	-0.012	0.060**
	(0.031)	(0.042)	(0.035)	(0.018)	(0.043)	(0.026)	(0.020)	(0.029)	(0.026)
More college	0.079**	0.014	0.135***	-0.021	-0.116**	0.056**	0.054**	-0.007	0.107***
	(0.033)	(0.043)	(0.036)	(0.025)	(0.051)	(0.026)	(0.022)	(0.034)	(0.023)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,052	3,351	3,701	6,331	2,656	3,675	11,117	4,938	6,179
R^2	0.091	0.137	0.099	0.131	0.206	0.129	0.069	0.121	0.076

Note: The cultural proxy is measured by country of origin, age group, and education level. Column 1 coincides with Column 3 of Table 1.2.3. Columns 2, 5 and 8 only incorporate immigrant men, and columns 3, 6 and 9 only incorporate immigrant women. In columns 4 to 6 we have incorporated non-head of household and exclude head of household in the living together sample. Columns 7 to 9 incorporate both head and non-heads of household. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Table 1.2.6: The cultural effect on different household arrangements

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable:	Married	Unmarried	Living together as same-gender married or unmarried couples	Living with adult child	Living with grandparent	Remain single	Family size	Age difference between partners
Home-country cultural	0.178**	0.223**	0.231***	0.253***	2.536***	0.225***	0.313*	4.325*
proxy	(0.078)	(0.090)	(0.080)	(0.056)	(0.406)	(0.068)	(0.164)	(2.320)
Man	0.112***	-0.023***	-0.382***	-0.050***	0.014	-0.004	-0.228***	3.478***
	(0.013)	(0.008)	(0.061)	(0.017)	(0.010)	(0.011)	(0.070)	(0.176)
White	0.063***	-0.045***	-0.015	-0.036***	-0.001	-0.059***	0.003	-0.245*
	(0.012)	(0.008)	(0.016)	(0.011)	(0.006)	(0.012)	(0.043)	(0.140)
Black	-0.085***	-0.086***	-0.178***	0.001	-0.023	0.013	-0.268***	1.304***
	(0.025)	(0.024)	(0.052)	(0.031)	(0.026)	(0.021)	(0.092)	(0.410)
Asian	0.059	-0.027	0.043	-0.033	0.044*	-0.035	0.175	-0.284
	(0.045)	(0.021)	(0.052)	(0.031)	(0.024)	(0.044)	(0.136)	(0.493)
Age	0.074***	0.002	0.039*	0.071***	-0.028	-0.079***	0.093	0.723**
	(0.010)	(0.008)	(0.022)	(0.017)	(0.024)	(0.013)	(0.099)	(0.290)
$Age^2/100$	-0.091***	-0.007	-0.061*	-0.060***	0.038	0.076***	-0.086	-0.925**
	(0.015)	(0.011)	(0.032)	(0.018)	(0.031)	(0.017)	(0.120)	(0.445)
High school graduate	0.064***	-0.013	0.058***	-0.031	0.016	-0.045***	-0.125	-0.185
	(0.022)	(0.019)	(0.018)	(0.018)	(0.011)	(0.014)	(0.089)	(0.220)
Some college	0.063**	-0.016	0.051**	-0.074***	0.005	-0.040**	-0.270**	0.393*
	(0.028)	(0.032)	(0.025)	(0.015)	(0.011)	(0.018)	(0.128)	(0.230)
More college	0.111***	-0.019	0.101***	-0.129***	-0.002	-0.040*	-0.455***	0.314
	(0.031)	(0.034)	(0.029)	(0.022)	(0.017)	(0.023)	(0.107)	(0.231)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,886	5,886	3,494	6,192	7,052	7,052	6,078	4,270
R^2	0.110	0.066	0.127	0.161	0.066	0.193	0.181	0.194

Note: The home-country cultural proxy has been calculated by country of origin, age group and education level in all estimations, but considering in each case the specific household arrangement. In columns 1 and 2, we examine both married and unmarried cohabitation, separately. We exclude those immigrants originating from countries of origin where married and unmarried couples, separately, are not identified in the IPUMS International. Column 3 analyzes the impact of culture on same-gender couples. In column 4, we study the effect of culture on living with an adult child. Column 5 shows the effect of culture on the probability of living with grandparents. In column 6, we explore the effect of culture on the decision to remain single. Column 7 shows the effect of culture on family size, and column 8 on the age differences between partners. The variation in the sample size is due to the availability of data for the variables considered. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Table 1.2.7: Same origin or not: Cultural Effect

	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Living together as same-origin couple	Living together as different-origin couple	Living together as same-origin couple	Living together as different-origin couple with a native partner	Living together as different-origin couple with a non-native partner
Home-country cultural proxy	1.920***	1.336***	1.911***	1.219***	1.664***
	(0.570)	(0.370)	(0.568)	(0.462)	(0.477)
Man	0.220**	0.444***	0.217**	0.445***	0.429***
	(0.092)	(0.098)	(0.092)	(0.126)	(0.100)
White	0.027	0.129**	0.024	0.051	0.366**
	(0.058)	(0.058)	(0.059)	(0.091)	(0.144)
Black	-0.669**	-0.648***	-0.655**	-0.875***	0.131
	(0.304)	(0.104)	(0.303)	(0.146)	(0.282)
Asian	0.444**	-0.063	0.452**	-0.464*	1.022***
	(0.189)	(0.210)	(0.187)	(0.253)	(0.317)
Age	0.145***	0.218***	0.144***	0.242***	0.144**
	(0.036)	(0.041)	(0.036)	(0.045)	(0.072)
$Age^2/100$	-0.154***	-0.276***	-0.153***	-0.309***	-0.174*
	(0.049)	(0.053)	(0.050)	(0.057)	(0.095)
High school graduate	-0.058	0.564***	-0.056	0.737***	0.114
	(0.103)	(0.101)	(0.102)	(0.122)	(0.159)
Some college	-0.257	0.591***	-0.255	0.794***	0.045
	(0.166)	(0.178)	(0.166)	(0.229)	(0.194)
More college	-0.348*	0.878***	-0.346*	1.078***	0.350*
	(0.210)	(0.152)	(0.209)	(0.195)	(0.188)
State fixed effects	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	7,052	7,052	7,052	7,052	7,052

Note: This table shows the results of two Multinomial Logit Models. The home-country cultural proxy has been calculated by country of origin, age group, and education level in all estimations. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.2.8: The mechanisms through which culture operates

Dependent Variable: Live together as married or unmarried couples	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Proportion of immigrants of	-0.032	0.031	-1.735**				
the same origin by MSA	(0.107)	(0.099)	(0.700)				
HCLT		0.374***				0.452***	0.434**
		(0.094)				(0.085)	(0.187)
Proportion of immigrants of			2.291***				
the same origin by MSA x			(0.840)				
Proportion of natives by MSA				-1.189			
				(1.141)			
Proportion of natives by MSA				2.511			
HCLT				(1.543)			
Proportion of immigrant elders of					-12.685***		
the same origin by MSA					(4.576)		
Proportion of immigrant elders of					16.694***		
the same origin by MSA x HCLT					(5.738)		
No pronoun drop						0.040	
						(0.075)	
No pronoun drop x HCLT						-0.114	
						(0.088)	
Gender-based system							0.016
							(0.206)
Gender-based system x HCLT							-0.042
							(0.217)
Male	0.085***	0.084***	0.085***	0.085***	0.085***	0.081***	0.081***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)
White	0.021*	0.019*	0.020*	0.021*	0.021*	0.030***	0.030***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)
Black	-0.157***	-0.155***	-0.159***	-0.153***	-0.158***	-0.148***	-0.147***
	(0.025)	(0.025)	(0.024)	(0.025)	(0.024)	(0.020)	(0.020)
Asian	0.005	0.006	0.003	0.009	0.003	0.003	0.011
	(0.035)	(0.035)	(0.035)	(0.035)	(0.036)	(0.036)	(0.035)
Age	0.077***	0.052***	0.073***	0.068***	0.074***	0.060***	0.057***
	(0.014)	(0.013)	(0.014)	(0.013)	(0.014)	(0.011)	(0.011)
$Age^2/100$	-0.093***	-0.064***	-0.088***	-0.082***	-0.089***	-0.075***	-0.071***
	(0.020)	(0.019)	(0.020)	(0.019)	(0.020)	(0.016)	(0.016)
High school graduate	0.027	0.039*	0.035	0.030	0.033	0.039*	0.030
	(0.021)	(0.020)	(0.023)	(0.021)	(0.022)	(0.020)	(0.019)
Some college	-0.006	0.032	0.012	0.005	0.007	0.039	0.027
	(0.037)	(0.031)	(0.038)	(0.033)	(0.036)	(0.031)	(0.032)
More college	0.048	0.079**	0.063	0.058*	0.059	0.086**	0.074**
	(0.038)	(0.033)	(0.039)	(0.034)	(0.038)	(0.032)	(0.032)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
P-value (F-test of HCLT + No pronoun drop x HCLT=0)						0.0011	
P-value (F-test of HCLT + Sex-based gender system x HCLT=0)							0.0002
Observations	7,052	7,052	7,052	7,052	7,052	7,052	6,853
R^2	0.086	0.091	0.087	0.087	0.087	0.123	0.123

Note: The home-country cultural proxy has been calculated by country of origin, age group, and education level in all estimations. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Appendix 1.2.A

Table 1.2.A1: The effect of culture on the living-together decision using Probit Models

Dependent Variable: Live together as married or unmarried couples	(1)	(2)	(3)
Home-country proportion of individuals living together	0.379***	1.154***	0.996***
	(0.111)	(0.381)	(0.250)
Male	0.228***	0.238***	0.235***
	(0.034)	(0.034)	(0.034)
White	0.002	0.058*	0.053*
	(0.043)	(0.030)	(0.030)
Black	-0.520***	-0.404***	-0.419***
	(0.050)	(0.068)	(0.071)
Asian	-0.183***	0.019	0.019
	(0.049)	(0.100)	(0.099)
Age	0.168***	0.137***	0.147***
	(0.028)	(0.022)	(0.038)
$Age^2/100$	-0.205***	-0.166***	-0.183***
	(0.034)	(0.029)	(0.053)
High school graduate	0.046	0.081	0.107**
	(0.050)	(0.056)	(0.055)
Some college	-0.083	-0.017	0.083
	(0.080)	(0.098)	(0.084)
More college	0.037	0.138	0.219**
	(0.087)	(0.103)	(0.089)
Observations	7,052	7,052	7,052

Notes: The home-country proportion of individuals living together as married and unmarried couples is calculated using information from the IPUMS International. The American Community Survey 2015 sample, consists of immigrants aged 18 to 50 who arrived in the US at or before the age of 5 and who report a country of origin. In the first column, the home-country cultural proxy has been calculated by country of origin. The second column incorporates the cultural proxy measured by country of origin and age group. In the third column, our variable of interest has been calculated by country of origin, age group, and education level. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.2.A2: More robustness checks and Placebo tests

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	Live together as married or unmarried couples	Live together as married or unmarried couples	Live together as married or unmarried couples	Having some college or more college studies	Live together as married or unmarried couples
Home-country cultural proxy	0.365***	0.374***	0.346***	-0.263	0.326***
	(0.098)	(0.100)	(0.092)	(0.223)	(0.065)
Man	0.078***	0.085***	0.083***	-0.003	0.090***
	(0.015)	(0.012)	(0.012)	(0.010)	(0.013)
White	0.023**	0.028***	0.023**	0.150***	0.015
	(0.010)	(0.007)	(0.011)	(0.043)	(0.010)
Black	-0.137***	-0.147***	-0.155***	0.218***	-0.159***
	(0.029)	(0.027)	(0.027)	(0.057)	(0.019)
Asian	0.029	0.004	0.013	0.411***	-0.0004
	(0.041)	(0.030)	(0.034)	(0.062)	(0.018)
Age	0.051***	0.052***	0.056***	0.031*	0.028***
	(0.014)	(0.012)	(0.013)	(0.016)	(0.008)
$Age^2/100$	-0.064***	-0.063***	-0.069***	-0.054**	-0.033***
	(0.019)	(0.017)	(0.019)	(0.020)	(0.010)
High school graduate	0.038*	0.047***			0.019
	(0.019)	(0.015)			(0.013)
Some college	0.024	0.033			0.013
	(0.030)	(0.024)			(0.017)
More college	0.074**	0.072**			0.046*
	(0.032)	(0.027)			(0.023)
State fixed effects	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	No	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	7,415	8,874	7,052	7,052	40,882
R^2	0.088	0.088	0.089	0.110	0.061

Note: The home-country cultural proxy has been calculated by country of origin, age group, and education level in the rest of estimations. Column 1 includes mixed race immigrants. Our sample has been enlarged in the second column where we include those individuals who arrive to the U.S at or before the age of 7. Controls for education have been excluded in column 3. In column 5, the sample is obtained from the American Community Survey 2010-2015 sample. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 1.2.A3: Home-Country Censuses from IPUMS International

Country	Year IPUMSI
Argentina	2001
Armenia	2011
Brazil	2010
Canada	2011
Chile	2002
China	2000
Colombia	2005
Costa Rica	2011
Cuba	2002
Dominican Republic	2010
Ecuador	2010
El Salvador	2007
France	2011
Germany	1970
Greece	2011
Haiti	2003
India	2009
Iran	2011
Iraq	1997
Italy	2001
Jamaica	2001
Mexico	2015
Netherlands	2001
Nicaragua	2005
Pakistan	1998
Panama	2010
Peru	2007
Philippines	2000
Poland	2002
Portugal	2011
Romania	2011
Spain	2001
Thailand	2000
Trinidad and Tobago	2011
Turkey	2000
United Kingdom	2001
Venezuela	2001
Vietnam	2009

Notes: This table shows the Censuses of the countries of origin utilized to calculate the cultural proxies.

1.3. The effect of culture on home-ownership

1.3.1. Introduction

Home-ownership has been found to have considerable socio-economic and demographic consequences, including impacts on household behavior, wealth, wages, mobility, labor-force participation, life satisfaction, physical and psychological health, and children's outcomes, as well as on urban structure and segregation (Aaronson, 2000; Coulson and Fisher, 2009; Dietz and Haurin, 2003; Green and White, 1997; Goodman and Mayer 2018; Haurin, et al., 2002; Munch et al.,2008). Policy-makers have also traditionally considered home-ownership as an important public policy (Goodman and Mayer, 2018). Nonetheless, at the country level, there is no clear pattern of convergence of home-ownership behavior (Fisher and Jaffee, 2003; Goodman and Mayer, 2018). Researchers have explored the possible determinants affecting the home-ownership decision, focusing on housing market conditions (Chiuri and Jappelli, 2003), mortgage markets (Badarinza et al., 2016), tax regulations (Bourassa and Hoesli, 2010), employment and marital status (Feijten, 2005), political instability (Mudrazija and Butrica, 2017), income (Fisher and Jaffee, 2003), and demographic variables (Fisher and Jaffee, 2003; Goodman and Mayer, 2018), among others. Although all the factors mentioned here can influence home-ownership patterns, there can be other possible cross-country dissimilarities that may matter, as Goodman and Mayer (2018) indicate. In this paper, we consider the role of cultural differences in the home-ownership decision.

Culture is defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2001) as "the set of distinctive spiritual, material, intellectual, and emotional features of society or a social group. Not only does this encompass art and literature, but it also includes lifestyles, ways of living together, value systems, traditions, and beliefs". These beliefs and values cannot easily be measured and compared across countries, due to the interrelationships among institutions (such as capital and mortgage markets), economic conditions, and social norms/culture in each country (Fernández, 2007). For this reason, Fernández (2007) proposes an epidemiological approach to isolate the cultural effect from the institutional and economic conditions. Thus, the cultural effect is not used to describe differences in capital and mortgage markets (institutional environment). We concentrate on individual preferences and beliefs, broadly defined, as culture. In this setting, we examine the behavior of immigrants who arrived in the US at, or younger than, age five. Those immigrants have grown up under US markets, laws, institutions, and economic conditions, but their attitudes are probably similar to the preferences of their parents, forebears, and ethnic communities. Then, following the epidemiological approach, if the proportion of homeowners in the country of origin can explain the variations in home-ownership outcomes of first-generation immigrants, even after controlling for their individual characteristics, only the cultural component of this variable can be the determinant of this correlation (Fernández, 2007).

Our work contributes to the growing research on the effect of culture on socio-economic and demographic outcomes (Fernández, 2011; Giuliano, 2016). Using methodologies analogous to ours, there is empirical evidence of the effect of culture on living arrangements (Giuliano, 2007), women's labor-force participation and fertility (Bellido et al., 2016; Contreras and Plaza, 2010; Fernández, 2007; Fernández and Fogli, 2006, 2009; Marcén et al., 2018), self-employment (Marcén, 2014), the search for a job (Eugster et al., 2017), the living-together decision (Marcén and Morales, 2019), divorce (Furtado et al., 2013), and even on the math gender gap (Nollenberger et al., 2016). Related to our paper is the work of Rodríguez-Planas (2018), who finds a cultural impact on the probability of having a mortgage, using data on immigrants living in Spain in 2007, a boom year for immigration and access to buying a house. Her conclusions are only applicable to individuals who decide to get a mortgage and, as she indicates, she focuses on the existence of a cultural financial liability. In our case, we focus on the home-ownership culture, although we also consider the possible cultural effect on both home-ownership and having a mortgage.

In the literature, a few studies suggest the possible existence of a relationship between ethnicity and home-ownership, but they primarily compare immigrant and native behavior (Krivo, 1995). In general, studies show that immigrants are much less likely to own their own homes than are natives (Cahill and Franklin, 2013), pointing to the assimilation process in the host country as the main determinant of the home-ownership gap. For example, Constant, Roberts, and Zimmermann (2009) show that immigrants in Germany, classified in six different ethnicities, with a strong commitment to the host country, are more likely to achieve home-ownership. In the United States, Chinese immigrants are less likely to own their own homes than are the native population of Los Angeles, with Chinese ethnicity being an important factor in determining housing outcomes (Painter, Yang, and Yu, 2004). As Borjas (2002) explain, they also suggest that ethnic enclaves increase the probability of immigrants owning their own home. We add to this body of research by using home-ownership data as evidence that immigrants maintain similar home-ownership behavior to that of their counterparts in their respective countries of origin, suggesting that culture is important in the home-ownership decision.

To run our main analysis, we use data from the 2016 American Community Survey (ACS) of the Integrated Public Use Microdata Series (IPUMS) (Ruggles et al., 2017). The cultural proxy is measured by utilizing data from the Integrated Public Use Microdata Series International (IPUMS International), Minnesota Population Center (2017), which allows us to calculate the variable of interest more precisely, as in Marcén et al. (2018) and Marcén and Morales (2019). Results point to culture being an important factor in home-ownership. We find a positive and statistically significant relationship between the probability of immigrants in the US reporting being a homeowner, and the proportion of their counterparts who are homeowners in their respective countries of origin or ancestry. This is maintained after adding controls for observable and unobservable characteristics (including country of origin fixed effects), regardless of the definition of the cultural proxy, using different subsamples, and carrying out several robustness checks considering same- and different-origin couples. Note that the inclusion of the country of origin fixed effects is important in order to show additional evidence that our cultural proxy is not capturing other characteristics that could vary at the country of origin level.

The last section presents evidence of the possible mechanisms of cultural transmission. Following Fernández and Fogli (2009) and Borjas (2002), we study whether culture is transmitted within communities. The possibility of vertical or inter-generational transmission cannot be directly explored, since there is no available data on parents' characteristics. However, we can study whether immigrants are sensitive to the concentration of elderly individuals of the same ethnicity, which can be considered as a channel for the intergenerational transmission of culture (Marcén and Morales, 2019). Similarly, we are able to study how culture operates horizontally by examining whether an increase in the concentration of old individuals of the same country of origin has an impact on the number of individuals who report being homeowners. Gender roles are also taken into account as potential determinants of how culture operates. All our findings reinforce the idea that culture is a significant factor in the home-ownership decision.

The remainder of the paper is organized as follows. Section 1.3.2 describes the data. Section 1.3.3 presents the empirical strategy. Our results are discussed in Section 1.3.4, and Section 1.3.5 concludes.

1.3.2. Data

We utilize data from the 2016 American Community Survey (ACS) of Integrated Public Use Microdata Series (IPUMS) (Ruggles et al. 2017) in our main analysis. Our sample consists of first-generation immigrants, aged 18 to 69 years old, who arrived in the United States when they were aged five or younger.[63] We select those immigrants who are heads of household or householders, in order to include one observation per household.[64] The sample is restricted to those individuals who live in identifiable metropolitan areas in the ACS data. In addition, we restrict our sample to those individuals reporting information about their country of origin and their home-ownership status. The main sample consists of 8,313 observations of heads of household who are early-arrival immigrants living in MSAs and coming from 48 countries of origin.[65]

Several studies using the epidemiological approach to identify the importance of culture on socio-economic and demographic variables concern second-generation immigrants, selected because they have been exposed to US markets and institutions their entire lives. In this setting, they are unlikely to suffer from language barriers and have not experienced the shock of immigration (Fernández, 2007; Fernández and Fogli, 2006, 2009; Giuliano, 2007). To determine whether an individual can be classified as second-generation, information on the birth place of the parents is needed, which is not always available. The ACS, for example, does not provide that information. Alternatively, Furtado et al. (2013) and Marcén et al. (2018) propose the use of young-arrival, first-generation immigrants since they can be considered quite similar to a sample of second-generation immigrants. Early-arrival immigrants, like second-generation immigrants, have been exposed to US conditions almost their entire lives and are not likely to have language barriers (Furtado et al., 2013). As Myers, Gao, and Emeka, (2009) explain, the impact of early arrival is important for English proficiency.

With respect to the cultural proxy, we consider the home-country proportion of homeowners. Prior literature measuring home-ownership rates for a large sample of countries, such as Fisher and Jaffe (2003), usually consider data provided by international

[63]As in Borjas (2002), we restrict our sample to those heads of household aged 18 or older. We do not include immigrant over age 69 because the number of observations is very small for that age group.
[64]This reference person (householder) is any household member in whose name the property is owned or rented, 2016 ACS. We revisit this issue below by extending the analysis to non-householders.
[65]We have eliminated those individuals originating from countries with less than 10 observations per country of origin, as in prior studies (Furtado et al., 2013). We use all the observations from countries where we have information on the cultural proxy in the IPUMS International.

organizations or government websites. In our case, we calculate our cultural proxy using data from the Integrated Public Use Microdata Series International (IPUMS International). This dataset provides harmonized data obtained from 365 censuses in 94 countries (Minnesota Population Center, 2017). Because we are interested in home-ownership, we have also chosen those countries with available information on whether a member of the household owns the housing unit. Unfortunately, we do not have information about home-ownership for all countries.[66] To calculate our cultural proxy, we select country-of-origin Censuses as close as possible to the year 2016 (see Table 1.3.A2 in the Appendix), since our empirical strategy relies on the fact that the behavior of early-arrival, first-generation immigrants who respond to the 2016 ACS is similar to the behavior of their counterparts in their country of origin, in the same period of time.[67] We have also maintained the same sample selection as that used for the early-arrival first generation immigrants; that is, a sample of heads of household aged 18 to 69.[68] Then, the home country home-ownership rate is the proportion of heads of household who own their residence (total number of heads of household aged 18 to 69 who are home-owners, in country of origin j, over the total number of heads of household aged 18 to 69 in country of origin j).

That way of calculating the cultural proxy provides one measure of culture for each country. However, we have also extended this by utilizing several measures of culture for each country of origin, as in Marcén et al. (2018) and Marcén and Morales (2019). This is necessary, because the use of one measure of culture is based on the assumption that culture does not differ within each country, which may generate concerns about the validity of the results. It should be noted that the sample of first-generation immigrants may not exhibit a similar composition to that of the population in the country of origin. For example, immigrants can be younger, or more likely to be unmarried, than their counterparts living in the home country. To address this issue, we measure the cultural proxy more precisely to capture the preferences and beliefs of different groups of

[66] Due to the non-availability of information in the IPUMS International for the variable measuring home-ownership status, we are not able to calculate the cultural proxy (home-ownership rate) for China, Cuba, Netherlands, and Ukraine. Then, we cannot include immigrants originating from those countries in our sample.
[67] This is a standard strategy, followed in the literature on the cultural effect. As Fernández (2007) points out, culture adjusts very slowly, and our findings do not vary after measuring the cultural proxy in other years (see below).
[68] As mentioned above, head of household (householder) is any household member in whose name the property is owned or rented. This restriction implies losing individuals originating from Germany since there is no information on householders for that country in the IPUMS International.

individuals with similar characteristics in each country of origin. Following the proposal of Marcén et al. (2018), the cultural proxy is defined by country of origin, marital status, age, and employment status. This is defined in detail in the Results Section.

Summary statistics are displayed in Table 1.3.1 for the main variables, classified from the lowest to the highest home-country proportion of homeowners. As can be seen, there are considerable differences in the number of individuals who are homeowners among countries of origin, from 33 percent in Switzerland to 96 percent in Hungary. This is calculated using the IPUMS International. The average of homeowners is 70 percent, which is quite similar to that presented in Goodman and Mayer (2018) for the year 2015 (at 69.6 percent). As mentioned above, although many factors can determine those home-ownership dissimilarities, it is possible to argue that housing tenure outcomes cannot only be explained within a standard framework that accounts only for socio-economic, demographic, and housing market characteristics. For example, countries like Austria and Switzerland have sophisticated financial architectures, which can guarantee easy access to mortgages but they have low rates of home-ownership; in contrast, Vietnam, with high ownership rates has less well-developed credit markets. Thus, the existence of a home-ownership culture may also matter. We examine this with a sample of first-generation immigrants. The rest of the columns in Table 1.3.1 describe our main sample of first-generation immigrants living in the US. Overall, 61 percent of the immigrants are homeowners, with those originating from Bolivia having the highest percentages (see column 2). By simply comparing the information obtained from the IPUMS International and that of the immigrants living in the US, in columns 1 and 2, a relationship between the behavior of the immigrants and that of their counterparts is not clearly observed.

It is also observed dissimilarities across immigrants in terms of gender composition, age, level of education, household composition, and marital status, by country of origin. Around 50 percent of immigrants are men, with this varying from just 32 percent in the case of immigrants from Iraq, to 67 percent in the case of those from Ethiopia. These first-generation immigrants are around 43 years old, on average, with the youngest being from Armenia, at 32 years old, and the oldest from Austria, at 61 years old. Regarding education, 27 percent of the immigrants have completed high school, with the lowest percentage being from Bangladesh and Malaysia, with no individual at this educational level, and the highest from Mexico (41 percent). With respect to those who have completed at least a college degree, the lowest percentages are observed among those originating from Mexico (45 percent), and the highest among those from

Bangladesh and Malaysia (100 percent). For household composition, 40 percent of immigrants have a child under the age of sixteen living in the household, with this ranging from a low of 8 percent for Austria and Hungary to a high of 56 percent for Malaysia. Our sample also presents dissimilarities in marital status: 27 percent of immigrants are singles or never married, with the lowest percentages for those from Jordan (5 percent), and the highest from Trinidad and Tobago (46 percent). All these differences in the composition of immigrants by country of origin are taken into account in our analysis by incorporating several variables to avoid the possibility that our results could be driven by these individual characteristics.

The use of the 2016 American Community Survey (ACS) can generate concerns because of the proximity of the economic crisis, which may affect the home-ownership decisions of immigrants living in the US. To mitigate this concern, we show data on the proportion of homeowners, calculated for all immigrants with information, from 2007 to 2016, and the same proportion for native US population (see Figure 1.3.1). Similar to what we find in the literature (Borjas, 2002; Coulson, 1999), home-ownership is, on average, lower for immigrants than for the native US population. That home-ownership gap is maintained during the economic crisis. Moreover, Figure 1.3.2 shows that the relationship between the proportion of immigrant homeowners in 2007 and the proportion of immigrant homeowners in 2016 in the U.S, by country of origin, is quite similar. Those who tend to choose to own a home in a low (high) proportion in 2007 also maintain a low (high) proportion in 2016. Thus, the behavior of immigrants by country of origin does not appear to change in the period under consideration.

1.3.3. Empirical Strategy

To determine the impact of culture on the home-ownership decision, we follow an epidemiological approach using data on early-arrival first-generation immigrants living in the US. Since these individuals grew up under the same US markets, laws, and institutions, if only the environmental factors are important in the home-ownership decision, the home-country proportion of their counterparts owning a home, which is the proxy of the culture or social norms, should have no effect on the home-ownership decision of those immigrants. If culture does play a role, we would expect to find a relationship between the behavior of the immigrants living in the US and that of their counterparts in their countries of origin. We examine this issue by estimating the following equation:[69]

$$Y_{ijk} = \beta_0 + \beta_1 HCPH_j + \boldsymbol{X_{ijk}\beta_2} + \boldsymbol{\delta_k} + \boldsymbol{\eta_j} + \varepsilon_{ijk} \qquad (1)$$

with Y_{ijk}being a dummy variable that takes value one when immigrant *i* of cultural origin j living in Metropolitan Statistical Area (MSA) k reports owning a home, and zero otherwise. The cultural proxy, $HCPH_j$, is the proportion of homeowners in the country of origin j. We revisit that measure of the cultural proxy below. In any case, if culture plays a role here, immigrants originating from countries whose counterparts tend to choose to own a home in a high proportion, should have a higher likelihood of being homeowners. In this setting, we would expect β_1 to be positive. The vector $\boldsymbol{X_{ijk}}$ includes individual characteristics, such as gender (being a man, or not), age and its square, education level (no high school graduate (omitted), high school graduate, some college, more college (more than four years of college), marital status (being single or never married, or not) and household composition (having children under sixteen living at home, or not).[70] The inclusion of gender is necessary because we choose those first-generation immigrants who are heads of household and, as we have described above, there are variations in the proportion of men by country of origin. Since men have traditionally been the breadwinners, and thus have the economic capacity to buy a home, cross-country-of-origin differences in the proportion of homeowners could be simply explained by differences in the proportion of men in each immigrant group. Other researchers also indicate that the variations in the home-ownership decisions may be the result of dissimilarities in the age of the individuals and their level of education, for reasons independent of culture (Chiuri and Jappelli, 2003; Coulson, 1999). Thus, this should be taken into consideration in our regressions by controlling for those individual characteristics. With respect to the household composition, the literature documents that household composition is an important determinant in home-ownership rates. As Constant et al. (2009) show, being married and having children under the age of sixteen increases the probability of home-ownership. As before, the variations across countries of origin of these characteristics could be explaining the cross-country variations in the proportion of homeowners. To address this issue, we have incorporated dummies to

[69]Following Furtado et al. (2013), we use a linear probability model for the sake of simplicity. Our results are maintained applying a probit model, as can be seen in Table 1.3.A1 (Appendix).
[70]Rodríguez-Planas (2018) uses similar controls.

control for whether the head of household is single or never married, and whether there is any child below the age of sixteen in the household. In addition, we control for unobservable variables across the US by introducing MSA fixed effects, denoted by δ_k and for the country of origin unobserved characteristics, by introducing country of origin fixed effects, $\boldsymbol{\eta_j}$.[71]

The empirical strategy described above allows us only to analyze the impact of culture on the home-ownership decision. We have also extended our work using alternative methodologies to explore the choice of owning a home living with a partner of the same ethnicity, or not, and to the analysis of home-ownership and taking on a mortgage. This is explained in detail in Section 1.3.4.

An alternative strategy to study the cultural effect would be the inclusion of dummy variables for the various countries of origin, rather than controlling directly for the home-ownership rate in these countries, as in Giuliano (2007). The benefit of this approach is that it does not require a linear relationship as our model establishes between the cultural proxy and the dependent variable. However, this technique does not allow for a clear specification of how culture matters (Furtado et al., 2013). First, because of the large number of countries of origin (48), which makes it difficult to interpret the coefficients in terms of culture. Second, country of origin dummies not only capture the differences in the home-ownership across countries, but also other unobservable characteristics that vary at the country level. Then, the interpretation of those coefficients would be tricky, because it is not clear that we would be capturing the home-ownership culture by only using country of origin dummies.

1.3.4. Results

a) Baseline model

Table 1.3.2 reports the estimates of Equation 1, with the cultural proxy defined as the home-country proportion of homeowners (HCPH). Our results appear to be consistent with the prior literature. Being male and having children under the age of sixteen increases the probability of home-ownership (Constant et al., 2009). As Goodman and Mayer

[71]The incorporation of the country of origin fixed effects is not possible in all specifications (see below). We have repeated the regressions replacing MSA fixed effects with state fixed effects, and we do not find substantial differences. Our findings do not change when including/excluding the country of origin fixed effects.

(2018) show, the older the individuals, the more likely they are to be homeowners. The impact of age has an inverted U-shape, achieving the maximum at 83 years old. Note that our immigrants are all below the age of 83. The estimates for the education level controls are also consistent with the existing empirical results, since higher levels of education are related to greater probabilities of home-ownership (Coulson, 1999; Constant et al., 2009; Goodman and Mayer, 2018). Being single or never married decreases the probability of owning one's own dwelling. This result is also in line with the literature suggesting that married individuals are more likely to be homeowners (Feijten, 2005; Constant et al., 2009).

The estimated coefficient on the cultural proxy (HCPH) indicates that a higher proportion of homeowners in an immigrant's country of origin is associated with an increase in the probability that that immigrant reports owning his/her home (see column 1). We observe that, when the cultural proxy (HCPH) increases by 1 percentage point, there is a rise of around 0.23 percentage points in the probability that an immigrant reports being a homeowner in the US. The cultural proxy in column 1 is measured as the home-country proportion of homeowners, by including only one measure of culture for each home country, which is the usual strategy in the research on the cultural effect. However, the use of just one cultural proxy by home country does not take into account the heterogeneity within countries of origin, which is a common problem in much of the literature on the cultural effect. For example, the preferences and attitudes regarding home-ownership can differ within each home country, depending on marital status. In some countries, individuals who decide to buy a home when they are singles can be stigmatized, whereas, in other countries, being a homeowner while single may be socially accepted. If this heterogeneity is transmitted to the preferences and beliefs of our sample of immigrants, the inclusion of additional controls does not take into consideration the cultural variations within each home country. As in Marcén et al. (2018), we can use alternative cultural proxies, measuring the culture more precisely by country of origin and marital status, with the marital status being classified as: married/unmarried couple, single or never married, separated or divorced, and widow.[72] Thus, we are capable of

[72] The married group includes those married and unmarried householders with a partner present in the household. Married individuals with spouse absent (194 observations) have been included in the separated and divorced group. Unmarried couples have been included here because there are some countries in which both categories are not separated in the IPUMS International. Thus, we follow Marcén and Morales (2019) who consider both categories together. Results do not change when excluding unmarried couples and/or those countries that do not distinguish between married and unmarried couples.

incorporating four different measures of the home-ownership culture for each home country.

Social norms (or culture) can also vary across age groups within each country of origin. Owning a home may be more socially acceptable for older individuals than for young individuals. The possible cultural differences across marital status and age group can easily be observed by plotting the relationship between the proportion of homeowner immigrants in the US, and the proportion of their counterparts owning a home by country of origin, marital status, and age group, in Figures 1.3.3 and 1.3.4. We have included those individuals who are aged 31 to 56, and two marital-status groups (married/unmarried couples and singles or never married) as an example. In both cases, we observe the expected positive relationship between the two variables: the larger the home-country proportion of homeowners, the greater the proportion of immigrants who decide to own a home in the US. Nonetheless, while, for example, in Ireland and Pakistan, individuals tend to choose to buy a home in a similar proportion when they are married/unmarried couples, we observe considerable differences between those two countries for the category single or never married individuals: 43 percent of single individuals in Ireland choose to buy a home on average, while 74 percent of single individuals in Pakistan decide to be homeowners. As before, to tackle this issue, were define our cultural proxy as the proportion of homeowners by country of origin, marital status, and age group, considering four age intervals: 18 to 30, 31 to 43, 44 to 56, and 57 to 69. In this case, we incorporate in our estimations 16 different measures of culture for each home country. The differences across age groups and employment status by home country may also generate concerns about how and for whom the home-ownership culture may play a role. Again, to address this issue, we repeat the same analysis with our cultural proxy calculated by country of origin, marital status, age group, and employment status (employed, unemployed, and not in the labor force). In this context, there are 48 different measures of culture for each home country.

Results are shown in Table 1.3.2, where the home-country cultural proxy is added by marital status in column 2, by marital status and age group in column 3, and by marital status, age group, and employment status in column 4.[73] The use of these definitions of the cultural proxy, with more than one measure of culture by country of origin, permits us to add country of origin fixed effects to capture the unobserved heterogeneity across

[73] The change in the sample size when the home-country cultural proxy is calculated by marital status, age group, and employment status is due to the non-availability of information for all categories.

countries. This is important because, without those fixed effects, the estimated coefficient of the cultural proxy could be picking up the effect of culture in addition to, or instead of, the impact of other unobservable characteristics that vary at the home country level, and that may also affect home-ownership decisions. In all cases (columns 2 to 4), we find a positive relationship between the home-country proportion of homeowners (regardless of the categories included in the cultural proxy) and the probability that an immigrant owns a home in the US. All these specifications include Metropolitan Statistical Areas (MSAs) fixed effects and country of origin fixed effects.[74] These estimates provide empirical evidence pointing to the fact that we are capturing the impact of culture on the home-ownership decision. The magnitude of the effect is considerably larger in column 2 than in the rest of the columns. In that specification, our cultural proxy has been calculated by marital status and country of origin, and our results point to an increase of 0.55 percentage points in the probability of being a homeowner in the US, when the cultural proxy (HCPH) increases by 1 percentage point. Therefore, comparing countries of origin, immigrants from countries where their counterparts tend to choose to buy a home in a high proportion (for example, Hungary), are about 34.5 percentage points more likely to be homeowners in the US because of the impact of culture, than immigrants from countries with a low HCPH (for example, Switzerland). It is worth noting that after redefining our main explanatory variable by groups, it can be surmised that we are over-controlling for age and marital status. To mitigate this concern, we repeat the analysis by excluding controls for age and marital status in column 5. Our findings do not change.[75] For the rest of the analysis, we consider the home-country cultural proxy by marital status in most of the specifications. Results are unchanged when we use the other measures of culture. In any case, Goodman and Mayer (2018) explain that the age-pattern of home-ownership in the United States is similar to that of other countries: the older the individuals, the more likely they are to be homeowners. Thus, cultural differences could be more important by marital status across countries of origin.[76]

[74] In the IPUMS USA, a metropolitan area is a region formed by neighboring communities that have a high degree of economic and social integration with the urban core. The population threshold to be classified as an MSA is 100,000 inhabitants.

[75] It is also possible to suggest the existence of possible endogeneity problems with some of the controls included in the analysis. Results do not vary when we exclude these controls. We have incorporated all these controls in the paper, as do other works examining the home-ownership decision.

[76] Note that, using the cultural proxy by marital status we do not lose observations, as in the case of the cultural proxy measured by employment status.

Since, in the literature, female heads of household have been found to be less likely to own a home than married non-head-of-household women (Haurin and Kamara, 1992), our results may be driven by gender differences. This can be more problematic, since we only consider, at this point of the analysis, the information on head of household though, as we have described above, we use a gender-balanced sample, on average. We revisit this issue below. In any case, we separate the sample by gender to explore the existence of possible gender issues in our estimations. Results are displayed in columns 6 and 7 for men and women, respectively. In both cases, we find that the home-country proportion of homeowners is positively related to the probability of home-ownership for immigrants (men and women, separately). Thus, our results do not appear to depend on gender differences.

Although all our sample of US early-arrival immigrants have grown up in the same country, the US, it can be argued that US markets, laws, and institutions are not equal in all states. Then, since immigrant groups are likely to cluster within particular parts of the US, it is possible to surmise that we are capturing differences in US states, in addition to (or instead of) the cultural effect of the country of origin. As mentioned above, we have run our analysis adding MSA fixed effects, which should pick up those differences - in our case, at a lower level than the state level. To examine this further, we check the consistency of our results by adding the proportion of homeowners by US state, in column 8 of Table 1.3.2. This variable is supposed to capture differences in home-ownership behavior across the US. Our findings do not change: neither the sign nor the magnitude of the coefficient of the cultural proxy.

We also report simple robustness checks by repeating the analysis without the two countries with the highest and the lowest home-country proportion of homeowners (Hungary and Switzerland), to check whether this affects our estimates. Results are presented in columns 1 and 2 of Table 1.3.3. Our estimates do not change. We conclude the same in observing column 3, where we eliminate those immigrants from Mexico, which is the country with the largest number of observations. We also repeat the analysis utilizing a subsample of immigrants aged 30 to 50 years old, to reduce concerns about heterogeneity across age groups.[77] Estimated coefficients are shown in column 4 of Table 1.3.3. We find that the impact of our cultural proxy remains statistically significant and the magnitude of the effect is slightly greater than that previously obtained.

[77]See a similar strategy in Furtado et al. (2013) and Marcén et al. (2018).

Until now, we have obtained the cultural proxy using information on the country of origin for the year 2016, or the closest available. This relies on the notion that the behavior of immigrants living in the US in 2016 is similar to their counterparts living in their home country in that year. Nevertheless, since culture is transmitted from parents to their children when they are young (Furtado et al., 2013), it can be argued that the preferences and beliefs of immigrants are quite similar to those of their parents when they arrived in the US, so to calculate the cultural proxy we should consider information on home-ownership in the countries of origin some decades earlier. Our immigrants are 43 years old on average in 2016, so information on home-ownership in the 1970s can represent the culture that their parents transmitted.[78] Results do not change, (see column 5 of Table 1.3.3), which is not surprising since culture changes slowly, as Fernández (2007) asserts.[79] It is also possible to argue that our results depend on the ACS data used in our analysis. We only consider the 2016 ACS in the main analysis. Although the behavior of the immigrants does not appear to change substantially over time, as observed in Figures 1.3.1 and 1.3.2, this is not conclusive. To provide further empirical evidence in favor of our findings, we extend our sample to include information from the 2014, 2015, and 2016 ACS. This gives us a larger sample of immigrants. Results are unchanged (see column 6 of Table 1.3.3). Then, the possible changes on the composition of the immigrant sample do not appear to lead to different findings.

The choice of heads of household characteristics in the main analysis is also a possible problem for the validity of our estimations, as mentioned above. We can easily check whether our conclusions vary after the incorporation of heads of household and their immigrant partners, if any, in our sample. Estimated points are reported in column 7 for the entire sample, in column 8 for men, and in column 9 for women. The positive relationship between the cultural proxy and the probability of being a homeowner is observed. It is reassuring that, regardless of the measure of the cultural proxy, and even after dividing the sample by gender, the effect of culture is still present.

As prior research suggests, economic or political changes that occurred in some countries are responsible for different waves of migration to the US (Villarreal, 2014), which can affect our estimates. To address this issue, we control for the timing of migration by adding dummies for the year of migration, in column 1 of Table 1.3.4. Our

[78] We have chosen country-of-origin Censuses as close as possible to the year 1970 (see Table 1.3.A2 in the Appendix).
[79] The variation in the sample size is due to the availability of information for the 1970s.

results remain similar to those previously described, suggesting that the differences in the year of migration do not have an impact on our regressions. Moreover, we analyze whether immigrants' sensitivities to their home-country culture differ, depending on their time of migration, by including interaction terms between our cultural proxy and the period of migration fixed effects. Because of the large number of interactions that this generates, we had to redefine the time of migration fixed effects using dummies for the decade in which the immigrants arrived in the US.[80] Results are shown in columns 2 and 3 (with a sample of individuals older than 30). Regardless of the decade of migration, the estimated cultural effect is always positive, although for the case of those arriving in the 1990s and 2000s, it is not statistically significant (and the magnitude of the coefficient is lower). This may be due to the fact that younger cohorts were more affected by the crisis than older ones. As Myers et al. (2019) explain, younger individuals have delayed home buying because of the Great Recession. We choose a sample of early-arrival first-generation immigrants who arrived in the US at or below the age of five, so that all those arriving in the 1990s and 2000s are the youngest individuals in our sample. We have repeated the analysis with a sample of individuals older than 30, who are supposed to be less affected in their home-ownership decision by the last recession, and our findings clearly point to the cultural effect (see column 3). Similarly, we can also examine this issue by including interaction terms between our cultural proxy and the age of individuals in our sample. As before, we redefine the age of individual fixed effects using dummies by age interval (18-29 (omitted), 30-39, 40-49, 50-59 and 60-69 years old). Results show that, for the youngest individuals (18-29), the cultural effect is the lowest and it is only statistically significant at the 10 percent level. Again, a possible explanation is that the ownership decision of young individuals could be more affected by the recent Great Recession by, for instance, the postponement of buying a home (Myers et al., 2019), than by the cultural effect. It can also be surmised that, since the negative impact that immigrant status has on the probability of home-ownership decreases over time (Coulson, 1999), those young immigrants needs more time to behave as their counterparts in their country of origin.[81]

[80] The omitted decade is the 1940s.

[81] The relationship between culture and home-ownership can be more complex than that between culture and, for example, fertility, where the fertility culture has been detected even in teenagers (Bellido et al. 2016).

For additional empirical evidence that our results are not affected by heterogeneity across countries, the analysis has been repeated incorporating controls for observable characteristics of the countries of origin, in Table 1.3.5. We include the unemployment rate, GDP per capita (in constant 2010 $US), the female labor-force participation rate, a property prices index, and a property rights index.[82]As prior research suggests, the probability of owning a home can be influenced by those factors that impact housing availability and affordability (Clark et al., 1997; Rodríguez-Planas, 2018). The exclusion of those variables can be problematic if those observable characteristics vary at the country level, and are correlated with our variable of interest, the cultural proxy. In this setting, it could be that our cultural proxy is picking up the effect of those determinants on the home-ownership decision. Table 1.3.5 presents the estimations incorporating all the measures of the cultural proxy considered in Table 1.3.2 (columns 1 to 4), as well as separating the sample by gender (columns 5 and 6).[83]We find, again, a positive association between the cultural proxy and the probability of being a homeowner. In short, all the estimations described in this section indicate that culture can affect the home-ownership decision.

b) First mortgage, second mortgage, and the home-ownership decision: The cultural effect

Recently, Rodríguez-Planas (2018) has suggested that there is a financial culture on the decision to have mortgage financing. She follows the epidemiological approach and finds that mortgage financing in the home country is a factor in the immigrants' mortgage

[82]GDP per capita is gross domestic product divided by mid-year population. Unemployment rate is the percentage of the total labor force that is without work but available for and seeking employment. The female labor-force participation rate shows the extent to which women are active in the labor force. Labor force comprises individuals aged 15 and older who supply labor for the production of goods and services during a specified period. The property prices index is the basic measure for apartment purchase affordability (lower is better). It is generally calculated as the ratio of median apartment prices to median family disposable income, expressed as years of income. The property rights index varies between 0 and 100, and measures the degree to which a country's laws protect private property rights and the degree to which its government enforces those laws. It also assesses the likelihood that private property will be expropriated and analyzes the independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts. The more effective the legal protection of property, the higher a country's score will be. Similarly, the greater the chances of government expropriation of property, the lower a country's score will be. This index is also used in Rodríguez-Planas (2018). Data are collected for the year 2016 (or for the closest year if no data is available for that year) and come from the World Bank Data (GDP pc, unemployment rate, and female labor force participation), from the Numbeo database (the property prices index), and from the Index of Economic Freedom (the property rights index).

[83]We do not have information on all these controls for the entire sample of countries of origin, so we lose around four thousand observations.

decision in the host country. This can be related to our framework, since to be able to buy a house, in most cases, people need mortgage financing. In her paper, the possible existence of social norms regarding home-ownership is not considered. With respect to home-ownership issues, she only adds the property rights index at the country of ancestry level. Although we do not focus on the possible impact of culture on mortgage financing, it could be that we are capturing the social norms affecting mortgage financing, in addition to, or instead of, those regarding home-ownership. This is also a possible problem in the work of Rodríguez-Planas (2018), since she could be confounding both culture regarding home-ownership and social norms regarding mortgage financing in her estimates. It can be argued that home-ownership is only attractive for those with positive attitudes regarding mortgage financing and so they are the only ones who can afford the payment for their own home. The opposite can also be surmised, that is, it is possible that only those immigrants originating from countries of origin where home-ownership is socially acceptable are the immigrants who consider mortgage financing more acceptable. The separation of both social norms is tricky. Unfortunately, we only have information on whether our sample of heads of household own their own dwelling but are encumbered by a mortgage, in the 2016 ACS. There is no information about the immigrants who have paid off their mortgages in 2016 or some years before.

In this setting, we can only check whether our conclusions vary when we separate the sample between those reporting owning a house with a mortgage and those that do not report having that debt. Results are shown in column 1 (excluding those individuals without a mortgage and with the dependent variable taking the value of one when an immigrant reports being a homeowner with a mortgage and zero otherwise), and column 2 (excluding those individuals with a mortgage and with the dependent variable taking the value of one when an immigrant reports being a homeowner and zero otherwise) of Table 1.3.6. In both cases, regardless of the definition of the dependent variable and the subsample considered, we observe a positive relationship between the cultural proxy and the probability of being a homeowner in the US, pointing to the importance of culture as a factor in determining home-ownership.

The ACS also provides information on whether owner-occupied housing units with a first mortgage were encumbered by a second mortgage or home equity loan. To provide additional estimates in favor of the cultural effect, we have extended the analysis, including first and second mortgages. We propose the use of a model for nominal outcomes, specifically a Multinominal Logit Model (MNL) in which we calculate a separate binary logit for each pair of outcome categories (Nervole and Press, 1973). Formally, we estimate the following equation:

$$\ln\varphi_{m|b} = \ln\frac{\Pr(y=m|\mathbf{x})}{\Pr(y=b|\mathbf{x})} = \mathbf{x}'\boldsymbol{\beta}_{\boldsymbol{m}|\boldsymbol{b}} \quad \text{for} \quad m=1 \quad \text{to} \ J \qquad (2)$$

with *b* being the base category and *m* varying from *one* to *J*. *J* is the total number of outcome categories, in our case, four (not being a homeowner, being a homeowner without mortgage, owning a house encumbered by only a first mortgage, owning a house encumbered by a second mortgage). The vector **x** also includes the controls that we have defined above. Results are presented in columns 3 to 5 of Table 1.3.6.[84] In order to study the dynamics among the outcome categories, we use odds ratios, (Greene, 2008; Long and Freese, 2014). Holding other variables constant, the changed factor in the odds of outcome category *m* versus outcome category *n*, when x_i increased by δ, equals:

$$\frac{\varphi_{m|n}(x,x_i+\delta)}{\varphi_{m|n}(x,x_i)} = e^{\boldsymbol{\beta}_{\mathbf{i,m|n}}\delta} \qquad (3)$$

For a unit change in x_i, $\delta = 1$, the odds of *m* versus *n* are expected to change by a factor of exp ($\beta_{i,m|n}$), holding all other variables constant. For a standard deviation change in x_i, $\delta = s_{x_i}$, the odds of *m* versus *n* are expected to change by a factor of exp ($\beta_{i,m|n} \times s_{x_i}$). The odds ratios have been plotted in an odds-ratio plot in Figure 1.3.5 to be easily interpreted (Long and Freese, 2014). Our variable of interest, the cultural proxy, and the rest of the controls are represented in separate rows. The horizontal axis measures the relative magnitude of the coefficients associated with each outcome category. The numbers correspond to the outcome categories: "one" denotes not being a homeowner, which is the base category in that figure, "two" is a homeowner without a mortgage, "three" owning a house encumbered by only a first mortgage, and "four" being a homeowner with a first mortgage, but also encumbered by a second mortgage. The distance between a given pair of outcome categories indicates the magnitude of the effect, and the statistical significance is shown by drawing a line between categories for which there is no statistically significant coefficient at the 10 percent level of significance. Results suggest that the greater the proportion of homeowners in the country of ancestry of our sample of immigrants, the less likely is the category one (not being a homeowner). Then, the choice would be the categories two or three, but between them there are no

[84]We cannot include the country of origin fixed effects and the MSA fixed effects because with many controls the multinomial models do not converge.

statistically significant differences. This is not surprising, since we do not know whether those homeowners without mortgage (category two) afforded a house with a mortgage but they have already paid off that mortgage in 2016, when the information for this survey was collected. In any case, both categories are to the right of the category not being a homeowner, suggesting that the cultural proxy matters in the home-ownership decision. What is not so predictable is that the higher the cultural proxy, the more willing are immigrants to take on debt - not only by way of a first mortgage, but also with a second mortgage. Thus, the more acceptable is home-ownership in an immigrant's home country, the more likely is that the immigrant takes on debt in order to buy a house in the host country. Being aware of the weaknesses of the information on mortgage finance, it is comforting that all these estimates suggest that culture is a factor in the home-ownership decision.

c) The effect of culture on home-ownership: Same origin partner or not

Previously, we have performed the analysis using the characteristics of the country of ancestry of our householder first-generation immigrants, where the decision to own a house is attributed to the characteristics, preferences, and beliefs of only one of the members of the household (the householder). Nevertheless, in those cases in which the householder has a married or unmarried partner, the characteristics of the other member of the couple may also be a factor in the home-ownership decision of the couple. There are two alternatives, having a partner of the same ethnicity, or having a partner of a different ethnicity.[85] We first explore whether the cultural effect is detected in the case of married or unmarried couples having a partner of the same ethnicity. Table 1.3.7 includes the estimated points. Column 1, which includes only a sample of couples with a partner of the same ethnicity, reveals similar results to those described above. The greater the proportion of married and unmarried couples who report being homeowners in the country of ancestry, the greater the probability of being homeowners in the US for a couple from that country of ancestry.

In the case of couples of different origin or ethnicity, it can be supposed that the preferences of the heads of household's partners are driving our findings.[86] In column 2 of Table 1.3.7, we incorporate as a measure of culture the HCPH of the head of

[85]US native partners have been included in this analysis. We have re-estimated our regressions without those individuals and results are the same.
[86]In Table 1.3.6, head of household is denoted by "HH".

household's partner (HH's partner). Although there is a positive relationship, which is not surprising since both the HCPH of the heads of household and that of their partners is positively related, the coefficient capturing this new measure of the cultural proxy is only significant at the 10 percent level. An explanation for this finding could be that we are adding to that regression the country of origin of the heads of household fixed effects, and this can be highly correlated with the home country cultural proxy of the heads of household's partner. The same is observed in column 3, where we have dropped the country of origin fixed effects because they cannot be used in this specification (since we have included the cultural proxy of the head of household defined with only one measure of culture for each home country).[87] In column 3, only the cultural proxy of the head of household's partner is statistically significant, but not that of the head of household. As mentioned above, this could be due to the fact that both are highly correlated. Alternatively, we include the mean between both cultural proxies of the head of household and his/her partner as a proxy of the home-ownership culture in that house. This measure of culture is included in column 4. As can be seen, there is a positive effect of the variable of interest on the probability of owning a home in the US, but again only at the 10 percent significance level. In columns 2 to 4, the sample used only includes couples with different ethnicities. We also check whether the redefinition of the cultural proxy as the mean HCPH of both members of the couple affects our initial sample. First, we consider the entire sample but excluding those immigrants with a partner for whom the Census provided by the IPUMS International has no information (see column 5). Then, with the sample of column 5, we maintain the same cultural proxy with the exception of that of different-origin couples, in which the mean HCPH of both members of the couple is utilized in column 6. The magnitude of the effect does not vary so much. The main sample is incorporated in the last column, column 7, where the redefinition of the cultural proxy for those couples of different origin, having information on the cultural proxy for both members of the couple, does not alter our findings.

d) The mechanisms through which culture operates

From the previous analysis, it is possible to infer that culture affects the home-ownership decision. This subsection explores the possible channels of transmission of culture. Furtado et al. (2013), Marcén et al. (2018), and Marcén and Morales (2019) explain that

[87]The cultural proxy is defined as the proportion of married and unmarried couples owning a home in each country of origin.

the vertical transmission of culture cannot be examined because we do not have information on parents' characteristics in some of the US Census and ACS data. However, home-ownership culture can also be transmitted horizontally, through neighbors, friends, or the ethnic communities in which immigrants live. Following the existing literature, we study the horizontal transmission of culture, analyzing whether immigrants' sensitivities to the home-country proportion of homeowners vary depending on whether they live in predominantly same-ethnicity communities. Fernández and Fogli (2009) also point to this mechanism of cultural transmission since local/ethnic communities maintain culture either by providing role models for acceptable behavior, or by punishing deviance from the social norm/culture. In this setting, we consider the possible existence of network effects in order to identify that horizontal transmission of culture, as Bertrand et al. (2000) do, with the following model:

$$Y_{ijk} = \beta_0 + \beta_1 P_{jk} + \beta_2 P_{jk} * HCPH_j + \boldsymbol{X}_{ijk}\boldsymbol{\beta_3} + \boldsymbol{\delta_k} + \boldsymbol{\eta_j} + \varepsilon_{ijk} \qquad (4)$$

where P_{jk} is the proportion of immigrants from the same country of origin j in each metropolitan area k. The remaining variables have been defined above. Our variable of interest is the interaction between ethnic concentration and the home-country proportion of homeowners. If there is a horizontal transmission of culture, we would expect that an increase in the concentration of same-ethnicity immigrants will increase the probability of home-ownership, more for immigrants originating from countries with a high proportion of homeowners than for those from countries with a low proportion of homeowners. Then, β_2 should be positive.

Table 1.3.8 shows the estimations of Equation 4. In the first column, ethnic concentration appears to have no effect on the probability of being a homeowner. The same occurs after adding the cultural proxy in column 2. The concentration coefficient is not statistically significant, but the home-country cultural proxy has the expected positive sign and the magnitude is the same value as in our baseline specification, in column 2 of Table 1.3.2. The interaction between the ethnic concentration and the HCPH is added in column 3, as in Furtado et al. (2013). In that case, the coefficient capturing the effect of the ethnic concentration is negative and statistically significant, and the interaction term is positive and statistically significant, indicating that, depending on the HCPH level, the effect of the ethnic concentration varies from positive to negative. This result may be interpreted as follows: an increase of 10 percentage points in the concentration of immigrants from Switzerland leads to a decrease of 0.11 in the probability of home-ownership for those immigrants in the US (the proportion of homeowners in Switzerland is 0.33). The same increase in the concentration of immigrants from Hungary results in an increase of 0.08 in the probability of home-ownership for Hungarians (the proportion of homeowners in Hungary is 0.96). An increase in the concentration of individuals of the same ethnic community appears to lead to a decrease in the probability of owning a home for individuals originating from countries where their counterparts tend to be homeowners in a low proportion, while an increase in the probability of owning a home is observed for those originating from countries with a high proportion of homeowners.

Prior studies point to the growth of ethnic enclaves in major American cities as an important factor in increasing immigrant demand for owner-occupied housing in many metropolitan areas. However, as before, such studies do not examine the different patterns by establishing a relationship between home-ownership behavior and those in the country of origin. Borjas (2002) suggests that ethnic enclaves increase the probability that immigrant households own their homes, although our results reveal that this is only true at certain levels of HCPH. Of course, we recognize that this is not a full-proof method of identifying the horizontal transmission of culture but, it is reassuring that our estimations suggest that immigrants are sensitive to their ethnic communities, providing additional empirical evidence that social norms/culture may play a role.

Another channel through which culture may operate is the respect for elders, as Marcén and Morales (2019) suggest. Since many societies are distinguished by the importance of respect for the elderly and the maintenance of family bonds (Jambunathan et al., 2000; Wakil et al., 1981), it is possible that an individual decides to be a homeowner in obedience to, or respect for, the traditions of the elderly members of their communities. Being conscious of the scarcity of data on this issue, we can only follow the same strategy as before, examining whether immigrants' sensitivities to the cultural proxy change depending on whether they live in predominantly older same-ethnicity communities. As can be seen in column 4, the coefficient picking up the effect of the proportion of the elderly of the same origin is negative and statistically significant, whereas that of the interaction term is positive and statistically significant. This indicates that the impact of the concentration of same-ethnicity elders varies from negative to positive, depending on the level of the cultural proxy, which may in turn suggest that culture is operating through respect for the older members of the community.

The gender roles may lead to different levels of home-ownership culture assimilation. To tackle this issue, we follow the proposal of Gay et al. (2017) and Marcén and Morales (2019), by controlling whether a language employs a grammatical gender system, based on biology, or not; individuals speaking a language with a gender-based system are more likely to follow traditional norms. Information is compiled by linguists in the World Atlas of Language Structures Online (Dryer and Haspelmath, 2013).[88] Assuming that more traditional norms imply a higher proportion of individuals owning their own homes by those individuals originating from more traditional cultures (considering the gender-based language systems), we see a greater impact of the home country cultural proxy. When the cultural proxy (HCPH) increases by 1 percentage point in countries of origin with gender-based language systems (countries not using gender-based language systems), there is a rise of around 0.555 (0.420) percentage points in the probability that an immigrant reports owning a house in the US (see column 5 of Table 1.3.8). The results described in this section provide evidence of some of the channels (ethnic enclaves, respect for the elderly, and gender roles) through which culture may be transmitted and may operate, providing supplementary empirical evidence in favor of the existence of a cultural effect in the home-ownership decision.

1.3.5. Conclusions

Cross-country differences in the proportions of home-ownership have not varied considerably in recent decades (Goodman and Mayer, 2018). The literature points to several factors as possible determinants of those dissimilarities, such as housing market conditions, mortgage markets, tax regulations, and demographic conditions, among others. However, even these institutional and economic factors cannot fully explain cross-country variation. For example, the access to sophisticated financial architectures, such as that of Austria or Switzerland, does not assure high home-ownership rates. In contrast, there can be observed quite high home-ownership rates in less well-developed credit markets, such as that of Vietnam. Thus, following Goodman and Mayer (2018), who suggest that culture may also play a role here, we examine the possible cultural effect on home-ownership. To pick up the effects of culture apart from those of markets, laws, and institutions (such as capital and mortgage markets) in determining the home-ownership decision, we follow an epidemiological approach (Fernández, 2007), using data on immigrants arriving in the US when very young, from the 2016 ACS. Since all of these

[88]The variation in sample size is due to the availability of information for the gender-based system in the World Atlas of Language Structures Online.

individuals grew up under the same US laws, markets, and institutions, we can interpret any positive relationship between the home-country proportion of homeowners and the decision to own a home in the US, as evidence that culture matters in the decision.

To the best of our knowledge, there is no prior research on this issue. In the literature, researchers point to ethnicity as an important factor in explaining the home-ownership gap between natives and immigrants, showing that more integrated immigrants in the host country are more likely to achieve home-ownership (Constant et al., 2009). Then, they focus on the comparison between natives and immigrants. Our paper builds on prior work, analyzing the home-ownership differences within immigrant populations. We study the relationship between immigrants' home-ownership behavior and that of their counterparts in their respective countries of origin, in order to explore the cultural effect.

We find evidence of a positive and statistically significant effect of the cultural proxy on the likelihood that an immigrant owns a home. The impact of culture is greater when the cultural proxy is measured more precisely within each country of origin, calculating the cultural proxy by marital status, age, and employment status, in order to take into account the heterogeneity within countries of ancestry as in Marcén et al. (2018) and Marcén and Morales (2019). Results are robust to controls for observable and unobservable characteristics by country of ancestry, and to the use of different subsamples. It is worth noting that we have detected a low impact of culture on the youngest individuals. A possible explanation of this result is that their ownership decision could be driven by recent Great Recession (Myers et al. 2019), diminishing the cultural effect.

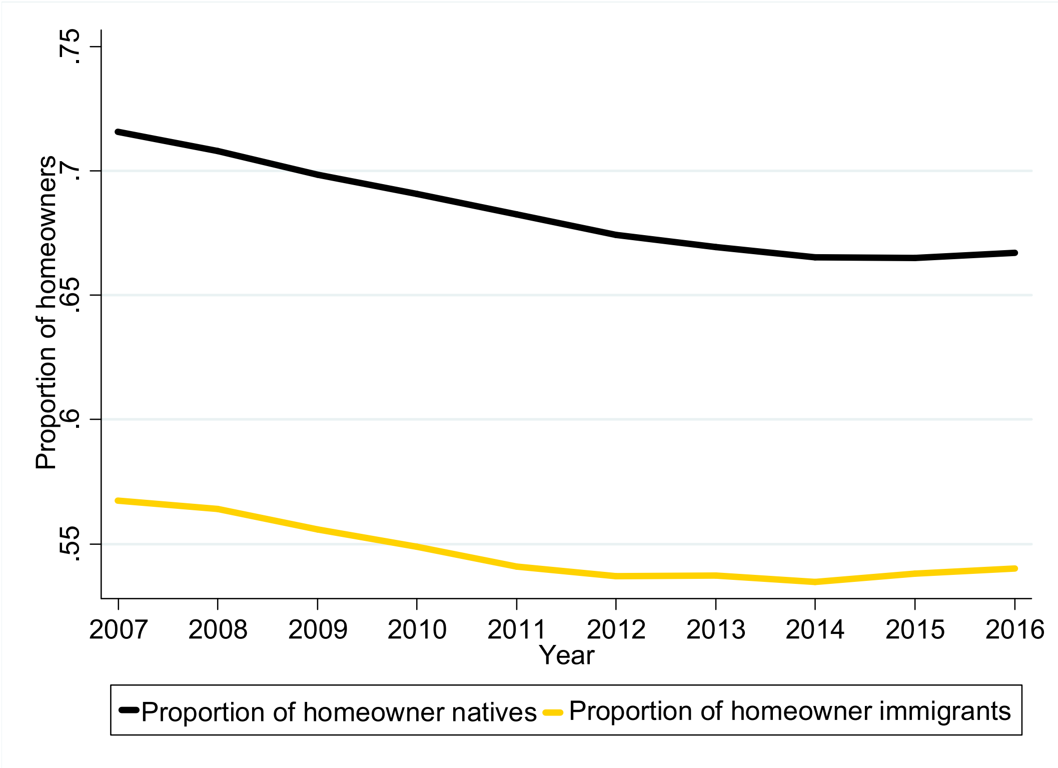
The possible existence of a mortgage-finance culture has also been considered in our analysis. Using the epidemiological approach, Rodríguez-Planas (2018) has explored mortgage-finance culture using Spanish data. This is related to our work, although it is not clear whether it is the home-ownership culture or the mortgage culture that matters, or whether both are important in the home-ownership decision. We present several scenarios of owning a home: without a mortgage, with only a first mortgage, and with a second mortgage. The cultural proxy is always positively related to those three possibilities, which again points to the possible existence of a cultural effect. Recognizing the scarcity of mortgage-finance data, what is remarkable from our analysis is that the more acceptable is home-ownership in an immigrant country of origin, the greater the probability that the immigrant will take on debt in order to afford a house in the host country.

The exploration of alternative kinds of household, such as same- or different-origins, provides additional empirical evidence of the cultural effect. With a sample of same-origin couples, our conclusions do not vary, and the cultural proxy is positively related to the probability of owning a home. For different-origin couples, we have checked several samples and definitions of the cultural proxy in order to include the culture of the head of household's partner. Again, all our results point to the possibility that culture can be a determinant in the home-ownership decision.

Finally, the transmission of culture has also been explored in this work. With the available data, we can only study the horizontal transmission (ethnic communities) of culture but not the vertical transmission (from parents to their offspring). Other researchers have also analyzed the possible effect of ethnic enclaves on home-ownership, without considering the cultural issue as we do here (following Furtado et al., 2013). Our analysis is interesting since we observe that the effect of ethnic concentration varies from positive to negative depending on the HCPH level. Specifically, we find that, for high levels of HCPH, immigrants are sensitive to the behavior of their ethnic communities, increasing the probability of being homeowners. However, for low levels of HCPH, the concentration of same-ethnicity individuals discourages immigrants from choosing to own a home. Additionally, we examine other possible ways through which culture may operate, such as respect for the elders and gender roles. In both cases, we find evidence that there can be transmission of culture through those channels.

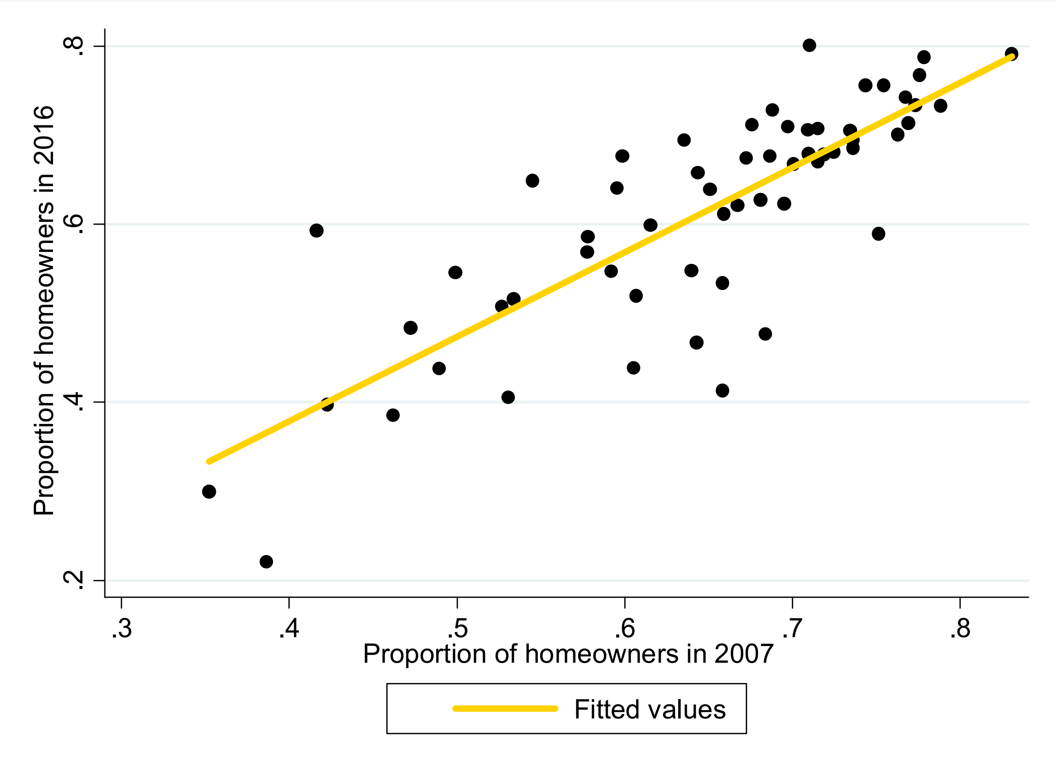
Figures and Tables

Figure 1.3.1: Evolution of the proportion of homeowner natives and the proportion of homeowner immigrants from 2007 to 2016.



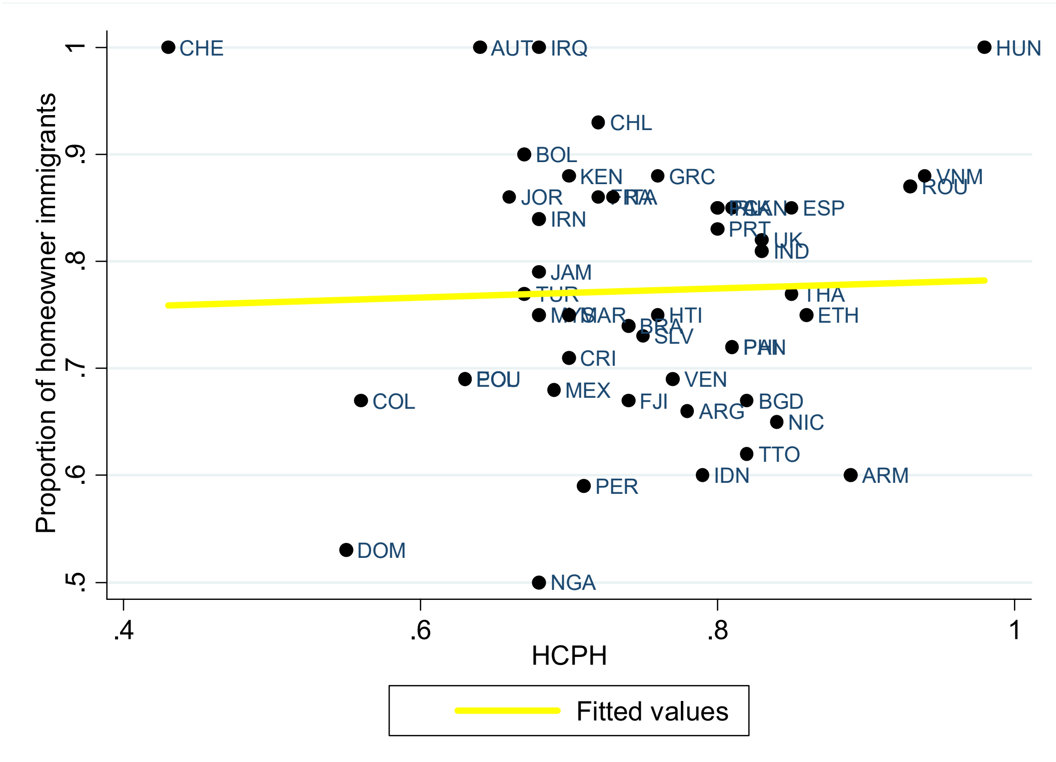
Notes: Data come from the IPUMS USA

Figure 1.3.2: Relationship between the proportion of homeowners in 2007 and the proportion of homeowners in 2016, by country of origin.



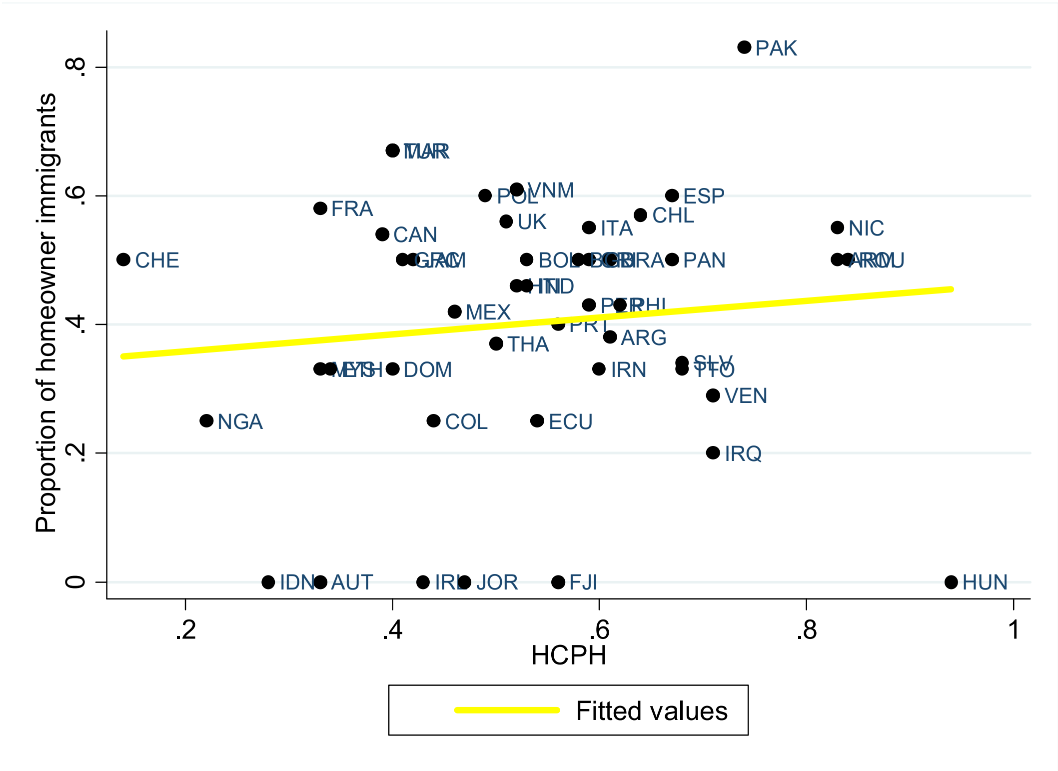
Notes: Data come from the IPUMS USA

Figure 1.3.3: The proportion of homeowner immigrants in the US, and the proportion of homeowners in their respective countries of origin. All married or unmarried and aged 31 to 56



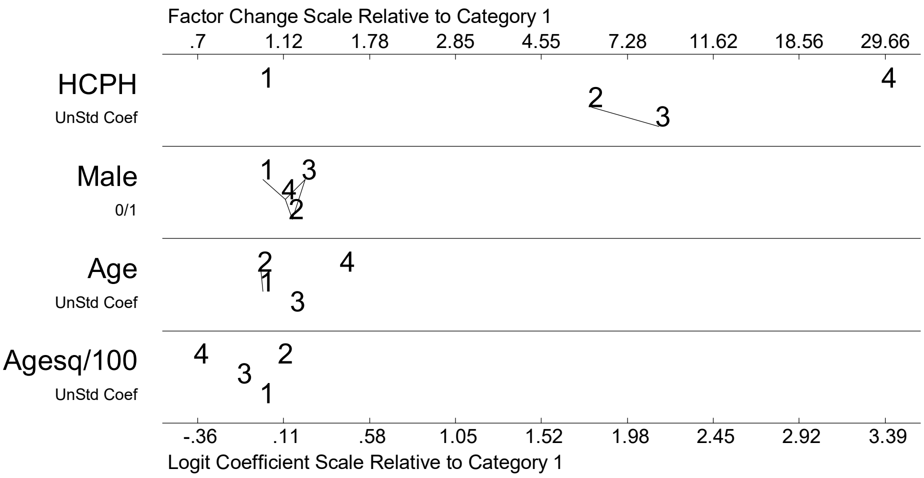
Notes: The home-country proportion of homeowners, calculated using data from the IPUMS International, is plotted on the x-axis, while the proportion of homeowner immigrants of those countries of origin, calculated using data from the 2016 ACS, is plotted on the y-axis. In both cases, married individuals aged 31 to 56 are considered.

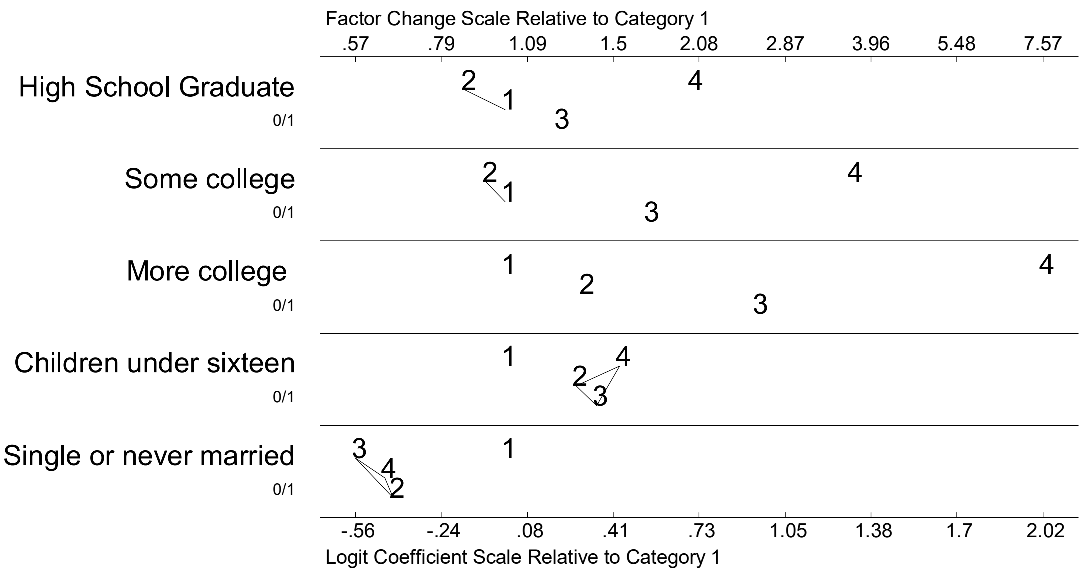
Figure 1.3.4: The proportion of homeowner immigrants in the US, and the proportion of homeowners in their respective countries of origin. All single and aged 31 to 56



Notes: The home-country proportion of homeowners, calculated using data from the IPUMS International, is plotted on the x-axis, while the proportion of homeowner immigrants of those countries of origin, calculated using data from the 2016 ACS, is plotted on the y-axis. In both cases, single individuals aged 31 to 56 are considered.

Figure 1.3.5: No homeowner (outcome one), homeowner without mortgage (outcome two), owning a house encumbered by only a first mortgage (outcome three), being a homeowner with a first mortgage but also encumbered by a second mortgage (outcome four): using a Multinomial Logit.





Notes: Robust standard errors. The numbers correspond to the outcome categories: one indicates not being a homeowner, two indicates being a homeowner without mortgage, three indicates owning a house encumbered by only a first mortgage, and four being a homeowner with a first mortgage but also encumbered by a second mortgage. The statistical significance is shown by drawing a line between categories for which there is no significant coefficient at the 10 percent level

Table 1.3.1: Summary statistics by country of origin

Country	Home-country cultural proxy	Proportion of homeowner immigrants	Man	Age	High school graduate	Some college	More college	Children under sixteen	Single or never married	Observations
Switzerland	0.33	0.68	0.61	43.52	0.06	0.06	0.87	0.32	0.23	31
Austria	0.50	0.79	0.47	61.10	0.27	0.24	0.42	0.08	0.15	62
Jamaica	0.53	0.56	0.43	41.04	0.21	0.21	0.57	0.37	0.41	104
Dominican Republic	0.54	0.37	0.43	38.63	0.21	0.36	0.33	0.54	0.35	150
Colombia	0.54	0.51	0.46	41.66	0.22	0.22	0.53	0.34	0.31	140
France	0.54	0.77	0.55	53.77	0.27	0.21	0.51	0.14	0.16	238
Poland	0.58	0.67	0.56	44.37	0.21	0.15	0.62	0.36	0.27	84
Ecuador	0.62	0.49	0.53	43.61	0.19	0.34	0.45	0.30	0.27	74
Nigeria	0.62	0.58	0.58	37.35	0.06	0.06	0.81	0.26	0.42	31
Ireland	0.64	0.72	0.48	51.62	0.08	0.36	0.56	0.18	0.22	50
Bolivia	0.65	0.81	0.44	41.00	0.13	0.31	0.56	0.50	0.25	16
Malaysia	0.65	0.63	0.63	38.5	0.00	0.19	0.81	0.56	0.31	16
Mexico	0.66	0.54	0.47	39.59	0.41	0.28	0.17	0.52	0.28	2,760
Jordan	0.66	0.79	0.63	48.05	0.32	0.26	0.42	0.32	0.05	19
Kenya	0.66	0.71	0.50	44.21	0.14	0.21	0.64	0.29	0.21	14
Turkey	0.67	0.67	0.48	47.19	0.12	0.39	0.49	0.34	0.21	67
Canada	0.68	0.73	0.55	49.04	0.20	0.22	0.57	0.24	0.23	725
Iran	0.68	0.71	0.62	39.95	0.11	0.21	0.68	0.51	0.24	76
Iraq	0.68	0.59	0.32	41.91	0.32	0.18	0.50	0.36	0.36	22
Morocco	0.68	0.62	0.41	51.22	0.27	0.24	0.41	0.16	0.32	37
Costa Rica	0.69	0.48	0.56	42.60	0.12	0.36	0.52	0.36	0.28	25
United Kingdom	0.69	0.70	0.53	48.25	0.22	0.24	0.52	0.25	0.24	721
Peru	0.70	0.53	0.53	42.43	0.14	0.26	0.55	0.34	0.31	58
Greece	0.70	0.68	0.47	49.25	0.27	0.21	0.52	0.31	0.22	77
Italy	0.70	0.79	0.54	51.97	0.29	0.23	0.44	0.24	0.17	333
Chile	0.71	0.77	0.49	44.41	0.15	0.13	0.69	0.33	0.28	39
Brazil	0.72	0.62	0.53	44.46	0.24	0.21	0.51	0.38	0.29	76
Portugal	0.72	0.75	0.53	47.78	0.32	0.25	0.29	0.34	0.18	96
Haiti	0.73	0.52	0.40	40.98	0.14	0.26	0.59	0.36	0.40	58
Argentina	0.73	0.66	0.52	46.84	0.15	0.26	0.56	0.34	0.25	61
Fiji	0.73	0.45	0.55	38.18	0.36	0.36	0.27	0.55	0.18	11
El Salvador	0.74	0.50	0.52	37.96	0.36	0.27	0.29	0.48	0.39	162
Trinidad and Tobago	0.77	0.48	0.43	41.35	0.22	0.39	0.37	0.37	0.46	46
Venezuela	0.77	0.57	0.56	43.22	0.13	0.19	0.65	0.22	0.28	54
Indonesia	0.77	0.67	0.52	41.74	0.07	0.22	0.67	0.48	0.22	27
Panama	0.79	0.69	0.55	50.27	0.25	0.22	0.51	0.25	0.16	134
Pakistan	0.80	0.65	0.56	35.60	0.05	0.25	0.69	0.49	0.31	55
Spain	0.81	0.76	0.53	45.88	0.23	0.21	0.56	0.32	0.19	104
Philippines	0.81	0.55	0.52	41.38	0.14	0.32	0.53	0.43	0.29	498
Ethiopia	0.81	0.57	0.67	43.71	0.10	0.19	0.67	0.29	0.29	21
Thailand	0.82	0.59	0.50	36.51	0.22	0.30	0.45	0.55	0.40	152
India	0.82	0.57	0.58	36.98	0.07	0.13	0.78	0.37	0.35	242
Bangladesh	0.82	0.59	0.45	32.77	0.00	0.32	0.68	0.32	0.41	22
Nicaragua	0.85	0.53	0.44	36.94	0.18	0.36	0.39	0.45	0.30	66
Armenia	0.89	0.39	0.54	31.89	0.14	0.29	0.57	0.46	0.29	28
Romania	0.92	0.59	0.49	37.03	0.15	0.28	0.54	0.38	0.38	39
Vietnam	0.92	0.73	0.54	39.45	0.11	0.21	0.67	0.52	0.34	368
Hungary	0.96	0.58	0.63	50.54	0.17	0.25	0.50	0.08	0.21	24
Mean	0.70	0.61	0.50	43.08	0.27	0.26	0.41	0.40	0.27	
Std. Dev.	0.09	0.49	0.50	12.60	0.44	0.44	0.49	0.49	0.45	

Note: Data comes from the 2016 American Community Survey (ACS) of Integrated Public Use Microdata Sample (IPUMS). The sample contains 8,313 observations of immigrants, aged 18 to 69, originating from 48 different countries.

Table 1.3.2: The effect of culture on the home-ownership decision

Dependent variable: Homeowner	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HCPH	0.230**							
	(0.110)							
HCPH by marital status		0.548***				0.577***	0.536***	0.548***
		(0.063)				(0.091)	(0.098)	(0.063)
HCPH by marital status and age group (18-30, 31-43, 44-56, 57-69)			0.493***		1.167***			
			(0.059)		(0.046)			
HCPH by marital status, age and employment status				0.440***				
				(0.056)				
Proportion of homeowners by state								0.767***
								(0.160)
Man	0.044***	0.037**	0.036**	0.032*	0.027*			0.037**
	(0.015)	(0.015)	(0.015)	(0.017)	(0.015)			(0.015)
Age	0.030***	0.031***	0.017***	0.017***		0.033***	0.028***	0.031***
	(0.003)	(0.003)	(0.003)	(0.003)		(0.004)	(0.004)	(0.003)
$Age^2/100$	-0.018***	-0.020***	-0.008**	-0.008**		-0.022***	-0.016***	-0.019***
	(0.003)	(0.004)	(0.003)	(0.003)		(0.005)	(0.004)	(0.004)
High school graduate	0.043***	0.043***	0.049***	0.052***	0.048***	0.023	0.051**	0.043***
	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.023)	(0.019)	(0.015)
Some college	0.113***	0.126***	0.129***	0.140***	0.124***	0.115***	0.118***	0.125***
	(0.027)	(0.028)	(0.027)	(0.023)	(0.029)	(0.042)	(0.026)	(0.028)
More college	0.196***	0.193***	0.198***	0.203***	0.187***	0.154***	0.216***	0.193***
	(0.019)	(0.027)	(0.026)	(0.024)	(0.031)	(0.036)	(0.028)	(0.027)
Children under sixteen	0.081***	0.059***	0.067***	0.067***	0.034*	0.069***	0.054**	0.058***
	(0.016)	(0.017)	(0.016)	(0.018)	(0.018)	(0.014)	(0.024)	(0.017)
Single or never married	-0.170***	-0.081***	-0.116***	-0.129***		-0.067***	-0.083***	-0.081***
	(0.011)	(0.015)	(0.012)	(0.011)		(0.023)	(0.022)	(0.015)
MSA fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,313	8,313	8,313	8,104	8,313	4,198	4,115	8,313
R^2	0.273	0.294	0.295	0.298	0.264	0.317	0.333	0.296

Notes: The home-country proportion of homeowners is calculated using information from the IPUMS International. The sample, obtained from the 2016 ACS, consists of immigrants aged 18 to 69 who arrived in the US at or before the age of 5 and who report their country of origin. In the first column, the home-country cultural proxy has been calculated by country of origin. In columns 2 to 4, that variable has been measured by marital status, marital status and age group, and marital status, age group and employment status, respectively. In column 5, controls for age and marital status have been excluded. Column 6 only incorporates immigrants who are men, and column 7 only incorporates immigrants who are women. Column 8 adds the proportion of homeowners in each US state using data from the IPUMS. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level

Table 1.3.3: Simple robustness checks

Dependent variable: Homeowner	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
HCPH by marital status	0.543***	0.550***	0.563***	0.703***		0.583***	0.498***	0.484***	0.551***
	(0.063)	(0.063)	(0.079)	(0.108)		(0.035)	(0.064)	(0.096)	(0.095)
HCPH (Census 1970)					0.646***				
					(0.116)				
Man	0.037**	0.037**	0.021	0.041**	0.035**	0.026***	0.011		
	(0.015)	(0.015)	(0.016)	(0.019)	(0.013)	(0.008)	(0.009)		
Age	0.031***	0.031***	0.031***	0.026	0.031***	0.036***	0.036***	0.038***	0.035***
	(0.003)	(0.003)	(0.005)	(0.030)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
$Age^2/100$	-0.020***	-0.020***	-0.020***	-0.012	-0.020***	-0.026***	-0.025***	-0.027***	-0.023***
	(0.004)	(0.004)	(0.006)	(0.038)	(0.004)	(0.002)	(0.003)	(0.004)	(0.003)
High school graduate	0.043***	0.043***	0.030	-0.004	0.041***	0.094***	0.088***	0.091***	0.078***
	(0.016)	(0.016)	(0.059)	(0.018)	(0.015)	(0.008)	(0.012)	(0.021)	(0.016)
Some college	0.126***	0.125***	0.078	0.089*	0.123***	0.154***	0.148***	0.167***	0.123***
	(0.028)	(0.028)	(0.061)	(0.045)	(0.028)	(0.011)	(0.018)	(0.024)	(0.024)
More college	0.193***	0.194***	0.149**	0.191***	0.190***	0.255***	0.227***	0.221***	0.224***
	(0.027)	(0.027)	(0.058)	(0.030)	(0.027)	(0.016)	(0.019)	(0.024)	(0.025)
Children under sixteen	0.059***	0.059***	0.082***	0.066**	0.055***	0.017*	0.060**	0.049**	0.073**
	(0.017)	(0.017)	(0.018)	(0.029)	(0.019)	(0.009)	(0.024)	(0.019)	(0.029)
Single or never married	-0.082***	-0.081***	-0.075***	-0.057***	-0.097***	-0.083***	-0.116***	-0.109***	-0.120***
	(0.015)	(0.015)	(0.023)	(0.017)	(0.013)	(0.010)	(0.013)	(0.021)	(0.017)
MSA fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,282	8,289	5,553	4,456	8,313	25,257	13,458	6,307	7,151
R^2	0.293	0.294	0.309	0.240	0.298	0.261	0.291	0.309	0.316

Note: The home-country proportion of homeowners is defined by marital status in all columns except in column 5. Our cultural proxy is calculated for International Censuses of 1970 in column 6. In column 7, 2014 and 2015 ACS are included in addition to 2016 ACS. Columns 7 to 9 incorporate both head and non-heads of household. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level

Table 1.3.4: The effect of culture on the home-ownership decision by year of migration and age

Dependent variable: Homeowner	(1)	(2)	(3)	(4)
HCPH by marital status	0.571***	0.989***	0.983***	0.133*
	(0.066)	(0.307)	(0.323)	(0.073)
1950s x HCPH by marital status		-0.456	-0.427	
		(0.378)	(0.394)	
1960s x HCPH by marital status		-0.282	-0.241	
		(0.350)	(0.367)	
1970s x HCPH by marital status		-0.353	-0.278	
		(0.339)	(0.350)	
1980s x HCPH by marital status		-0.285	-0.217	
		(0.299)	(0.313)	
1990s x HCPH by marital status		-0.885***	0.709	
		(0.328)	(0.447)	
2000s x HCPH by marital status		-0.815*		
		(0.427)		
30-39 years x HCPH by marital status				0.561***
				(0.107)
40-49 years x HCPH by marital status				0.570***
				(0.115)
50-59 years x HCPH by marital status				0.450***
				(0.119)
60-69 years x HCPH by marital status				0.551***
				(0.162)
MSA fixed effects	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes
Year of immigration fixed effect	Yes	No	No	No
P-value (F-test of HCPH + 1950 x HCPH)		0.003	0.004	
P-value (F-test of HCPH + 1960 x HCPH)		0.000	0.000	
P-value (F-test of HCPH + 1970 x HCPH)		0.000	0.000	
P-value (F-test of HCPH + 1980 x HCPH)		0.000	0.000	
P-value (F-test of HCPH + 1990 x HCPH)		0.207	0.000	
P-value (F-test of HCPH + 2000 x HCPH)		0.558		
P-value (F-test of HCPH + 30-40 years x HCPH				0.000
P-value (F-test of HCPH + 40-50 years x HCPH				0.000
P-value (F-test of HCPH + 50-60 years x HCPH				0.000
P-value (F-test of HCPH + 60-69 years x HCPH				0.000
Observations	8,313	8,313	6,731	8,313
R^2	0.302	0.299	0.233	0.299

Note: The home-country proportion of homeowners is defined by marital status in columns 1 to 4. We have included all the controls for the individual characteristics defined in Equation 1. Column 3 only includes individuals older than 30 years old. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

Table 1.3.5: More robustness checks, adding home-country observable characteristics

Dependent variable: Homeowner	(1)	(2)	(3)	(4)	(5)	(6)
HCPH	0.262**					
	(0.100)					
HCPH by marital status		0.468***			0.484***	0.470***
		(0.062)			(0.075)	(0.092)
HCPH by marital status and age			0.421***			
group (18-30, 31-43, 44-56, 57-69)			(0.051)			
HCPH by marital status, age and				0.380***		
employment status				(0.047)		
Man	0.040**	0.034**	0.033**	0.029		
	(0.016)	(0.016)	(0.016)	(0.018)		
Age	0.032***	0.034***	0.021***	0.021***	0.036***	0.031***
	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.004)
Age2/100	-0.021***	-0.023***	-0.013***	-0.012***	-0.026***	-0.019***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
High school graduate	0.048***	0.047***	0.052***	0.056***	0.026	0.066***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.023)	(0.017)
Some college	0.111***	0.110***	0.113***	0.125***	0.091*	0.116***
	(0.030)	(0.033)	(0.032)	(0.027)	(0.054)	(0.021)
More college	0.194***	0.187***	0.190***	0.196***	0.134***	0.230***
	(0.024)	(0.026)	(0.026)	(0.023)	(0.040)	(0.019)
Children under sixteen	0.073***	0.056***	0.063***	0.063***	0.070***	0.043**
	(0.016)	(0.017)	(0.016)	(0.017)	(0.014)	(0.020)
Single or never married	-0.171***	-0.095***	-0.126***	-0.137***	-0.081***	-0.102***
	(0.012)	(0.016)	(0.012)	(0.012)	(0.023)	(0.022)
Property Prices Index	0.001	0.0005	-0.001	-0.0004	-0.001	0.002
	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)
Property Rights Index	-0.0005	-0.001	-0.001	-0.001	-0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GDP pc	0.002*	0.002	0.002	0.002	0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Unemployment rate	-0.001	-0.001	-0.001	-0.001	-0.004	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Female labor force participation	-0.002	-0.003*	-0.002	-0.001	-0.001	-0.005**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
MSA fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,885	7,885	7,885	7,677	3,987	3,898
R^2	0.282	0.290	0.290	0.294	0.307	0.325

Note: In column 1, the home-country cultural proxy has been calculated by country of origin. In columns 2 to 4, that variable has been measured by marital status, marital status and age group, and marital status, age group and employment status, respectively. Column 5 only incorporates immigrants who are men, and column 6 only incorporates immigrants who are women. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

Table 1.3.6: Home-ownership and mortgage finance culture

	(1)	(2)	(3)	(4)	(5)
			Multinomial Logit Model:		
Dependent variable:	Homeowner with mortgage	Homeowner without mortgage	Homeowner without mortgage	Homeowner with a first mortgage	Homeowner with a second mortgage
HCPH by marital status	0.633***	0.378***	1.791***	2.155***	3.390***
	(0.077)	(0.066)	(0.373)	(0.374)	(0.750)
Man	0.038**	0.022*	0.158**	0.228***	0.119
	(0.015)	(0.011)	(0.077)	(0.072)	(0.131)
Age	0.033***	-0.009***	-0.011	0.165***	0.438***
	(0.003)	(0.003)	(0.029)	(0.016)	(0.051)
$Age^2/100$	-0.023***	0.026***	0.099***	-0.123***	-0.358***
	(0.004)	(0.003)	(0.030)	(0.019)	(0.050)
High school graduate	0.056***	0.007	-0.152	0.201**	0.702***
	(0.019)	(0.015)	(0.141)	(0.094)	(0.259)
Some college	0.151***	0.049***	-0.073	0.537***	1.302***
	(0.032)	(0.012)	(0.131)	(0.141)	(0.318)
More college	0.231***	0.090***	0.294***	0.947***	2.024***
	(0.032)	(0.016)	(0.105)	(0.099)	(0.323)
Children under sixteen	0.066***	0.038***	0.269***	0.345***	0.431**
	(0.019)	(0.011)	(0.101)	(0.098)	(0.174)
Single or never married	-0.071***	-0.033**	-0.422***	-0.563***	-0.453**
	(0.017)	(0.015)	(0.088)	(0.122)	(0.183)
MSA fixed effects	Yes	Yes	No	No	No
Country fixed effects	Yes	Yes	No	No	No
Observations	7,071	4,451	8,313	8,313	8,313
R^2	0.296	0.311			

Note: The home-country proportion of homeowners has been defined by marital status. In column 1, those homeowners without mortgage have been excluded from our sample. In column 2. those homeowners with mortgage have been excluded from our sample. In columns 3 to 5, we study the effect of culture on home-ownership using a Multinomial Logit Model. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level.

Table 1.3.7: Same- or different-origin couples (Heads of Household (HH) and their partners)

Dependent variable: Homeowner	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	Same origin couples	Different origin couples	Different origin couples	Different origin couples	All (excluding immigrants without their partner's HCPH)		All
HCPH of the HH for married and	0.740***		0.105				
Unmarried couples	(0.152)		(0.148)				
HCPH of the HH's partner		0.444*	0.598**				
		(0.251)	(0.236)				
Mean between the HCPH of the HH				0.888*			
and the HCPH of the HH's partner				(0.503)			
HCPH by marital status					0.564***		
					(0.064)		
HCPH by marital status and the mean						0.576***	0.558***
HCPH of the different origin couples						(0.066)	(0.065)
Man	0.017	0.016	0.015	0.016	0.036**	0.035**	0.036**
	(0.018)	(0.019)	(0.019)	(0.019)	(0.015)	(0.015)	(0.015)
Age	0.028***	0.047***	0.048***	0.047***	0.031***	0.031***	0.031***
	(0.005)	(0.004)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)
$Age^2/100$	-0.012*	-0.037***	-0.038***	-0.037***	-0.019***	-0.019***	-0.020***
	(0.006)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
High school graduate	-0.004	0.021	0.027	0.021	0.041**	0.038**	0.040**
	(0.021)	(0.047)	(0.044)	(0.047)	(0.016)	(0.016)	(0.015)
Some college	0.095***	0.061	0.058	0.061	0.120***	0.117***	0.122***
	(0.016)	(0.062)	(0.061)	(0.062)	(0.029)	(0.028)	(0.028)
More college	0.154***	0.153***	0.161***	0.153***	0.186***	0.181***	0.189***
	(0.025)	(0.055)	(0.050)	(0.055)	(0.029)	(0.028)	(0.027)
Children under sixteen	0.027	0.058***	0.064***	0.058***	0.053***	0.053***	0.058***
	(0.027)	(0.016)	(0.016)	(0.016)	(0.017)	(0.017)	(0.017)
Single or never married	-0.175***	-0.189***	-0.186***	-0.189***	-0.080***	-0.075***	-0.078***
	(0.025)	(0.030)	(0.030)	(0.030)	(0.015)	(0.015)	(0.016)
MSA fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin of the HH FE	No	Yes	No	Yes	Yes	Yes	Yes
Observations	1,466	3,319	3,319	3,319	8,039	8,039	8,313
R^2	0.363	0.342	0.326	0.342	0.296	0.297	0.295

Note: The home-country proportion of homeowners has been defined by marital status. Column 1 only includes those individuals with a same-ethnicity partner. Columns 2, 3 and 4 only include those individuals with different-origin partner. Those individuals with a different-origin partner for whom there is no information in IPUMS International have been excluded from our sample in columns 5 and 6. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level

Table 1.3.8: Channels of transmission of culture

Dependent variable: Homeowner	(1)	(2)	(3)	(4)	(5)
Proportion of individuals of the same origin by MSA	-0.189	-0.192	-2.015***		
	(0.202)	(0.196)	(0.262)		
HCPH by marital status		0.548***			0.420**
		(0.063)			(0.171)
Proportion of individuals of the same origin by MSA X HCPH by marital status			2.882***		
			(0.293)		
Proportion of immigrant elders of the same origin by MSA				-1.571***	
				(0.242)	
Proportion of immigrant elders of the same origin by MSA x HCPH				2.270***	
				(0.303)	
Gender-based system					-0.167
					(0.142)
Gender-based system x HCPH					0.135
					(0.158)
Man	0.043***	0.037**	0.042***	0.042***	0.042***
	(0.015)	(0.015)	(0.014)	(0.015)	(0.014)
Age	0.030***	0.031***	0.030***	0.030***	0.030***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
$Age^2/100$	-0.018***	-0.020***	-0.018***	-0.018***	-0.019***
	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)
High school graduate	0.043***	0.043***	0.044***	0.044***	0.038**
	(0.015)	(0.016)	(0.015)	(0.015)	(0.016)
Some college	0.124***	0.126***	0.126***	0.125***	0.122***
	(0.027)	(0.028)	(0.027)	(0.027)	(0.031)
More college	0.196***	0.193***	0.197***	0.197***	0.196***
	(0.026)	(0.027)	(0.026)	(0.026)	(0.028)
Children under sixteen	0.080***	0.059***	0.077***	0.078***	0.065***
	(0.018)	(0.017)	(0.019)	(0.018)	(0.018)
Single or never married	-0.167***	-0.081***	-0.151***	-0.155***	-0.079***
	(0.011)	(0.015)	(0.016)	(0.013)	(0.015)
MSA fixed effects	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes	Yes
P-value (F-test of HCPH + Gender-based system x HCPH=0)					0.000
Observations	8,313	8,313	8,313	8,313	7,9730
R^2	0.285	0.294	0.287	0.286	0.295

Note: The home-country proportion of homeowners has been defined by marital status. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level

Appendix 1.3.A

Table 1.3.A1: The effect of culture on the home-ownership decision using Probit Models

Dependent variable: Homeowner	(1)	(2)	(3)	(4)
HCPH	0.652*			
	(0.374)			
HCPH by marital status		1.277***		
		(0.221)		
HCPH by marital status and age			1.064***	
group (18-30, 31-43, 44-56, 57-69)			(0.196)	
HCPH by marital status, age and				0.991***
employment status				(0.177)
Man	0.137***	0.122***	0.120***	0.112**
	(0.044)	(0.043)	(0.044)	(0.049)
Age	0.071***	0.073***	0.041***	0.041***
	(0.010)	(0.011)	(0.010)	(0.008)
$Age^2/100$	-0.036***	-0.037***	-0.010	-0.010
	(0.011)	(0.012)	(0.010)	(0.009)
High school graduate	0.089	0.080	0.094*	0.099*
	(0.055)	(0.051)	(0.054)	(0.055)
Some college	0.269***	0.258***	0.261***	0.284***
	(0.062)	(0.071)	(0.071)	(0.065)
More college	0.536***	0.507***	0.509***	0.514***
	(0.044)	(0.046)	(0.045)	(0.042)
Children under sixteen	0.240***	0.202***	0.221***	0.216***
	(0.054)	(0.057)	(0.055)	(0.058)
Single or never married	-0.513***	-0.320***	-0.412***	-0.437***
	(0.038)	(0.060)	(0.047)	(0.041)
Observations	8,313	8,313	8,313	8,104

Notes: The home-country proportion of homeowners is calculated using information from the IPUMS International. The sample, obtained from the 2016 ACS, consists of immigrants aged 18 to 69 who arrived in the US at or before the age of 5 and who report a country of origin. In the first column, the home-country cultural proxy has been calculated by country of origin. In columns 2 to 4, that variable has been measured by marital status, marital status and age group, and marital status, age group and employment status, respectively. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1 percent level, ** Significant at the 5 percent level, * Significant at the 10 percent level

Table 1.3.A2: Home-Country Censuses from IPUMS International

Country	2016 Census Year (IPUMS International)	1970 Census Year (IPUMS International)
Argentina	2001	1970
Armenia	2011	2001
Austria	2001	1981
Bangladesh	2011	1991
Bolivia	2001	1976
Brazil	2010	1970
Canada	2011	1981
Chile	2002	1970
Colombia	2005	1973
Costa Rica	2011	1973
Dominican Republic	2010	1981
Ecuador	2010	1974
El Salvador	2007	1992
Ethiopia	2007	1984
Fiji	2007	1986
France	2011	1968
Greece	2011	1971
Haiti	2003	1971
Hungary	2011	1970
India	1987	1987
Indonesia	2010	1971
Iran	2006	2006
Iraq	1997	1997
Ireland	2011	1981
Italy	2001	2001
Jamaica	2001	2001
Jordan	2004	2004
Kenya	2009	1989
Malaysia	2000	1970
Mexico	2015	1970
Morocco	2004	1982
Nicaragua	2005	1971
Nigeria	2010	2006
Pakistan	1998	1998
Panama	2010	1980
Peru	2007	1993
Philippines	1990	1990
Poland	2002	1978
Portugal	2011	1981
Romania	2011	1977
Spain	2001	1991
Switzerland	2000	1970
Thailand	2000	1970
Trinidad and Tobago	2011	1970
Turkey	2000	1985
United Kingdom	2001	1991
Venezuela	2001	1971
Vietnam	2009	1999

Notes: This table shows the Censuses of the countries of origin utilized to calculate the cultural proxies.

References

Aaronson, D. (2000). “A note on the benefits of homeownership”, *Journal of Urban Economics*, 47(3), 356–369.

Abma, J. C., and Martínez, G. M. (2006). “Childlessness among older women in the United States: Trends and profiles”, *Journal of Marriage and Family*, *68*(4), 1045-1056.

Adserà, A., and Ferrer, A. (2015). “Immigrants and demography: Marriage, divorce, and fertility”, *Handbook of the economics of international migration*, edited by Chiswick, B. R., and Miller, P. W. Elsevier, 1(7), 315-374.

Ahituv, A., and Lerman, R.I. (2011). “Job Turnover, Wage Rates, and Marital Stability: How Are They Related?”, *Review of Economics of the Household*, 9(2), 221-249.

Ahn, N., and Mira, P. (2002). “A note on the changing relationship between fertility and female employment rates in developed countries”, *Journal of Population Economics*, 15(4), 667-682.

Akerlof, G. A., and Kranton, R.E. (2000). “Economics and Identity”, *Quarterly Journal of Economics*, 115(3), 715-753.

Ananat, E., Gruber, J., and Levine, P. (2007). “Abortion legalization and life-cycle fertility”, *Journal of Human Resources*, 42(2), 375-397.

Andaluz, J., Marcén, M., and Molina, J. A. (2017). “The Effects of Inter-Generational Transfers on the Marital Surplus”, *The Manchester School*, 85(3), 320-338.

Angrist, J. (2002). “How do sex ratios affect marriage and labor markets? Evidence from America's second generation”, *Quarterly Journal of Economics*, 117(3), 997-1038.

Badarinza, C., Campbell, J. Y., and Ramadorai, T. (2016). “International comparative household finance”, *Annual Review of Economics*, 8(1), 111-144.

Barro, R., and Becker, G. (1988). “A Reformulation of the economic theory of fertility”, *Quarterly Journal of Economics*, 103(1), 1-25.

Barro, R. J., and Lee, J. W. (2013). “A new data set of educational attainment in the world, 1950–2010”, *Journal of development economics,* 104, 184-198.

Becker, G. (1973). “A Theory of Marriage: Part I”, *Journal of Political Economy*, 81(4), 813-846.

Becker, G. (1981). “A treatise on the family”, Cambridge *MA: Harvard University Press*.

Bellido, H., and Marcén, M. (2014). “Divorce laws and fertility”, *Labour Economics*, 27, 56-70.

Bellido, H., and Marcén, M. (2020). “Will you marry me? It depends (on the business cycle)”, *Review of Economics of the Household*, 1-29. https://doi.org/10.1007/s11150-020-09493-z

Bellido, H., Marcén, M., and Molina, J.A. (2016). “The effect of culture on fertility behavior of US teen mothers”, *Feminist Economics,* 22(3), 101-126.

Bertrand, M., Luttmer, E. F. P., and Mullainathan, S. (2000). “Network effects and welfare cultures”, *Quarterly Journal of Economics*, 115(3), 1019-1055.

Bisin, A., Topa, G., and Verdier, T. (2004). “Religious Intermarriage and Socialization in the United States”, *Journal of Political Economy*, 112(3), 615-664.

Bisin, A., and Verdier, T. (2000). “Beyond the Melting Pot: Cultural Transmission, Marriage, and the Evolution of Ethnic and Religious Traits”, *Quarterly Journal of Economics,* 115(3), 955-988.

Bitler, M., Gelbach, J., Hoynes, H., and Zavodny, M. (2004). “The Impact of Welfare Reform on Marriage and Divorce”, *Demography*, 41(2), 213-236.

Blau, F. D., Kahn, L. M., Liu, A. Y. H., and Papps, K. L. (2013). “The transmission of women’s fertility, human capital, and work orientation across immigrant generations”, *Journal of Population Economics*, 26(2), 405-435.

Borjas, G. J. (2002). “Homeownership in the immigrant population”, *Journal of Urban Economics*, 52(3), 448-476.

Bourassa, S. C., and Hoesli, M. (2010). “Why do the Swiss rent?”, *The Journal of Real Estate Finance and Economics*, 40(3), 286-309.

Breierova, L., and Duflo, E. (2004). "The impact of education on fertility and child mortality: Do fathers really matter less than mothers?", *National Bureau of Economic Research, Working Paper 10513*.

Brewster, K., and Rindfuss, R. (2000). "Fertility and women's employment in industrialized nations", *Annual Review of Sociology,* 26(1), 271-296.

Brien, M.J. (1997). "Racial differences in marriage and the role of marriage markets", *Journal of Human Resources*, 32(4), 741-778.

Browning, M., Chiappori, P., and Weiss, Y. (2014). "Economics of the Family", Cambridge, UK: Cambridge University Press.

Buckle, L.,Gallup, G.G., and Rodd, Z.A. (1996). "Marriage as a reproductive contract: Patterns of marriage, divorce, and remarriage", *Ethology and Sociobiology*, 17(6), 363–377.

Bumpass, L., and Lu, H. (2000). "Trends in cohabitation and implications for children's family contexts in the United States", *Population Studies*, 54(1), 29–41.

Card, D., Dinardo, J.E., and Estes, E. (2000). "The more things change: immigrants and the children of immigrants in the 1940s, the 1970s, and the 1990s", in G. Borjas editor, *Issues in the Economics of Immigration, Chicago: University of Chicago Press.*

Cahill, M. E., and Franklin, R. S. (2013). "The minority homeownership gap, home foreclosure, and nativity: Evidence from Miami-Dade County", *Journal of Regional Science*, 53(1), 91-117.

Cherlin, A. (2002). *"*The Marriage Problem: How Our Culture Has Weakened Families*",* *Population and Development Review,* 28(3), 566-568.

Chiappori, P. A., Fortin, B., and Lacroix, G. (2002). "Marriage market, divorce legislation, and household labor supply", *Journal of Political Economy*, 110(1), 37-72.

Chiuri, M. C., and Jappelli, T. (2003). "Financial market imperfections and home ownership: a comparative study", *European Economic Review*, 47(5), 857-875.

Clark, W.A., Deurloo, M.C., and Dieleman, F.M., (1997)." Entry to home-ownership in Germany: Some comparisons with the United States", *Urban Studies,* 34(1), 7–19.

Constant, A. F., Roberts, R., and Zimmermann, K. F. (2009). “Ethnic identity and immigrant homeownership”, *Urban Studies*, 46(9), 1879-1898.

Contreras, D., and Plaza, G. (2010). “Cultural factors in women’s labor force participation in Chile”, *Feminist Economics,* 16(2), 27-46.

Coulson, N. E. (1999). “Why are Hispanic-and Asian-American homeownership rates so low?: Immigration and other factors”, *Journal of Urban Economics*, 45(2), 209-227.

Coulson, N. E., and Fisher, L. M. (2009). “Housing tenure and labor market impacts: The search goes on”, *Journal of Urban Economics*, 65(3), 252-264.

Cragg, J. (1971). “Some statistical models for limited dependent variables with application to the demand for durable goods”, *Econometrica,* 39(5), 829-844.

Datta Gupta N., and Stratton L.S. (2010). “Institutions, social norms and bargaining power: an analysis of individual leisure time in couple households”, *Review of Economics of the Household,* 8(3), 325–343

Day, C., and Guest, R. (2016). “Fertility and female wages: A new link via house prices”, Economic Modelling, 53, 121-132.

Dietz, R. D., and Haurin, D. R. (2003). “The social and private micro-level consequences of homeownership”, *Journal of Urban Economics*, 54(3), 401-450.

Doepke, M. (2005). “Child mortality and fertility decline: Does the Barro-Becker model fit the facts?”, Journal of Population Economics, 18(2), 337-366.

Doepke, M., and Kindermann, F. (2016). “Bargaining over babies: theory, evidence, and policy implications”, National Bureau of Economic Research, Working Paper 22072

Doepke, M., and Kindermann, F. (2017). “Intrahousehold decision making and fertility”, forcoming in Demographic Change and Long-Run Development, edited by Cervellati M., and Sunde U., MIT Press.

Dryer, M., and Haspelmath, M. (2011). “The world atlas of language structures online”, Leipzig: Max Planck Institute for Evolutionary Anthropology.

Dryer, M. S., and Haspelmath, M. (Eds.) (2013). *The World Atlas of Language Structures Online*. Leipzig: Max Planck Institute for Evolutionary Anthropology. (Available online at http://wals.info, Accessed on 2018-08-09.).

Durand, J., Massey, D. S., and Parrado, E. A. (1999). “The new era of Mexican migration to the United States”, The Journal of American History, 86(2), 518-536.

Engelhardt, H., Kögel, T., and Prskawetz, A. (2004). “Fertility and women's employment reconsidered: A macro-level time-series analysis for developed countries, 1960-2000”, *Population Studies*, 58(1), 109-120.

Eugster, B., Lalive, R., Steinhauer, A., and Zweimüller, J. (2017). “Culture, work attitudes and job search: Evidence from the Swiss language border”, *Journal of the European Economic Association*, 15(5), 1056-1100.

Fanti, L., and Gori, L. (2011). “Child policy ineffectiveness in an overlapping generations small open economy with human capital accumulation and public education”, *Economic Modelling*, 28(1), 404-409.

Fanti, L., and Spataro, L. (2013). “On the relationship between fertility and public national debt”, *Economic Modelling*, *33*, 843-849.

Feijten, P. (2005). “Union dissolution, unemployment and moving out of homeownership”, *European Sociological Review*, 21(1), 59-71.

Fernández, R. (2007). “Women, work, and culture”, *Journal of the European Economic Association,* 5(2-3), 305-332.

Fernández, R. (2011). “Does culture matter”. In Jess, Benhabib, Bisin, and Jackson (Eds.), *Handbook of Social Economics,* 1, 481-510. North-Holland.

Fernández, R., and Fogli, A. (2006). “Fertility: the role of culture and family experience”, *Journal of the European Economic Association,* 4(2–3), 552-561.

Fernández, R., and Fogli, A. (2009). “Culture: an empirical investigation of beliefs, work, and fertility”, *American Economic Journal: Macroeconomics,* 1(1), 146-177.

Fisher, L. M., and Jaffe, A. J. (2003). “Determinants of international home ownership rates”, *Housing finance international*, 18(1), 34-37.

Furtado, D. (2015). “Ethnic Intermarriage”, *International Encyclopedia of Social and Behavioral Sciences,* 2nd Edition, edited by James D. Wright, Elsevier, Oxford, 2015, 118-122.

Furtado, D., Marcén, M., and Sevilla, A. (2013). "Does culture affect divorce? Evidence from European immigrants in the United States", *Demography,* 50(3), 1013-1038.

Furtado, D., and Theodoropoulos, N. (2011). "Interethnic Marriage: a Choice between Ethnic and Educational Similarities", *Journal of Population Economics*, 24(4), 1257-1279.

Galor, O., and Weil, D. (1996). "The gender gap, fertility and growth", *American Economic Review*, 86(3), 374-387.

Gay, V., Hicks, D. L., Santacreu-Vasut, E., and Shoham, A. (2017). "Decomposing culture: An analysis of gender, language, and labor supply in the household", *Review of Economics of the Household*, 1-29, doi.org/10.1007/s11150-017-9369-x.

Gierveld, J.D. (2004). "Remarriage, Unmarried Cohabitation, Living Apart Together: Partner Relationships Following Bereavement or Divorce", *Journal of Marriage and Family"*, 66(1), 236-243.

Giuliano, P. (2007). "Living arrangements in western Europe: Does cultural origin matter?", *Journal of the European Economic Association*, 5(5), 927-952.

Giuliano, P. (2016). "Review of cultural evolution: society, technology, language, and religion". In J. Richerson J. and H. Christiansen (Eds.), *Journal of Economic Literature,* 54(2), 522-533.

Goldstein, J.R., and Kenney, C.T. (2001). "Marriage Delayed or Marriage Forgone? New Cohort Forecasts of First Marriage for U.S. Women", *American Sociological Review*, 66(4), 506-519.

González-Val, R., and Marcén, M. (2012a). "Unilateral divorce versus child custody and child support in the U.S.", *Journal of Economic Behavior & Organization*, 81(2), 613-643.

González-Val, R., and Marcén, M. (2012b). "Breaks in the breaks: An analysis of divorce rates in Europe", *International Review of Law and Economics*, 32(2), 242-255.

González-Val, R., and Marcén, M. (2017). "Divorce and the business cycle: a cross-country analysis", *Review of Economics of the Household*, 15(3), 879-904.

González-Val, R., and Marcén, M. (2018). "Unemployment, marriage and divorce", *Applied Economics*, 50(13), 1495-1508.

Goodman, L. S., and Mayer, C. (2018). "Homeownership and the American Dream", *Journal of Economic Perspectives*, 32(1), 31-58.

Green, R.K., and White, M.J., (1997). "Measuring the benefits of homeownership: Effects on children", *Journal of Urban Economics,* 41(3), 441-461.

Greene, W.H. (2008). *Econometric analysis*. New Jersey: Prentice Hall.

Greenwood, J., and Seshadri, A. (2002). "The U.S. demographic transition", *American Economic Review*, 92(2), 153-159.

Grossbard-Shechtman, S. (1993). "On the economics of marriage: a theory of marriage labor and divorce", Boulder CO: Westview Press.

Goldin, C., and Katz, L. (2000). "Career and marriage in the age of the pill", *American Economic Review*, 90(2), 461-465.

Goldin, C., and Katz, L. (2002). "The power of the pill: Oral contraceptives and women's career and marriage decisions", *The Journal of Political Economic,* 110(4), 730-770.

Guldi, M. (2008). "Fertility effects of abortion and birth control pill access for minors", *Demography*, 45(4), 817-827.

Haurin, D. R., Parcel, T. L., and Haurin, R. J. (2002). "Does homeownership affect child outcomes?", *Real Estate Economics*, 30(4), 635-666.

Haurin, D. R., and Kamara, D. A. (1992). "The homeownership decision of female-headed households", *Journal of Housing Economics*, 2(4), 293-309.

Hobbs, F., and Stoops, N. (2002). *Demographic trends in the 20th century* (Vol. 4).

Ishida, J. (2003). "The role of social norms in a model of marriage and divorce", *Journal of Economic Behavior & Organization*, 51(1), 131-142.

Jalovaara, M. (2003). "The Joint Effects of Marriage Partners' Socioeconomic Positions on the Risk of Divorce", *Demography*, 40(1), 67-81.

Jambunathan, S., Burts, D. C., and Pierce, S. (2000). "Comparisons of parenting attitudes among five ethnic groups in the United States", *Journal of Comparative Family Studies*, 31(4), 395-406.

Kalmijn, M., and Uunk, W. (2007). "Regional value differences in Europe and the social consequences of divorce: A test of the stigmatization hypothesis", *Social Science Research,* 36(2), 447-468.

Kalmijn, M., and van Groenou, M.B. (2005). "Differential effects of divorce on social integration", *Journal of Social and Personal Relationships*, 22(4), 455-476.

Kalwij, A. (2000). "The effects of female employment status on the presence and number of children", *Journal of Population Economics*, 13(2), 221-239.

Kashima, E. S., and Kashima, Y. (1998). "Culture and language: The case of cultural dimensionsand personal pronoun use", *Journal of Cross-Cultural Psychology*, *29*(3), 461-486.

Krivo, L. J. (1995). "Immigrant characteristics and Hispanic-Anglo housing inequality", *Demography*, 32(4), 599-615.

Lehrer, E.L. (2004). "The role of religion in union formation: An economic perspective", *Population Research and Policy Review*, 23(2), 161-185.

Lehrer, E.L., and Chiswick, C.U. (1993). "Religion as a determinant of marital stability". *Demography,* 30(3), 385-404.

Lehrer, E.L., and Son Y.J. (2017). "Marital Instability in the United States: Trends, Driving Forces, and Implications for Children", IZA DP No. 10503.

Leon, A. (2004). "The effect of education on fertility: evidence from compulsory schooling laws", Unpublished manuscript, *University of Pittsburgh*.

Long, J., and Freese, J. (2006). "Regression Models for Categorical Dependent Variables Using Stata 2nd ed", *Stata Press Publication.*

Long, J., and Freese, J. (2014). *Regression models for categorical dependent variables using Stata.* 3rd ed. College Station, TX: US: Stata Press.

Lundberg, S., and Pollak, R. A. (1996). "Bargaining and distribution in marriage", *Journal of Economic Perspectives*, 10(4), 139-158.

Manning, W.D., Brown, S.L., and Payne, K.K. (2014). "Two Decades of Stability and Change in Age at First Union Formation", *Journal of Marriage and Family,* 76(2), 247-260.

Marcén, M. (2014). "The role of culture on self-employment", *Economic Modelling,* 44(1), s20-s32.

Marcén, M., and Molina, J. A. (2012). "Informal caring-time and caregiver satisfaction", *The European Journal of Health Economics*, 13(6), 683-705.

Marcén, M., Molina, J. A., and Morales, M. (2018). "The effect of culture on the fertility decisions of immigrant women in the United States", *Economic Modelling*, 70, 15-28.

Marcén, M., and Morales, M. (2019). "Live together: Does culture matter?", *Review of Economics of the Household*, 17 (2), 671-713. DOI: 10.1007/s11150-018-9431-3.

Mencarini, L., Pasqua, S., and Romiti, A. (2017). "Single-mother families and the gender gap in children's time investment and non-cognitive skills" *Review of Economics of the Household*, 1-28, doi.org/10.1007/s11150-017-9385-x

Michael, R. (1985). "Consequences of the rise in female labor force participation rates: questions and probes", *Journal of Labor Economics*, 3(1, Part 2), s117-s146.

Minnesota Population Center (2015). *Integrated Public Use Microdata Series, International: Version 6.4* [dataset]. Minneapolis, MN: University of Minnesota.

Minnesota Population Center (2017). *Integrated Public Use Microdata Series, International: Version 6.5* [dataset]. Minneapolis, MN: University of Minnesota. https://doi.org/10.18128/D020.V6.5

Mudrazija, S., and Butrica, B. A. (2017). "Homeownership, Social Insurance, and Old-Age Security in the United States and Europe", *Innovation in Aging*, 1(1), 183–184

Munch, J. R., Rosholm, M., and Svarer, M. (2008). "Home ownership, job duration, and wages", *Journal of Urban Economics*, 63(1), 130-145.

Münz, R., and Ulrich, R. (1997). "Changing patterns of immigration to Germany 1945-1995: ethnic origins demographic structure future prospects". In migration and refugees: politics and policies in the United States and Germany, edited by Bade, K. J., and Weiner, M., Providence and Oxford: Berghahn Books, 1, 65-119

Myers, D., Gao, X., and Emeka, A. (2009). "The Gradient of Immigrant Age-at-Arrival Effects on Socioeconomic Outcomes in the US", *International Migration Review*, 43(1), 205-229.

Myers, D., Lee, H., and Simmons, P. A. (2019). "Cohort Insights into Recovery of Millennial Homeownership after the Great Recession", *Journal of Housing Economics,* forthcoming.

Negrusa, B., and Oreffice, S. (2010). "Quality of available mates, education, and household labor supply", *Economic Inquiry*, 48(3), 558-574.

Nervole, M., and Press, S. (1973). Univariate and Multivariate Log-Linear and Logistic Models. Santa Monica, California: Rand Corporation.

Nollenberger, N., Rodríguez, N., and Sevilla, A. (2016). "The math gender gap: The role of culture", *American Economic Review,* 106(5), 257-261.

Oreffice, S. (2014). "Culture and household decision making. balance of power and labor supply choices of us-born and foreign-born couples", *Journal of Labor Research*, 35(2), 162-184.

Painter, G., Yang, L., and Yu, Z. (2004). "Homeownership determinants for Chinese Americans: Assimilation, ethnic concentration and nativity", *Real Estate Economics*, 32(3), 509-539.

Perelli-Harris, B., Styrc, M. E., Addo, F., Hoherz, S., Lappegard, T., Sassler, S., and Evans, A. (2017). "Comparing the benefits of cohabitation and marriage for health in mid-life: Is the relationship similar across countries?", ESRC Centre for Population Change Working Paper 84

Pylypchuk, Y., and Kirby, J. B. (2017)."The role of marriage in explaining racial and ethnic disparities in access to health care for men in the US", *Review of Economics of the Household*, 15(3), 807-832.

Rodríguez-Planas, N. (2018). "Mortgage Finance and Culture", *Journal of Regional Science*, 58(4), 786-821.

Ruggles, S., Genadek, K., Goeken, R., Grover, J., and Sobek, M. (2015). *Integrated Public Use Microdata Series: Version 6.0* [dataset]. Minneapolis, MN: University of Minnesota.

Ruggles, S., Genadek, K., Goeken, R., Grover, J., and Sobek, M. (2017). *Integrated Public Use Microdata Series: Version 7.0* [dataset]. Minneapolis, MN: University of Minnesota. https://doi.org/10.18128/D010.V7.0.

Sah, R. (1991). "The effect of child mortality changes on fertility choice and parental welfare", *Journal of Political Economy*, 99(3), 582-606.

Sevilla, A. (2010). "Division of household labor and cross-country differences in household formation rates", Journal of Population Economics, 23(1), 225-249.

Simeonova, E. (2013). "Marriage, bereavement and mortality: The role of health care utilization", *Journal of Health Economics*, 32(1), 33-50.

Sorenson, A. M. (1989). "Husbands' and wives' characteristics and fertility decisions: A diagonal mobility model", *Demography*, *26*(1), 125-135.

Steele, F., Kallis, C., Goldstein, H., and Joshi, H. (2005). "The relationship between childbearing and transitions from marriage and cohabitation in Britain", *Demography*, 42(4), 647-673.

Stevenson, B., and Wolfers, J. (2007). "Marriage and divorce: Changes and their driving forces", *Journal of Economic Perspectives*, 21(2), 27-52.

Tabellini, G. (2008). "Institutions and culture", *Journal of the European Economic Association*, 6(2-3), 255-294.

Tempo, C. J. B. (2008). "Americans at the gate: The United States and refugees during the Cold War", *Princeton NJ: Princeton University Press*.

The Economist (2014). http://www.economist.com/news/international/21603024-why-shrinking-populations-may-be-no-bad-thing-quality-time

The world atlas of language structures: http://wals.info/feature/31A.html#2/25.5/148.2

Thomson, E., McDonald, E., and Bumpass, L. L. (1990). "Fertility desires and fertility: Hers, his, and theirs", *Demography*, *27*(4), 579-588.

Thornton, A., and Young-DeMarco, L. (2001). "Four decades of trends in attitudes toward family issues in the United States: The 1960s through the 1990s", *Journal of Marriage and Family,* 63(4), 1009–1037.

Tobin, J. (1958). “Estimation of relationships for limited dependent variables”, *Econometrica*, 26 (1), 24-36.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2001). “*Universal Declaration on Cultural Diversity”*, 31st Session of the General Conference of Unesco.

Villarreal, A. (2014). “Explaining the decline in Mexico-US migration: The effect of the Great Recession”, *Demography*, 51(6), 2203-2228.

Waite, L. J. (1995). “Does marriage matter?”, *Demography*, 32(4), 483-507.

Wakil, S. P., Siddique, C. M., and Wakil, F. A. (1981). “Between two cultures: A study of socialization of children of immigrants”, *Journal of Marriage and the Family,* 43(4), 929-940.

Weiss, Y., and Willis, R.J. (1997), “Match Quality, New Information, and Marital Dissolution”, *Journal of Labor Economics*, 15(l), S293-S329.

Willis, R. (1973). “A new approach to the economic theory of fertility behaviour”, *Journal of Political Economy*, 81(2), 14-64.

World Bank Data *http://data.worldbank.org/*

World Values Survey *http://www.worldvaluessurvey.org/wvs.jsp*

Supplementary Analysis Spain/Aragón

Intergenerational transmission of fertility outcomes

Introduction

In line with the different analysis presented above, we now amplify our work by showing empirical evidence of the intergenerational transmission of fertility outcomes in Spain and a review of the specific case of Aragón. In the last years, the total fertility rate has fallen significantly in many countries and does not appear to be bottoming out. In Spain, it has dropped to worrying levels below the replacement rate, set at 2.1 children per woman (see Supplementary Figure 1.1) which points out the necessity to analyze the factors that may explain these low levels of fertility. Supplementary Figure 1.2 also shows several differences within the country when we take a look at the total fertility rates by region. There has been a considerable decline in the fertility rates of many regions, whereas in others the fertility rate has remained quite high. As can be seen, Aragón is one of those showing the lowest number of children per women. Higher dissimilarities are found when we explore the total fertility rate among those having, at least, 3 children (see Supplementary Figure 1.3). Although a pattern of convergence is observed during the last years, the TFR of this type of families in Aragón has been below the Spanish mean during all the considered period (see Supplementary Figure 1.4). Hence, the special treatment (primarily economic) that families with 3 or more children enjoy, does not appear to encourage couples to have more children in some regions, such as Aragón. The ineffectiveness of pronatalist policies, has also been observed in the application of policies aiming to reverse the negative trend of fertility rates, such as that enacted in Spain in 2007 (Law 35/2007), known as 'the baby check'. This leads us to wonder whether economic conditions, laws, and institutions are the only factors affecting fertility behavior, or whether the fertility culture (social norms) may also be important.

Several studies have contributed to understanding the progressive decline in the fertility rate, focusing on the increase in the participation of women in the labor market (Ahn and Mira, 2002; Brewster and Rindfuss, 2000; Engelhardt et al., 2004), the increased opportunity cost of women's time (Becker, 1981), technological progress (Greenwood and Seshadri, 2002), the decline in infant mortality rates (Doepke, 2005), the reform of the laws that have made birth control and abortion more accessible (Ananat et al., 2007; Goldin and Katz, 2000, 2002; Guldi, 2008), the public debt (Fanti and

Spataro, 2013), and the introduction of reforms in divorce laws (Bellido and Marcén, 2014), among others.

Although all of these factors, separately and together, can influence the evolution of fertility rates, it cannot explain the existence of the large differences in fertility outcomes across Spanish regions mentioned above (INE, 2019). In this paper, we study the possible existence of the intergenerational transmission of fertility outcomes in Spain through parents to their children. Using methodologies analogous to ours, there are recent papers showing the vertical transmission (that is, from parents to their children), of teenage smoking (Rodríguez-Planas, N., and Sanz-de-Galdeano, A. 2019), entrepreneurial activity (Ferrando-Latorre et al., 2019), body mass (Dolton, P., and Xiao, M. 2017), housework time (Marcén and Morales, 2019), unemployment status (Morales, 2019) and homeownership status (Morales, 2020). Similar to our study are those of Salari (2018) and Marcén et al. (2018). Using a sample of immigrants living in the United States, they provide evidence of the existence of a cultural effect by showing a positive relationship between their fertility behavior and that of their counterparts in their country of ancestry. However, few studies focus on understanding the mechanism through which fertility culture is transmitted. To our knowledge, none of the prior literature examines the issue proposed here, that is the vertical transmission of fertility decisions from parents to their children, for the specific case of Spain.

In our empirical strategy, we use data from the Survey of Living Conditions (2011) provided by the Spanish Statistical Institute, for the latest year, providing information about the household characteristics when individuals were teenagers. We study the transmission of fertility decisions over two generations by analyzing whether the parent's decision about how many children may be related to the number of children their daughters and sons have in the future. We find a positive and statistically significant relationship between the number of children that individuals have and that of their parents. We also find that belonging to a large family (that with 3 or more children) when individuals were teenagers increases the probability of having 3 or more children in adulthood. These results may partly explain the low mean number of children and the low proportion of large families in Aragón compared to other regions. Our findings are unaffected after controlling for unobservable characteristics by region, including region fixed effects, and using different subsamples. We can interpret our findings as evidence of the intergenerational transmission of fertility outcomes in Spain.

Empirical strategy

In our empirical strategy, we use the parents' number of children and the parents' large family choice when individuals were teenagers as our measures of fertility culture.[89] A statistically significant relationship between parents' decisions and the future number of children of their daughters and sons may point to the existence of a vertical transmission of fertility decisions in Spain. To test this issue, we estimate the following model:

$$Y_{ik} = \beta_0 + \beta_1 PF_i + \boldsymbol{X_{ik}}\beta_2 + \delta_k + \varepsilon_{ik} \qquad (1)$$

Where Y_{ik} is a measure of the fertility decisions of individual i, living in the region k. In the first analysis, our dependent variable is the number of children that individuals decide to have. In a second analysis, that variable is defined as the probability of having 3 or more children. Similarly, the definition of our variable of interest, that is, parents' fertility decisions (PF_i), changes depending on the objective of our analysis. First, we define this variable as the parents' number of children and second as a dummy variable that takes value 1 if an individual was raised in a large family, and 0 otherwise.[90] The vector $\boldsymbol{X_{ik}}$ includes individual characteristics, such as gender, age, and level of education. Controls for unobserved characteristics of the areas of residence are added using region fixed effects, denoted by δ_k.

Data

We use data from the Survey of Living Conditions (SLC) of 2011, provided by the Spanish Statistical Institute, for the latest year providing information about the household characteristics when individuals were teenagers. The SLC provides rich information that allows us to identify the number of children under the age of 18 in the household, as well as the specific characteristics of each household during individuals' adolescence, such us the composition of the household. We use data from the Intergenerational Transmission of Poverty included in the SLC, which allows us to capture parents' attitudes related to

[89] We define large families as those with 3 or more children in the household. Individuals from 2-partner households with, at least, 1 child under the age of 18 years old, have been included in our sample.
[90] Following Marcén and Morales (2019), we use a linear probability model for the sake of simplicity. Our results are maintained applying a probit model when using a dichotomous dependent variable.

their fertility decisions. We restrict our sample to those individuals having children. Our main sample contains 6,282 observations of individuals aged 26 to 60.[91]

Supplementary Table 1.1 presents the summary statistics for the main variables by region. The first two columns show large variations in the fertility decisions across the Spanish regions, ranging from around 2 children per individual and 38% of large families in Melilla to an average of 1.57 children and only a 5% of large families in Aragón. This summary statistics are consistent with those provided by the INE. As in the previous figures discussed before, our data place Aragón among the regions showing the lowest average number of children. The data reveals that individuals have 1.68 children in Spain on average and only 9% of the individuals in our sample belong to a large family. Columns 3 and 4 include the summary statistics for parents' fertility outcomes when individuals where young. Comparing these columns, we can deduce, although not in all regions, a relationship between the fertility decisions of individuals in our sample and those of their parents. Fewer differences are observed in terms of age and gender composition. Male adults are 49 percent of the sample and the age of the individuals is around 43 years, on average. The raw data reveals some dissimilarities across regions in the level of education. Overall, 12 percent of individuals have completed primary school, with the lowest percentage being from Madrid (6%), and the highest from Melilla (25%). Regarding those who have completed at least secondary school, the lowest percentages are observed among those from País Vasco (34%), and the highest among those from Melilla (63%). Finally, 36% of respondents report having completed a university degree, with this ranging from just 6% in the case of individuals from Melilla, to 59% in the case of those from País Vasco.

Results

Supplementary Table 1.2 presents the estimated coefficients for Eq. (1). As the existing literature shows, the higher the level of education, the lower the number of children that women decide to have (Marcén et al., 2018). This mainly occurs because of the increase in the opportunity costs of time for those more educated individuals (Becker and Barro, 1988). The impact of age follows an inverted U-shape, achieving the maximum at 44 years old, which is in line with the literature suggesting that the older the individuals, the more likely are those individuals to have a greater number of children (Marcén et al.,

[91] Our results are maintained when using a sample of individuals older than 40 years old as a robustness check.

2018). With respect to our variable of interest, the higher the parents' number of children, the higher the number of children that individuals have (see column 1). However, this effect appears to be quite small. We find that if the parents' mean number of children increases by one, there is an increase of around 0.04 children born to the individuals in our sample. Living in a large family during adolescence is also related to a higher probability of having 3 or more children in the future. We find that being raised in a large family, increases the probability of belonging to a large family in the future by around 3 percentage points (see column 2).

A greater relationship is found when analyzing heterogeneity effects by educational level in columns 3 to 6. The intergenerational transmission of fertility culture is detected among both subgroups, with the magnitude of the cultural coefficient being more than 50% greater when the sample of low educated individuals is considered. We find that if the parents' mean number of children increases by one, there is an increase of around 0.09 children born to the low educated individuals in our sample, and coming from a large family increases the probability of being part to a large family in the future by around 6 percentage points. Thus, because of the possible fertility culture transmitted from their parents, low educated individuals from Aragón (the average proportion of parents with 3 or more children is 0.28) are about 2 percentage points less likely to have 3 or more children than those living in Ceuta (the average proportion of parents with 3 or more children is 0.53). Although we use a gender-balanced sample, we have also divided the sample by gender to explore the possibility of gender issues driving our results. As can be seen in columns 7 to 10, we find that the coefficient on parents' fertility decisions, remains statistically significant and positive, regardless of the gender of individuals, however, the magnitude of the relationship seems to be slightly higher in the case of females.[92]

To reinforce our results, we run some robustness checks in Supplementary Table 1.3. In columns 1 and 2, we repeat our analysis by using a sample of individuals older than 40 years old. Those individuals constitute an interesting sample in our analysis, since variations in the number of children born would be expected to be quite insignificant. We find that the coefficient on parents' fertility decisions remains statistically significant and positive. The set of individual and household characteristics has been enlarged in columns 3 and 4. As prior researchers show, marital status or economic characteristics can affect

[92] These results are consistent with prior literature showing a higher effect of culture among females and low educated individuals (Marcén and Morales, 2019)

fertility decisions (Ahn and Mira, 2003; Bellido and Marcen, 2014). Thus, we include controls for whether individuals are currently married and whether individuals live in a household at risk of poverty. As can be seen, our variable of interest is still significant after controlling for all these characteristics in both columns. We can reach the same conclusion when we add additional controls for the regions in columns 5 and 6. We introduce GDP per capita, female labor force participation, and the unemployment rate.[93] It is worth noting that the inclusion of this set of observable characteristics, which can also influence the fertility decisions (Ahn and Mira, 2002; Brewster and Rindfuss, 2000; Engelhardt et al., 2004), does not alter our estimates. Thus, since individuals in our sample appear to be sensitive to their parents' behavior, our results point to the possible existence of the intergenerational transmission of fertility outcomes in Spain.

Conclusions

In recent decades, there has been a considerable decline in the fertility rates of many regions, with that reaching levels below the replacement rate set at 2.1 children per woman, whereas in others the fertility rate has remained quite high. Thus, identifying the channels through which culture impacts fertility decisions may have important implications for policy makers, planners, and economists who make different strategies regarding fertility decisions in the society. The aim of this paper is to show that fertility attitudes in Spain may be transmitted vertically, that is, from parents to their children. Data point to Aragón as one of the regions with the lowest number of children per women. Individuals in this region are also those with the lowest probability of having 3 or more children among the Spanish regions. Our results suggest that these inter regional differences may be partly explained by the fertility culture transmitted though parents to their children. Specifically, our results show that the higher the parents' number of children, the higher the number of children that individuals decide to have. Moreover, living in a large family during childhood is related with a higher likelihood of l belonging to a large family in the future. Our findings also point to a more important role of culture in fertility decisions among females and low educated individuals.

[93] Data come from the Spanish Statistical Institute.

References

Ahn, N., and Mira, P. (2002). “A note on the changing relationship between fertility and female employment rates in developed countries”, *Journal of population Economics*, 15(4), 667-682.

Ahn, N., and Mira, P. (2003). “Job bust, baby bust?: Evidence from Spain”. *In Family, Household and Work* (pp. 389-405). Springer, Berlin, Heidelberg.

Ananat, E. O., Gruber, J., and Levine, P. (2007). “Abortion legalization and life-cycle fertility”, *Journal of Human Resources*, 42(2), 375-397.

Becker, G., 1981. A Treatise on the Family. Harvard University Press, Cambridge MA.

Becker, G. S., and Barro, R. J. (1988). “A reformulation of the economic theory of fertility”, *The quarterly journal of economics*, 103(1), 1-25.

Bellido, H., and Marcén, M. (2014). “Divorce laws and fertility”, *Labour Economics*, 27, 56-70.

Brewster, K. L., and Rindfuss, R. R. (2000). “Fertility and women's employment in industrialized nations”, *Annual review of sociology*, 26(1), 271-296.

Doepke, M. (2005). “Child mortality and fertility decline: Does the Barro-Becker model fit the facts?”, *Journal of population Economics*, 18(2), 337-366.

Dolton, P., and Xiao, M. (2017). “The intergenerational transmission of body mass index across countries”, *Economics and Human Biology*, 24, 140-152.

Engelhardt, H., Kögel, T., and Prskawetz, A. (2004). “Fertility and women's employment reconsidered: A macro-level time-series analysis for developed countries, 1960–2000”, *Population studies*, 58(1), 109-120.

Fanti, L., and Spataro, L. (2013). “On the relationship between fertility and public national debt”, *Economic Modelling*, 33, 843-849.

Greenwood, J., and Seshadri, A. (2002). “The US demographic transition”, *American Economic Review*, 92(2), 153-159.

Goldin, C., and Katz, L. F. (2000). “Career and Marriage in the Age of the Pill”, *American Economic Review*, 90(2), 461-465.

Guldi, M. (2008). "Fertility effects of abortion and birth control pill access for minors", *Demography*, 45(4), 817-827.

Ferrando-Latorre, S., Velilla, J., and Ortega, R. (2019). "Intergenerational transmission of entrepreneurial activity in Spanish families", *Journal of Family and Economic Issues*, 40(3), 390-407.

INE (1975/2019), Spanish Statistical Institute, available at: https://www.ine.es/dynt3/inebase/index.htm?padre=1149&capsel=2043

Marcén, M., Molina, J. A., and Morales, M. (2018). "The effect of culture on the fertility decisions of immigrant women in the United States", *Economic Modelling*, 70, 15-28.

Morales, M. (2019). "Can family characteristics influence the future labor situation of children? Evidence for Spain", *International Journal of Social Economics*, 46 (10), 1214-1233.

Marcén, M., and Morales, M. (2019). "Gender division of household labor: How does culture operate?", (No. 373). GLO Discussion Paper.

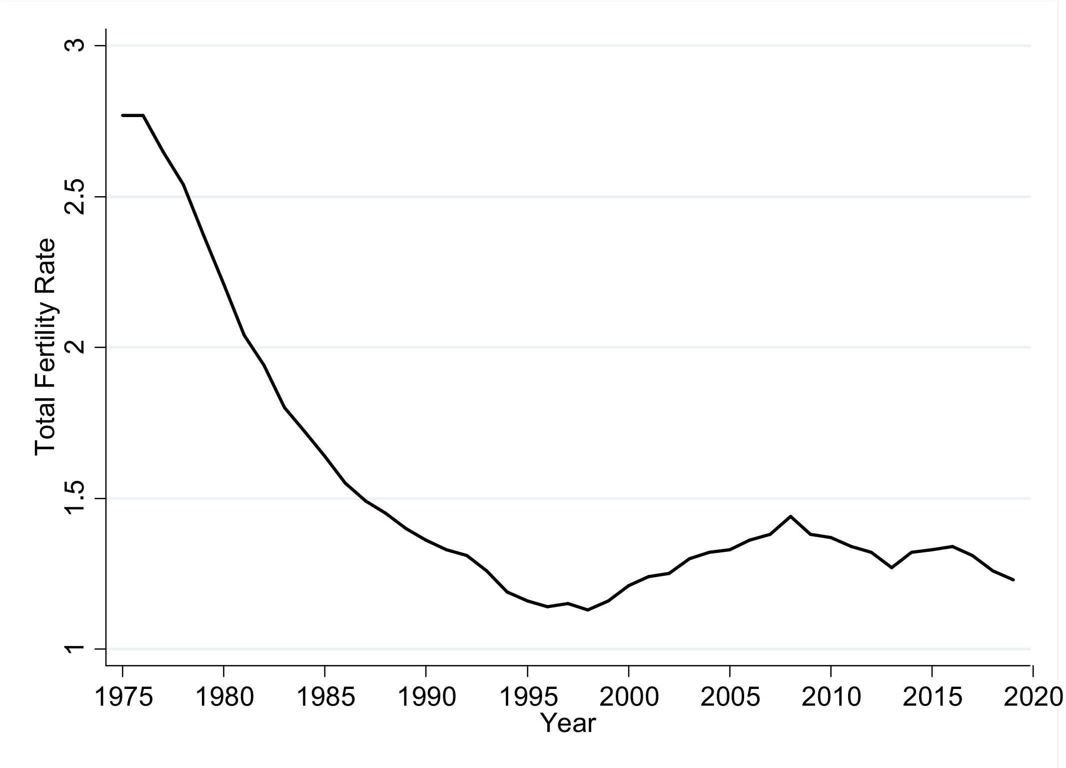
Morales, M. (2020). "Intergenerational transmission of homeownership decisions in Spain", *Economics Bulletin*, 40 (1), 632-638.

Rodríguez-Planas, N., and Sanz-de-Galdeano, A. (2019). "Intergenerational transmission of gender social norms and teenage smoking", *Social Science and Medicine*, 222, 122-132.

Salari, M. (2018). "The impact of intergenerational cultural transmission on fertility decisions", *Economic Analysis and Policy*, 58, 88-99.

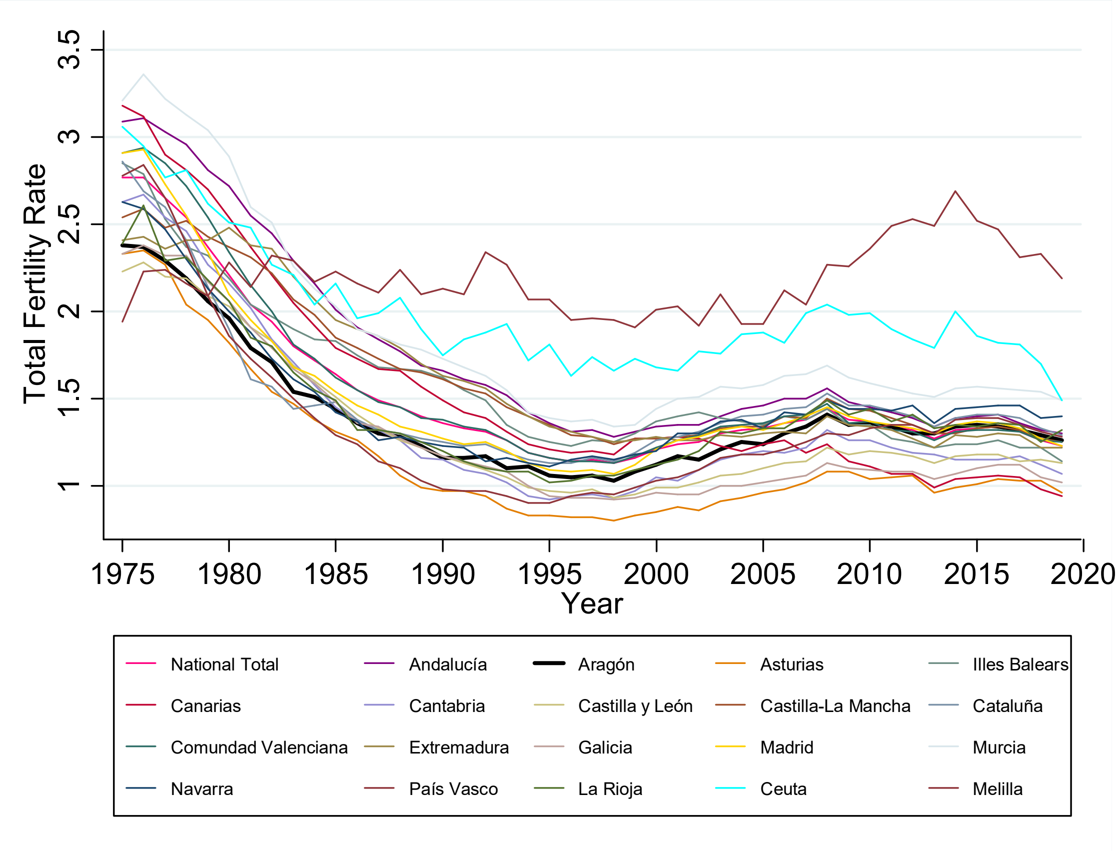
Survey of Living Conditions (2011) *Spanish Statistical Institute.*

Supplementary Figure 1.1: Evolution of the total fertility rate in Spain from 1975 to 2019



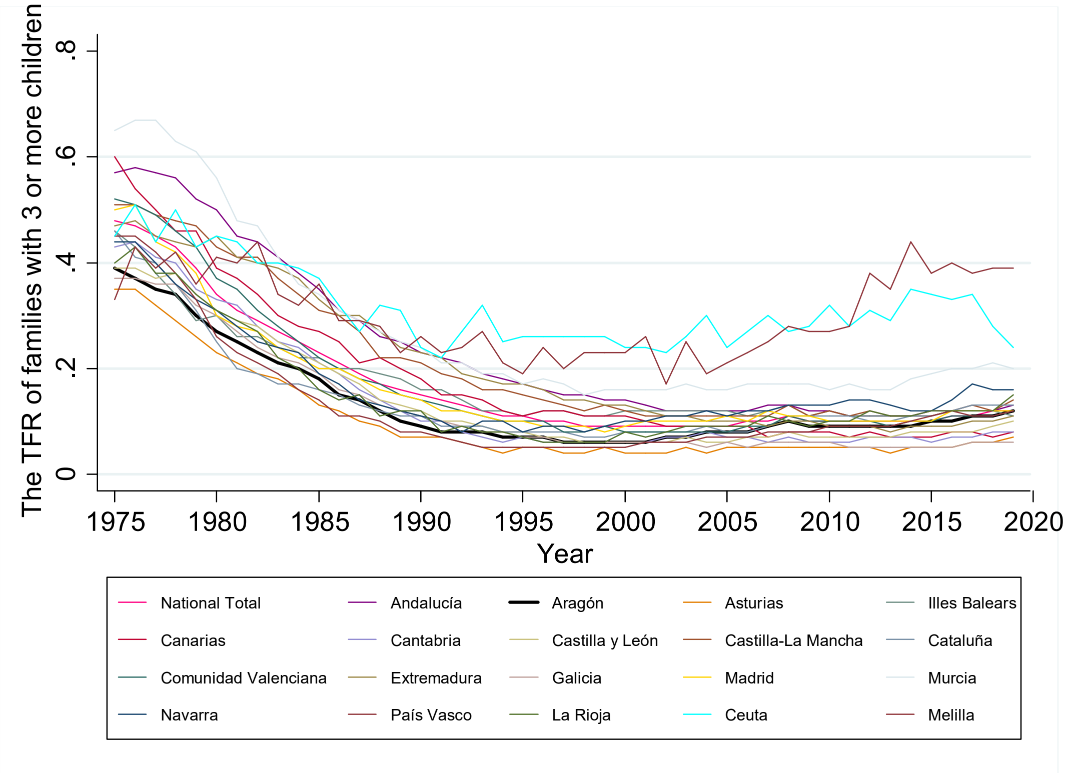
Notes: Data come from the Spanish Statistical Institute

Supplementary Figure 1.2: The evolution of the Total Fertility Rate in Spain by region



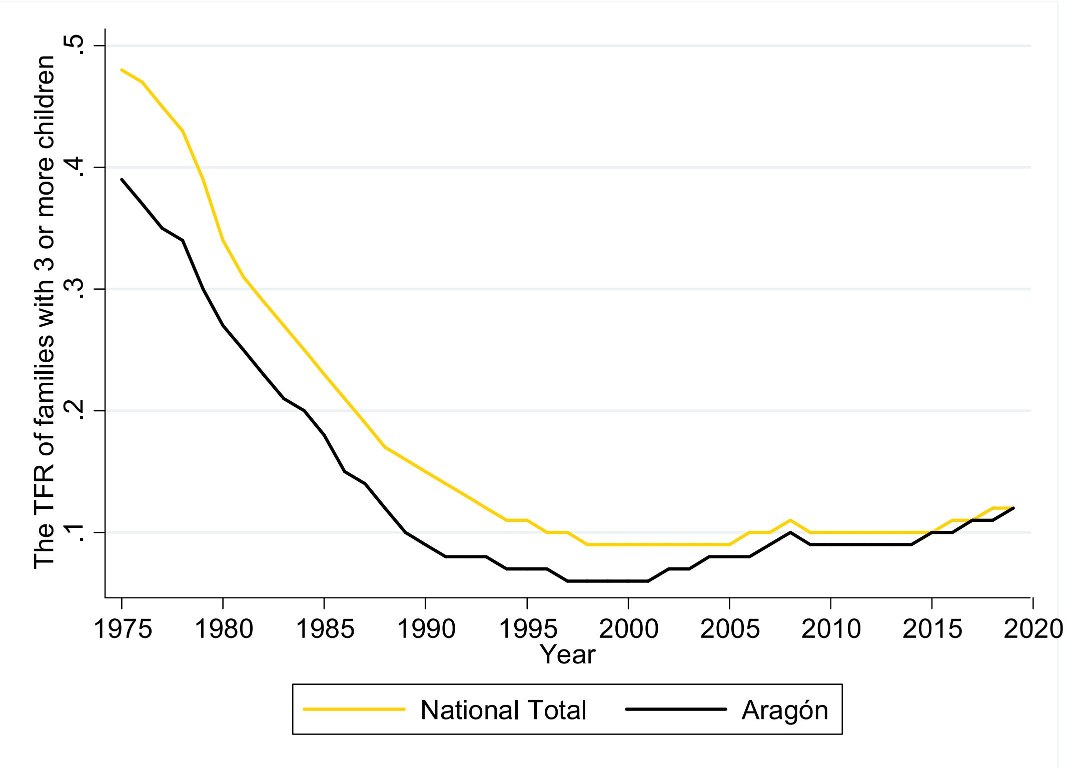
Notes: Data come from the Spanish Statistical Institute

Supplementary Figure 1.3: The evolution of the total fertility rate of families with 3 or more children in Spain by region



Notes: Data come from the Spanish Statistical Institute

Supplementary Figure 1.4: A comparation between the TFR in Aragón and the average TFR in Spain of families with 3 or more children



Notes: Data come from the Spanish Statistical Institute

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Supplementary Table 1.1: Summary statistics

Region	Mean number of children	Proportion of families with 3 or more children	Parents' mean number of children	Proportion of parents with 3 or more children	Age	Man	Primary school	Secondary school	University degree	Obs
Andalucía	1.74	0.11	2.12	0.40	41.97	0.49	0.15	0.53	0.31	772
Aragón	1.57	0.05	1.99	0.28	42.67	0.49	0.09	0.55	0.35	319
Asturias	1.57	0.06	2.09	0.38	43.57	0.48	0.07	0.58	0.36	228
Canarias	1.62	0.09	2.08	0.39	43.17	0.49	0.17	0.47	0.32	264
Cantabria	1.64	0.10	1.87	0.23	42.98	0.47	0.10	0.54	0.35	175
Castilla y León	1.67	0.06	2.11	0.38	44.12	0.50	0.13	0.52	0.34	395
Castilla-La Mancha	1.76	0.10	2.06	0.33	42.52	0.50	0.10	0.59	0.30	418
Cataluña	1.66	0.11	2.13	0.35	42.60	0.48	0.16	0.45	0.34	648
Ceuta	1.94	0.19	2.42	0.53	40.47	0.51	0.21	0.48	0.27	77
Comunidad Valenciana	1.62	0.09	2.01	0.31	42.27	0.49	0.07	0.60	0.32	560
Extremadura	1.83	0.11	2.16	0.42	44.08	0.49	0.18	0.50	0.31	252
Galicia	1.61	0.06	1.97	0.30	42.93	0.49	0.08	0.46	0.45	261
Illes Balears	1.63	0.08	2.14	0.35	41.54	0.48	0.13	0.62	0.24	191
La Rioja	1.70	0.10	2.20	0.43	42.10	0.48	0.10	0.59	0.31	226
Madrid	1.69	0.11	2.07	0.37	43.37	0.49	0.06	0.45	0.48	612
Melilla	2.06	0.38	2.00	0.25	37.56	0.38	0.25	0.63	0.06	16
Murcia	1.74	0.10	2.01	0.33	41.01	0.49	0.18	0.57	0.24	258
Navarra	1.73	0.10	2.17	0.40	43.34	0.49	0.11	0.37	0.52	241
País Vasco	1.61	0.08	2.02	0.32	44.14	0.48	0.07	0.34	0.59	369
Mean	1.68	0.09	2.08	0.36	42.77	0.49	0.12	0.51	0.36	
Std. Dev.	0.64	0.29	0.79	0.48	7.10	0.50	0.32	0.50	0.48	

Notes: The sample contains 6,282 observations of individuals aged 26 to 60

Supplementary Table 1.2: Main results

Dependent variable	(1) Number of children	(2) Large family	(3) Number of children	(4) Large family	(5) Number of children	(6) Large family	(7) Number of children	(8) Large family	(9) Number of children	(10) Large family
Parents' number of children	0.043***		0.087***		0.038***		0.032**		0.054***	
	(0.010)		(0.029)		(0.011)		(0.011)		(0.015)	
Parents with 3 or more children		0.028***		0.063**		0.026***		0.022**		0.033***
		(0.009)		(0.024)		(0.009)		(0.010)		(0.009)
Age	0.180***	0.029***	0.130**	0.019	0.180***	0.028***	0.173***	0.025***	0.210***	0.040***
	(0.014)	(0.004)	(0.059)	(0.032)	(0.019)	(0.006)	(0.019)	(0.006)	(0.016)	(0.006)
Age2/100	-0.205***	-0.033***	-0.164**	-0.023	-0.201***	-0.031***	-0.190***	-0.026***	-0.248***	-0.048***
	(0.016)	(0.005)	(0.063)	(0.035)	(0.023)	(0.007)	(0.023)	(0.007)	(0.018)	(0.007)
Male	-0.013*	-0.003	0.026	-0.012	-0.015	-0.002				
	(0.007)	(0.003)	(0.042)	(0.014)	(0.009)	(0.002)				
Primary school	-0.587***	-0.366***					-0.559***	-0.378***	-0.608***	-0.351***
	(0.088)	(0.057)					(0.129)	(0.088)	(0.096)	(0.074)
Secondary school	-0.639***	-0.393***					-0.592***	-0.389***	-0.677***	-0.393***
	(0.089)	(0.062)					(0.130)	(0.084)	(0.076)	(0.072)
University degree	-0.630***	-0.377***					-0.579***	-0.368***	-0.677***	-0.383***
	(0.091)	(0.067)					(0.130)	(0.088)	(0.086)	(0.078)
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,282	6,282	802	802	5,480	5,480	3,063	3,063	3,219	3,219
R-squared	0.069	0.043	0.094	0.055	0.059	0.013	0.065	0.044	0.084	0.046

Note: The sample, obtained from Spanish Living Conditions Survey 2011, consists of individuals with children aged 26 to 60 A sample of individuals who have completed less than college has been included in columns 3 and 4. A sample of individuals who have completed at least secondary school has been used in columns 5 and 6. Males have been included in columns 7 and 8 and females in columns 9 and 10. Estimates are weighted. Robust standard errors, clustered by region, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Supplementary Table 1.3: Simple robustness checks

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Number of children	Large family	Number of children	Large family	Number of children	Large family
Parents' number of children	0.033***		0.037***		0.043***	
	(0.008)		(0.012)		(0.010)	
Parents with 3 or more children		0.033**		0.024***		0.028***
		(0.012)		(0.007)		(0.008)
Age	0.148	0.029	0.171***	0.029***	0.181***	0.029***
	(0.087)	(0.032)	(0.013)	(0.005)	(0.015)	(0.004)
Age2/100	-0.176*	-0.033	-0.193***	-0.032***	-0.206***	-0.033***
	(0.088)	(0.032)	(0.015)	(0.006)	(0.017)	(0.005)
Male	0.055***	0.012**	-0.017**	-0.004	-0.013*	-0.003
	(0.016)	(0.004)	(0.006)	(0.003)	(0.007)	(0.003)
Primary school	-0.505***	-0.318***	-0.489***	-0.336***	-0.582***	-0.365***
	(0.116)	(0.077)	(0.076)	(0.051)	(0.086)	(0.057)
Secondary school	-0.516***	-0.337***	-0.496***	-0.347***	-0.639***	-0.392***
	(0.121)	(0.081)	(0.080)	(0.053)	(0.087)	(0.060)
University degree	-0.393***	-0.295***	-0.454***	-0.319***	-0.630***	-0.376***
	(0.125)	(0.088)	(0.085)	(0.058)	(0.090)	(0.066)
Married			0.256***	0.042***		
			(0.054)	(0.014)		
Currently household at risk of poverty			0.268***	0.094***		
			(0.038)	(0.025)		
GDP pc					0.014**	0.006***
					(0.007)	(0.002)
Unemployment rate					10.801***	3.897***
					(3.330)	(1.172)
Female labor force participation					-0.010*	-0.002
					(0.006)	(0.001)
Region fixed effects	Yes	Yes	Yes	Yes	No	No
Observations	3,827	3,827	6,282	6,282	6,282	6,282
R-squared	0.065	0.037	0.106	0.059	0.065	0.041

Note: The sample, obtained from Spanish Living Conditions Survey 2011, consists of individuals with children aged 26 to 60. Individuals older than 40 years have been included in columns 1 and 2. Estimates are weighted. Robust standard errors, clustered by region, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Chapter 2

“The effect of culture/social norms and legal changes on migration decisions”

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2.1 The relationship between cultural differences and migration: Does cultural dilemma matter?

2.1.1. Introduction

According to the United Nations Educational, Scientific, and Cultural Organization (UNESCO 2001), culture is defined as *the set of distinctive spiritual, material, intellectual and emotional features of society or a social group. Not only does this encompass art and literature, but it also includes lifestyles, ways of living together, value systems, traditions, and beliefs*. Almost all researchers can argue that culture is very difficult to measure since it appears to be a black box, but surely, all measurement methods would also point to culture as an important determinant of economic outcomes (Guiso et al., 2009). During the last decade, there has been a growing amount of literature studying culture with respect to socio-economic and demographic variables (Fernández, 2011; Giuliano, 2016). Several researchers have found empirical evidence of the importance of culture on living and marital arrangements (Furtado et al., 2013; Giuliano, 2007; Marcén and Morales, 2018; 2019), women's labor force participation and fertility (Bellido et al., 2016; Contreras and Plaza, 2010; Fernández, 2007; Fernández and Fogli, 2006; 2009; Marcén et al., 2018), and other labor market decisions (Eugster et al., 2017; Marcén, 2014). In this chapter, we contribute to these lines of research by exploring how cultural differences may affect migrants' choice of the destination country.

We are not the first researchers to study the role of culture on migration issues. In the literature, it has been suggested that culture may affect the migration process not only for migrants but also for the native population (see for a review, Epstein and Gang, 2010). With respect to the location choice, the literature distinguishes three possible channels through which culture may operate. First, the presence of individuals of the same culture or identity/ethnicity in the country of destination could increase its attractiveness (network effects) since it can help immigrants in the host country (decreasing migration costs) and may enhance their economic success (Carrington et al., 1996; Munshi, 2003; Pedersen et al., 2008). This could partially explain the migration flow as a result of the cultural effect. However, as Wang et al. (2016) claimed, network effects have decreased in importance for migrants during the last years, and other mechanisms of importance should then be identified. In the second place, researchers point to the cultural diversity (several cultures in specific areas as opposed to just one culture) as a factor that may affect regional attractiveness (Florida, 2002; Ottaviano and Peri, 2006; Olfert and

Partridge, 2011; Bakens et al., 2013; Wang et al., 2016). In this setting, the literature shows that cultural diversity, which can generate different amenities and complementarities of skills, can make a potential destination country more attractive for migrants. Third, as strongly related to the two previous channels, either cultural distance or differences may play a role in location choice (Belot and Ederveen, 2012; Caragliu et al., 2013; Collier and Hoeffler, 2018; Wang et al., 2016; White and Buehler, 2018). Cultural distance is normally measured as the differences between the home (natives) and host countries. There is empirical evidence indicating that the greater the cultural differences, which can create ethnic/identity conflict (Caselli and Coleman, 2013; Wang et al., 2016), the lower the attractiveness of a region/country. In our case, we focus on the third channel although some existing research tries to decompose several of these channels (Wang et al., 2016; White and Buehler, 2018).

We argue that cultural differences can make the dilemma of identity preservation and cultural adaptation more difficult. The cultural distance between home and host societies may first affect the immigrants' integration process in the host country followed by the rate at which their bonds with their country of origin decline. Integration appears to be the preferred choice, but it is not always so easily achieved (Ward, 2009). Thus, it is not beyond the bounds of possibility that a small cultural gap between the home and host countries would facilitate the adaptation process. Nevertheless, when the cultural gap is large, the integration is more difficult, making those host countries less attractive for immigrants.

There are many possibilities for measuring the cultural differences, using really complex indices in some cases. On the one hand, in order to observe the differences in the values and beliefs of individuals, subjective aspects of culture are used from social/attitudinal surveys such as the World Values Survey or the European Social Survey (Caragliu et al., 2013; Wang et al., 2016; White and Buehler, 2018). This way of calculating the cultural distance generates some concerns because of the potential problems associated with a definition of culture based on subjective responses of individuals (Belot and Ederveen, 2012). On the other hand, it is possible to find some research papers, including more objective characteristics of cultural differences by means of indicators such as common language or religion and even genetic distances (Collier and Hoeffler, 2018).

As Caragliu et al. (2013) explained, other forms of cultural differences can also play a role in the choice of the destination country. Surely, migrants do not know all of the values, preferences, and beliefs of the people who live in a specific country, but immigrants can guess the culture (social norms, values, beliefs, and preferences) of the people living in their chosen country based on observable characteristics. They can understand the way in which and with whom native people live (for example, marriage versus cohabitation practices), they observe the number of children people have (fertility culture; having few children can be socially more acceptable in some countries), their employment behaviors (if women work or not [culturally-related gender roles]), they also observe whether people has access to specific activities (culturally-related amenities), and of course the language and the main religion of a country. Our analysis is based on the supposition that individuals reveal their values and preferences according to their behavior. In this setting, we proposed a definition of cultural distance taking into account the differences in the observable characteristics related to fertility, marriage, labor market, and amenity cultures, economic conditions, language, and religion. Migrants can be ostracized because their behavior related to observable characteristics differ from the standard behavior of the host country. In order to mitigate the cultural dilemma (that is, integration or not into the new country), it would be expected to observe larger migration flow between countries that are culturally similar to each other.

We consider two separate analyses. On the one hand, we use data on migration flow from the International Migration Database provided by the Organization for Economic Cooperation and Development (OECD), which provides extensive migration flow numbers during a long period of time. On the other hand, we utilize data concerning migrants (stock of migrants) obtained from the Integrated Public Use Microdata Series International (IPUMS International), and Minnesota Population Center (2018), which allows us to control for immigrants' personal characteristics taking into account these immigrants' heterogeneity. The cultural differences are measured by utilizing data on observable characteristics (cultural proxies) at the country level such as the total fertility, crude marriage, and unemployment rates, female labor force participation, gross domestic production (GDP) per capita, language, and religion. This is a common strategy in the recent literature in which it is examined whether culture matters (Fernández, 2011; Giuliano, 2016). Results point to the cultural differences between sending and receiving countries as important factors in the destination country choice. In line with prior literature, we find a negative and statistically significant relationship between the cultural distances and migration flows. When the physical distance is considered, cultural differences appear to be only important in the case of non-border countries. However, in the analysis of the migration stock, cultural differences appear to have an effect on the choice of the destination country depending on the physical distance (border or non-border). It is also possible to argue that there are differences with respect to the importance of cultural differences because of the kind of dataset used: migration flows versus migration stock. Also, the migration stock analysis allows us to explore how the relationship between cultural differences and the migrant location choice varies depending on the physical distance, revealing interesting differences in the importance of cultural differences. Our findings are maintained after conducting several robustness checks using different subsamples and adding controls for potential ethnic networks, years of migration, and unobservable characteristics that can vary at the country (destination and origin) level and/or over time.

2.1.2. Data

We utilize data concerning the inflow of foreign populations according to nationality based on the Organization for Economic Co-operation and Development (OECD) Statistics for the period from 2000 to 2015.[94] The selected longitudinal data by home and host country covers 32 OECD receiving countries and 64 countries of origin.[95] During this entire period, there were around 36.5 million migrants arriving in the destination countries (see Table 2.1.A1 in the Appendix) for a classification of destination countries). To our knowledge, this is a large sample that had not been considered in the previous literature addressing cultural differences.[96] Nonetheless, although the number of observations is significant, the migration flow sample presents an important drawback since we cannot control for the individual characteristics of the migrants (heterogeneity problem). This can be problematic in our analysis when, for example, only some individuals with specific characteristics decide to migrate. Imagine a situation in which men are more likely to migrate than women. In this setting, it is possible to hypothesize that the fertility culture of women or female labor force participation can be aspects of the destination country that are less likely to matter in men's location choice. Men are less likely to be ostracized because of those issues. Thus, the personal characteristics of

[94]We recognize that this includes the last Great Recession which could be driving our findings. It is worth noting that we have re-run the analysis with different subsamples and results are invariant. We have also added year fixed effects in our estimations.
[95] All countries with available information on the variables measuring cultural differences are included.
[96]We do not restrict the sample to developed or developing countries since; in some cases, the cultural differences are greater among those countries.

the immigrants can make some cultural aspects more important than others. In order to take these characteristics into account, we have extended the analysis by exploring individual data with information from the Integrated Public Use Microdata Series International (IPUMS International), Minnesota Population Center (2018).[97] Our sample selection consist of 1,284,490 migrants originating from 64 countries of origin and living in 23 host countries.[98] The set of countries of origin (64) covered in both analyses is the same, but the destination countries vary somewhat, depending on the information available in the Integrated Use Microdata Series (IPUMS) International.[99]

As mentioned above, in order to measure cultural differences between the home and the host countries, we use observable characteristics that are supposed to be cultural proxies revealing the values, social norms, and beliefs of individuals (Fernández, 2007). The cultural proxies are defined here. In order to measure the fertility culture (Fernández, 2007; Bellido et al. 2016; Marcén et al. 2018), we use the observable total fertility rate, which represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of a specified year. As a proxy of the marriage or living together culture (Marcén and Morales, 2018), we include the crude marriage rate calculated as the annual number of marriages per 1,000 mid-year population. In the case of the employment culture, we consider two different variables. The female labor force participation rate, which is the proportion of the female population $\geq$15 years of age and who are economically active, can also represent the gender role culture of a country. We also consider the unemployment rate with unemployment referring to the share of the labor force that is without work but available for and seeking employment; this variable is used to represent the employment culture of a country (Eugster et al., 2017; Marcén, 2014). In order to measure the culture concerning amenities, we use the gross domestic product (GDP) per capita (constant 2010 US$). The use of this variable could generate concerns, but this is included under the assumption that those countries with different GDPs per capita have access to very different amenities, at least for the average population, which

[97] The use of census microdata also allows us to consider several additional analyses that cannot be done with the migration flow. For example, from the microdata, we can obtain information on possible ethnic networks, which can affect the migration location choice based on cultural differences; see below for a detailed explanation of all supplementary analyses.

[98] We selected the most recent sample for each destination country provided by the IPUMS International.

[99] The analysis was repeated, maintaining the same destination countries. Results did not significantly change, but we lost many observations. For this reason, we prefer the inclusion of the information of all available countries of origin and destination.

is not an unrealistic supposition. We revisit this supposition below. Information on the crude marriage rate comes from the United Nations (UN) Demographic Yearbooks (several issues), and the rest of the data is obtained from the World Bank Data. In order to determine a country's main languages and religions, we use information about all languages and religions from the Central Intelligence Agency's World FactBook.[100]

The cultural differences are calculated in a very simple way. In our study, the cultural distance is defined as the difference in absolute values between the cultural proxies in the sending and receiving countries. According to Wang et al. (2016), this is called as the Bilateral Cultural Distance. For languages and religions, we construct dummy variables representing the home and the host country differences in those two cultural proxies. Of course, as mentioned above, we recognize that very complex definitions of cultural differences can be obtained (for example, see Wang et al., 2016); thus, what we show here should be interpreted as a benchmark of the way in which the cultural differences in observable cultural proxies may affect immigrants' location choices.

By simply looking at the raw data, Figure 2.1.1 shows the relationship between the cultural differences or distances between the home and host countries and the migration flow between those countries for the entire period of 2000 to 2015. For language and religion, we observe that migrants are more likely, on average, to move to a country with the same language and religion. Thus, *a priori*, this suggests that cultural differences may play a role in the location choice, but we examine this issue in more detail below.

The raw data concerning migration stock can also be explored. In this case, we have the stock of migrants living in each destination country.[101] In order to measure the previously mentioned cultural differences, we follow Fernández (2007). As this author explains, although culture changes very slowly, cultural differences do not vary much over time. Under this assumption, the exact year in which the cultural differences are measured coincide with that of the census's data since it is not an important problem in the analysis.[102] Table 2.1.1 presents the summary statistics for the main variables included

[100] We revisit the definition of the cultural proxies below by including only information for native population; this is possible in those cultural variables. This information is included to mitigate potential bias in the cultural proxy variables.
[101] The definition of migrant status is based on the country of birth, which is designated in this study as country of origin, sending country, or home country. We assume that all individuals born outside the host country are migrants as, for example, in Nowotny and Pennerstorfer (2019).
[102]As a simple robustness check, we consider cultural differences during different periods of time. Our findings are in agreement with previous findings.

in this analysis by country of origin (destination countries are listed in Table 2.1.A1 in the Appendix). The raw data reveals dissimilarities across countries with respect to immigrants' age, gender composition, and education levels. The average age of the immigrants in our sample is around 46 years old with the youngest originating from United States (at 19 years old) and the oldest from Croatia, at 69 years old. Regarding gender, 48% of immigrants are men with variations in this percentage from just 33% in the case of Mongolian immigrants to 63% in the case of those from Jordan. Overall, 28% of the immigrants completed high school with the lowest percentage being from United States (9%) and the highest from Azerbaijan (67%). With respect to those who completed at least a college degree, some college (1–3 years of degree studies), and college and more (≥4 years of degree studies), the lowest percentages are observed from those originating from Albania (8%), and the highest among those from Korea (65%). Thus, differences across countries of origin may indicate the necessity of controlling for those individual characteristics.

2.1.3. Empirical Strategy

Theoretically, the migration decision can be represented by a random utility maximization model (RUM; Marschak, 1960) in which the utility that an individual obtains from living in a particular country is compared with the expected utility received if moving to other destinations. Because the decision-maker's utility is unknown, both expected benefits and migration costs are usually based on the characteristics of the country of origin and destination, which can be used to define the representative utility function (Nowotny and Pennerstorfer, 2019). In our case, we focus our attention on cultural differences between countries of origin and destination countries as factors related to migration location decision since those differences can have an effect on the decision of identity preservation or immigrant's integration process in the host country. We argue that when the cultural gap between the home and the host country is large, both the integration or the identity preservation are more difficult, making some potential destination countries less attractive for immigrants.

The data availability imposes limitations on the empirical analysis. This is a common problem in the migration literature. As mentioned above, we propose two different analyses in our work. First, we examine the association between cultural differences and migration flow. In this analysis, the dependent variable is the proportion of immigrants defined as the number of immigrants of country of origin *i* who move to the destination country j in year t over the total number of immigrants that move to country j in year t, PI_{ijt}.[103] It is possible to argue that we are not considering the population "at risk" of migrate since the total population of the country of origin is not considered there. For the analysis of the migration flow using gravity (based on the Newton's gravitational law) or pseudo-gravity models of migration, which is a similar framework to that developed in this empirical strategy, the use of the total population is considered by some researchers (Bertoli and Moraga, 2015) but there are other alternatives (Beine and Parsons, 2015; Ortega and Peri, 2013). However, the total population can be problematic because variations in that variable could change the proportion of immigrants for reasons unrelated to cultural differences thus leading to biased estimates of the cultural differences. Also, selection problems may arise here since those who decide to move to another country cannot be considered a random sample of the population of the country of origin.[104] For all of these reasons, we decided to select only those who decide to migrate in order to examine whether the destination country and the cultural differences between that country and the country of origin are important for migrants. In this setting, since all the individuals that decide to migrate to a specific country are likely to have similar knowledge of the characteristics of the destination country and/or even a similar pattern of risk aversion, the variation in the proportion of immigrants for each particular country of origin can be interpreted as a consequence of the cultural differences. Formally, we estimate the equation:

$$\begin{aligned}\ln(PI_{ijt}) = \alpha + \mathbf{ln}\,(\boldsymbol{Cultural\,Differences_{ijt}})\boldsymbol{\beta} \\ + \boldsymbol{OtherDifferences_{ijt}}\mu + \\ + \gamma \ln(D_{ij}) + \Sigma_{\mathrm{i}} HomeCountryFE_i + \Sigma_{\mathrm{j}} HostCountryFE_j + \\ + \Sigma_{\mathrm{t}} YearFE_t + \left[\Sigma_{\mathrm{j}} Host_j \times Time_t + \Sigma_{\mathrm{j}} Host_j \times Time_t^2\right] + u_{ijt} \quad (1)\end{aligned}$$

in which $Cultural\,Differences_{ijt}$ include a set of variables on a logarithm scale measuring the cultural differences between sending i and receiving j countries in year t. The log (logarithmic) transformation, which is similar to that applied in gravity or

[103] We repeated the analysis with this variable not measured on a logarithmic scale. Results do not change so much between different analytical methods.
[104] In any case, the selectivity issues are normally more problematic when using microdata, see Greenwood (2016). We revisit this issue below.

“pseudo” gravity models, is useful for interpreting the coefficients as elasticities.[105] If cultural differences play a role in this analysis, immigrants should decide to migrate to countries culturally similar to their home country in order to mitigate the cultural dilemma (identity preservation or integration). $\boldsymbol{\beta}$ and μ coefficients should then be negative given that we would expect that the greater the cultural differences, the lower the proportion of immigrants that move to a culturally different destination country. We have also included a distance (decay) variable, D_{ij}, which is a measure of the physical distance between sending i and receiving j countries.[106] As the gravity models and other migration models predict, we would expect γ to be negative since high physical distances (high migration costs) may imply low migration flow (Caragliu et al., 2013; White and Buehler, 2018; Schwartz, 1973). Home and host countries’ fixed effects are incorporated in addition to years fixed effects in order to account for unobservable characteristics that vary at the country level and/or over time. Specific linear and quadratic trends at the host country level are included to account for pre-existing trends in the migration behavior of the destination countries.[107] Regressions are estimated using population-weighted least squares.

Although, as it is explained above, we have added a distance variable in equation 1, the importance of the distance should be more thoroughly explored. We wonder whether the cultural differences lose (or not) their importance when migration costs in terms of travel costs are high as a consequence of the physical distance between sending and receiving countries. In order to examine these differences, we develop a supplemental analysis focused on the comparison of the cultural differences between bordering (neighboring) and non-bordering countries by way of the introduction of interaction terms.

It should be noted that the model proposed above may generate some concerns. We recognize that the definition of the dependent variable with only the total number of migrants in the denominator could also be problematic since the proportion of immigrants

[105] When our variables take value of zero in both analyses, we change this for value 0.001 in order to be able to calculate the logarithm. We also ran the regressions with/without those observations and changing that value of 0.001. Results are invariant. This is also a common strategy in gravity models when the number of zeros is not excessive, which is our case with only 3.1% in the migration flow. Then, we prefer the use of this simple method rather than the zero-inflated Poisson model, which is the alternative for a large number of zero values (Bohara and Krieg, 1996).
[106] In order to calculate the distance variable, we use information from latitude and longitude for each home and host country based on the geodetic datum WGS84.
[107]All estimates are repeated with/without home and host countries’ fixed effects and with/without linear and quadratic trends. Results do not vary between models.

can vary because of a change in the numerator or because of a change in the denominator. Imagine that there is an armed conflict or a war in a particular country *k*. The number of immigrants that receive a country j may increase because of the rise in the number of refugees. In this setting, the proportion of immigrants that the country j receives from country i can change because a variation in the denominator regardless of the changes in cultural differences. In order to mitigate these concerns, we run several robustness checks (see below). We also extend our analysis to the study of the relationship between the cultural differences and migration by using microdata concerning migration stock from the national censuses. This dataset has some advantages since the census data can be of higher quality than the sources collecting annual migration flows (Ramos, 2016). Microdata from censuses allow us to take the individual heterogeneity into account, which is not possible by using migration flows in an aggregate way. Additionally, census data incorporate information on unambiguous permanent movers, which can provide us with some interesting results on the association between cultural differences and migration. As previously described, the possible variation concerning the relationship between cultural differences and migration location choice as a consequence of the physical distance is also taken into consideration by exploring the residence choice between home and host countries that share or do share not borders (or are or not quite close countries in terms of physical distance).[108] In order to do that, we estimate the equation:

$$Y_{mijt} = \alpha + \mathbf{ln}\ (\boldsymbol{Cultural\ Differences_{ijt}})\boldsymbol{\beta} +$$
$$+\boldsymbol{OtherDifferences_{ijt}}\mu + \boldsymbol{X_{mijt}\delta} \quad + \eta \ln\ (Ethnicnetwork_{mijt}) +$$
$$+\Sigma_{i} HomeCountryFE_{i} + \Sigma_{j} HostCountryFE_{j} +$$
$$+\varepsilon_{mijt} \qquad (2)$$

in which Y_{mijt} is a dummy variable that takes value of 1 when immigrant *m* originating from home country i is living in a neighbor (or quite close) country j in year *t* and takes value of 0 when immigrant m originating from the home country i is living in a non-neighbor country j. Our variables of interest, the cultural differences, are described above. Similarly, in this specification, common culture may play a role in immigrants' places of residence through facilitation of immigrants' integration into the host country. If cultural differences matter despite the increase in physical distance costs, those individuals whose

[108] We repeated the analysis by considering several different physical distances to account for the physical proximity of countries that are not border countries, see below.

neighboring countries present high cultural differences with respect to their home-country should prefer to migrate to a non-neighbor country. $\boldsymbol{\beta}$ and μ coefficients should then be negative. However, if the relationship between the cultural differences and the migration location choice varies depending on the physical distance, we would expect to observe changes in the $\boldsymbol{\beta}$ and μ coefficients. We address this issue by extending migrants' location choices (not only border [neighboring] countries but also other close countries versus the rest of the non-border and non-close countries). $\boldsymbol{X_{mijt}}$ includes individual characteristics, such as gender, age, and education levels, which may be important in the migration choice for culturally independent reasons. Migrants' location choice can also be influenced by ethnic networks. On the one hand, the set of destination countries may be conditioned to the presence of ethnic networks in the destination countries that provide information to the potential migrants. However, it is arguable that the use of migration stock data instead of migration flows could reduce those concerns.[109] On the other hand, the existence of large population of the same ethnicity in a region (ethnic enclaves) may mitigate the adaptation or identity preservation costs of those individuals having the same origin, thus reducing the importance of cultural differences between home and host countries. This should be taken into consideration in our analysis. A control for the ethnic network is needed since, if omitted, our estimated coefficients concerning the variables of interest could be biased. Following Nowotny and Pennerstorfer (2019), we use information on the regional distribution of migrants by country of origin in each destination country in order to account for the ethnic networks. The $Ethnicnetwork_{mijt}$ is calculated as the number of migrants of country of origin *i* living in the region of migrant *m* over the total number of migrants living in that region of country *j* and year *t*. Controls for unobserved characteristics of the countries of origin and destination in which our immigrants live are added by using host country fixed effects and for the country of origin's unobserved characteristics by introducing home-country fixed effects.[110]

[109] In the case of the migration flow analysis, we are not able to control for the existence of ethnic enclaves in particular regions because we do not know the region of residence of the migrants in the destination country.

[110]We used a linear probability model (LPM) for simplicity since results can be easily interpreted and the LPM consistently estimates the coefficients (Greene, 2011). Of course, alternative methodologies can be suggested because of the concerns in which the LPM may generate in a model with a binary dependent variable. However, our LPM proposal is suitable since the heteroskedasticity problem and the absence of normality of the error term in the LPM do not present a problem for us. Standard errors have been calculated by using the procedure called robust standard or White-Huber standard errors, so any heteroscedasticity concerns should be mitigated. The non-normality of the error term is really only a problem with small samples, which is not our case. With a large enough sample, such as that considered here, the central limit

2.1.4. Results

a. Migration flow

Table 2.1.2 reports the estimates for Equation (1). In column 1, we incorporate all of our cultural difference variables. Our results show a negative and statistically significant relationship between fertility cultural differences and the flows of population between countries. When the differences in the total fertility rate (TFR) between a home and a host country increased by 1%, the migration flow, defined as the proportion of migrants originating from that home country, is reduced by 0.17%. The same negative and statistically significant relationship is found in the case of the living and marriage arrangement culture. Our estimations indicate a decrease of 0.03% in the migration flow after an increase of 1% in the crude marriage rate (CMR) differences. At this stage of the analysis, differences in the female labor force participation (FLFP) between sending and receiving countries appear to be attractive in terms of migration flow since the association between FLFP differences and the proportion of migrants appear to be positive. However, we do not separate male and female migration, which can distort the importance of gender roles in the location choice because of the different incentives in migration by gender (Lee, 1966; Morrison et al., 2007) under the assumption that the FLFP is an appropriate cultural proxy of the gender roles. We revisit this issue in the migration stock analysis. Other employment cultural proxies are incorporated in column 1 using the differences in unemployment rates. While unemployment rate differences are not statistically significant, there is a positive relationship between GDP per capita differences and migration flow. This may indicate that we capture differences in economic conditions rather than differences in the amenities with that cultural proxy. In any case, the study of the impact of economic conditions on migration is not the aim of our chapter, and the inclusion or exclusion of those variables does not alter our findings. We also add language and religious differences in this specification. As expected, not having the same language

theorem delivers normal distributions for the coefficient estimates and the predicted values; see a similar case in Betts and Fairlie (2001). In order to check the validity of our estimation, we compared the LPM and the probit model, which provides very similar estimations and predictions. However, because of the introduction of many dummy variables to control for unobservable characteristics, the use of probit or logit models is not convenient due to convergence problems in the estimations. This is a common problem for the recent and growing literature on the effect of culture on several demographic and economic variables that use the LPM as the main analytical method in order to be able to control for a large number of unobservable characteristics (Furtado et al., 2013; Marcén and Morales, 2019). It is worth noting that the LPM is widely applied in social research (Holm et al., 2015). Then, following prior literature, we retained the LPM in our analysis. All of our estimations were repeated with/without home-country and host-country fixed effects. Results did not vary between estimates.

decreases the proportion of immigrants. The same is observed in the case of the relationship between religious differences and migration flow.

The definition of cultural differences may provoke some debate since it includes new or established immigrant populations. In this setting, it is possible to suggest that averaging the cultural proxies could have created bias in our estimations. In order to check this, we redefine the cultural proxies by incorporating information only about the native population. This is tricky because the information is scarce in the International IPUMS for most of the countries of origin that are considered. In any case, we build the cultural proxies and restrict our sample to those reporting native origin for the fertility culture, gender role culture, and unemployment.[111] Estimates are reported in column 2. The link between fertility culture differences and migration flow is maintained in addition to the relationship between the gender role variable and unemployment with the migration flow. In column 3, we repeat the analysis but select the sample from column 2 in order to explore whether our results are consequence of the change in the sample size. Our findings are similar between analyses.

Throughout this work, we express the necessity of taking the distance between sending and receiving countries into consideration for the potential influence that its absence has on the relationship between cultural differences and migration. We adopt the measurement of distance as the physical distance although there are other alternatives (travel time or travel costs as distance measurements). Nevertheless, the physical distance can easily be obtained and determined for the large number of possible combinations between our origin and destination countries.[112] We add the distance variable in column 4 of Table 2.1.2. As expected, the estimated coefficient is negative. With respect to our variables of interest, the cultural differences, our findings are unchanged after considering different variables albeit the magnitude of the coefficients decreases (in absolute value). At this point, the importance of the cultural differences can be interpreted. For example, the migration flow of migrants originating from Guatemala (with a TFR of 4.6 in 2000)

[111] The fertility cultural proxy is defined as the number of children of native women in each country over the total number of native women in that country. The gender culture is calculated as the number of employed native women aged ≥ 15 over the total number of female active native women in that country. The unemployment proxy is measured as the number of unemployed native individuals in a specific country over the total active native population in that country. All of these variables are obtained using information from the International IPUMS in the same years as the year considered in the migration stock analysis. For the rest of variables of interest, the use of only native information is not possible because data availability problems.

[112] We are not able to obtain reliable information on all possible travel time and/or travel costs for more than 20,000 observations in the migration flow analysis and more than one million observations in the migration stock case.

to Spain (TFR of 1.22 in 2000) is almost 6% lower than that of those originating from Latvia (TFR of 1.25 in the same year) because of the differences in the fertility cultural proxy while holding the rest of variables constant. However, the migration flow would increase by 71% for those migrants having the same language as Spain (for instance, Guatemala) while holding the rest of variables constant. Along the same line, the migration flow also rises by 33% for those having the same religion (again, as in Guatemala and Spain) while holding the rest of variables constant. Therefore, language and religion appear to play a more important role in migration flow than other cultural differences. Similarly, our results are maintained when we drop those countries of origin and destination countries that were in armed conflict or war during the period under consideration (see column 5.)[113] Although the year and country's fixed effects should incorporate possible regional wars, it is comforting that adding or deleting those countries from our sample does not alter our results.

In order to present further evidence on the effects of the cultural differences while considering the physical distance between the home and the destination country, we rerun the entire analysis, including interaction terms between the variables capturing cultural differences and a dummy variable accounting for whether the home and the host countries are neighboring countries (with quite low travel costs). Results are presented in column 6 of Table 2.1.2. Our estimations suggest that for most of the variables of interest (with the exception of the GDP per capita and religion) the expected role of the differences between home and host countries can only be detected when countries are non-neighboring countries. When countries are neighbors, the opposite situation is observed or non-statistically significant effects of the cultural differences are obtained. We can interpret the differences for the case of the fertility culture as an example. The migration flow of migrants originating from France (with a TFR of 2.01 in 2012) to Spain (a border country, TFR of around 1.3 in 2012) is almost 0.09% higher than that of those originating from Portugal (TFR of 1.28 in the same year) because of the differences in the fertility cultural proxy while holding the rest of variables constant. However, migration flow of migrants originating from France (with a TFR of 2.01 in 2012) to Poland (a non-border country but with a TFR of around 1.3 in 2012 similar to that of Spain) is almost –0.02% lower than that of those originating from Portugal (TFR of 1.28 in the same year) because of the differences in the fertility cultural proxy while holding the rest of variables

[113] Data on countries on armed conflict or war is obtained from the Armed Conflict Dataset (UCDP/PRIO).

constant. Comparing this finding with language, the migration flow for border countries that have different language increases by 2.19%, but it decreases by 0.26% for non-neighboring countries while holding the rest of variables constant. As before, the importance of the language is greater than that of other cultural differences when examining the migration flow. Our results are unchanged when we eliminate those countries that are involved in armed conflicts or wars (see column 7). It makes sense that integration costs in the host country would be less important when immigrants have to face low physical distance costs, but it is also possible that individual heterogeneity or the decision of being a permanent resident in the host country could have driven our findings concerning the border analysis. This is discussed in the next section.

b. Migration stock accounting for heterogeneity, ethnic networks, and sample selection

Table 2.1.3 presents the estimates for Equation (2), which permits us to control for the individual characteristics of the migrants and for potential ethnic networks. All specifications include controls for age and its square, gender (man=1, woman=0), education (high school, college, and more than college). Home and host countries' fixed effects are included in all specifications in order to capture unobserved heterogeneity across countries. Controls for the ethnic network are also included in all regressions. We focus our analysis on the estimated coefficients concerning cultural differences. Estimations suggest a negative relationship between cultural differences and the probability of residing in a neighboring (border) country. This finding is detected in all cultural aspects with the exception of the language (see column 1 in Table 2.1.4). Our findings suggest that the integration costs of changing fertility, marriage, employment cultures, and gender roles can be assumed when migrants decide to migrate to a non-neighboring country, but this integration does not happen when language dissimilarities are considered. Other researchers find opposite results concerning the relationship between language and country of destination choice. Some of these researchers conclude that language matters (Belot and Ederveen, 2012), whereas others detect no relationship (Karemera et al. 2000; Mayda, 2010; Ortega and Peri, 2009). However, since learning a language can be costly, not only because of the direct costs of learning but also because of the lower earnings received in the destination country during the adjustment period until acquiring proficiency and integration, it is possible to argue that immigrants prefer to move to neighboring countries (lower migration costs in terms of travel costs) when there are language differences between the home and the host country. The coefficient of the ethnic network is positive and statistically significant and points to the importance of those networks in the probability of choosing a border country rather than a non-border country. The ethnic network is redefined in column 2 by considering a dummy variable that takes the value 1 when a region has a higher proportion of immigrants than the country's average proportion, and 0 otherwise. Again, our estimated points are similar. The ethnic networks then do not appear to be driving our findings.

Since we consider data on the migration stock by using information from the censuses, selectivity concerns may arise in this setting. As Dustmann and Görlach (2015) indicate, potential problems may be a consequence of the selective out-migration since the census data mostly include information on migrants who opt for a permanent residence or a long residence in the destination country. This may be mitigated by controlling for the year of migration because empirical evidence suggests a possible relationship between the potential possibilities of staying (or being successful) in the host country and the year of migration (Dustmann and Görlach, 2015). We address this issue in column 3 of Table 2.1.3 in which the year of migration's fixed effects are incorporated. We should note that the sample size is considerably diminished because of the lack of availability of the year of migration in several destination countries. In any case, it is reassuring that our estimations do not vary with the exception of the unemployment differences, which is positively correlated with the probability of reporting a border country as place of residence. After re-running the analysis with the reduced sample shown in column 3, it is revealed that the change in the coefficient capturing the unemployment differences is due to the variation in the sample rather than the inclusion of the year of migration's fixed effects (see column 4).

Although the home and host countries' fixed effects should have picked up all unobserved characteristics at the country level, it can be argued that the country sizes are very different, which might have distorted the number of individuals that choose a neighboring country or another one. In order to address this issue, we add the host-country size in column 5 of Table 2.1.3.[114] We do not find significant differences compared to our previous estimations. Also, as in the migration flow analysis, the cultural proxies are also calculated using information only for native population (see their definitions above). We recognize the problems with the definition of these variables because of the scarcity of

[114] Data on country size come from The World Factbook and is defined as the sum of all land and water areas delimited by international boundaries and/or coastline.

data for several countries of origin. Even being conscious of that scarcity, it is comforting that the relationships between the cultural differences and the probability of reporting a place or residence as a border country are maintained (see column 6 of Table 2.1.3).

Table 2.1.4 presents additional robustness checks in order to explore the consistency of our findings using different subsamples. Column 1 shows the results after restricting our sample to those immigrants between 30 and 50 years old. As can be seen, our conclusions do not change. Our results are also unchanged when our sample consists of immigrants between 25 and 64 years old (see column 2) and after separating the sample between the youngest (25 and 40 years) and the oldest individuals (41 and 64 years) (see columns 3 and 4). Since there could have been differences in the gender roles that affect individuals' migration decisions, we divide the sample between males and females in columns 5 and 6, respectively. We find the same results in both columns with the exception of the religious differences, which is not statistically significant for the case of the men's sample. The magnitude of the coefficients is quite similar in all cases. All of our findings suggest that cultural differences can play a role in a person's destination country choice. The higher the cultural differences with the exception of language, the lower the probability of moving to a neighboring country. In the case of language, cultural differences behave in the opposite way. Thus, it is possible to argue that the cultural differences are not so important in the case of the migration flow, but when we observe the immigrant stock residing in a country, the cultural differences are more important, which can be due to the cultural dilemma between identity preservation and integration.

Up to now, we have considered the migrant choice between neighboring and non-neighboring countries. Additionally, in this framework, we can explore the way in which cultural differences matter when the physical distance increases. It can be hypothesized that in some cases being neighboring countries or quite close countries may not affect the relationship between cultural differences and migration location choice. It is also interesting answer the question about which physical distances change that relationship. We have considered from 400 to 2000 km. The estimated coefficients are plotted in Figure 2.1.2. Two findings are deduced from those graphs. First, not all cultural differences behave in the same way. With respect to all cultural differences, except language, the relationship with reporting living in a neighboring or closely bordering country is negative. The greater the physical distance with the non-neighboring destination countries, the more important the TFR, language, and religious differences (the magnitude of the coefficients increases in absolute value) are, whereas the rest of cultural differences are less important (the magnitude of the coefficients decreases in absolute value). Second, the relationship between cultural differences and the migrant's choice of residence does not change until the interval 800–1200 km (which is the equivalent of travelling from Paris to Praha around 1200 km or 2 h by plane) with the exception of religion that changes at the 1600 km distance. Our findings point to variations in the importance of cultural differences depending on the physical distance between the home and the host countries.

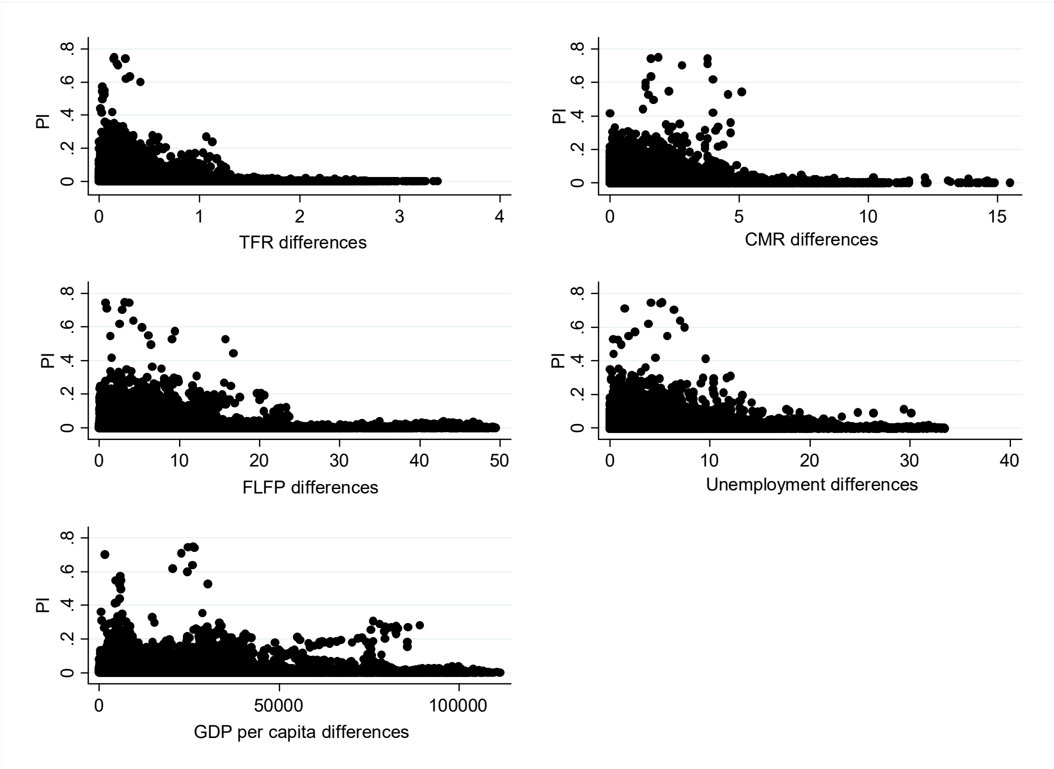
2.1.5. Conclusions

Intercultural migration presents two important questions: (1) should I move to a country with a culture similar to that of my country of origin; and (2) if not, should I adopt the host country's culture? Integration or adaptation to a new culture can be costly because making a change in a personal values, preferences, and beliefs is not easy. In addition, besides the learning of culture and skills, migration success depends on the feeling of being accepted. Thus, to mitigate the adaptation costs migrants should migrate to those countries with a common culture. The aim of this paper is to show empirical evidence of the relationship between cultural differences across countries and the location decisions of migrants.

In order to present this evidence, we consider observable characteristics such as cultural proxies that reflect different cultural aspects, which is a common strategy described in the recent literature on cultural issues (Fernández, 2007). We conduct two separate analyses using information on both migration flow and stock. Those datasets have advantages and disadvantages, but both of them allow us to develop an easy analysis of the possible effects of the cultural differences on location choices. Our findings suggest that cultural differences between sending and receiving countries may play a role in the immigrants' choice of location. When the physical distances are considered, results are not so clear. It appears that in order to migrate (migration flow) cultural differences are not so important, but when migrants decide to reside in a country (migrant stock), the cultural differences matter in the choice of destination country, depending on the physical distance. We view our findings as a benchmark that still leaves the door open to a more extensive and later analysis on this issue.

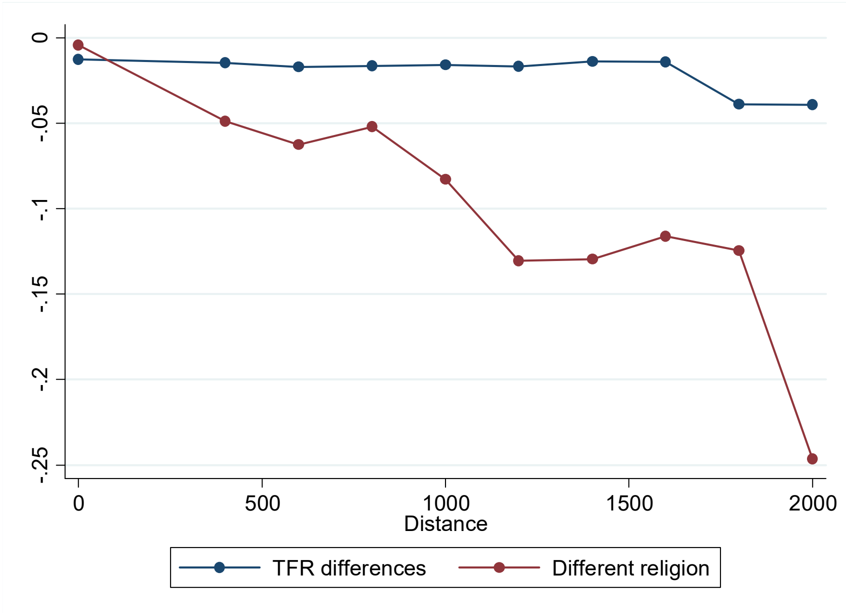
Figures and Tables

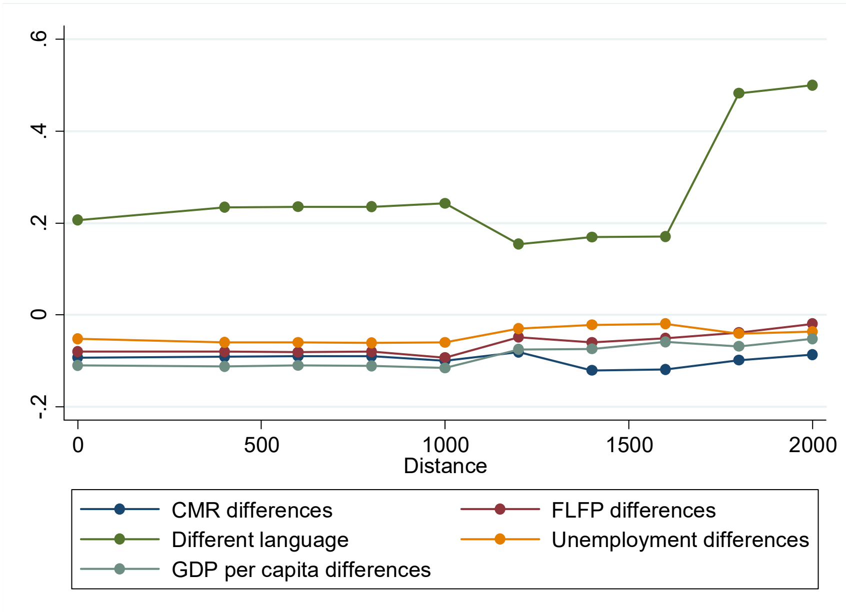
Figure 2.1.1: The proportion of immigrants representing the migration flow between home and host countries by year and the cultural differences



Notes: The cultural differences calculated in absolute value, were plotted on the x-axis, while the proportion of immigrants were plotted on the y-axis.

Figure 2.1.2: The estimated coefficient on the relationship between cultural differences and the probability of moving to a neighbor or close country by physical distance





Notes: Data is obtained from IPUMS International. Estimates are weighted. Robust standard errors are calculated. Y-axes show the estimated coefficients and the X-axed the physical distance. The physical distance is 0 when countries are neighbor, with those coefficients corresponding to those reported in column 1 of Table 2.1.3. All the specifications include the same controls as those shown in column 1 of Table 2.1.3. All coefficients are significant at the 1% level with the exception of religion whose estimated coefficients when countries are only neighbor or close countries (neighbor and those non-border countries with a physical distance lower than 400).

Table 2.1.1: Migration Stock

Country of origin	Age	Man	High School	College	More college	Observations
Albania	35.25	0.53	0.34	0.03	0.05	45,392
Argentina	37.81	0.49	0.34	0.05	0.19	25,367
Armenia	39.82	0.46	0.39	0.11	0.22	2,855
Australia	38.08	0.47	0.37	0.11	0.28	4,288
Austria	52.01	0.45	0.31	0.09	0.24	2,336
Azerbaijan	53.38	0.41	0.67	0.01	0.22	7,793
Belgium	42.60	0.47	0.37	0.04	0.22	4,298
Bulgaria	43.43	0.41	0.43	0.03	0.13	40,762
Chile	45.94	0.47	0.22	0.03	0.07	26,568
Costa Rica	38.18	0.47	0.19	0.15	0.23	1,771
Croatia	69.08	0.49	0.53	0.02	0.10	5,532
Cuba	49.57	0.48	0.35	0.13	0.25	18,813
Cyprus	40.00	0.42	0.47	0.05	0.33	2,192
Czech Republic	48.90	0.43	0.41	0.06	0.20	2,593
Denmark	51.12	0.48	0.30	0.12	0.33	1,081
Dominican Republic	38.58	0.39	0.27	0.12	0.11	14,543
Estonia	40.21	0.40	0.41	0.09	0.25	402
Finland	49.72	0.34	0.35	0.08	0.39	777
France	44.04	0.46	0.32	0.03	0.23	31,634
Georgia	46.10	0.42	0.47	0.03	0.22	17,117
Germany	46.25	0.45	0.34	0.10	0.19	51,741
Greece	51.49	0.52	0.27	0.08	0.20	2,680
Guatemala	35.56	0.52	0.13	0.07	0.06	12,690
Hungary	45.53	0.46	0.35	0.10	0.24	3,037
Iran	50.90	0.51	0.33	0.07	0.24	10,582
Ireland	50.41	0.49	0.31	0.15	0.30	2,463
Israel	35.67	0.62	0.33	0.06	0.32	762
Italy	61.49	0.49	0.24	0.01	0.14	143,070
Japan	44.56	0.40	0.21	0.22	0.36	6,373
Jordan	39.77	0.63	0.25	0.18	0.34	866
Korea	43.15	0.42	0.19	0.21	0.44	10,890
Kuwait	31.34	0.55	0.19	0.21	0.43	288
Kyrgyzstan	41.90	0.55	0.38	0.03	0.17	60
Latvia	35.06	0.43	0.48	0.03	0.13	2,555
Lithuania	54.55	0.41	0.34	0.01	0.14	12,370
Luxembourg	29.20	0.49	0.29	0.00	0.19	317
Macedonia	50.11	0.55	0.44	0.06	0.11	1,062
Malta	44.12	0.51	0.24	0.00	0.59	41
Mauritius	32.38	0.58	0.50	0.00	0.13	386
Mexico	39.20	0.52	0.25	0.11	0.07	99,146
Moldova	40.86	0.41	0.35	0.03	0.32	6,662
Mongolia	31.26	0.33	0.31	0.00	0.57	61
Netherlands	47.09	0.50	0.36	0.08	0.29	4,816
New Zealand	39.76	0.49	0.28	0.17	0.37	711
Norway	50.06	0.46	0.33	0.12	0.30	895
Panama	40.96	0.45	0.19	0.18	0.24	2,979
Poland	48.65	0.46	0.44	0.04	0.17	32,443
Portugal	48.94	0.51	0.23	0.00	0.07	208,206
Puerto Rico	46.15	0.48	0.27	0.21	0.15	13,168
Qatar	40.00	0.45	0.48	0.05	0.08	130
Romania	41.15	0.46	0.41	0.01	0.10	51,788
Russia	43.09	0.43	0.34	0.02	0.25	61,960
Serbia	51.19	0.43	0.34	0.04	0.22	1,036
Singapore	36.09	0.43	0.16	0.14	0.49	399
Slovakia	35.66	0.47	0.49	0.03	0.17	1,750
Slovenia	58.59	0.42	0.32	0.03	0.15	260
Spain	58.55	0.44	0.25	0.01	0.16	110,780

Table 2.1.1 continued

St. Vincent	44.42	0.44	0.39	0.26	0.16	185
Sweden	40.50	0.43	0.34	0.10	0.30	2,451
Switzerland	36.50	0.49	0.42	0.03	0.17	7,102
Tajikistan	46.48	0.40	0.44	0.00	0.56	25
United Kingdom	45.42	0.49	0.33	0.05	0.25	57,162
United States	18.65	0.50	0.09	0.03	0.09	84,883
Uruguay	43.56	0.48	0.33	0.04	0.07	17,145
Average	45.88	0.48	0.28	0.04	0.04	
Std. Dev.	25.20	0.50	0.45	0.20	0.20	

Notes: Data comes from IPUMS International. Our main micro data sample consists of 1,284,490 observations of immigrants from 64 different countries of origin.

Table 2.1.2: Main results on the relationship between cultural differences and the migration flow

Dependent variable: Ln (PI)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ln (TFR differences)	-0.1782***	-0.1835***	-0.2435***	-0.0536***	-0.0449***	-0.0006***	-0.0006***
	(0.013)	(0.028)	(0.030)	(0.011)	(0.011)	(0.0001)	(0.0001)
Ln (CMR differences)	-0.0356***		-0.0460	-0.0152*	-0.0143*	-0.0001	-0.0001
	(0.009)		(0.032)	(0.008)	(0.008)	(0.0001)	(0.0001)
Ln (FLFP differences)	0.0606***	0.0272	-0.0123	0.0259**	0.0228**	-0.0003**	-0.0004***
	(0.012)	(0.036)	(0.027)	(0.010)	(0.011)	(0.0001)	(0.0001)
Ln (Unemployment differences)	0.0072	-0.0759	-0.0144	0.0268***	0.0265**	-0.0001	-0.0002
	(0.012)	(0.046)	(0.020)	(0.010)	(0.011)	(0.0001)	(0.0001)
Ln (GDP per capita differences)	0.1780***		0.2406***	0.1603***	0.1607***	0.0005***	0.0006***
	(0.012)		(0.029)	(0.011)	(0.011)	(0.0001)	(0.0001)
Different language	-1.2619***		-1.0942***	-0.7148***	-0.7112***	-0.0026***	-0.0022***
	(0.057)		(0.127)	(0.050)	(0.050)	(0.001)	(0.001)
Different religion	-0.4382***		-0.5678***	-0.3259***	-0.3289***	0.0013***	0.0014***
	(0.037)		(0.143)	(0.032)	(0.033)	(0.0004)	(0.0004)
Ln (Distance between host- and home-country)				-1.0355***	-1.0445***	-0.0082***	-0.0087***
				(0.018)	(0.018)	(0.0003)	(0.0003)
Border						-0.1369***	-0.1367***
						(0.012)	(0.012)
Ln (TFR differences)*Border						0.0032**	0.0026**
						(0.001)	(0.001)
Ln (CMR differences)*Border						0.0030***	0.0027***
						(0.001)	(0.001)
Ln (FLFP differences)*Border						0.0025**	0.0026**
						(0.001)	(0.001)
Ln (Unemployment						-0.0012	-0.0009

Table 2.1.2 continued							
differences)*Border						(0.001)	(0.001)
Ln (GDP per capita						0.0142***	0.0140***
differences)*Border						(0.001)	(0.001)
Different language*Border						0.0245***	0.0237***
						(0.003)	(0.003)
Different religion*Border						0.0480***	0.0477***
						(0.004)	(0.003)
Home-country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Host-country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Host-country*time	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Host-country*time^2	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
P-value (F-test of Dif_TFR + Dif_TFR*Border=0)						0.0699	0.1114
P-value (F-test of Dif_CMR + Dif_CMR*Border=0)						0.0003	0.0009
P-value (F-test of Dif_FLFP + Dif_FLFP*Border=0)						0.077	0.0587
P-value (F-test of Dif_Unemployment+ Dif_Unemployment*Border=0)						0.3755	0.441
P-value (F-test of Dif_GDP + Dif_GDP*Border=0)						0.0000	0.0000
P-value (F-test of Language + Language*Border=0)						0.0000	0.0000
P-value (F-test of Religion + Religion*Border=0)						0.0000	0.0000
Observations	23,814	1,713	1,713	23,814	22,396	23,814	22,396
R^2	0.613	0.740	0.778	0.712	0.710	0.498	0.520

Notes: The proportion of immigrants was calculated using data on inflows of foreign population by nationality obtained from the OECD Statistics for the years 2000 to 2015. In column 2, our cultural variables have been calculated using a sample of native population obtained from IPUMS International. Countries of origin at war have been dropped in columns 4 and 7. Estimates were weighted. Robust standard errors are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Table 2.1.3: Main results concerning the relationship between cultural differences and the migration stock

Dependent variable: Migrate to a border country	(1)	(2)	(3)	(4)	(5)	(6)
Ln (TFR differences)	-0.0125***	-0.0057***	-0.0109***	-0.0109***	-0.0369***	-0.0107***
	(0.001)	(0.001)	(0.0005)	(0.0005)	(0.0004)	(0.001)
Ln (CMR differences)	-0.0931***	-0.0960***	-0.0399***	-0.0397***	-0.0898***	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
Ln (FLFP differences)	-0.0795***	-0.0745***	-0.0825***	-0.0824***	-0.0785***	-0.0787***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Ln (Unemployment differences)	-0.0519***	-0.0553***	0.0068***	0.0070***	-0.0611***	-0.0276***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.0005)	(0.001)
Ln (GDP per capita differences)	-0.1100***	-0.1175***	-0.0718***	-0.0716***	-0.1092***	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
Different language	0.2061***	0.2073***	0.1740***	0.1716***	0.2792***	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	
Different religion	-0.0040*	-0.0067***	-0.0494***	-0.0499***	-0.2259***	
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	
Ln (Ethnic network)	0.0517***		0.0327***	0.0329***	0.0656***	0.0504***
	(0.0004)		(0.0004)	(0.0004)	(0.0004)	(0.001)
Dummy Ethnic network		0.0651***				
		(0.0004)				
Ln (Host-country size)					0.0290***	
					(0.0004)	
Home-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Host-country FE	Yes	Yes	Yes	Yes	No	Yes
Year of migration FE	No	No	Yes	No	No	No
Observations	1,284,490	1,284,490	486,601	486,601	1,284,490	372,224
R^2	0.905	0.900	0.962	0.962	0.875	0.963

Notes: Data was obtained from IPUMS International. All specifications include controls for age and its square, gender (man=1, woman=0), education (high school, college and more college). The variation in the sample size in columns 3 and 4 is due to the availability of information for the individuals' year of immigration. In column 6 our cultural variables have been calculated using a sample of native population obtained from IPUMS International. Estimates were weighted. Robust standard errors are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 2.1.4: Robustness checks

Dependent variable: Migrate to a border country	(1)	(2)	(3)	(4)	(5)	(6)
Ln (TFR differences)	-0.0104***	-0.0121***	-0.0124***	-0.0085***	-0.0138***	-0.0113***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ln (CMR differences)	-0.0694***	-0.0849***	-0.0599***	-0.1008***	-0.0889***	-0.0982***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ln (FLFP differences)	-0.0779***	-0.0846***	-0.0600***	-0.1099***	-0.0819***	-0.0770***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Ln (Unemployment differences)	-0.0472***	-0.0549***	-0.0400***	-0.0688***	-0.0585***	-0.0459***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ln (GDP per capita differences)	-0.0969***	-0.1095***	-0.0947***	-0.1083***	-0.1132***	-0.1075***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Different language	0.2425***	0.2163***	0.2540***	0.2019***	0.2105***	0.2018***
	(0.004)	(0.003)	(0.005)	(0.003)	(0.003)	(0.003)
Different religion	-0.0935***	-0.0384***	-0.0796***	-0.0187***	0.0012	-0.0071**
	(0.004)	(0.003)	(0.005)	(0.004)	(0.003)	(0.003)
Ln (Ethnic network)	0.0495***	0.0485***	0.0512***	0.0458***	0.0514***	0.0520***
	(0.001)	(0.0005)	(0.001)	(0.001)	(0.001)	(0.001)
Home-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Host-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	426,459	763,716	280,931	482,785	612,103	672,387
R^2	0.921	0.913	0.925	0.909	0.908	0.903

Notes: Data was obtained from IPUMS International. All specifications include controls for age and its square, gender (man=1, woman=0), education (high school, college and more college). Column 1 incorporates immigrants between 30 and 50 years. Column 2 includes immigrants between 25 and 64 years, whereas those aged 25 to 40 and 41 to 64 are in columns 3 and 4, respectively. We selected a sample of immigrant men and women in columns 5 and 6, respectively. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Appendix 2.1.A

Table 2.1.A1: Host-countries

Host-countries	Migration Flow	Migration Stock
Argentina	No	Yes
Armenia	No	Yes
Australia	Yes	No
Austria	Yes	No
Belgium	Yes	No
Chile	Yes	Yes
Costa Rica	No	Yes
Cuba	No	Yes
Czech Republic	Yes	No
Denmark	Yes	No
Dominican Republic	No	Yes
Estonia	Yes	No
Finland	Yes	No
France	Yes	Yes
Germany	Yes	No
Greece	Yes	Yes
Hungary	Yes	No
Ireland	Yes	Yes
Israel	Yes	Yes
Italy	Yes	No
Japan	Yes	No
Korea	Yes	No
Kyrgyzstan	No	Yes
Latvia	Yes	No
Luxembourg	Yes	No
Mexico	Yes	Yes
Mongolia	No	Yes
Netherlands	Yes	No
New Zealand	Yes	No
Norway	Yes	No
Panama	No	Yes
Poland	Yes	Yes
Portugal	Yes	Yes
Puerto Rico	No	Yes
Romania	No	Yes
Slovakia	Yes	No
Slovenia	Yes	Yes
Spain	Yes	Yes
Sweden	Yes	No
Switzerland	Yes	No
United Kingdom	Yes	Yes
United States	Yes	Yes
Uruguay	No	Yes

Notes: This table shows the host-countries included in each analysis.

2.2. The effect of same-sex marriage legalization on interstate migration in the United States

2.2.1. Introduction

The location choice of homosexuals (gays and lesbians) has been partly analyzed in the economic literature on homosexual behavior (Black et al., 2007). Using urban economic models, it has been suggested that the geographic distribution of homosexuals depends on the access to amenities (Black et al., 2002, 2007). However, other factors can also play a role (Vossen et al., 2019). The homosexual-related factors that have dramatically changed during the last two decades across the world are positioned in the area of legislation (ILGA World, 2019). One major recent policy change has been the approval of same-sex marriage, which has been introduced in 29 out of the 195 countries in the world (ILGA World, 2019; national legislations). In the U.S., since the Supreme Judicial Court of Massachusetts ruled in 2003 that the ban on same-sex marriage was unconstitutional (Goodridge v. Department of Public Health, 2003), there was a progressive increase in the number of states legalizing same-sex marriage until 2015. The U.S. Supreme Court ruling (Obergefell v. Hodges, 2015) opened this form of partnership to the rest of the country. This study examines whether the introduction of same-sex marriage in the U.S. had an impact on the migratory behavior of homosexuals.[115]

Access to marriage can be a motivation for a change of residence. Marriage allows individuals access to more citizenship rights, welfare benefits, tax benefits, health care, social, property, and parental rights than any other form of partnership in the U.S. For example, homosexuals cannot be covered by their partner's employer-provided health insurance and non-married couples cannot file taxes jointly in the U.S. (see an extensive review in Badgett, 2009). The gains de19rived from marriage are not limited to economic and welfare benefits and legal rights; researchers suggest that marriage may help homosexuals to gain recognition and support (Ocobock, 2013). From a theoretical point of view, the Beckerian framework (Becker, 1973; Black et al., 2007), could be applicable here. In this setting, individuals choose to marry when their expected lifetime utility derived from marriage exceeds the expected utility from remaining single. Thus, those states where same-sex marriage is legal would be a potentially attractive place of

[115] The term *homosexual* refers to gays and lesbians in this study.

residence for those homosexuals whose expected utility in marriage exceeds that of remaining single.

Differences across states or even counties in terms of public policies and legislation have been found to have an effect on the migration behavior of individuals in the U.S. (Gelbach, 2004; Gius, 2011; McKinnish, 2005, 2007; Fiva, 2009). The literature studying the impact of same-sex marriage on mobility is quite scarce. Pinello (2016) conducted a comprehensive survey of the effects of same-sex marriage legalization on gay and lesbian couples across six states in the U.S., and Beaudin (2017), using micro-level data, suggested that heads of households in both different- and same-sex relationships were more likely to leave states where same-sex marriage was not legal. She also suggested that same-sex marriage could be increasing the imbalanced geographic distribution of same- and different-sex couples across the U.S. Further research is necessary to analyze the effects of same-sex marriage legalization on the mobility of homosexuals.

There is an increasing amount of literature that analyzed the effect of same-sex marriage legalization on different socioeconomic and demographic variables. Langbein and Yost (2009) explored whether the legal recognition of same-sex marriage has had an adverse impact on outcomes related to traditional family values, and found that that it did not have a negative effect. Hatzenbuehler et al. (2012) studied the effect of the enactment of same-sex marriage legislation in Massachusetts on health care use and expenditures among gay and bisexual men, and Francis et al. (2012) analyzed the relationship between same-marriage laws and sexually transmitted infections. Using a difference-in-difference strategy, Dillender (2014) examined how changes in U.S. legal recognition allowing same-sex couples to marry have altered marriage rates in the U.S., and Trandafir (2015) studied the effect on marriage, divorce, and extramarital births in OECD countries, finding positive effects on family formation. More recently, Hansen et al. (2020) explored the effects of same-sex marriage on the labor supply and reveal mixed results (i.e., no effect on gay men and a negative effect on lesbian women). Hamermesh and Delhommer (2020) determined that same-sex couples' income and their likelihood of home ownership increased with the partnerships' duration only when/where same-sex marriage was legal. They point to greater legal protection as an incentive in same-sex couple relationships.

This study supplements previous literature by firstly analyzing the dynamic response of homosexual migration to same-sex marriage legalization, which allows us to study whether the effect was observed in the subsequent years following its approval. To do this, we constructed a panel representing the 50 U.S. states and the District of

Columbia covering the period 2001 to 2015. We used data from the American Community Survey of the Integrated Public Use Microdata Series (IPUMS) (Ruggles et al., 2018), to analyze the effect of the legalization of same-sex marriage on homosexuals moving between states. From that dataset, we can only observe the behavior of those gay men and lesbian women who are cohabiting, as in the prior literature (Black et al., 2007; Negrusa and Oreffice, 2011; Hansen et al., 2020). We identified the relationship between the migration flow of homosexuals and same-sex marriage by using the legislative history of the liberalization of same-sex marriage across the United States.

Our results suggest that the introduction of same-sex marriage increased the percentage of gays who moved to a state allowing same-sex marriage; however, no statistically significant effect was found among lesbians. In all our regressions, we accounted for unobservable state-specific factors by including state-fixed effects as well as time-varying characteristics by adding year-fixed effects. These results were maintained after controlling for observable characteristics at the state level, which can vary over time. We provide additional evidence suggesting that our results are not driven by other legislative changes related to discrimination based on gender identity in adoption, employment, housing and public accommodation, gender marker changes on birth certificates, the repeal of sodomy laws, and the approval of civil unions or domestic partnerships. This is in line with Hamermesh and Delhommer (2020) who suggest that only the legal protection of marriage matters in some homosexual decisions, but not the availability of other non-discrimination measures, such as the access to civil unions or domestic partnerships.

We add to the literature, secondly, by studying whether the relationship between same-sex marriage legalization and homosexual migration varies after controlling for distance–related costs of migrating. This can be important in this framework, because the introduction of same-sex marriage was phased in and not all gays and lesbians had a nearby state that allowed same-sex marriage. Two different costs can be distinguished here: the costs of starting a "new" life in a different place (which may include finding a new job, a house, shops, doctors, etc.) and the psychological cost of reducing contact with friends/family. All interstate moves involve paying the "new" life costs, but this is not the case with the psychological costs that are more likely to vary with distance. However, it is not only the long trips what may matter but also the access to transportation that can allow individuals to easily travel to other places.[116]

Another unexplored issue related to the effect of same-sex marriage is how this can affect the number of homosexuals (stock). As previously mentioned, Beaudin (2017), without showing empirical evidence, pointed out the possibility that the phased introduction of same-sex marriage across the U.S. could be changing the spatial distribution of homosexuals. We can check this by focusing on the analysis of the dynamic response of homosexuals to the liberalization of same-sex marriage. Thus, our work is not limited to the exploration of the migration flow of homosexuals; we also pay attention to the evolution of the number of homosexuals, which is our third contribution to the literature. We found that there had been an impact on the number of homosexuals after the introduction of same-sex marriage, but that this was transitory. We detected no empirical evidence in favor of a change in the geographic distribution of homosexuals as a consequence of same-sex marriage. The observed effect on mobility does not appear to be translated to the spatial distribution of homosexuals as time passes.

To our knowledge, there is also a lack of research relating to how the introduction of same-sex marriage affects individuals originating from countries that are not tolerant of same-sex relations. On the one hand, it can be surmised that states with same-sex marriage would be more attractive for those individuals who flee persecution because of the criminalization of same-sex relations in their country of origin. One way to examine this issue is to explore data on asylum seekers by type of persecution (including gender identity and sexual orientation). Unfortunately, as is explained by the Center for Gender & Refugee Studies, the absence of official reporting on asylum cases at most stages of adjudication make this analysis impossible. On the other hand, states having same-sex marriage would be dissimilar to intolerant countries in terms of sexual orientation, reducing the incentives to live in those states for individuals originating from intolerant countries. We found empirical evidence that appears to confirm this behavior, which is our fourth contribution to the existing literature. The percentage of individuals from countries that criminalize same-sex relations decreased in those states with same-sex marriage.

[116] We want to thank a referee for this interesting suggestion.

The remainder of the paper is organized as follows. Section 2.2.2 presents the empirical strategy, while Section 2.2.3 describes the data. Our results are discussed in Section 2.2.4, and Section 2.2.5 offers a conclusion.

2.2.2. Data

The dataset used in this work covers the 50 states of the U.S. and the District of Columbia from 2001 to 2015. The migration flow of individuals is calculated by using data from the American Community Survey (ACS) of Integrated Public Use Microdata Series (IPUMS, Ruggles et al., 2018). The ACS provides information on the state of residence during the previous year. This allows us to calculate the number of individuals who have moved from one state to another in the previous year. To identify whether an individual is homosexual, we are only capable of observing those men and women living with a partner of the same-sex in the ACS sample.[117] This data limitation is common in other studies (Black et al., 2007; Negrusa and Oreffice, 2011; Hansen et al., 2020, among others).[118] Our sample selection consists of homosexuals aged 30 (beyond the education period and after the period of more intense job mobility (Bureau of Labor and Statistics, 2018; Borghans and Golsteyn, 2012)) to 64 (below retirement age) who can legally marry (single, divorcee, or widower).

With respect to our variable of interest, we obtained information on same-sex marriage from Gerstmann (2017). As mentioned above, the introduction of same-sex marriage in the U.S. began in 2003, when Massachusetts legally recognized same-sex marriage.[119] Between 2008 and 2009 four more states (Connecticut, Iowa, New Hampshire, and Vermont) and the District of Columbia followed. By 2015, the legalization of homosexual marriage had already been established in 37 states (Alabama, Alaska, Arizona, California, Colorado, Delaware, Florida, Hawaii, Idaho, Illinois, Indiana, Kansas, Maine, Maryland, Minnesota, Montana, Nevada, New Jersey, New Mexico, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island,

[117] We omitted respondents for whom sex was allocated by the data administrators to avoid erroneous classification of same-sex households (Hansen et al., 2020).

[118] Not all individuals in the LGBT community are included in the data since we can only identify couples where both individuals are male, or both are identified as female from the ACS. These data consider only a subset of individuals in the LGBT community. We recognize that this is an inherent problem when analyzing same-sex individuals.

[119] We did not consider the effective date of the legislation since the announcement of the introduction of same-sex marriage can also attract homosexuals. Note that we are using annual data, so the differences between the effective date and the date used here are not likely to have an impact on our dataset. In any case, our results are robust to the use of the timing of the effective date of the law instead of using the announcement date. Results are presented in the Appendix, Table 2.2.A3.

South Carolina, Utah, Virginia, Washington, West Virginia, Wisconsin, Wyoming, and the five states mentioned above) and District of Columbia. Since 2015, all states have allowed same-sex marriage (see Figure 2.2.1).

As seen in Figure 2.2.2, the percentage of U.S. people living in a state having same-sex marriage was below 10% until 2012 when it rose to almost 20%. Subsequently, a considerable increase was observed until 2015 when 100% of the population lived in a state allowing same-sex marriage. This figure also shows the evolution of the migration flow of homosexuals. We have represented the percentage of homosexual migrants (considering all states), as the number of homosexual migrants over the total number of homosexuals *at risk* of migrating from 2001 to 2015. It is observed that the rise in homosexual migration has taken off since 2011, but this is not so clear in the previous years. Figure 2.2.3 provides additional evidence in favor of the possible relationship between the homosexual migration and same-sex marriage legalization, since the number of homosexuals aged 30-64 moving to states without access to same-sex marriage decreased considerably after 2006, whereas the number of homosexuals moving to states with access to same-sex marriage slightly increased after 2003 and took off after 2008. Thus, it can be surmised that it is not the migration flow to states without same-sex marriage that is driving the behavior of the homosexual migration. Of course, this is not a conclusive analysis and we need to test it more thoroughly.

2.2.3. Empirical Strategy

To identify the effects of same-sex marriage on the interstate migration of individuals, our empirical approach makes use of the variations in the timing of the introduction of same-sex marriage across the U.S. The use of the history of legalization of same-sex marriage allows us to analyze the causal link between same-sex marriage and the migration behavior of individuals.[120] We follow Wolfers's methodology (Wolfers, 2006) to determine the dynamic effect of same-sex marriage legalization. Formally, we estimate:

[120] Using methodologies quite similar to that presented here, we have found several papers that examine the role of law reforms on different outcomes. For example, some researchers focus their attention on the impact of divorce law reforms on divorce rates (Wolfers, 2006; González-Val and Marcén, 2012), fertility rates (Bellido and Marcén, 2014), marriage rates (Drewianka, 2008), and suicide and domestic violence (Stevenson and Wolfers, 2006). Other papers have considered the effect of custody law reforms on marriage rates and fertility rates (Halla, 2013), economic well-being (Del Boca and Ribero, 1998; Allen et al., 2011), and educational attainment (Leo, 2008; Nunley and Seals, 2011). In all these cases, the empirical approach is based on the exogeneity of the law reforms. We revisit this issue below.

$$PHM_{ct} = \Sigma_s \beta_s legalization_{cts} + \Sigma_c StateFE_c + \Sigma_t YearFE_t + u_{ct} \qquad (1)$$

where PHM_{ct} is the percentage of homosexuals who move to state *c* in the year t. This variable is defined as the number of homosexual migrants over the total homosexuals *at risk* of migrating multiplied by 100. In the denominator, the individuals *at risk* of migrating incorporate all identifiable homosexuals living in the rest of the states in year *t*, excluding those living in state *c* in year *t*. Our main explanatory variable, $legalization_{cts}$, is a dummy variable that takes value *1* when state *c* has legal same-sex marriage in year *t* for *s* period, and *0* otherwise. In this way, equation (1) includes dummies showing whether same-sex marriage has been effective for 1-2 years, 3-4 years, and so on. As explained above, access to marriage (which implies legal rights and social benefits) may alone be sufficient to encourage homosexual migration. In this setting, we would expect β_s parameters to be positive indicating that the inflow migration of homosexuals to state *c* has increased by β_s percentage points after *s* periods since the introduction of same-sex marriage. The interpretation of a negative sign would mean just the opposite. We include state- and year-fixed effects in equation (1) to account for evolving unobserved attributes varying at the state level and over time. Regressions are estimated by population-weighted least squares.[121]

This methodology allows us to analyze the dynamic response of the homosexual migration flow to changes in marriage access (dynamic model). Prior literature is limited to the exploration of how same-sex marriage may affect the probability of homosexual and heterosexual couple migration using microdata (Beaudin, 2017). In our case, we use aggregate data to examine how same-sex marriage affects the evolution of homosexual migration flow. To examine the possible differences between gay men and lesbian women, we ran the entire analysis separating the sample between both group of individuals. The rest of our work also applies a similar empirical strategy to that presented in this section (see below for a detailed explanation) to examine the importance of the distance-related costs on the migration process, the possible impact on the number of homosexuals (stock), and the migration process of those individuals originating from intolerant countries regarding same-sex relations.

[121] We obtain similar results when accounting for pre-existing differences across states incorporating the interaction between the state-fixed effects and calendar and quadratic calendar time (see Table 2). Results do not vary with/without weights. The intuition behind using weighted least squares is that a positive effect of same-sex marriage legalization in say, California, will carry more weight than a positive effect in New Hampshire (Friedberg, 1998).

2.2.4. Results

a) Same-sex marriage and migration flow of homosexuals

Table 1 reports our estimates on the effect of same-sex marriage on the migration flow of homosexuals. The first column, which includes state- and year-fixed effects, shows an increase in the percentage of homosexual migrants in the years following the introduction of same-sex marriage. In the other columns, we have separated the sample by gender.[122] This is necessary, since it can be surmised that our estimated coefficients are capturing the responses from gay men in addition to/instead of the responses from lesbian women. This argument is based on the idea that there can be differences between female and male migration because of possible dissimilarities in the factors affecting migration decisions by gender (Enchautegui, 1997). Column 2 incorporates as the dependent variable the percentage of gay men, whereas column 3 includes the percentage of lesbian women. Estimations indicate clear gender differences. A positive and statistically significant effect is found in all years subsequent to the introduction of same-sex marriage for gay men. However, this effect is only significant (only at a 10% level) seven years after the introduction of same-sex marriage for lesbian women. This can be explained by the lower wages (low opportunity costs) of gay men in comparison to those of lesbian women (Klawitter, 2015) as a factor encouraging migration for only gay men.[123] It is worth noting that the effect of same-sex marriage is sizable, representing almost half (0.027) of the mean of the percentage of gay migrants (0.06) and almost doubling that mean more than seven years after the legalization of same-sex marriage.[124]

[122] The variation in sample size is due to the fact that in some states all homosexuals identified in some years are gay or lesbian. North Dakota only has gay migrants in some years but not lesbian. Alaska, North Dakota, South Dakota, Vermont and Wyoming only have lesbian migrants but not gay migrants in some years. Our results are maintained without those states and years in which there is no observations in the microdata about lesbian women or gay men, (see column 1 of Table 2.2.A2 in the Appendix). This can be consequence of a problem of identification of gay/lesbian individuals in some specific state-years because the sample size is quite small in some cases. We prefer to be conservative and run the analysis without the information of those state-years when separating the sample by gender. In any case, we only lost five observations in the gay sample and two in the lesbian sample. Results are maintained if we consider no gay/lesbian migrants in those state-years. We have also run the analysis filling those gaps with linear interpolation and results are maintained (see columns 2 and 3 of Table 2.2.A2 in the Appendix).

[123] Note that there is evidence of this in the U.S., Italy, the UK, and the Netherlands, among others (Plug et al., 2004; Patacchini et al. 2014; Drydakis, 2019), but not for Greece, which observed a negative effect of lesbian sexual orientation on labor outcomes (Drydakis, 2011).

[124] Note that our findings are limited to the use of a sample that only includes individuals living in a same-sex relationship. We recognize that the number of unmarried couples identified in those states without same-sex marriage can be underestimated since homosexuals can be more likely to be living apart to reduce stigma in. This could bias our estimates.

It is possible that unobservable factors such as culture or demographic trends evolve over time at different paces in different states. For example, in one state, it may be more socially acceptable to have a same-sex partner, while in others it may be less so. Those states with a higher social norm associated with homosexual couples would experience higher increases in the percentage of homosexuals moving in and might also be more likely to introduce same-sex marriage. Adding state-specific linear and quadratic trends can capture these issues.[125] Columns 1 and 2 of Table 2 presents these results.[126] As seen, a statistically significant effect at 1% level is found in all years subsequent to the introduction of same-sex marriage for gay men and this effect is now detected five to six years after the introduction of same-sex marriage for lesbian women. Our results are also maintained after clustering the standard errors at a state level in columns 3 and 4.

Although all our previous specifications incorporated controls for unobservable characteristics that can vary at the state level and/or over time, we ran additional regressions to check whether the findings were driven by omitted economic and/or demographic variables. The impact of these omitted variables, if correlated with the outcome of interest, could be captured by the coefficients measuring the effect of same-sex marriage legalization. To tackle this issue, we added more controls to our baseline regression. Since the characteristics of the individuals (e.g., race, education) living in a state can make it more or less attractive to the individuals living in the rest of the country, we have added controls by state and year for the proportion of individuals by race (white and black), education (the proportion of people who had completed high school, one to three years of college, and four or more years of college) and the proportion of individuals by type of industry in which individuals worked. The economic situation of the potential state of residence may also affect migration decisions, and for this reason we added the employment rate by state and year. After adding these variables in columns 5 and 6 of

[125] We provided additional evidence that pre-existing trends on homosexual migration are not driving our results by including a dummy variable which takes the value 1 during the periods -1 and -2, that is, 1 and 2 years prior to the legalization of the same-sex marriage. Results are reported in Table 2.2.A3 in the Appendix where it is observed that that the pre-same-sex marriage coefficient is not statistically significant. Thus, it appears that our results are not simply the continuation of prior patterns. We also re-ran our main analysis by limiting the sample to those states that legalized same-sex marriage via a judicial decision (Hansen et al., 2020), since this implementation may be less likely to be predicted. Note that these results should be taken with caution due to the scarcity of observations after this limitation of the sample. In any case, we find evidence of a positive and significant impact on the migration of gay men, which is in line with all our findings.

[126] Note that the scarcity of observations can generate concerns on the validity of our estimates after the inclusion of all these additional controls. For this reason, the analysis is presented without those state-specific trends.

Table 2.2.2, the dynamic response of gays and lesbians to the introduction of same-sex marriage is quite similar although the estimated coefficient on the impact of same-sex marriage 1-2 years after its legalization appears to be less efficiently estimated.[127]

To reinforce the consistency of previous results, we estimated supplementary analysis using different samples and redefining the dependent variable. Results are reported in Table 2.2.3. We first redefined the sample of homosexuals including not only those individuals who can legally marry but also married homosexuals.[128] The observed effect of same-sex marriage on the migration flow of those who could legally marry could be due to a change in the population at risk of marrying, since it can be assumed that fewer homosexuals could legally marry after the introduction of same-sex marriage (some of them had access to marriage). columns 1 and 2 report our results by gender. As both columns show, our conclusions are maintained, and the coefficients do not change in regard to married homosexuals. Next, a possible decrease in the homosexual population who could legally marry was considered in our findings. We tested our findings considering a young sample since younger individuals can have different incentives to change their place of residence than older individuals. Results are displayed in columns 3 and 4 for a sample of individuals aged 25 to 55 years old. We found that the effect of same-sex marriage is positive and statistically significant three to four years after its introduction for gay men, and the magnitude of the effect with respect to the mean is quite similar to that presented in Table 2.2.1.[129] As before, no statistically significant coefficients were detected for lesbian women.

The migration process in the U.S. is not limited to interstate migration; international migration might be affected by the introduction of same-sex marriage. We extended the sample by adding those living in another country in the previous year in columns 5 and 6 of Table 2.2.3. Results changed very little. In addition, we repeated the analysis by excluding the non-native population, since several studies have shown evidence of the existence of differences between non-native and native individuals in interstate migration. Rogers and Raymer (1998) found that the migration patterns of the foreign-born, in

[127] We have re-run these specifications including each of these additional controls separately, and the results did not vary.

[128] Note that all same-sex couples who reported being married were recoded to unmarried cohabiting partners until 2013. Thus, the addition of married individuals to the sample only captured married individuals from 2013 to 2015 (https://usa.ipums.org/usa-action/variables/MARST#editing_procedure_section).

[129] The coefficient picking up the effect 1-2 years is positive and different from zero although non-statistically significant, which may indicate that this is less efficiently estimated.

general, exhibited levels of spatial focus that exceeded those of their native-born counterparts. Gurak and Kritz (2000) indicated that while human capital factors were the most important sources of differences between immigrants and natives in internal migration patterns, contextual dimensions associated with the social capital of native groups and state economic conditions strongly influenced the interstate migration of immigrants.

To check whether this was driving our results, we repeated our main analysis including only those homosexuals originating from the U.S. (see columns 7 and 8). Results were unchanged, and, therefore, the behavior of non-native individuals did not appear to affect to our findings. However, it is possible that the behavior of non-native individuals differs depending on their country of origin, since there are considerable differences in the way same-sex relations are considered throughout the world. We revisited this issue below when we explored the behavior of non-native individuals originating from intolerant countries (where same-sex relations are illegal). It can be argued that the decision to move from one state to another depends on the laws in both states, host, and home state.[130] As an additional robustness check, we redefined our dependent variable as the percentage of homosexuals who move to state *c* from another state, where same-sex marriage was not legalized in the year *t*. Results are shown in columns 9 and 10. As can be seen, the positive and statistical significant effect is detected in almost all years following the legal change for gay men. In line with the previous results, no statistically significant effect was found among lesbian women. In short, all the results described in this section suggest that the introduction of same-sex marriage positively affects the migration flow of homosexuals to those states that have same-sex marriage, but this response appears to be consequence of the behavior of gay men.

b) Is it the effect of same-sex marriage, or is it the effect of other regulations?

Same-sex marriage legalization was accompanied by related legal changes that may also have affected the interstate migration of lesbian, gay, bisexual, and trans (LGBT) people (see Table 2.2.A1 in the Appendix 2.2.A). Since the time of these legal changes varies by state, it could be possible that our estimated coefficient capturing the effect of same-sex marriage might include the effects of other antidiscrimination legislations.

[130] Unfortunately, we cannot re-run the analysis considering migration between each pair of states due to the scarcity of observations to obtain reliable estimations.

By 2019, only seven states and the District of Columbia had passed regulations that banned the discrimination based on gender identity in adoption. Since the 1990s, regulations have been introduced prohibiting discrimination based on gender identity in employment, housing, and/or public accommodations. By 2019, 21 states and the District of Columbia had such laws (Movement Advancement Project, 2019). Similarly, policies for changing gender markers on birth certificates vary from state to state. By 2019, 22 states and the District of Columbia had issued new style birth certificates with new gender markers (Movement Advancement Project, 2019). Since the 1970s, some states have repealed their sodomy laws. These laws made certain kinds of sexual activity illegal. By 2003, 36 states and the District of Columbia had repealed them (Kane, 2003). Since the late 1990s, other marriage alternatives, such us civil unions and domestic partnerships were allowed (Hansen et al. 2020). We need to control for this issue to mitigate concerns as to whether our estimations are capturing the effect of same-sex marriage rather than other differences in LGBT legislation across states.

To capture the impact of all LGBT-related legislation mentioned above, we used variation in the timing of these reforms by adding explanatory variables to control for the years since each law was adopted.[131] None of the prior literature considers this legislation in its totality, so with regard to previous research on the impact of same-sex marriage on socio-economic and demographic variables, there can be some concerns about what exactly is being picked up by the estimated coefficients on same-sex marriage legalization. Table 2.2.4 shows the dynamic response of interstate homosexual migration to same-sex marriage legalization, after controlling for the prohibition of discrimination based on gender identity in adoption; employment, housing or public accommodation; the approval of gender marker changes on birth certificates; the introduction of the repeal of sodomy laws; and the legalization of marriage alternatives. As can be seen, the reform allowing gender marker changes on birth certificates is the only one which appears to play a significant role in the migration flow of gay men. It is reassuring to observe that, even after adding those controls, we found an effect of the same-sex marriage legislation, which suggests that it was not the LGBT-related legal changes that were driving our findings. It, therefore, appears that same-sex marriage does play a role in the migration

[131] Results on the impact of these legislations should be taken with caution, since in some cases the dates of the reforms are quite close and even coincide. In any case, we have repeated the analysis including each legislation at a time and our results have not changed substantially. We recognize that the estimated coefficients after five to six years of same-sex marriage legalization appear to be less efficiently estimated, albeit positive.

flow of homosexuals. Our results are in line with those of Hamermesh and Delhommer (2020), who suggest that only the greater legal protection of marriage matters in partnership decisions among homosexual individuals, not the availability of other non-discrimination measures, such as access to civil unions or domestic partnerships.

c) Distance-related costs

Up to this point, we have focused on the relationship between same-sex marriage legalization and interstate homosexual migration. In this section, we examine whether that relationship varies when controlling for distance-related costs. Prior research has shown that among the variables affecting the costs of migration, the distance between destination and origin appears to be one of the most important factors: the further away the two places are, the higher the monetary travel costs for the initial move, as well as for visits back home (Long et al., 1988; Mayda, 2010). Another explanation as to why distance may negatively affect migration is that it is costlier to acquire information about distant locations (Greenwood, 1997; Lucas, 2001). The literature on this subject offers a consensus on the effect of distance on migration (Davies et al., 2001). Even if the migration pattern of homosexuals were different than their heterosexual counterparts, it would not be surprising to observe that the greater the physical distance, the lower the incentives to migrate.[132]

Our analysis here is concentrated in controlling for the possible distance-related costs. There can be two different distance-related costs: the costs of starting a "new" life in a different place (which may include finding a new job, a house, shops, doctors, etc.) and the psychological cost of reducing contact with friends/family. All interstate moves would involve paying the "new" life costs, but this is not the case with the psychological costs that are more likely to vary with distance. Focusing on the latter, it is not only the long trips that may matter, but also access to transportation that can allow individuals to easily travel to other places in order to reduce the psychological costs related to migration.

[132] Homosexuals appear to earn less than their heterosexual counterparts in the U.S. and in other countries (Ahmed and Hammarstedt, 2010; Badgett, 1995; Clain and Leppel, 2001; Grossbard and Jensen, 2008), generating budget constraints to move to a more distant state, because the greater the physical distance, the higher the migration costs (Belot and Hatton, 2012; Bellido and Marcén, 2015). Although this is mainly only observed for gay men (Drydakis, 2012) and not for lesbian women who are found to earn more than heterosexual individuals (Klawitter, 2015). However, the opposite could be possible. With low wages, opportunity costs would be lower for homosexuals, encouraging migration for homosexuals. Also, since homosexual households are less likely to have children, this reduces over a lifetime the necessities of some household resources (Black et al., 2002; Grossbard and Jensen, 2008), which can make them freer in the migration process. Our preliminary results, controlling for the possible effect of physical distance, do not alter our findings. We do not include these here because, as suggested by a referee, this is not surprising.

To tackle this issue, we use the number of air passengers arriving to each state by year as a control. Data comes from the Bureau of Transportation Statistics. Those states with high flight availability would also be those receiving a high number of passengers and, therefore, those with low distance-related costs of migrating.[133] After including this control in Table 2.2.5, our estimations show a statistically significant effect even seven years after the introduction of same-sex marriage legislation for gay men. As previously, no significant effect was detected for lesbian women. The magnitude of the effect is quite similar to that obtained in Table 2.2.1 in all cases.

d) The effect of same-sex marriage legalization on the number of homosexual migrants (stock)

To our knowledge, there is only one study that explores the possible impact of same-sex marriage on migration decisions at the individual level (Beaudin, 2017). However, there are no studies of the possible effect of same-sex marriage on the geographical distribution of homosexuals across the U.S. Beaudin (2017) points to the possibility of an increasing imbalance in the distribution of homosexuals but does not provide empirical evidence. The draw data show in Figure 2.2.4 shows that during the period considered, there is a greater concentration of gays and lesbians in the West, Southwest, and Northeast regions of the U.S. Is this driven by the same-sex marriage legislation? In our research, we examined the impact of same-sex marriage on the number of homosexuals by state. Formally, we estimate this using the following equation:

$$Stock_{ct} = \Sigma_s \beta_s legalization_{cts} + \Sigma_c StateFE_c + \Sigma_{\mathrm{t}} YearFE_t + u_{ct} \qquad (2)$$

where $Stock_{ct}$ is defined as the number of homosexuals living in state *c* in year *t* per 100 inhabitants. The rest of the variables have been defined previously. We would expect β_s parameters to be positive since the impact on the migration flow appears to be positive and permanent.[134] Table 2.2.6 presents the estimations. There appears to be empirical evidence in favor of an increase in the number of gay men following the introduction of

[133] We want to thank a referee for this interesting suggestion.

[134] Same-sex marriage can increase cohabitation/marriage among state residents in addition to migration. Therefore, these results cannot be completely attributed to the effect of migration. Note again that here we are considering a subset of individuals of the LGBT community: individuals in same-sex couples. We can only identify this subset in the ACS. According to the School of Law Williams Institute (UCLA), the total same-sex couples were 646,500 (1.3 million individuals) which represent around 0.4% of the US population in 2010 (https://williamsinstitute.law.ucla.edu/visualization/lgbt-stats/?topic=SS#density). This is quite close to the mean of the number of homosexuals obtained in our sample (0.42% for the entire period; see Table 6).

same-sex marriage, but after five to six years, no significant coefficient has been detected. In the case of lesbians, all the previous analysis point to a non-significant effect in the migration flow. When we analyze the impact on the number of lesbian women, the estimated coefficients are negative, although not statistically significant and quite close to zero in almost all cases. Thus, the positive effect on inflow migration is not translated to any significant degree into the number of homosexuals (stock), since after five to six years, there is no clear empirical evidence of a change in the geographical distribution of homosexuals as a consequence of same-sex marriage.

e) The effect of same-sex marriage on non-native individuals originating from intolerant countries

There can be some specific individuals for whom the introduction of same-sex marriage in a state can reduce the attractiveness of moving there. States having same-sex marriage would perhaps unsurprisingly not be culturally similar to intolerant countries in terms of sexual orientation. This subsection will address this issue. It can also be argued that states with same-sex marriage would be more attractive for individuals who flee persecution because of the criminalization of same-sex relations in their country of origin. Unfortunately, this relationship cannot be examined since there is no available information. Data on asylum seekers by type of persecution (including gender identity and sexual orientation) is quite scarce (Some data is available through the Center for Gender & Refugee Studies).

Focusing on the possible negative effects that cultural differences can generate, we calculated the percentage of non-native individuals originating from intolerant countries who moved from one state to another over the total number of non-native individuals originating from intolerant countries who are at risk of migrating (and multiplied by 100).[135] The sample selection of individuals is the same as before, that is, we have selected individuals between the ages of 30 and 64 who can legally marry. The intolerant countries of origin are classified in accordance with the information provided by the ILGA in 2019. All countries for which same-sex relations are not legal for men in the period under examination are considered here as intolerant countries. As observed in Table 2.2.7, our estimations suggest that same-sex marriage reduces the incentive for non-native individuals originating from intolerant countries to move to a state that permits

[135] Note that the pattern of homophobic behavior appears to persist over time across countries (Chang, 2020).

same-sex marriage. We find that the effect of same-sex marriage is negative and statistically significant one to four years after its introduction. This provides evidence that same-sex marriage can diminish the attractiveness of those places for individuals originating from less tolerant countries.

2.2.5. Conclusions

The aim of this paper is to analyze the impact of same-sex marriage on the interstate migration evolution of homosexuals in the United States. The mere access to marriage can encourage individuals to move to states having same-sex marriage if their lifetime utility in marriage is greater than that obtained in other forms of partnership or in singlehood (Black et al., 2007). From a theoretical point of view, the expected effect on the migration flow of homosexual appears to be positive.

To examine this issue, we used data covering the 50 states of the U.S. and the District of Columbia. Our results suggested that the introduction of same-sex marriage has a positive effect on the interstate migration flow of homosexuals to states having same-sex marriage, but this appears to be due to the response of gay men. Our findings are unaltered after adding controls for observable state-specific factors to different subsamples, and to the possible distance-related costs of migration.

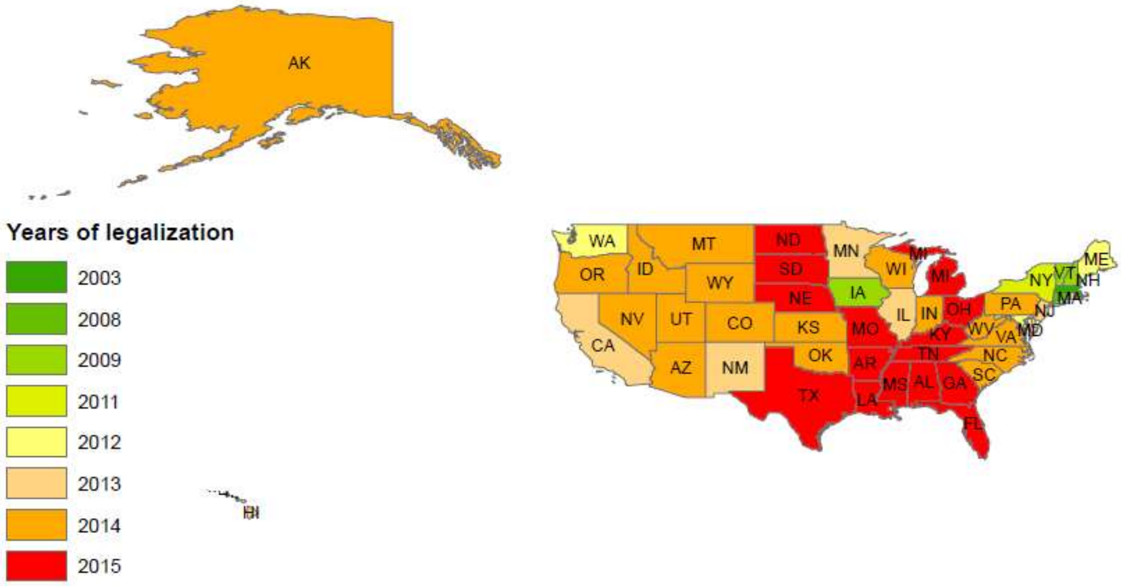
A possible concern with prior research on the impact of same-sex marriage legislation on socio-demographic outcomes is that it omits other legal reforms affecting LGBT individuals. It could be surmised that this affected our results. The battle for LGBT rights has not ended, since even now, LGBT parents and their children in some states of the U.S. can be refused by social services or ejected from a business by someone who cites a religious belief. In this study, we show that the effect of same-sex marriage on homosexual migration between states is robust to the control of the prohibition of discrimination based on gender identity in adoption, employment, housing and public accommodation, the legalization of gender marker changes on birth certificates, the repeal of sodomy laws, and the legalization of other marriage alternatives (civil unions and domestic partnerships). As seen in Hamermesh and Delhommer (2020), it is the greater legal protection of marriage that plays a role rather than non-discriminatory legislation.

This study is the first to examine the dynamic response to same-sex marriage in terms of migration. Moreover, by exploiting the different timing of homosexual marriage legislation, this research fills a gap in the literature by exploring the impact of same-sex marriage on the geographical distribution of homosexuals in the U.S. Results appear to point to a positive and temporary effect. After five to six years, the positive effect on inflow migration is not translated to a statistically significant effect on the distribution of homosexuals in the U.S. Same-sex marriage legislation appears to play a role in the movement of homosexuals across the U.S. but it is not sufficiently important to change their spatial distribution.

The legalization of same-sex marriage can also generate outflow migration of those individuals who are less tolerant of same-sex relationships. We tested this using data on the migration behavior of non-native individuals originating from intolerant countries (in which same-sex relations are illegal). These individuals may consider states that permit same-sex marriage to be less attractive because the cultural differences in their home countries discourage them from moving there. Our findings appear to confirm this. We observe a negative effect on the interstate migration of non-native migrants originating from intolerant countries following the introduction of same-sex marriage. Thus, cultural differences regarding homosexuality may be of significance in the migration decisions of some individuals.

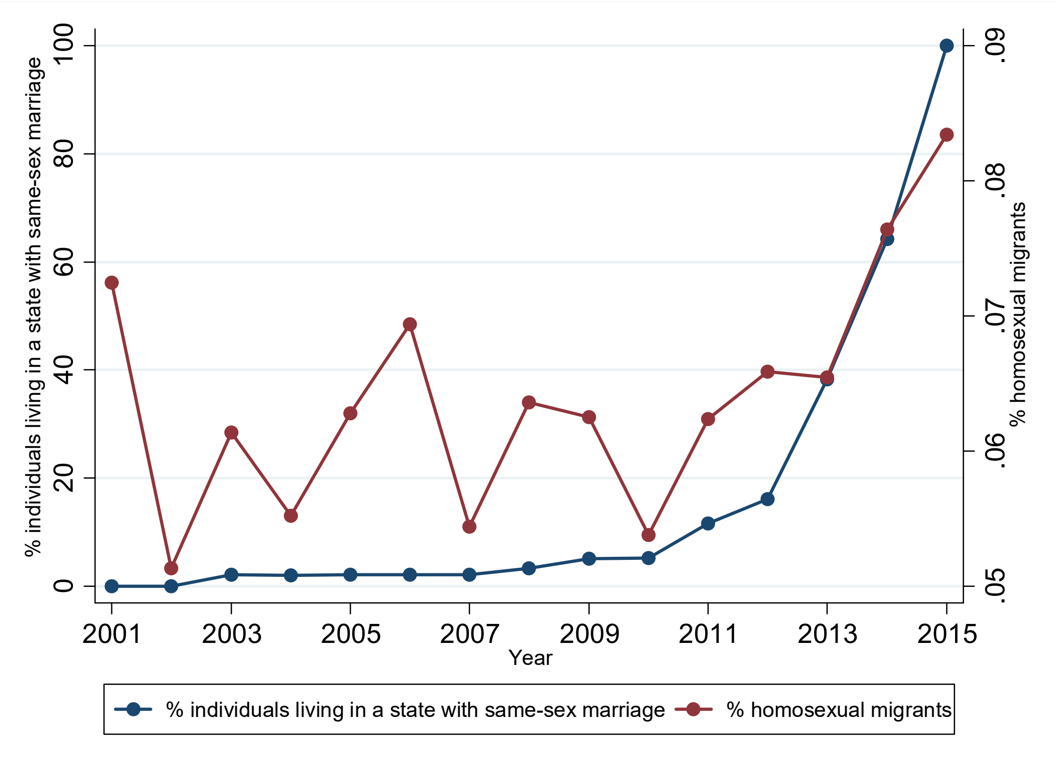
Figures and Tables

Figure 2.2.1: Evolution of same-sex marriage across states



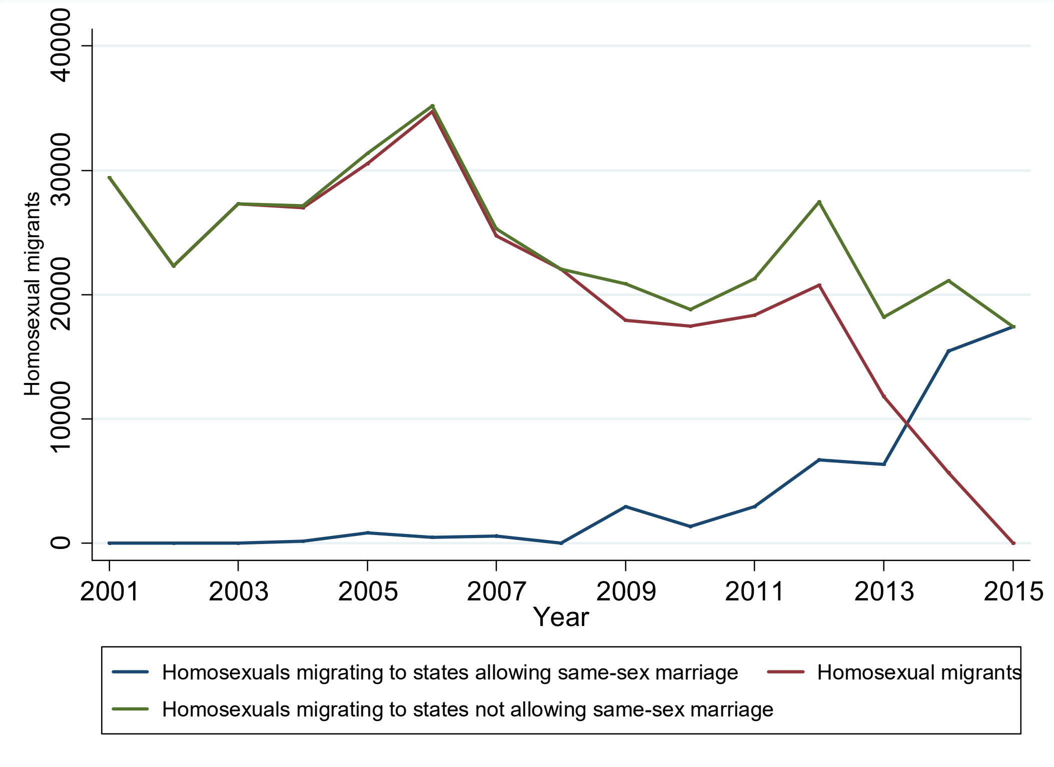
Note: This figure presents the years of the introduction of same-sex marriage.

Figure 2.2.2: Percentage of individuals living in a state with same-sex marriage and percentage of homosexual migrants during the period 2001-2015



Note: Data comes from The American Community Survey of Integrated Public Use Microdata Series. The percentage of individuals living in a state with same-sex marriage is defined as the total number of individuals living in all states with same-sex marriage among the total population in year *t*. The percentage of homosexual migrants is defined as the average of the number of homosexual migrants to state *i* over the total homosexuals at risk of migrating multiplied by 100 in year t.

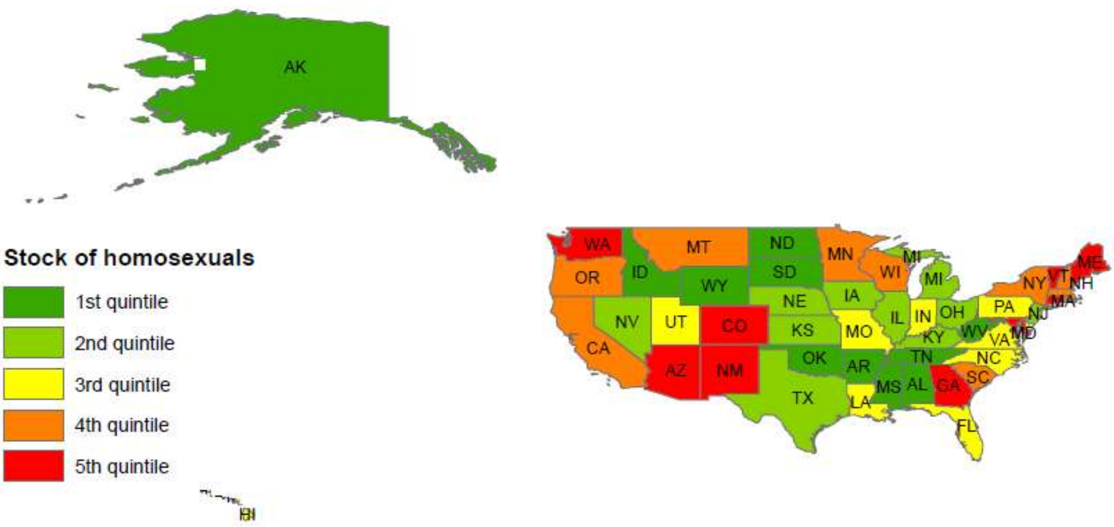
Figure 2.2.3: Homosexuals migrating to states allowing same-sex marriage vs homosexuals migrating to states not allowing same-sex marriage



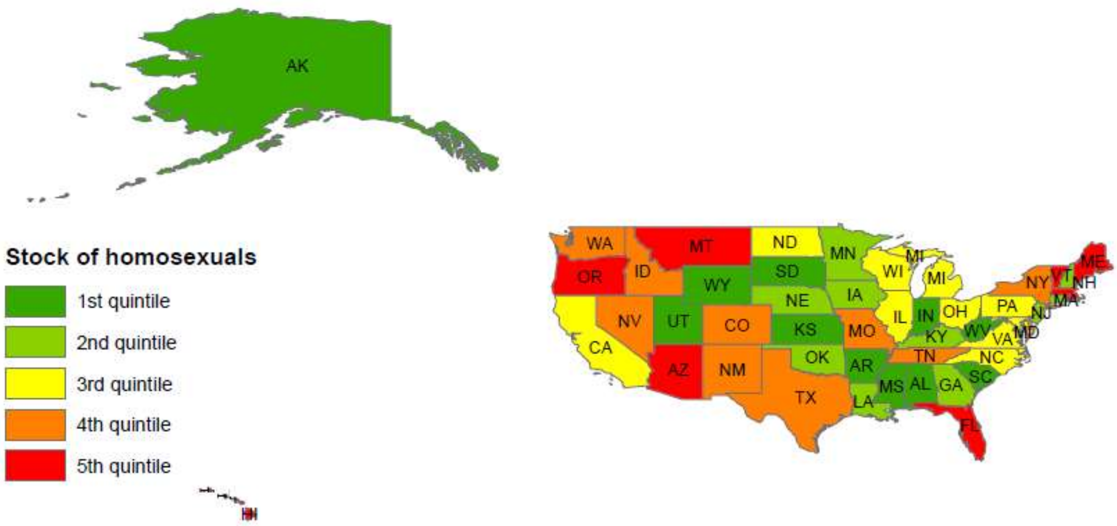
Note: This figure has been calculated using data from The American Community Survey of Integrated Public Use Microdata Series. We use a sample of homosexuals aged 30 to 64 who can legally marry.

Figure 2.2.4: The number of homosexuals (stock)

2003



2015



Note: This figure has been calculated using data from The American Community Survey.

Table 2.2.1: The effect of same-sex marriage legalization on the percentage of homosexual migrants

Dependent variable: Percentage of homosexual migrants	(1) All	(2) Men	(3) Women
Same-sex marriage 1–2	0.021*	0.027*	0.017
	(0.011)	(0.015)	(0.014)
Same-sex marriage 3-4	0.064***	0.134***	0.005
	(0.017)	(0.022)	(0.022)
Same-sex marriage 5-6	0.032	0.067**	0.005
	(0.025)	(0.034)	(0.032)
Same-sex marriage >7	0.078***	0.106***	0.062*
	(0.028)	(0.040)	(0.035)
Year FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
State*time	No	No	No
State*time^2	No	No	No
Mean	0.05	0.06	0.05
Observations	765	760	763
R^2	0.738	0.740	0.460

Note: Column 1 shows our baseline estimate. We have excluded lesbian women in column 2 and gay men in column 3. Estimates using state population weights. Standard errors are in parentheses. ***Significant at the 1% level, ** Significant at the 5% level, *Significant at the 10% level.

Table 2.2.2: Simple Robustness Checks

Dependent variable: Percentage of homosexual migrants	(1) Men	(2) Women	(3) Men	(4) Women	(5) Men	(6) Women
Same-sex marriage 1–2	0.059***	0.022	0.027	0.017	0.027*	0.021
	(0.020)	(0.019)	(0.017)	(0.022)	(0.015)	(0.014)
Same-sex marriage 3-4	0.233***	0.057	0.134*	0.005	0.136***	0.013
	(0.044)	(0.040)	(0.068)	(0.024)	(0.025)	(0.023)
Same-sex marriage 5-6	0.273***	0.129*	0.067**	0.005	0.063*	0.020
	(0.073)	(0.068)	(0.028)	(0.050)	(0.037)	(0.034)
Same-sex marriage >7	0.366***	0.269***	0.106***	0.062	0.087**	0.081**
	(0.102)	(0.090)	(0.039)	(0.039)	(0.043)	(0.038)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
State*time	Yes	Yes	No	No	No	No
State*time^2	Yes	Yes	No	No	No	No
Mean	0.06	0.05	0.06	0.05	0.06	0.05
Observations	760	763	760	763	760	763
R^2	0.778	0.546	0.740	0.460	0.755	0.481

Note: Estimates in columns 1 and 2 include lineal and quadratic trends. Standard errors are clustered at state level in columns 3 and 4. Columns 5 and 6 include controls for the proportion of white and black individuals, the proportion of individuals who have completed high school, who have studied 1 to 3 years of college, who have studied 4 or more years of college, the proportion of individuals by type o industry and the employment rate and by state and year. Estimates are weighted. Standard errors are in parentheses. ***Significant at the 1% level, ** Significant at the 5% level, *Significant at the 10% level.

Table 2.2.3: More robustness checks with different subsamples and redefining the dependent variable

Dependent variable: Percentage of homosexual migrants	(1) Men	(2) Women	(3) Men	(4) Women	(5) Men	(6) Women	(7) Men	(8) Women	(9) Men	(10) Women
Same-sex marriage 1–2	0.023	0.020	0.006	0.014	0.031**	0.031**	0.040**	0.018	0.005	0.006
	(0.015)	(0.014)	(0.018)	(0.017)	(0.015)	(0.015)	(0.016)	(0.014)	(0.013)	(0.014)
Same-sex marriage 3-4	0.126***	0.006	0.221***	-0.042	0.130***	0.014	0.142***	0.013	0.052***	-0.019
	(0.023)	(0.021)	(0.027)	(0.026)	(0.023)	(0.024)	(0.024)	(0.022)	(0.020)	(0.022)
Same-sex marriage 5-6	0.062*	0.004	0.079**	0.004	0.069**	0.012	0.063*	0.023	0.055*	-0.012
	(0.034)	(0.031)	(0.040)	(0.039)	(0.035)	(0.035)	(0.035)	(0.032)	(0.030)	(0.032)
Same-sex marriage >7	0.097**	0.063*	0.149***	0.041	0.108***	0.079**	0.111***	0.060*	0.070**	0.053
	(0.040)	(0.034)	(0.047)	(0.043)	(0.041)	(0.038)	(0.041)	(0.035)	(0.036)	(0.035)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State*time	No	No	No	No	No	No	No	No	No	No
State*time^2	No	No	No	No	No	No	No	No	No	No
Mean	0.06	0.05	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05
Observations	760	763	757	764	760	763	758	763	760	763
R^2	0.738	0.473	0.706	0.478	0.773	0.534	0.692	0.424	0.733	0.428

Note: Columns 1 and 2 include married individuals. Columns 3 and 4 include individuals aged 25 to 55. Those individuals who lived in other country the year before have been included in addition to those individuals who lived in a different state in the previous year, in columns 5 and 6. Columns 7 and 8 only include those individuals who are originating from the US. The dependent variable is redefined as the percentage of homosexuals who move to state c from another state where same-sex marriage was illegal in the year t in columns 9 and 10. Estimates are weighted. Standard errors are in parentheses. ***Significant at the 1% level, ** Significant at the 5% level, *Significant at the 10% level

Table 2.2.4: The effect of same-sex marriage on the percentage of homosexual migrants including other laws

Dependent variable: Percentage of homosexual migrants	(1) All	(2) Men	(3) Women
Same-sex marriage 1–2	0.018*	0.025*	0.015
	(0.011)	(0.015)	(0.014)
Same-sex marriage 3-4	0.055***	0.121***	-0.0001
	(0.017)	(0.023)	(0.022)
Same-sex marriage 5-6	0.014	0.036	-0.005
	(0.027)	(0.036)	(0.034)
Same-sex marriage >7	0.061*	0.077*	0.058
	(0.031)	(0.044)	(0.039)
Prohibition of discrimination by adoption agencies	-0.030	-0.044	-0.002
based on sexual orientation and gender identity	(0.023)	(0.031)	(0.031)
Prohibition of discrimination based on	-0.002	0.004	-0.015
gender identity in employment, housing or public accommodations	(0.013)	(0.017)	(0.016)
Allowing a gender marker change	0.020**	0.036***	0.012
on birth certificates	(0.010)	(0.014)	(0.013)
The repeal of sodomy laws	0.033	-0.018	0.078
	(0.071)	(0.096)	(0.094)
Other marriage alternatives	0.012	0.003	0.013
	(0.013)	(0.018)	(0.017)
Year FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
State*time	No	No	No
State*time^2	No	No	No
Mean	0.05	0.06	0.05
Observations	765	760	763
R^2	0.740	0.743	0.462

Notes: Columns show results after controlling for the prohibition of discrimination by adoption agencies and officials based on sexual orientation and gender identity, the prohibition of discrimination based on gender identity in employment, housing and public accommodation, the approval of gender marker change on birth certificates, the introduction of the repeal of sodomy laws, and the legalization of civil unions or partnership respectively. Estimates are weighted. Standard errors are in parentheses. ***Significant at the 1% level, ** Significant at the 5% level, *Significant at the 10% level.

Table 2.2.5: The effect of same-sex marriage on the percentage of homosexual migrants controlling for cost of migration

Dependent variable: Percentage of homosexual migrants	(1) All	(2) Men	(3) Women	(4) All	(5) Men	(6) Women
Same-sex marriage 1–2	0.022*	0.028*	0.018	0.021*	0.027*	0.017
	(0.011)	(0.015)	(0.014)	(0.011)	(0.015)	(0.014)
Same-sex marriage 3-4	0.068***	0.142***	0.009	0.064***	0.134***	0.005
	(0.017)	(0.024)	(0.022)	(0.017)	(0.022)	(0.022)
Same-sex marriage 5-6	0.033	0.082**	0.001	0.032	0.067**	0.005
	(0.026)	(0.036)	(0.032)	(0.025)	(0.034)	(0.032)
Same-sex marriage >7	0.082***	0.118***	0.065*	0.078***	0.106***	0.062*
	(0.029)	(0.041)	(0.035)	(0.028)	(0.040)	(0.035)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
State*time	No	No	No	No	No	No
State*time^2	No	No	No	No	No	No
Mean	0.06	0.06	0.05	0.05	0.06	0.05
Observations	750	745	748	765	760	763
R^2	0.737	0.739	0.465	0.738	0.740	0.460

Note: We control for the number of air passengers arriving each state and year in all columns. Data comes from the Bureau of Transportation Statistics. The variation in the sample size is due to the no availability of data on the number of passengers for the District of Columbia. Table 2.2.A3 presents the results for our main analysis using this subsample without D.C. Columns 1 to 3 present the results after including it. Columns 4 to 6 are the same as in Table 2.2.1. Estimates are weighted. Standard errors are in parentheses. ***Significant at the 1% level, ** Significant at the 5% level, *Significant at the 10% level.

Table 2.2.6: The effect of same-sex marriage on the stock of homosexual migrants

Dependent variable: Percentage of homosexual migrants	(1) All	(2) Men	(3) Women
Same-sex marriage 1–2	0.013	0.045***	-0.002
	(0.010)	(0.016)	(0.013)
Same-sex marriage 3-4	-0.005	0.066***	-0.041**
	(0.015)	(0.024)	(0.020)
Same-sex marriage 5-6	-0.000	0.021	-0.000
	(0.022)	(0.036)	(0.029)
Same-sex marriage >7	-0.020	0.000	-0.033
	(0.025)	(0.043)	(0.032)
Year FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
State*time	No	No	No
State*time^2	No	No	No
Mean	0.42	0.43	0.41
Observations	765	764	765
R^2	0.872	0.868	0.743

Note: This table shows the effect of same-sex marriage on the stock of homosexual migrants. Estimates are weighted. Standard errors are in parentheses. ***Significant at the 1% level, ** Significant at the 5% level, *Significant at the 10% level.

Table 2.2.7: The effect of same-sex marriage on the non-native individuals originating from non-tolerant countries

Dependent variable: Percentage of non-native individuals	(1) Countries with criminalization
Same-sex marriage 1–2	-0.029**
	(0.013)
Same-sex marriage 3-4	-0.050**
	(0.020)
Same-sex marriage 5-6	-0.049
	(0.031)
Same-sex marriage >7	-0.057
	(0.037)
Year FE	Yes
State FE	Yes
State*time	No
State*time^2	No
Mean	0.06
Observations	765
R^2	0.656

Note: Estimates are weighted. Standard errors are in parentheses. ***Significant at the 1% level, ** Significant at the 5% level, *Significant at the 10% level.

Appendix 2.2.A

Table 2.2.A1: Data on the year of the introduction of other laws

State	Year discrimination based on gender identity in adoption banned	Year discrimination based on gender identify in employment, housing or public accommodations banned	Year gender marker change on birth certificates allowed	Year the repeal of sodomy laws	Year civil union or domestic partnership
Alabama			1992		
Alaska			2012	1978	
Arizona			2006	2001	
Arkansas			1995	2002	
California	2003	2003	2014	1975	2000
Colorado		2007	2019	1971	2013
Connecticut		2004	2012	1969	2005
Delaware		2013	2017	1972	2012
District of	1977	2006	2013	1993	2002
Florida			2018		
Georgia			2005	1998	
Hawaii		2005	2015	1972	2012
Idaho			2018		
Illinois		2005	2017	1961	2011
Indiana			2006	1976	
Iowa		2007	2004	1976	
Kansas			2019		
Kentucky			2005	1992	
Louisiana			2006		
Maine		2005	2005	1975	2004
Maryland	2019	2014	2006	1999	2008
Massachusetts		2011	2006	2002	
Michigan			2006		
Minnesota		1993	2006	2001	
Mississippi			2006		
Missouri			2006		
Montana			2017	1997	
Nebraska			2005	1977	
Nevada	2015	2011	2006	1993	
New Hampshire		2018	2006	1973	
New Jersey	2019	2007	2013	1978	
New Mexico		2003	2019	1975	
New York	2019	2015	2014	1980	1997
North Carolina			2005		
North Dakota			2005	1973	
Ohio				1972	
Oklahoma					
Oregon	2007	2007	2017	1971	2008
Pennsylvania			2016	1980	
Rhode Island	2015	2001	2005	1998	2011
South Carolina					
South Dakota				1976	
Tennessee				1996	
Texas					
Utah		2015	2004		
Vermont		2007	2011	1977	2000
Virginia			2006		
Washington		2006	2018	1975	2007
West Virginia			2006	1976	
Wisconsin			2006	1983	2009
Wyoming			2005	1977	

Notes: This table shows the year in which each law was introduced in each state. Data for columns 1 to 3 come from the Movement Advancement Project. Data in column 4 come from Kane (2003). Data in column 5 come from Hansen et al. (2020).

Table 2.2.A2: More robustness with different subsamples

Dependent variable: Percentage of homosexual migrants	(1) All (without those states and years in which there is not available information about lesbians or gays)	(2) Men (including all states and years)	(3) Women (including all states and years)	(4) All (without District of Columbia)	(5) Men (without District of Columbia)	(6) Women (without District of Columbia)
Same-sex marriage 1–2	0.021*	0.027*	0.017	0.021*	0.028*	0.017
	(0.011)	(0.015)	(0.014)	(0.011)	(0.015)	(0.014)
Same-sex marriage 3-4	0.064***	0.134***	0.005	0.066***	0.143***	0.005
	(0.017)	(0.022)	(0.022)	(0.017)	(0.024)	(0.022)
Same-sex marriage 5-6	0.032	0.066**	0.005	0.034	0.082**	0.003
	(0.025)	(0.033)	(0.032)	(0.026)	(0.036)	(0.033)
Same-sex marriage >7	0.078***	0.106***	0.062*	0.081***	0.118***	0.062*
	(0.028)	(0.039)	(0.035)	(0.029)	(0.041)	(0.035)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
State*time	No	No	No	No	No	No
State*time^2	No	No	No	No	No	No
Mean	0.06	0.06	0.05	0.06	0.06	0.05
Observations	758	765	765	750	745	748
R^2	0.738	0.740	0.460	0.736	0.739	0.459

Note: Estimate in column 1 does not include those states and years in which there is not available information about lesbian women or gay men. Columns 3 and 4 include those states without lesbian women or gay men, using a value equal to zero in the dependent variable for those states and years. We exclude District of Columbia in columns 4 to 6. Estimates are weighted. Standard errors are in parentheses. ***Significant at the 1% le vel, ** Significant at the 5% level, *Significant at the 10% level.

Table 2.2.A3: The effect of same-sex marriage legalization on the percentage of homosexual migrants controlling for prior patterns

Dependent variable: Percentage of homosexual migrants	(1) All	(2) Men	(3) Women	(4) All	(5) Men	(6) Women	(7) Men	(8) Women
Same-sex marriage legalization (-1)–(-2)	0.017	0.009	0.022					
	(0.011)	(0.015)	(0.014)					
Same-sex marriage 1–2	0.037**	0.035*	0.041**	0.017	-0.002	0.035	0.018	0.019
	(0.015)	(0.021)	(0.020)	(0.024)	(0.033)	(0.028)	(0.015)	(0.014)
Same-sex marriage 3-4	0.086***	0.146***	0.038	0.142***	0.256***	0.043	0.137***	0.010
	(0.022)	(0.030)	(0.028)	(0.035)	(0.049)	(0.041)	(0.023)	(0.022)
Same-sex marriage 5-6	0.058*	0.075*	0.048	0.107*	0.154*	0.075	0.065*	0.039
	(0.031)	(0.042)	(0.038)	(0.058)	(0.080)	(0.068)	(0.034)	(0.032)
Same-sex marriage >7	0.103***	0.103**	0.117***	0.046	0.036	0.059	0.085**	0.004
	(0.036)	(0.050)	(0.044)	(0.081)	(0.113)	(0.095)	(0.040)	(0.035)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State*time	No	No	No	No	No	No	No	No
State*time^2	No	No	No	No	No	No	No	No
Mean	0.05	0.06	0.05	0.06	0.06	0.05	0.06	0.05
Observations	765	760	763	315	313	315	760	763
R^2	0.742	0.755	0.483	0.820	0.837	0.602	0.741	0.458

Notes: Columns 1 to 3 show our baseline estimate but including a dummy variable which takes the value 1 the periods -1 and -2, that is, 1 and 2 years prior to the legalization of the same-sex marriage. We limit the sample to those states that legalized same-sex marriage via a judicial decision in columns 4 to 6. Data come from Hansen et al. (2020). We use the effective date of same-sex legalization in columns 7 and 8. Estimates are weighted. Standard errors are in parentheses. ***Significant at the 1% level, ** Significant at the 5% level, *Significant at the 10% level.

References

Ahmed, A. M., and Hammarstedt, M. (2010). "Sexual orientation and earnings: A register data-based approach to identify homosexuals", *Journal of Population Economics*, 23(3), 835-849.

Allen, B. D., Nunley, J. M., and Seals, A. (2011). "The effect of joint-child-custody legislation on the child-support receipt of single mothers", *Journal of Family and Economic Issues*, 32(1), 124-139.

Badgett, M. L. (1995). "The wage effects of sexual orientation discrimination", *Industrial and Labor Relations Review*, 48(4), 726-739.

Badgett, M. V. (2009). "The economic value of marriage for same-sex couples", *Drake Law Review*, 58, 1081.

Bakens, J., Mulder, P., and Nijkamp, P. (2013). "Economic impacts of cultural diversity in the Netherlands: Productivity, utility, and sorting", *Journal of Regional Science*, 53(1), 8-36.

Beaudin, L. (2017). "Marriage equality and interstate migration", *Applied Economics*, 49(30), 2956-2973.

Becker, G. (1973). "A theory of marriage: Part I", *Journal of Political Economy*, 81(4), 813–846.

Beine, M., and Parsons, C. (2015). "Climatic factors as determinants of international migration", *The Scandinavian Journal of Economics*, 117(2), 723-767.

Bellido, H., and Marcén, M. (2014), "Divorce laws and fertility", *Labour Economics*, 27, 56-70.

Bellido, H. and Marcén, M., and (2015). "Spaniards in the wider World", *MPRA Paper 63966, University Library of Munich, Germany.*

Bellido, H., Marcén, M., and Molina, J.A. (2016). "The effect of culture on fertility behavior of US teen mothers", *Feminist Economics,* 22(3), 101-126.

Belot, M., and Ederveen, S. (2012). "Cultural barriers in migration between OECD countries", *Journal of Population Economics*, 25(3), 1077-1105.

Belot, M. V., and Hatton, T. J. (2012). “Immigrant Selection in the OECD”, *The Scandinavian Journal of Economics*, 114(4), 1105-1128.

Bertoli, S., and Moraga, J. F. H. (2015). “The size of the cliff at the border”, *Regional Science and Urban Economics*, 51, 1-6.

Betts, J. R., and Fairlie, R. W. (2001). “Explaining ethnic, racial, and immigrant differences in private school attendance”, *Journal of Urban Economics,* 50(1), 26-51.

Black, D., Gates, G., Sanders, S., and Taylor, L. (2002). “Why do gay men live in San Francisco?”, *Journal of Urban Economics*, 51(1), 54-76.

Black, D. A., Sanders, S. G., and Taylor, L. J. (2007). “The economics of lesbian and gay families”, *Journal of Economic Perspectives*, 21(2), 53-70.

Bohara, A. K., and Krieg, R. G. (1996). “A zero-inflated Poisson model of migration frequency”, *International Regional Science Review*, 19(3), 211-222.

Borghans, L., and Golsteyn, B. H. (2012). “Job Mobility in Europe, Japan and the United States”, *British Journal of Industrial Relations,* 50(3), 436-456.

Bureau of Labor and Statistics (2018). “labor market activity, education, and partner status among Americans at age 31: results from a longitudinal survey” https://www.bls.gov/news.release/pdf/nlsyth.pdf

Caragliu, A., Del Bo, C., de Groot, H. L., and Linders, G. J. M. (2013). “Cultural determinants of migration”, *The Annals of Regional Science*, 51(1), 7-32.

Carrington, W. J., Detragiache, E., and Vishwanath, T. (1996). “Migration with endogenous moving costs”, *The American Economic Review*, 909-930.

Caselli, F., and Coleman, W. J. (2013). “On the theory of ethnic conflict”, *Journal of the European Economic Association*, 11(1), 161-192.

Chang, S. (2020). “The sex ratio and global sodomy law reform in the post-WWII era”, *Journal of Population Economics*, 1-30, https://doi.org/10.1007/s00148-020-00773-7

Clain, S. H., and Leppel, K. (2001). “An investigation into sexual orientation discrimination as an explanation for wage differences”, *Applied Economics*, 33(1), 37-47.

Collier, P., and Hoeffler, A. (2018). “Migration, Diasporas and Culture: An Empirical Investigation”, *Kyklos*, 71(1), 86-109.

Contreras, D. and Plaza, G. (2010). “Cultural factors in women’s labor force participation in Chile”, *Feminist Economics,* 16(2), 27-46.

Davies, P. S., Greenwood, M. J., and Li, H. (2001). “A conditional logit approach to US state-to-state migration”, *Journal of Regional Science*, 41(2), 337-360.

Del Boca, D., and Ribero, R. (1998). “Transfers in non-intact households”, *Structural Change and Economic Dynamics*, 9(4), 469-478.

Dillender, M. (2014). “The death of marriage? The effects of new forms of legal recognition on marriage rates in the United States”, *Demography*, 51(2), 563-585.

Drewianka, S. (2008). “Divorce law and family formation”, *Journal of Population Economics*, 21(2), 485-503.

Drydakis, N. (2011). “Women's sexual orientation and labor market outcomes in Greece”, *Feminist Economics*, 17(1), 89-117.

Drydakis, N. (2012). “Sexual orientation and labour relations: new evidence from Athens, Greece”, *Applied Economics*, 44(20), 2653-2665.

Drydakis, N. (2019). “Sexual orientation and labor market outcomes”, IZA World of Labor, doi: 10.15185/izawol.111.v2

Dustmann, C., and Görlach, J. S. (2015). “Selective out-migration and the estimation of immigrants’ earnings profiles”, In *Handbook of the Economics of International Migration* (Vol. 1, pp. 489-533). North-Holland.

Enchautegui, M. E. (1997). “Welfare Payments and Other Economic Determinants of Female Migration”, *Journal of Labor Economics*, 15 (3): 529–554, doi:10.1086/209871

Epstein, G. S., and Gang, I. N. (2010). “Migration and Culture”, *In Gil S. Epstein, and Ira N. Gang (Eds),* Migration and Culture: Frontiers of Economics and Globalization, volume 8, 1-21, Emerald Group Publishing Limited.

Eugster, B., Lalive, R., Steinhauer, A., and Zweimüller, J. (2017). “Culture, Work Attitudes, and Job Search: Evidence from the Swiss Language Border”*, Journal of the European Economic Association,* 15(5), *1056-1100.*

Fernández, R. (2007). “Women, work, and culture”, *Journal of the European Economic Association,* 5(2-3), 305-332.

Fernández, R. (2011). “Does culture matter?”, *Handbook of Social Economics*, edited by Jess, Benhabib, Bisin, and Jackson, vol. 1A. North-Holland, 481-510.

Fernández, R. and Fogli, A. (2006). “Fertility: the role of culture and family experience”, *Journal of the European Economic Association,* 4(2–3), 552-561.

Fernández, R. and Fogli, A. (2009). “Culture: an empirical investigation of beliefs, work, and fertility”, *American Economic Journal: Macroeconomics,* 1(1), 146- 177.

Fiva, J. H. (2009). “Does Welfare Policy Affect Residential Choices? An Empirical Investigation Accounting for Policy Endogeneity”, *Journal of Public Economics* 93, 529-540.

Florida, R. (2002). “Bohemia and economic geography”, *Journal of Economic Geography*, 2(1), 55-71.

Francis, A. M., Mialon, H. M., and Peng, H. (2012). “In sickness and in health: Same-sex marriage laws and sexually transmitted infections”, *Social Science and Medicine*, 75(8), 1329-1341.

Friedberg, L. (1998). “Did unilateral divorce raise divorce rates? Evidence from panel data”, *The American Economic Review*, 88(3), 608-627.

Furtado, D., Marcén, M., and Sevilla, A. (2013). “Does culture affect divorce? Evidence from European immigrants in the United States”, *Demography,* 50(3), 1013-1038.

Gelbach, J. B. (2004). “Migration, the life cycle, and state benefits: How low is the bottom?”, *Journal of Political Economy*, 112(5), 1091-1130.

Gerstmann, E. (2017). “Same-Sex Marriage and the Constitution”. In Same-Sex Marriage and the Constitution (pp. I-Ii). Cambridge: Cambridge University Press.

Giuliano, P. (2007). “Living arrangements in western Europe: Does cultural origin matter?”, *Journal of the European Economic Association*, 5(5), 927-952.

Giuliano, P. (2016). “Review of cultural evolution: society, technology, language, and religion”, *Journal of Economic Literature,* 54(2), 522-533.

Gius, M. (2011). “The effect of income taxes on interstate migration: an analysis by age and race”, *The Annals of Regional Science*, 46(1), 205-218.

González-Val, R. and Marcén, M. (2012). “Unilateral divorce versus child custody and child support in the U.S.”, *Journal of Economic Behavior & Organization*, 81(2), 613-643.

Goodridge v. Department of Public Health 440 Mass. 309, 798 N.E. 2d 941 (2003).

Greene, W. H. (2011). “Econometric Analysis”, 7th Edition. Upper Saddle River, NJ: Prentice Hall.

Greenwood, M. J. (1997). “Internal migration in developed countries”, *Handbook of Population and Family Economics*, 1, 647-720.

Greenwood, M. J. (2016). “Perspectives on Migration Theory – Economics”, In: White M. (eds) International Handbook of Migration and Population Distribution. International Handbooks of Population, vol 6. Springer, Dordrecht

Grossbard, S., and Jepsen, L. K. (2008). “The economics of gay and lesbian couples: Introduction to a special issue on gay and lesbian households”, *Review of Economics of the Household*, 6(4), 311-325.

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

Gurak, D. T., and Kritz, M. M. (2000). “The interstate migration of US immigrants: Individual and contextual determinants”, *Social Forces*, 78(3), 1017-1039.

Halla, M. (2013). “The effect of joint custody on family outcomes”, *Journal of the European Economic Association*, 11(2), 278-315.

Hamermesh, D. S., and Delhommer, S. (2020). “Same-Sex Couples and the Marital Surplus: The Importance of the Legal Environment”, (No. w26875). National Bureau of Economic Research.

Hansen, M. E., Martell, M. E., and Roncolato, L. (2020). “A labor of love: The impact of same-sex marriage on labor supply”, *Review of Economics of the Household*, 18, 265-283.

Hatzenbuehler, M. L., O'Cleirigh, C., Grasso, C., Mayer, K., Safren, S., and Bradford, J. (2012). "Effect of same-sex marriage laws on health care use and expenditures in sexual minority men: a quasi-natural experiment", *American Journal of Public Health*, 102(2), 285-291.

Holm, A., Ejrnæs, M., and Karlson, K. (2015). "Comparing linear probability model coefficients across groups", *Quality & Quantity*, 49(5), 1823-1834.

ILGA World, (2019). "International Lesbian, Gay, Bisexual, Trans and Intersex Association: Lucas Ramon Mendos", *State-Sponsored Homophobia*, Geneva.

Kane, M. (2003). "Social movement policy success: Decriminalizing state sodomy laws, 1969–1998", *Mobilization: An International Quarterly*, 8(3), 313-334.

Karemera, D., Oguledo, V. I., and Davis, B. (2000). "A gravity model analysis of international migration to North America", *Applied Economics*, 32(13), 1745-1755.

Klawitter, M. (2015). "Meta-analysis of the effects of sexual orientation on earnings", *Industrial Relations: A Journal of Economy and Society*, 54(1), 4-32.

Langbein, L., and Yost, M. A. (2009). "Same-sex marriage and negative externalities", *Social Science Quarterly*, 90(2), 292-308.

Lee, E. S. (1966). "A theory of migration", *Demography*, 3(1), 47-57.

Leo, T. W. (2008). "From Maternal Preference to Joint Custody: The Impact of Changes in Custody Law on Child Educational Attainment", *Working Paper.*

Long, L., Tucker, C. J., and Urton, W. L. (1988). "Migration distances: An international comparison", *Demography*, 25(4), 633-640.

Lucas, R. E. (2001). "The effects of proximity and transportation on developing country population migrations", *Journal of Economic Geography*, 1(3), 323-339.

Marcén, M. (2014). "The role of culture on self-employment", *Economic Modelling,* 44(1), s20-s32.

Marcén, M., Molina, J. A., and Morales, M. (2018). "The effect of culture on the fertility decisions of immigrant women in the United States", *Economic Modelling,* 70, 15-28.

Marcén, M., and Morales, M. (2019). "Live together: Does culture matter?", *Review of Economics of the Household*, 17, 671–713, DOI: 10.1007/s11150-018-9431-3.

Marcén, M., and Morales, M. (2020). “The effect of culture on home-ownership”, *Journal of Regional Science*, 60 (1), 56-87, DOI: 10.1111/jors.12433

Marschak, J. (1960). “Binary choice constraints on random utility indications”, In K. Arrow Ed.), *Stanford symposium on mathematical methods in the social sciences* (pp. 312–322). Stanford: Stanford University Press.

Mayda, A. M. (2010). “International migration: A panel data analysis of the determinants of bilateral flows”, *Journal of Population Economics*, 23(4), 1249-1274.

McKinnish, T. (2005). “Importing the poor welfare magnetism and cross-border welfare migration”, *Journal of Human Resources*, 40(1), 57-76.

McKinnish, T. (2007). “Welfare-induced migration at state borders: New evidence from micro-data”, *Journal of Public Economics*, 91(3), 437-450.

Minnesota Population Center (2018). *Integrated Public Use Microdata Series, International: Version 7.1* [dataset]. Minneapolis, MN: University of Minnesota. https://doi.org/10.18128/D020.V7.1

Morrison, A. R., Schiff, M., and Sjöblom, M. (2007). “The international migration of women”, Washington, DC: World Bank and Palgrave Macmillan.

Movement Advancement Project (2019), “Non-Discrimination Laws.” https://www.lgbtmap.org/equality-maps/non_discrimination_laws

Munshi, K. (2003). “Networks in the modern economy: Mexican migrants in the US labor market”, *The Quarterly Journal of Economics*, 118(2), 549-599.

Negrusa, B., and Oreffice, S. (2011). “Sexual orientation and household financial decisions: evidence from couples in the United States”, *Review of Economics of the Household*, 9(4), 445.

Nowotny, K., and Pennerstorfer, D. (2019). “Network migration: do neighbouring regions matter?”, *Regional Studies,* 53(1), 107-117.

Nunley, J. M., and Seals, R. A. (2011). “Child-custody reform, marital investment in children, and the labor supply of married mothers”, *Labour Economics*, 18(1), 14-24.

Obergefell vs. Hodges, 576 U.S. (no. 14-556), 2015 WL 2473451

Ocobock, A. (2013). “The power and limits of marriage: Married gay men's family relationships”, *Journal of Marriage and Family*, 75(1), 191-205.

Olfert, M. R., and Partridge, M. (2011). “Creating the cultural community: ethnic diversity vs. agglomeration”, *Spatial Economic Analysis*, 6(1), 25-55.

Organization for Economic Cooperation and Development. Revenue Statistics of OECD Member Countries 2000-2015. magnetic tape, Organization for Economic Cooperation and Development, Paris.

Ortega, F., and Peri, G. (2009). “The Causes and Effects of International Migrations: Evidence from OECD Countries 1980-2005”, Working Paper No. 09.6, Department of Economics, University of California, USA.

Ortega, F., and Peri, G. (2013), “The Role of Income and Immigration Policies in Attracting International Migrants”, *Migration Studies*, 1, 47-74.

Ottaviano, G. I., and Peri, G. (2006). “The economic value of cultural diversity: evidence from US cities”, *Journal of Economic Geography*, 6(1), 9-44.

Patacchini, E., Ragusa, G., and Zenou, Y. (2015), “Unexplored dimensions of discrimination in Europe: Homosexuality and physical appearance”, *Journal of Population Economics*, 28(4), 1045-1073.

Pedersen, P. J., Pytlikova, M., and Smith, N. (2008). “Selection and network effects—Migration flows into OECD countries 1990–2000”, *European Economic Review*, 52(7), 1160-1186.

Pinello, D. R. (2016). “America's War on Same-sex Couples and Their Families: And how the Courts Rescued Them”. Cambridge: Cambridge University Press. doi:10.1017/CBO9781316402351

Plug, E., and Berkhout, P. (2004). “Effects of sexual preferences on earnings in the Netherlands”, *Journal of Population Economics*, 17(1), 117-131.

Ramos, R. (2016). Gravity models: a tool for migration analysis. *IZA World of Labor,* 239, 1-10.

Rogers, A., and Raymer, J. (1998). “The spatial focus of US interstate migration flows”, *Population, Space and Place*, *4*(1), 63-80.

Ruggles, S., Genadek, K., Goeken, R., Grover, J., and Sobek, M. (2018). *Integrated Public Use Microdata Series: Version 7.0 [Machine-readable database]*. Minneapolis: University of Minnesota. https://doi.org/10.18128/D010.V8.0

Schwartz, A. (1973). “Interpreting the effect of distance on migration”, *Journal of Political Economy*, 81(5), 1153-1169.

Stevenson, B., and Wolfers, J. (2006). “Bargaining in the shadow of the law: Divorce laws and family distress”, *The Quarterly Journal of Economics*, 121(1), 267-288.

Trandafir, M. (2015). “Legal recognition of same-sex couples and family formation”, *Demography*, 52(1), 113-151.

Vossen, D., Sternberg, R. and Alfken, C. (2019) “Internal migration of the “creative class” in Germany”, *Regional Studies*, 53 (10), 1359-1370.

Wang, Z., De Graaff, T., and Nijkamp, P. (2016). “Cultural diversity and cultural distance as choice determinants of migration destination”, *Spatial Economic Analysis*, 11(2), 176-200.

Ward, C. (2009). “Acculturation and social cohesion: Emerging issues for Asian immigrants in New Zealand”, In C.-H. Leong, & J. W. Berry (Eds.), Intercultural relations in Asia: Migration and work effectiveness (pp. 3–24). Singapore: World Scientific.

White, R., and Buehler, D. (2018). “A closer look at the determinants of international migration: decomposing cultural distance”, *Applied Economics*, 50(33), 3575-3595.

Wolfers, J., 2006. “Did unilateral divorce laws raise divorce rates? A reconciliation and new results”, *The American Economic Review*, 96(5), 1802–1820.

Supplementary Analysis

An analysis of the migration by country of origin in Aragón

Introduction

In line with the prior chapter, the aim of this section is to analyze the relationship between the cultural distances and migration flows for the specific case of Aragón. The study of migration patterns in Aragón or other Spanish regions has captured the attention of prior scholars. Some of them have explored patterns in immigration from specific countries, such as Morocco, into Spain (Bodega et al., 1995) and others have focused on interregional migration within Aragón (Pinilla at al., 2008). We contribute with this literature by focusing on cultural distance as one possible factor driving migration flows in Aragón.

In our empirical strategy, we merge data on the proportion of immigrants in Aragón by country of origin with the six Hofstede cultural dimensions. Our results suggest that the lower the cultural distance between a country and Spain, the higher is the proportion of immigrants in Aragón from that country.

Data

We use data on the number immigrants in Aragón by country of origin from 2010 to 2019, provided by the Spanish Statistical Institute. Thus, the selected data covers one receiving region, Aragón, and 95 countries of origin. On average, there are around 153,000 immigrants in Aragón.

Once we have information on the number of immigrants by country of origin in Aragón, we merge it with different cultural measures. We use data on the six Hofstede cultural dimensions which can get a good overview of the deep drivers of each countries culture relative to the Spanish culture. Hofstede developed a model that identifies six dimensions to assist in differentiating cultures: Power Distance, Individualism, Masculinity, and Uncertainty Avoidance. From the initial results Hofstede identified four (Hofstede, 1984) and later five dimensions (Hofstede et al., 1990), and finally a sixth dimension was added (Hofstede et al., 2010). Data at country level are publicly available at Hofstede Insights.[136]

[136] https://www.hofstede-insights.com/product/compare-countries/

Individualism (versus collectivism) is related to the integration of individuals into primary groups. In individualist societies everyone is supposed to take care of him/herself and the personal opinion prevails over social norms. On the other hand, in collectivist societies people are raised in extended families or ethnic communities which protect them in exchange for loyalty. With a score of 51, Spain is a collectivist country in comparison with the rest of the European countries.

Power Distance is defined as the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally. Then, a high score means that people accept a hierarchical society without the need of justification. According to data (ref) Spanish people seems to accept a hierarchical order which reflect the inherence of inequalities. Spain's score on this dimension is 57.

Masculinity (versus Femininity) is related to the division of emotional roles between women and men. A high score on this dimension indicates that a society is driven by competition, achievement and success, and there is a high emotional and social role differentiation between the genders. Work prevails over family and fathers deal with facts while mothers with feelings. Spain scores 42 on this dimension. It does not seem to define Spain very clearly. Excessive competitiveness is not appreciated. Spanish children are educated in search of harmony and people focus on managing through discussion and consensus.

Uncertainty Avoidance is related to the level of stress in a society in the face of an unknown future. It is defined as the extent to which the members of a culture feel threatened by ambiguous or unknown situations and have created beliefs and institutions that try to avoid these. In those countries showing a high score in this dimension there is great concern for changing and ambiguous situations. This is the case of Spain, which is clearly classified as an Uncertainty Avoidance country, as is reflected in a high score of 86. Since changes causes stress to Spanish people, they prefer following rules for everything.

Long Term Orientation (versus Short Term) deals with people' choice between the future or the present and past. Societies with a high score encourage thrift for future investments, including education as a way to prepare for the future. Normative societies, which score low on this dimension, on the other hand, prefer to follow traditions and norms and people are typically religious and nationalistic. Despite an intermediate score of 48, Spain is a normative country. Spanish people think that most important events in life take place now and they do not have a great concern about the future.

Indulgence (versus restraint) is related with happiness research. Indulgence societies people get gratification of basic and natural human desires related to enjoying life and having fun. Societies with a low score, such as Spain (44) are restraint societies which regulate it by means of strict social norms. They tend to be pessimistic.

Thus, Spain seems to be a non-individualistic and non-indulgence country where uncertainty avoidance and power distance are present. The intermediate scores on masculinity and long-term orientation point to unclear conclusions in those dimensions.

Supplementary Table 2.1 presents the summary statistics for the main variables by country of origin. The first column shows large variations in the percentage of immigrants by origin. As can be seen the higher percentage are found among those from Morocco and Romania. data also reveal several differences on the cultural dimensions by country of origin presented in the rest of columns. By simply comparing the columns, we can see that the higher proportion of immigrants are found among those from Morocco and Romania which seem to keep quite cultural similitudes with Spain. A Spain, both countries show low scores is individualism and indulgence, high scores in uncertainty avoidance and power distance and intermediate scores in masculinity. Regarding the long-term orientation, while Romania presents an intermediate score, Morocco is clearly defined as a short-term orientation country.

Empirical strategy

As we explain above, in our empirical strategy we use the six Hofstede cultural dimensions as our measures of cultural distance. If there is a relationship between the cultural distance (between sending countries and Aragón) and the migration flows in Aragón, we would expect to find that the higher the cultural similitudes between a country and Aragón, the higher the migration flows from that country to Aragón.[137] To test this issue, we estimate the following model:

$$Y_{it} = \beta_0 + \beta_1 Hofstede\ Cultural\ Dimensions_i + \delta_i + \theta_t + \varepsilon_{it} \qquad (1)$$

Where Y_{ik} is the proportion of individuals migrating from the country *i* to Aragón in the year *t*. Our main explanatory variable varies depending on the measure of culture: Power Distance, Individualism, Masculinity, and Uncertainty Avoidance. We include continent of origin- and year-fixed effects to account for evolving unobserved attributes

[137]Since Hofstede dimensions are only available at country level, we use Spain values on those dimensions as indicators of culture in Aragón.

varying at the origin level and over time. According to the cultural values obtained for Spain in those dimensions, since Aragón is defined as a non-individualistic (collectivist) and non-indulgence (restraint) society, we should expect a negative relationship between individualistic and indulgence countries and the migration flows coming from those countries to Aragón. Then, we would expect β_1 to be negative when using those cultural dimensions. Similarly, we should find that immigrants from countries with high scores in uncertainty avoidance and power distance are less likely to migrate to Aragón. Then, in case of using those measures of culture, we would expect β_1 to be positive.

Results

Supplementary Table 2.2 provides the coefficient estimates from a simple linear regression of the country-level cultural indicators on the proportion of immigrants moving to Aragón. As can be seen, in all estimates using a cultural dimension in which Aragón is clearly classified we find the expected significant relationship. In column 1, we observe that the more individualistic is a country, the lower is the proportion of immigrants from that country in Aragón. Results in column 2 suggest that higher scores in the uncertainty avoidance dimension in a country are associated with a higher flow of immigrants to Aragón. No statistically significant relationship appears to be found when using masculinity and long-term orientation (see columns 3 and 4). In column 5, we find that those countries defined as indulgence societies are also those migrating to Aragón in a high proportion. Finally, the higher the scores on the power distance dimension, the higher the proportion of immigrants from that origin in Aragón. All in all, our results suggest that having cultural similitudes between a country and Aragón is positively related with the proportion of immigrants from that country in Aragón.

Conclusions

In this part of the chapter, we extend our work to the study of the relationship between cultural differences across countries and the location decisions of migrants, for the specific case of Aragón. We use data on the proportion of immigrants by country of origin from 2010 to 2019, provided by the Spanish National Institute. Merging migration data with the six Hofstede cultural dimensions, we analyze whether the proportion of immigrants from each country of origin is positively related with the cultural similitudes between each of those countries and Aragón. In line with the previous results at international level, our simple liar regressions show a negative and statistically significant relationship between the cultural distances and migration flows in Aragón. Our results shed some light on one of the possible determinants driven the patterns of migration flows in Aragón

References

Bodega, I., Cebrian, J. A., Franchini, T., Lora-Tamayo, G., and Martin-Lou, A. (1995). “Recent migrations from Morocco to Spain”, International Migration Review, 29(3), 800-819.

Hofstede, G. (1984). “Cultural dimensions in management and planning”, Asia Pacific journal of management, 1(2), 81-99. 13

Hofstede, G., Neuijen, B., Ohayv, D. D., and Sanders, G. 1990. “Measuring organizational cultures: A qualitative and quantitative study across twenty cases”, Administrative Science Quarterly, 35(2): 286–316.

Hofstede, G., Hofstede, G.J. and Minkov, M. (2010). Cultures and Organizations: Software of the Mind, revised and expanded 3rd ed., McGraw-Hill, New York, NY.

INE (2010/2019), Spanish Statistical Institute, Madrid, available at: https://www.ine.es/jaxi/Tabla.htm?path=/t20/e245/p08/l0/&file=02005.px&L=0 resultados&secc=1254736194824&idp=1254735976608

Pinilla, V., Ayuda, M. I., and Sáez, L. A. (2008), “Rural depopulation and the migration turnaround in Mediterranean Western Europe: a case study of Aragon”, Journal of Rural and Community Development, 3(1).

Supplementary Table 2.1: Summary statistics

Country of origin	Percentage of migrants	Individualism Index	Uncertainty Avoidance Index	Masculinity Index	Long-Term Orientation Index	Indulgence Index	Power Distance Index
Malta	0.0004	59	96	47	47	66	56
Saudi Arabia	0.0008	25	80	60	36	52	95
Iceland	0.0013	60	50	10	28	67	30
Macedonia	0.0014	22	87	45	62	35	90
Luxembourg	0.0016	60	70	50	64	56	40
Ethiopia	0.0049	20	55	65	-	46	70
New Zealand	0.0051	79	49	58	33	75	22
Liberia	0.0055	38	68	52	23	34	80
Indonesia	0.0064	14	48	46	62	38	78
Estonia	0.0076	60	60	30	82	16	40
Nepal	0.0077	30	40	40	-	-	65
South Africa	0.0083	65	49	63	34	63	49
Israel	0.0088	54	81	47	38	-	13
Sierra Leone	0.0098	20	50	40	-	-	70
Iraq	0.0100	30	85	70	25	17	95
Thailand	0.0111	20	64	34	32	45	64
Kazakhstan	0.0118	20	88	50	85	22	88
Iran	0.0118	41	59	43	14	40	58
Croatia	0.0138	33	80	40	58	33	73
Lebanon	0.0140	40	50	65	14	25	75
Bangladesh	0.0147	20	60	55	47	20	80
Australia	0.0154	90	51	61	21	71	38
Norway	0.0163	69	50	8	35	55	31
Jordan	0.0177	30	65	45	16	43	70
Korea	0.0177	18	85	39	100	29	60

Supplementary Table 2.1 continued

Vietnam	0.0180	20	30	40	57	35	70
Slovenia	0.0193	27	88	19	49	48	71
Finland	0.0193	63	59	26	38	57	33
Bosnia and	0.0218	22	87	48	70	44	90
Canada	0.0238	80	48	52	36	68	39
Denmark	0.0270	74	23	16	35	70	18
Kenya	0.0275	25	50	60	-	-	70
Angola	0.0287	18	60	20	15	83	83
Japan	0.0332	46	92	95	88	42	54
Costa Rica	0.0339	15	86	21	-	-	35
Albania	0.0356	20	70	80	61	15	90
Philippines	0.0356	32	44	64	27	42	94
Serbia and	0.0360	25	92	43	52	28	86
Sweden	0.0372	71	29	5	53	78	31
Panama	0.0381	11	86	44	-	-	95
Greece	0.0387	35	100	57	45	50	60
Austria	0.0390	55	70	79	60	63	11
Latvia	0.0405	70	63	9	69	13	44
Switzerland	0.0435	68	58	70	74	66	34
Turkey	0.0437	37	85	45	46	49	66
Georgia	0.0493	41	85	55	38	32	65
Tunisia	0.0531	40	75	40	-	-	70
Ireland	0.0598	70	35	68	24	65	28
Belarus	0.0634	25	95	20	81	15	95
Syria	0.0681	35	60	52	30		80
Burkina Faso	0.0719	15	55	50	27	18	70
Guatemala	0.0720	6	98	37	-	-	95
Slovakia	0.0782	52	51	100	77	28	100

Supplementary Table 2.1 continued

Armenia	0.0800	22	88	50	61	25	85
Hungary	0.0849	80	82	88	58	31	46
Egypt	0.0882	25	80	45	7	4	70
India	0.1029	48	40	56	51	26	77
Czech Republic	0.1070	58	74	57	70	29	57
Belgium	0.1272	75	94	54	82	57	65
Paraguay	0.2236	12	85	40	20	56	70
Cape Verde	0.2335	20	40	15	12	83	75
Moldova	0.2337	27	95	39	71	19	90
El Salvador	0.2342	19	94	40	20	89	66
Lithuania	0.2464	60	65	19	82	16	42
Mexico	0.2481	30	82	69	24	97	81
Uruguay	0.2730	36	98	38	26	53	61
Netherlands	0.2747	80	53	14	67	68	38
United States	0.3045	91	46	62	26	68	40
Chile	0.3696	23	86	28	31	68	63
Germany	0.4338	67	65	66	83	40	35
Bolivia	0.4756	10	87	42	25	46	78
United Kingdom	0.5108	89	35	66	51	69	35
Russia	0.5302	39	95	36	81	20	93
Nigeria	0.5557	30	55	60	13	84	80
Venezuela	0.6896	12	76	73	16	100	81
Honduras	0.6927	20	50	40	-	-	80
Argentina	0.8530	46	86	56	20	62	49
France	1.0134	71	86	43	63	48	68
Italy	1.0828	76	75	70	61	30	50
Peru	1.1168	16	87	42	25	46	64
Pakistan	1.1808	14	70	50	50	0	55

Supplementary Table 2.1 continued

Ghana	1.1893	15	65	40	4	72	80
Brazil	1.2093	38	76	49	44	59	69
Ukraine	1.3960	25	95	27	86	14	92
Dominican	1.5552	30	45	65	13	54	65
Poland	1.9648	60	93	64	38	29	68
Portugal	2.0076	27	99	31	28	33	63
Senegal	2.1745	25	55	45	25	-	70
Algeria	3.3716	35	70	35	26	32	80
Colombia	3.4225	13	80	64	13	83	67
China	3.4444	20	30	66	87	24	80
Bulgaria	3.5000	30	85	40	69	16	70
Ecuador	3.8982	8	67	63	-	-	78
Morocco	12.3087	46	68	53	14	25	70
Romania	36.6814	30	90	42	52	20	90

Notes: The sample contains 95 different countries of origin. Data on migration comes from the Spanish Statistical Institute. Data on cultural dimensions at country level are publicly available at Hofstede Insights.

Supplementary Table 2.2: Main results

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Percentage of migrants	Percentage of migrants	Percentage of migrants	Percentage of migrants	Percentage of migrants	Percentage of migrants
Individualism	-0.049***					
	(0.008)					
Uncertainty		0.028***				
Avoidance		(0.007)				
Masculinity			0.002			
			(0.007)			
Long-Term				-0.005		
Orientation				(0.008)		
Indulgence					-0.047***	
					(0.008)	
Power						0.051***
Distance						(0.007)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	950	950	950	850	830	950
R-squared	0.066	0.047	0.031	0.034	0.074	0.086

Notes: The variation in the sample size in columns 4 to 6 is due to the no available data for all Hofstede's indexes for all countries. Robust standard errors, clustered by region, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Chapter 3

“Gender Stereotyping in Sports”

Chapter 3 has been recently presented in the 2021 American Economic Association Annual Meeting (AEA/ASSA).

The Supplementary Analysis has been partly published in:

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3.1. Introduction

Gender differences in academic achievement have dramatically reversed in the last decades. For example, in the United States whereas in the 1960s there were 1.6 men for every woman graduating from four-year colleges, there are now 1.35 women for every man (Goldin et al., 2006). Yet there still remain important gender differences in educational attainment that seem to be persistent over time. For example, girls continue to perform relatively worse than boys in math tests, particularly at the top of the ability distribution (Guiso et al., 2008; Fryer and Levitt, 2010; Pope and Sydnor, 2010). A much lesser understood phenomenon is how the practice of sports while in high school differs by gender. The economic literature has documented positive causal effects on later-life economic outcomes from the participation in sports during high school (Stevenson, 2010). Beyond the direct physiological benefits, foster the acquisition of important skills such as the ability to cooperate, compete, and team work, which are likely to be valued in the market later on. This paper contributes to the literature of gender differences in academic attainment by putting together several sources of data going back several decades to investigate how gender stereotypes and parental time investments shape sport choices of boys and girls during high school.

Following the passage of Title IX in 1972, which required schools to provide equal access to all sport activities by 1978, the number of high-school girls participating in sports as a percentage of female high-school enrollment increased ten-fold from close to 3 in 100 girls in 1972 to almost 30 in 100 girls in 1978 (Stevenson, 2007). However, the increase in female participation in sports was not homogeneous across all sports. Although the legislation did not make any stipulation as to the type of sports to be taken on by girls, girls stayed away from highly popular male-dominated sports such as football and baseball, and instead new sports emerged such as softball and volleyball that rapidly became female-dominated. At the same time, the number of boys participating in less popular sports such as field hockey and gymnastic dramatically dropped following the sharp rise in participation by girls (Stevenson, 2007).

Using data from the 2002-2019 National Federation of State High School Association, which provides information for every state on the total number of high school participants by gender in each sport, we construct a Gender Stereotype Defier (GSD) sports index to capture the share of boys and girls practicing sports dominated by the opposite sex in each state. Whereas the ratio of girls to boys is relatively constant over this period time, with about 7 girls for every 10 boys playing sports, the GSD sports index reveals a high degree of specialization in the choice of sport by gender. The average of the GSD sports index is far from 1 at a value of 0.027, indicating that athletes of a given gender are 37 times more likely to play a sport dominated by their own gender than are athletes from the opposite gender.

We also document that despite large cross-state differences in the GSD sports index, the rates at which boys and girls participate in a sport that is dominated by the opposite sex remains quite persistent over time. It is possible that physical capabilities between boys and girls, which have been shown to emerge at the age of 12, could explain the lack of convergence across states over this period (McKay et al., 2017). However, physical innate abilities between boys and girls should be the same regardless of the state, and thus seem unlikely to be able to explain the large cross-state variation in the GSD sports index documented here. Additionally, given the fact that girls and boys compete against athletes of the same sex, it is very unlikely that comparative advantage considerations in physical abilities can drive the gendered pattern in sports choice documented here.

Using several questions from the 1972-2018 General Social Survey (GSS) on attitudes towards women, indicators on the status of women in society from the Institute for Women's Policy Research (IWPR) for the period 1989-2006, as well as labor and non-labor market outcomes from the 2002-2018 American Community Survey (ACS) and the 2002-2018 Current Population Survey (CPS), we document that states with more gender-equal norms and where the relative position of women is relatively better are also states where boys and girls tend to break stereotypes in sport choices.

We also identify parental time investments as being an important cultural-transmission mechanism through which gender stereotypical patterns in the choice of sports across US states are maintained. We use the 2003-2018 America Time Use survey, which records detailed information on individuals' activities for 24-hour of the previous day. A particular advantage of the ATUS over other time diary surveys is that parents record the time they spend with each child in the household. Using a siblings fixed-effect estimation strategy, we document that fathers living in states with a higher GSD sports index spend more time with daughters (relative to sons) than fathers living in states with a lower GSD sports index. This is particularly so for time spent in recreational childcare, which includes playing sports with children as well as attending events. This type of childcare is particularly important during middle childhood as children's lives extend beyond the family to include peers, when parent's role in arranging for human-capital enhancing extracurricular academic, recreational, and social activities become more important (Kalil, 2012).

This paper is organized as followed. Section 3.2 presents variation in the GSD sports index across states. Section 3.3 presents the correlation between the GSD sports index with subjective and objective indicators of the position of women in society. Section 3.4 looks at parental time investments as a driving cultural-transmission mechanism in sport choice. Section 3.5 concludes.

3.2. Gender Stereotype Defier (GSD) Sports Index

We use publicly available data from the 2002/2003 to 2018/2019 academic years from the National Federation of State High School Associations (NFHS), which collects and publishes on-line information on the number of players in each sport by gender for each state over time.[138] Each of their 51 member state associations (50 states plus District of Columbia) is responsible for gathering information on high school sports from individual schools, covering about 80 per cent of the total students enrolled in high school in the U.S. Our sample consists of 128,294,593 high school students, about three million girls and four and a half million boys playing 91 sports across 19,500 schools over this period.[139]

For each state, we construct a GSD sports index that captures the relative share of girls doing male-dominated sports and the relative share of boys doing female-dominated sports, as follows:

$$GSD_j = \left[\sum_k^{m,f} GSD_j^k\right]/2 \qquad (1)$$

[138] https://members.nfhs.org/participation_statistics

[139] Sports listed by the NFHS are Adapted Basketball, Adapted Bocce (Indoor), Adapted Bowling, Adapted Floor Hockey, Adapted Football, Adapted Soccer, Adapted Softball, Adapted Track, Adapted Volleyball, Adaptive Corn Toss, Adaptive Golf, Adaptive Handball, Adaptive Strength Training, Adaptive Tennis, Air Riflery, Archery, Badminton, Baseball, Basketball, Bass Fishing, Beach Volleyball, Bocce (Outdoor), Bowling, Canoe Paddling, Canoeing, Competitive Spirit Squad (Boys who cheer/Girls who cheer), Crew, Cross Country, Cycling, Dance, High Kick, Jazz, Dance/Drill, Decathlon, Drill Team, Equestrian, Fencing, Field Hockey, Figure Skating, Flag Football, Football (11 player), Football (6 player), Football (8 player), Football (9 player), Golf, Gymnastics, Heptathlon, Ice Hockey, Judo, Kayaking, Lacrosse, Martial Arts, Mixed 6-Coed Volleyball, Mt. Biking, Native Youth Olympics, None, Outrigger Canoe Paddling LL, Pentathlon, Rugby, Riflery, Rock, Climbing, Rodeo, Roller Hockey, Rhythmic Gymnastics, Sand Volleyball, Skiing (Alpine), Skiing (Cross Country), Snowboarding, Soccer, Soft Tennis, Softball (Fast Pitch), Softball (Slow Pitch), Squash, Surfing, Swimming and Diving, Synchronized Swimming, Team Tennis, Tennis, Track and Field (Indoor), Track and Field (Outdoor), Trap Shooting, Ultimate Frisbee, Unified Basketball, Unified Flag Football, Unified Track and Field (Outdoor), Volleyball, Water Polo, Weight Lifting, Wrestling, Sailing, Other.

where *j* refers to state, *i* refers to the individual, *k* refers to either male-dominated (*m*) or female-dominated sport (*f*). We consider a sport to be female-dominated if over the analyzed period the proportion of girls playing a sport (over all the players in that sport) is over 80 per cent, and male-dominated if the proportion of boys playing a sport (over all the players in that sport) is over 80 per cent. We choose a national cut-off of 80 per cent as a conservative threshold, and our results are robust to more conservative thresholds of 70 per cent and 60 per cent (See Tables 3.A1 and 3.A2). Considering a national-level cut-off, as opposed to state-level thresholds makes sense since professional leagues are national labor markets. Out of the 91 sports listed by the NFHS over this period, there are 15 female-dominated sports (dance, dance team (high kick), dance team (jazz), dance/drill, field hockey, cheer leader, drill team, equestrian, figure skating, flag football, gymnastics, synchronized swimming, volleyball, heptathlon and softball), and 11 male-dominated sports (American football (6, 8, 9 or 11 players), baseball, rugby, bass fishing, ice hockey, adaptive golf, native youth Olympics and wrestling).

For each state, GSD_j^m is constructed as follows:

$$GSD_j^m = \left(\frac{\frac{\sum_{i=1}^{NF_j} I_{i,j}^m}{NF_j}}{\frac{\sum_{i=1}^{NM_j} I_{i,j}^m}{NM_j}} \right) \qquad (2)$$

where NF_j and NM_j are the number of girls and boys in our sample who play sports in high school in state *j* over this period. $I_{i,j}^m$ takes value 1 if an individual *i* plays a male-dominated sport and 0 otherwise. The numerator is the share of girls who play a male-dominated sport (relative to the total number of girls playing sports). The denominator is the share of boys who play a male-dominated sport (relative to the total number of boys playing sports). Higher values of GSD_j^m represent breaking with stereotypes in the choice of sports either as a result of more girls playing male-dominated sports, or fewer boys playing male-dominated sports.

Similarly, GSD_j^f is constructed as follows:

$$GSD_j^f = \left(\frac{\frac{\sum_{i=1}^{NM_j} I_{i,j}^f}{NM_j}}{\frac{\sum_{i=1}^{NF_j} I_{i,j}^f}{NF_j}} \right) \qquad (3)$$

where $I_{i,j}^f$ takes value 1 if an individual i plays a female-dominated sport and 0 otherwise. The numerator is now the share of boys who play a female-dominated sport (relative to the total number of boys playing sports), and the denominator is the share of girls who play a female-dominated sport (relative to the total number of boys playing sports). Higher values of GSD_j^f represent breaking with stereotypes in the choice of sports either as a result of more boys playing female-dominated sports, or fewer girls playing female-dominated sports.

We construct the GSD_j sports index as an average of GSD_j^m and GSD_j^f. Values of the GSD_j sports index closer to 1 indicate a higher probability that girls and boys break stereotypical gender patterns in the choice of sport. Closer values to 1 may either result from the share of girls playing male-dominated sports being similar to the share of boys playing male-dominated sports, i.e. $GSD_j^m = 1$, or from the share of boys playing female-dominated sports being similar to the share of girls playing female-dominated sports, i.e. $GSD_j^f = 1$.[140] The values of the GSD sports index range from 0 to 0.17, with an average of 0.027 and standard deviation of 0.032. The average of the GSD sports index is far from 1 at a value of 0.027, indicating that the share of boys(girls) playing a male(female)-dominated sport is 37 times the share of girls(boys) playing a male(female)-dominated sport.[141]

3.3. Gender Norms and Stereotyping in Sport

Figure 1 shows that the national average of the GSD sports index marks high level of heterogeneity across states. An F-test rejects the null hypothesis that the rates at which boys and girls participate in sports dominated by the opposite gender are the same across states, with p-values below 0.05 in every case.[142] At the 95th percentile, the state with the largest GSD sports index is Hawaii (0.17), where boys (girls) are 6 times more likely than girls (boys) to play a male (female)-dominated sport. The two states with the lowest value GSD sports index take are Alabama and South Carolina, followed closely by West

[140] $\mathrm{GSD_j^m}$ and $\mathrm{GSD_j^f}$ are highly correlated with the $\mathrm{GSD_j}$ sports index with a Pearson correlation coefficients of 0.88 and 0.76 respectively.

[141] For example, if we focus on male-dominated sports, then $\mathrm{GSD_j^m} = 0.027$ translates into $\frac{\sum_{i=1}^{NM_j} I_{i,j}^m}{NM_j} = 37\,\frac{\sum_{i=1}^{NF_j} I_{i,j}^m}{NF_j}$, where 37=1/0.027.

[142] The F-test for the equality test among the GSD sports index (by year) across states is 111.84 with a p-value below 0.01.

Virginia and Indiana, where hardly any children play sports dominated by the opposite sex. There also seem to be geographical clusters of states that are more likely to break with stereotypical gender choices in sports, as shown by the darker areas in Figure 3.1. These regions are the West, Southwest and Northeast. In contrast, the lighter areas in Figure 3.1 coincide with the South and Mountain West regions, where high school children are less likely to break stereotypical gender patterns when practicing sports.

Despite large cross-state differences in the GSD sports index, the rates at which boys and girls participate in a sport that is dominated by the opposite gender remain quite persistent over time, with no sign of convergence across states over this period. Formally, analyses of the R^2 resulting from regressions that relate the GSD sports index to state and year fixed effects shows that additionally controlling by the interaction of state and year dummies can account for about an additional 2 per cent of the variation over time in state level variation in the GSD sports index.

It is possible that comparative advantage considerations in physical abilities that differ between boys and girls, which have been shown to emerge at the age of 12, could explain the lack of convergence across states over this period (McKay et al., 2017). However, physical innate abilities between boys and girls should be the same regardless of the state, and thus seem unlikely to be able to explain the large cross-state variation in the GSD sports index documented here. Additionally, given the fact that girls and boys compete against athletes of the same sex, makes an explanation based on comparative advantage considerations less likely and suggests the presence of relatively constant state-level factors behind the state variation in GSD.[143] The GSD sport index is highest in the state where boys and girls are most likely to break gender stereotypes in the choice of sport (Hawaii, 0.17). If gender equality in sport choice is captured by a value of the GSD sports index of 1, then at least 17 per cent (1-0.17)-(1-0.027))/(1-0.027) of the gender stereotypical sports choices can be explained by these cross-state factors.

We next investigate how gender norms about the position of women in society may relate to gender stereotyping in sports choice. Using several questions from the 1972-2018 General Social Survey (GSS) we construct the share of individuals that strongly agree with a gender-equal statement (or strongly disagree with a non gender-equal statement) in each of the nine US regions for which the GSS is publicly available by

[143] The R^2 of regressions that relate the state-level GSD sports index to state and year fixed-effects only yield an R^2 of 0.887, and adding the interaction of state and year fixed effects increases the R^2 to 0.908.

calculating (see Table 3.B1).[144] On average 50 per cent percent of respondents display gender-equal attitudes in the US over the 1972-2018 period, consistent with findings in the literature (Charles et al., 2019). Second, we use indicators on women's social and economic autonomy, political participation, women's reproductive rights, and health and well-being from the Institute for Women's Policy Research (IWPR) for the period 1989-2006.[145]

Panel A in Table 3.1 provides the coeffificient estimates from a simple linear regression of the state-level gender norms indicators on the state-level GSD sports index. Women appear to do better in states with a higher GSD sports index. Column 1 shows the estimated effect of the share of individuals with gender-equal attitudes on the GSD

[144] https://gss.norc.org/get-the-data is publicly available for 9 US regions New England, Middle Atlantic, East north Central, West north Central, South Atlantic, East south Central, West. south Central, Mountain, and Pacific. We use the following GSS Questions: (1) Do you approve of a married woman earning money in business or industry if she has a husband capable of supporting her? (Answer Yes: coded as gender-equal attitudes=1); (2) If your party nominated a woman for president, would you vote for her if she were qualified for the job? (Answer Yes: coded as gender-equal attitudes=1); (3) Do you agree or disagree with this statement? Women should take care of running their home and leave running the country up to men. (Answer strongly disagree: coded as gender-equal attitudes=1) (4) Most men are better suited emotionally for politics than are most women. (Answer strongly disagree: coded as gender-equal attitudes=1) (5) A working mother can establish just as warm and secure a relationship with her children as a mother who does not work. (Answer strongly agree: coded as gender-equal attitudes=1) (6) A preschool child is likely to suffer if his or her mother works (Answer strongly disagree: coded as gender-equal attitudes=1); (7) It is more important for a wife to help her husband's career than to have one herself (answer strongly disagree: coded as gender-equal attitudes=1); (8) It is much better for everyone involved if the man is the achiever outside the home and the women takes care of the home and family (answer strongly disagree: coded as gender-equal attitudes=1). Results do not change when we consider the dummy to take value 1 if a respondent strongly agrees/agrees with a gender-equal statement (or strongly disagrees/disagrees with a non gender-equal statement).

[145] These indicators can be downloaded from https://iwpr.org/tools-data/data-for-researchers/status-women-states-data/. A detailed description of how these indicators are constructed can be found at https://iwpr.org/wp-content/uploads/wpallimport/files/iwpr-export/publications/appendices.pdf. We average across the years in which the information is available for each index as follows: social and economic autonomy (1989-2005), political participation (1992-2004), employment and earnings (1989-2005), reproductive rights (1996-2004) and health and well-being (1991-2002). Indicators capture how far a state is from reaching equality. Equality in women's status in the political participation area is achieved in a state: when women's voter registration and voter turnout are set at the value of the highest state for these components; when 50 percent of elected positions are held by women; and when a state has both a commission for women and a women's legislative caucus in each house of the state legislature. In the case of the social and economic autonomy, equality is considered: when a state achieves the highest value for all states in the percentage of women with health insurance; when the percentage of women with higher education achieves that of men at the national level; when the percentage of businesses owned by women are set as if 50 percent of businesses were owned by women; and when the percentage of women in poverty are equal to that of men at the national level. For the reproductive rights index equality takes place when a state assumes to have: no notification/consent or waiting period policies; public funding for abortion, prochoice government, 100 percent of women living in counties with an abortion provider, insurance mandates for contraceptive coverage and infertility coverage, maximum legal guarantees of second-parent adoption, and mandatory sex education for students. The health and well-being index consider equality in a state when: mortality rates (from heart disease, lung cancer, breast cancer, and suicide), the incidence of some diseases (diabetes, chlamydia, and AIDS), and the mean days of poor mental health and mean days of activity limitations are equal to the national goal, and in the absence of goals to the level of the best state among all states.

variable. The coefficient of 0.005 indicates that the difference the proportion of individuals with equal-gender attitudes between two states where the GSD sports index varies by one standard deviation (representing approximately the difference between living in New Jersey rather than Texas, or in Ohio rather than Alabama) is 1.6 percentage points. Similarly, columns 2-5 show that a one standard deviation increase in the GSD sports index is positively related to the status of women in society for all the indicators considered, explaining between 26 percent and 60 percent of the standard deviations of the indicators of the status of women.[146] Looking at the R^2s the state-level GSD sports index accounts between 7 percent and 37 percent of the variation in gender norms. We check the robustness of our estimates to outliers such as Hawaii. Results do not change (see Table 3.A3 in the Appendix).

We next look at how the GSD sports index is associated with objective measures of the position of women in society. To that end we use information from the 2002-2018 American Community Survey (ACS) to construct state-level variables of labor force participation gender gaps, the (log) wage gender gap, the share of females never married, and the average female age at first child, and to see whether they are related to the level of gender stereotypes in sport participation.[147] These variables have been shown to be negatively correlated with the level of sexism in a state (Charles et al., 2019). Labor market outcomes are estimated using a sample of natives aged 25-64 and non-labor market outcomes are for native women aged 20 to 40.

Panel B of table 1 presents the result from an OLS regression where the main control variable is the state GSD sports index. States with higher values of the GSD sports index have lower gender wage and labor force participation gaps, and women marry and have a first child at a later age. In particular, an increase of one standard deviation in the GSD sports index in a state is associated with a 6.8 percent decrease in the gender gap in labor force participation. Similarly, columns 3-4 show that comparing two adult women living in two states where the GSD sports index varies in one standard deviation (representing approximately the difference between living in New Jersey rather than

[146] For example for Political participation: 0.032 (GSD sd) x 0.327 (coef.)x100=1.0464; 1.0464/4.029 (sd Political participation indicator)=0.259 (approx.26%)

[147] The labor force participation gap is constructed as the difference between the percentage of females in labor force and the percentage of males in labor force in each state. The wage gender gap is constructed as the difference between the average female wages and the average male wages (conditional on working). The share of females never married is calculated as the percentage of females never married by state and the average age at first birth by state is obtained using information on how old a woman was when her first child was born from the reported age of her eldest child living in the same household. We use ACS weighting.

Texas, or in Ohio rather than Alabama), a woman living in a state with the highest GSD sports index is 2.7 percentage points less likely to be married, and bears her first child more than a quarter year later.

3.4. Gender Stereotypes in Sport Choice and Parental Time Investments

This section looks at whether differences in parental time investments are related to stereotypical gender patterns in sports choice. To that end we pool data from the 2003-2018 America Time Use survey, which records detailed information on individuals' activities for 24-hour of the previous day. A particular advantage of the ATUS over other time diary surveys is that parents record the time they spend with every child living in the household, and the activity they engage with. Together with the information on the child's sex, we can construct the time that boys and girls receive from parents as the sum of all minutes per day spent in parental activities with the child as primary activity.[148] Our main sample includes parents between 21 and 55 years old with at least one child aged 6 to 11 living in the household. We focus on children before the high school years because for two main reasons. First, parental time investments are more important during this period than during adolescence, when children become autonomous and child's own investments matter more than the parent's (Del Boca et al., 2017). Second, we want to make sure that parental time does not capture parent's reactions to the differential rates of physical development for boys and girls after the child is 12.

As in Guryan et al. (2008) we define "child care" as the sum of three primary time use components. *Basic child care* is time spent on the basic needs of children, *Educational child care* includes reading to/with children and helping children with homework, and *Recreational child care* with involves playing with children and attending children's events.[149]

[148] The information on the gender of the child is limited to children who are classified as household members. We cannot use information on child care of non-household members. Results are maintained when we use a sample of married individuals who are supposed to be less likely to have non-household children than those divorced or separated individuals.

[149] Categories of the time use survey are described as follows, where children refer to household children only. Basic child care: Physical care for hh children, Organization and planning for hh children, Looking after hh children (as a primary activity), Waiting for/with hh children, Picking up/dropping off hh children, Caring for and helping hh children, n.e.c, Activities Related to Household Children's Health, Providing medical care to hh children, Obtaining medical care for hh children, Waiting associated with hh children's health, Activities related to hh child's health, n.e.c.. Recreational child care is defined incorporating: Playing with hh children, not sports, Arts and crafts with hh children, Playing sports with hh children, and Attending hh children's events. Educational child care includes: Reading to/with hh children, Talking with/listening to hh children, Activities Related to Household Children's Education, Homework (hh children), Meetings

Panel C and D present the results from a siblings-FE model of the time that parents spent with a child on the GSD sports index for fathers and mothers separately.[150] Results from an OLS regression model are qualitatively the same (see Table 3.A4). The coefficient on the female dummy in the first row of Panel C shows that fathers spend around 9 minutes less per day with daughters than with sons. The gender difference in father's time is economically meaningful representing a 16 per cent decrease in father's time for daughters with respect to sons, and it holds for the three kinds of parental time investments considered here. Yet, fathers living in states with a higher GSD sports index spend more time with daughters (relative to sons) than fathers living in states with a lower GSD sports index. This is particularly so for time spent in basic care and recreational activities. In particular, a standard deviation increase (approximately the difference between living in New Jersey rather than Texas, or in Ohio rather than Alabama) increases the time fathers spend with their daughters (relative to sons) by 3.5 minutes per day, reducing the gender gap in paternal time by almost half. A big proportion of fathers increase in time with daughters relative to sons is concentrated in recreational childcare, which includes playing sports with children as well as attending events. This type of childcare is particularly important during middle childhood as children's lives extend beyond the family to include peers, when parent's role in arranging for human-capital enhancing extracurricular academic, recreational, and social activities become more important (Kalil, 2012).

3.5. Conclusion

This paper documents that whereas there is a large heterogeneity in stereotypical gender choices of sports during high school across states, the rates at which boys and girls participate in a sport that is dominated by the opposite gender remains quite persistent over time. Using several sources of data over long periods of time, we present correlational evidence suggesting that the extent to which boys and girls break stereotype when choosing what sports to practice during high school depends on how women are

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and school conferences (hh children), Home schooling of hh children, Waiting associated with hh children's education, and Activities related to hh child's education, n.e.c.

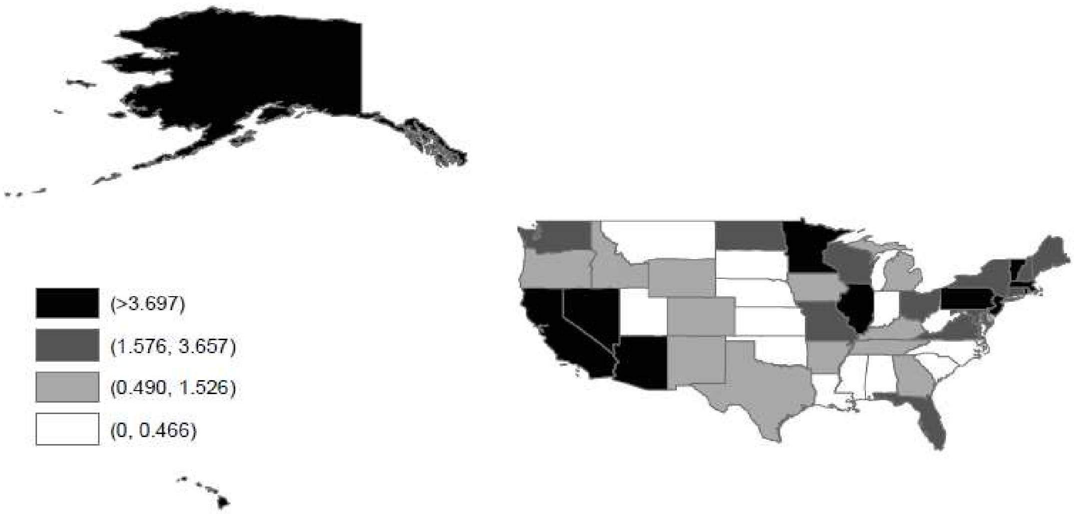
[150] In particular, we estimate: $Y_{ijs} = \alpha_1 female_{j,s} + \alpha_2 female_{j,s} * GSD_s + x_{j,s} + U_{i,s} + \varepsilon_{ij}$
where *i* denotes father (mother), *j* denotes child and s indicates state. Y_{ijs} are minutes per day that a father (mother) spends with child *j*. $female_j$ is an indicator equal to one if the child *j* is a girl and zero otherwise. GSD_s is the gender stereotypical defier sports index in state s, $x_{j,s}$ captures child characteristics such as age, and U_i captures household invariant characteristics.

viewed in society. We also identify parental time investments as being an important cultural-transmission mechanism through which gender stereotypical patterns in the choice of sports across US states may be maintained.

Establishing causal effects for these state-level variations is beyond the scope of this paper. We cannot rule out that the degree of gender specialization in sports documented here may reflect that resources for these sports may simply be allocated toward a particular gender. Given the importance of practicing sports for later labor market outcomes, understanding these associations can point towards future research on gender differences in sport choice during high school, and inform a public policy issue of first-order importance.

Figures and Tables

Figure 3.1: Gender Stereotype Defier (GSD) Sports Index across US States



Notes: Labels represents four GSD sports index quartiles. Darker shades indicate a higher GSD sports index. The values of the GSD sports index are multiplied by 100 for ease of exposition.

Alabama	0	Iowa	0.491	Washington	1.576	Pennsylvania	3.698
South Carolina	0	Idaho	0.674	Missouri	1.992	Minnesota	3.838
North Carolina	0.033	Wyoming	0.679	Maryland	2.143	Arizona	4.100
West Virginia	0.048	Michigan	0.814	Virginia	2.199	New Jersey	4.142
Indiana	0.068	Kentucky	0.932	North Dakota	2.401	Nevada	5.713
Louisiana	0.134	New Mexico	0.945	DC	2.558	Illinois	5.879
Mississippi	0.157	Arkansas	0.953	Wisconsin	2.660	Massachusetts	6.525
Utah	0.166	Texas	1.025	Florida	2.721	Alaska	6.778
Montana	0.234	Tennessee	1.081	New Hampshire	3.087	California	8.397
Kansas	0.369	Georgia	1.086	Connecticut	3.129	Rhode Island	9.351
South Dakota	0.391	Colorado	1.124	Ohio	3.196	Vermont	9.854
Oklahoma	0.412	Oregon	1.392	Maine	3.643	Hawaii	17.143
Nebraska	0.466	Delaware	1.526	New York	3.657		

Table 3.1: Gender Stereotyping in Sports, Gender Norms, And Parental Time Investments

Panel A					
	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Gender-equal	Political Participation	Social and Economic Autonomy	Reproductive Rights	Health and Well-being
GSD sports index	0.005***	0.327**	0.051***	0.269***	0.031**
	(0.002)	(0.152)	(0.013)	(0.035)	(0.012)
Observations	51	50	51	51	51
R-squared	0.225	0.070	0.219	0.367	0.071
Mean	0.499	0.890	7.002	2.362	2.038

Panel B				
	(1)	(2)	(3)	(4)
Dependent variable:	LFP Gap (Female - Male) (%)	Log Wage Gaps, conditional on working (Female-Male)	Share of Females Never married (%)	Average Female Age at First Birth
GSD sports index	0.200**	0.009	0.997***	0.098**
	(0.089)	(0.009)	(0.344)	(0.042)
Observations	51	51	51	51
R-squared	0.079	0.047	0.178	0.177
Mean	-9.335	-0.139	45.412	23.564

Panel C: Parental Time Investments - Fathers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	-8.635***	-4.425***	-3.044***	-1.166***
	(1.479)	(1.243)	(0.667)	(0.408)
GSD x Female	1.090***	0.525***	0.437***	0.128
	(0.282)	(0.203)	(0.159)	(0.088)
Observations	18,716	18,716	18,716	18,716
R-squared	0.015	0.008	0.006	0.003
N of households	13,609	13,609	13,609	13,609
Mean	48.310	21.023	18.568	8.720

Panel D: Parental Time Investments - Mothers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	2.901	1.343	1.201**	0.357
	(1.827)	(1.196)	(0.535)	(1.005)
GSD x Female	0.096	-0.105	0.079	0.122
	(0.451)	(0.322)	(0.155)	(0.181)
Observations	27,575	27,575	27,575	27,575
R-squared	0.025	0.030	0.005	0.003
N of households	20,278	20,278	20,278	20,278
Mean	74.404	41.417	15.615	17.371

Notes: Panel A shows a state-level OLS regression of gender equality and women's status on the GSD sports index (multiplied by 100). The dependent variable in column 1 is the proportion of individuals reporting gender-equal attitudes from the 1972-2018 General Social Survey. Columns 2-5 includes average state-level variables on the status of women from the Institute for Women's policy research. There is no availability of information on the Political Participation Index for the District of Columbia (Panel A, column 2). Panel B shows a state-level OLS regressions of labor and non-labor market outcomes for women relative to men on the GSD sports index: The labor force participation gender gap, the share of females never married, and the average female age at first child are constructed from the 2002-2018 American Community Survey (ACS), and the (log) wage gender gap is constructed from the 2002-2018 Current Population Survey (CPS) on the hourly wage. Labor market outcomes are estimated on a sample of natives aged 25-64 and non-labor market outcomes are estimated for a sample of native women aged 20 to 40. Panels C and D present siblings fixed effects model of parental time (minutes per day) from the 2003-2018 America Time Use survey. The sample includes native parents aged 21 to 55 with at least one child between 6 and 11 years in the household. Estimations are obtained using survey-specific weights and include controls for age of children. Robust standard errors are in parentheses. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

References

Charles, K. K., Guryan, J., and Pan, J. (2018). “The effects of sexism on American women: The role of norms vs. discrimination.” *National Bureau of Economic Research* No. w24904.

Del Boca, D., Monfardini, C., and Nicoletti, C. (2017). “Parental and child time investments and the cognitive development of adolescents.” *Journal of Labor Economics,* 35(2): 565-608.

Flood, S., King, M., Rodgers, R., Ruggles, S., and Warren, J. R. (2019). Integrated Public Use Microdata Series, Current Population Survey: Version 7.0 [dataset]. Minneapolis, MN: IPUMS. https://doi.org/10.18128/D030.V7.0

Fryer Jr, R. G., and Levitt, S. D. (2010). “An empirical analysis of the gender gap in mathematics.” *American Economic Journal: Applied Economics,* 2(2): 210-40.

General Social Survey https://gss.norc.org/Get-The-Data

Goldin, C., Katz, L. F., and Kuziemko, I. (2006) “The homecoming of American college women: The reversal of the college gender gap” *Journal of Economic Perspectives,* 20(4): 133-156.

Guiso, L., Monte, F., Sapienza, P., and Zingales, L. (2008) “Culture, gender, and math.” *Science,* 320(5880): 1164-1165.

Guryan, Jonathan, Erik Hurst, and Melissa Kearney. 2008. “Parental education and parental time with children.” *Journal of Economic Perspectives,* 22(3): 23-46.

Hofferth, S. L., Flood, S., and Sobek, M. (2018). American Time Use Survey Data Extract Builder: Version 2.7 [dataset]. College Park, MD: University of Maryland and Minneapolis, MN: IPUMS. https://doi.org/10.18128/D060.V2.7

Kalil, A., Ryan, R., and Corey, M. (2012). “Diverging destinies: Maternal education and the developmental gradient in time with children”, *Demography,* 49(4): 1361-1383.

McKay, M. J., Baldwin, J. N., Ferreira, P., Simic, M., Vanicek, N., Burns, J., and 1000 Norms Project Consortium (2017). “Reference values for developing responsive functional outcome measures across the lifespan”, *Neurology,* 88(16): 1512-1519.

National Center for Education statistics, Digest of Education Statistics 2018. https://nces.ed.gov/programs/digest/d18/tables/dt18_105.30.asp

National Federation of State High School Associations https://members.nfhs.org/participation_statistics

Pope, D. G., and Sydnor, J. R. (2010). "Geographic variation in the gender differences in test scores," *Journal of Economic Perspectives,* 24(2): 95-108.

Status of Women in the States Data, Institute for Women's Policy Research https://iwpr.org/tools-data/data-for-researchers/status-women-states-data/

Stevenson, B. (2007), "Title IX and the evolution of high school sports." *Contemporary Economic Policy,* 25(4): 486-505.

Stevenson, B. (2010). "Beyond the classroom: Using Title IX to measure the return to high school sports", *The Review of Economics and Statistics,* 92(2): 284-301.

Ruggles, S., Flood, S., Goeken, R., Josiah Grover, Meyer, E., Pacas, J., and Sobek, M. (2019). IPUMS USA: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2019. https://doi.org/10.18128/D010.V9.0

United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics. http://uis.unesco.org/

Appendix 3.A

Table 3.A1: Gender Stereotyping in Sports, Gender Norms, and Parental Time Investments (70 Per Cent Threshold)

Panel A					
	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Gender-equal	Political Participation	Social and Economic Autonomy	Reproductive Rights	Health and Well-being
GSD sports index	0.005***	0.339**	0.050***	0.268***	0.029**
	(0.002)	(0.155)	(0.013)	(0.034)	(0.013)
Observations	51	50	51	51	51
R-squared	0.221	0.077	0.217	0.374	0.065
Mean	0.499	0.890	7.002	2.362	2.038

Panel B				
	(1)	(2)	(3)	(4)
Dependent variable:	LFP Gap (Female - Male) (%)	Log Wage Gaps, conditional on working (Female-Male)	Share of Females Never married (%)	Average Female Age at First Birth
GSD sports index	0.197**	0.009	1.000***	0.096***
	(0.088)	(0.009)	(0.336)	(0.041)
Observations	51	51	51	51
R-squared	0.080	0.046	0.183	0.174
Mean	-9.335	-0.139	45.412	23.564

Panel C: Parental Time Investments - Fathers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	-8.536***	-4.371***	-2.984***	-1.182***
	(1.450)	(1.223)	(0.648)	(0.397)
GSD x Female	1.003***	0.481***	0.395***	0.127
	(0.250)	(0.179)	(0.142)	(0.078)
Observations	18,716	18,716	18,716	18,716
R-squared	0.015	0.008	0.006	0.003
N of households	13,609	13,609	13,609	13,609
Mean	48.310	21.023	18.568	8.720

Panel D: Parental Time Investments - Mothers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	3.150*	1.459	1.197**	0.494
	(1.785)	(1.169)	(0.535)	(0.976)
GSD x Female	0.013	-0.137	0.076	0.074
	(0.413)	(0.302)	(0.145)	(0.155)
Observations	27,575	27,575	27,575	27,575
R-squared	0.025	0.030	0.005	0.003
N of households	20,278	20,278	20,278	20,278
Mean	74.404	41.417	15.615	17.371

Notes: See Table 1.
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

Table 3.A2: Gender Stereotyping in Sports, Gender Norms, and Parental Time Investments (60 Per Cent Threshold)

Panel A					
	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Gender-equal	Political Participation	Social and Economic Autonomy	Reproductive Rights	Health and Well-being
GSD sports index	0.004***	0.270*	0.037***	0.179***	0.036**
	(0.001)	(0.142)	(0.011)	(0.031)	(0.009)
Observations	51	50	51	51	51
R-squared	0.168	0.060	0.144	0.203	0.118
Mean	0.499	0.890	7.002	2.362	2.038

Panel B				
	(1)	(2)	(3)	(4)
Dependent variable:	LFP Gap (Female - Male) (%)	Log Wage Gaps, conditional on working (Female-Male)	Share of Females Never married (%)	Average Female Age at First Birth
GSD sports index	0.153**	0.003	0.616**	0.058*
	(0.070)	(0.007)	(0.237)	(0.030)
Observations	51	51	51	51
R-squared	0.059	0.007	0.085	0.079
Mean	-9.335	-0.139	45.412	23.564

Panel C: Parental Time Investments - Fathers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	-9.943***	-5.071***	-3.746***	-1.126**
	(1.726)	(1.310)	(0.917)	(0.547)
GSD x Female	0.778***	0.377***	0.342***	0.059
	(0.219)	(0.143)	(0.128)	(0.080)
Observations	18,716	18,716	18,716	18,716
R-squared	0.014	0.008	0.006	0.003
N of households	13,609	13,609	13,609	13,609
Mean	48.310	21.023	18.568	8.720

Panel D: Parental Time Investments - Mothers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	2.367	0.987	1.536*	-0.156
	(2.592)	(1.724)	(0.812)	(1.313)
GSD x Female	0.140	0.006	-0.016	0.150
	(0.383)	(0.274)	(0.131)	(0.154)
Observations	27,575	27,575	27,575	27,575
R-squared	0.025	0.030	0.005	0.003
N of households	20,278	20,278	20,278	20,278
Mean	74.404	41.417	15.615	17.371

Notes: See Table 1.
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

Table 3.A3: Gender Stereotyping in Sports, Gender Norms, and Parental Time Investments (Without Hawaii)

Panel A					
	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Gender-equal	Political Participation	Social and Economic Autonomy	Reproductive Rights	Health and Well-being
GSD sports index	0.008***	0.485**	0.067***	0.294***	0.021
	(0.001)	(0.208)	(0.015)	(0.054)	(0.017)
Observations	50	49	50	50	50
R-squared	0.283	0.091	0.230	0.291	0.020
Mean	0.498	0.861	6.994	2.295	2.025

Panel B				
	(1)	(2)	(3)	(4)
Dependent variable:	LFP Gap (Female - Male) (%)	Log Wage Gaps, conditional on working (Female-Male)	Share of Females Never married (%)	Average Female Age at First Birth
GSD sports index	0.299***	0.023***	1.500***	0.161***
	(0.104)	(0.005)	(0.329)	(0.039)
Observations	50	50	50	50
R-squared	0.105	0.174	0.238	0.280
Mean	-9.352	-0.136	45.331	23.563

Panel C: Parental Time Investments - Fathers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	-8.749***	-4.483***	-3.091***	-1.174***
	(1.494)	(1.257)	(0.675)	(0.414)
GSD x Female	1.136***	0.548***	0.455***	0.132
	(0.291)	(0.211)	(0.165)	(0.092)
Observations	18,670	18,670	18,670	18,670
R-squared	0.015	0.008	0.006	0.003
N of households	13,574	13,574	13,574	13,574
Mean	48.317	21.022	18.599	8.695

Panel D: Parental Time Investments - Mothers with children 6-11				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (minutes per day)	Time Spent in Basic Care (minutes per day)	Time Spent in Recreational Activities (minutes per day)	Time Spent in Educational activities (minutes per day)
Female	3.089	1.561	1.127**	0.401
	(1.905)	(1.248)	(0.563)	(1.036)
GSD x Female	0.021	-0.192	0.108	0.104
	(0.498)	(0.352)	(0.175)	(0.197)
Observations	27,492	27,492	27,492	27,492
R-squared	0.025	0.030	0.005	0.003
N of households	20,216	20,216	20,216	20,216
Mean	74.375	41.415	15.584	17.376

Notes: See Table 1.
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

Table 3.A4: Parental Time Investments (OLS Regressions)

Panel C: Paternal time (children aged 6 to 11)				
	(1)	(2)	(3)	(4)
Dependent variable	Total Time (in minutes per day)	Time Spent in Basic Care (in minutes per day)	Time Spent in Recreational Activities (in minutes per day)	Time Spent in Educational activities (in minutes per day)
Female	-8.440***	-1.960*	-4.908***	-1.572**
	(1.742)	(1.003)	(1.092)	(0.687)
GSD Index x Female	1.016**	0.205	0.533**	0.277
	(0.460)	(0.287)	(0.262)	(0.195)
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	18,716	18,716	18,716	18,716
R-squared	0.030	0.025	0.016	0.018
Mean	48.310	21.023	18.568	8.720
Panel D: Maternal time (children aged 6 to 11)				
	(5)	(6)	(7)	(8)
Dependent variable	Total Time (in minutes per day)	Time Spent in Basic Care (in minutes per day)	Time Spent in Recreational Activities (in minutes per day)	Time Spent in Educational activities (in minutes per day)
Female	3.394*	3.225**	-0.778	0.947
	(1.938)	(1.298)	(0.877)	(1.005)
GSD Index x Female	-0.322	-0.135	0.070	-0.258
	(0.511)	(0.350)	(0.234)	(0.247)
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	27,575	27,575	27,575	27,575
R-squared	0.042	0.044	0.018	0.014
Mean	74.404	41.417	15.615	17.371

Notes: Panels C and D present OLS regression model of parental time (minutes per day) from the 2003-2018 America Time Use survey on GSD sports index (multiplied by 100). The sample includes parents aged 21 to 55 with at least one child between 6 and 11 years in the household. Estimations are obtained using survey-specific weights and include controls for age of children, education of parents, race of parents, state and year fixed effects. Race is included as a set of two dummies (white, black, other(omitted)). Education is included as a set of three dummies indicating whether the father/mother has completed high school, 3 years of college, or 4 or more years of college. Robust standard errors are in parentheses.
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

APPENDIX 3.B

Table 3.B1: Data Appendix

Data	Unit of obs	Main variables description	Other variables	Sample Selection
2002/2003 to 2018/2019 academic years National Federation of State High School Associations (NFHS) https://members.nfhs.org/participation_statistics	State level	Variable: GSD sports index To construct the GSD sports index, we use data from the NFHS, which collects and publishes on-line information on the number of players in each sport by gender for each state over time. Sports listed by the NFHS are Adapted Basketball, Adapted Bocce (Indoor), Adapted Bowling, Adapted Floor Hockey, Adapted Football, Adapted Soccer, Adapted Softball, Adapted Track, Adapted Volleyball, Adaptive Corn Toss, Adaptive Golf, Adaptive Handball, Adaptive Strength Training, Adaptive Tennis, Air Riflery, Archery, Badminton, Baseball, Basketball, Bass Fishing, Beach Volleyball, Bocce (Outdoor), Bowling, Canoe Paddling, Canoeing, Competitive Spirit Squad (Boys who cheer/Girls who cheer), Crew, Cross Country, Cycling, Dance, High Kick, Jazz, Dance/Drill, Decathlon, Drill Team, Equestrian, Fencing, Field Hockey, Figure Skating, Flag Football, Football (11 player), Football (6 player), Football (8 player), Football (9 player), Golf, Gymnastics, Heptathlon, Ice Hockey, Judo, Kayaking, Lacrosse, Martial Arts, Mixed 6-Coed Volleyball, Mt. Biking, Native Youth Olympics, None, Outrigger Canoe Paddling LL, Pentathlon, Rugby, Riflery, Rock, Climbing, Rodeo, Roller Hockey, Rhythmic Gymnastics, Sand Volleyball, Skiing (Alpine), Skiing (Cross Country), Snowboarding, Soccer, Soft Tennis, Softball (Fast Pitch), Softball (Slow Pitch), Squash, Surfing, Swimming and Diving, Synchronized Swimming, Team Tennis, Tennis, Track and Field (Indoor), Track and Field (Outdoor), Trap Shooting, Ultimate Frisbee, Unified Basketball, Unified Flag Football, Unified Track and Field (Outdoor), Volleyball, Water Polo, Weight Lifting, Wrestling, Sailing, Other.		

1972-2018 General Social Survey (GGS) https://gss.norc.org/Get-The-Data	9 US regions: New England, Middle Atlantic, East north Central, West north Central, South Atlantic, East south Central, West. South Central, Mountain, and Pacific. (this is the only data publicly available)	Variable: Gender equal We construct the share of individuals that strongly agree with a gender-equal statement (or strongly disagree with a non-gender-equal statement). We use the following GSS Questions: (1) Do you approve of a married woman earning money in business or industry if she has a husband capable of supporting her? (Answer Approve: coded as gender-equal attitudes=1); (2) If your party nominated a woman for president, would you vote for her if she were qualified for the job? (Answer Yes: coded as gender-equal attitudes=1); (3) Do you agree or disagree with this statement? Women should take care of running their home and leave running the country up to men. (Answer disagree: coded as gender-equal attitudes=1) (4) Most men are better suited emotionally for politics than are most women. (Answer disagree: coded as gender-equal attitudes=1) (5) A working mother can establish just as warm and secure a relationship with her children as a mother who does not work. (Answer strongly agree: coded as gender-equal attitudes=1) (6) A preschool child is likely to suffer if his or her mother works (Answer strongly disagree: coded as gender-equal attitudes=1); (7) It is more important for a wife to help her husband's career than to have one herself (answer strongly disagree: coded as gender-equal attitudes=1); (8) It is much better for everyone involved if the man is the achiever outside the home and the women takes care of the home and family (answer strongly disagree: coded as gender-equal attitudes=1). Results do not change when we consider the dummy to take value 1 if a respondent strongly agrees/agrees with a gender-equal statement (or strongly disagrees/disagrees with a non-gender-equal statement) in those questions in which both alternatives are available.	We exclude respondents who do not answer and those coded as not applicable or do not know

Institute for Women's Policy Research (IWPR) Status of Women in the States Data, Institute for Women's Policy Research https://iwpr.org/tools-data/data-for-researchers/status-women-states-data/	State level	Variables: Political Participation, Social and Economic Autonomy, Reproductive Rights, and Health and Well-being We average across the years in which the information is available for each index as follows: social and economic autonomy (1989-2005), political participation (1992-2004), reproductive rights (1996-2004) and health and well-being (1991-2002). Indicators capture how far a state is from reaching equality. Equality in women's status in the political participation area is achieved in a state: when women's voter registration and voter turnout are set at the value of the highest state for these components; when 50 percent of elected positions are held by women; and when a state has both a commission for women and a women's legislative caucus in each house of the state legislature. In the case of the social and economic autonomy, equality is considered: when a state achieves the highest value for all states in the percentage of women with health insurance; when the percentage of women with higher education achieves that of men at the national level; when the percentage of businesses owned by women are set as if 50 percent of businesses were owned by women; and when the percentage of women in poverty are equal to that of men at the national level. For the reproductive rights index equality takes place when a state assumes to have: no notification/consent or waiting period policies; public funding for abortion, prochoice government, 100 percent of women living in counties with an abortion provider, insurance mandates for contraceptive coverage and infertility coverage, maximum legal guarantees of second-parent adoption, and mandatory sex education for students. The health and well-being index considers equality in a state when: mortality rates (from heart disease, lung cancer, breast cancer, and suicide), the incidence of some diseases (diabetes, chlamydia, and AIDS), and the mean days of poor mental health and mean days of activity limitations are equal to the national goal, and in the absence of goals to the level of the best state among all states. A detailed description of how these indicators are constructed can be found at https://iwpr.org/wp-content/uploads/wpallimport/files/iwpr-export/publications/appendices.pdf.

2002-2018 American Community Survey (ACS) Ruggles, Steven, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas and Matthew Sobek. IPUMS USA: Version 9.0 [dataset]. Minneapolis, MN: IPUMS, 2019. https://doi.org/10.18128/D010.V9.0	Individual level	Variables: LFP Gap (Female - Male) (%), Share of Females Never married (%), and Average Female Age at First Birth The labor force participation gap is constructed as the difference between the percentage of females in labor force and the percentage of males in labor force in each state. The share of females never married is calculated as the percentage of females never married by state. The average age at first birth by state is obtained using information on how old a woman was when her first child was born from the reported age of her eldest child living in the same household.	LFP Gap (Female - Male) (%): Natives aged 25-64 Share of Females Never married (%), and Average Female Age at First Birth: Native women aged 20 to 40.
2002-2018 Current Population Survey (CPS) Flood, Sarah, Miriam King, Renae Rodgers, Steven Ruggles, and J. Robert Warren. Integrated Public Use Microdata Series,	Individual level	Variable: Log Wage Gaps, conditional on working (Female-Male) The wage gender gap is constructed as the difference between the average female wages and the average male wages (in logs and conditional on working).	Natives aged 25-64

Current Population Survey: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, 2019. https://doi.org/10.18128/D030.V7.0				
2003-2018 American Time Use Survey Hofferth, Sandra L., Sarah Flood, and Matthew Sobek. American Time Use Survey Data Extract Builder: Version 2.7 [dataset]. College Park, MD: University of Maryland and Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D060.V2.7	Individual level	Variables: Time (minutes per day), Time Spent in Basic Care (minutes per day), Time Spent in Recreational Activities (minutes per day), and Time Spent in Educational Activities (minutes per day) We construct the time that boys and girls receive from parents as the sum of all minutes per day spent in parental activities with the child as primary activity. A particular advantage of the ATUS over other time diary surveys is that parents record the time they spend with every child living in the household, and the activity they engage with. Together with the information on the child's gender, we construct the time that boys and girls receive from parents as the sum of all minutes per day spent in parental activities with the child as primary activity. The information on the gender of the child is limited to children who are classified as household members. We cannot use information on child care of non-household members. Results are maintained when we use a sample of married individuals who are supposed to be less likely to have non-household children than those divorced or separated individuals. Categories of the time use survey are described as follows, where children refer to household children only. Basic child care: Physical care for hh children, Organization and planning for hh children, Looking after hh children (as a primary activity), Waiting for/with hh children, Picking up/dropping off hh children, Caring for and helping hh children, n.e.c, Activities Related to Household Children's Health, Providing medical care to hh children, Obtaining medical care for hh children, Waiting associated with hh children's health, Activities related to hh child's health, n.e.c.. Recreational child care is defined incorporating: Playing with hh children, not sports, Arts and crafts with hh children, Playing sports with hh children, and Attending hh children's events. Educational child care includes: Reading to/with hh children, Talking with/listening to hh children, Activities Related to Household Children's Education, Homework (hh children), Meetings and school conferences (hh children), Home schooling of hh children, Helping or teaching hh children, Waiting associated with hh children's education, and Activities related to hh child's education, n.e.c.	Age Age of children Education of parents (Dummies: high school, college or more college) Race of parents (Dummies: white and black).	Native parents aged 21 to 55 with at least one child between 6 and 11 years in the household

Supplementary Analysis Spain/Aragón

Can family characteristics influence the future labor situation of children?

Introduction

In line with the previous analysis on parental time, we now amplify our work by exploring whether parental investments may affect children's future outcomes in the labor market for the specific case of Spain and a review for the specific case of Aragon. Major social changes in the institution of the family in Western countries have resulted in a process of separation in the household, with rising divorce rates and growing numbers of single-family households (Cherlin, 2002; Manning et al., 2014).[151] Supplementary Figure 3.1 shows the evolution of the proportion of single-family households and married and unmarried couple household, in recent years in Spain.[152] Although living with a partner still appears to be the favored state for Spanish individuals, the number of single-family households has increased during the period of study, and does not appear to be slowing down.[153] A slight increase is also observed when we only look at single-family households with children in Supplementary Figure 3.2. This figure also reveals several differences in the proportion of single-parent families across Spanish regions. While this type of households has considerable increased in some regions, in others it has remained quite low. As can be seen, individuals in Aragón are found among those showing the lowest levels. Although there has been a slight increase during the recent years, the proportion of single-parent families in Aragón has remained below the Spanish mean and a pattern of convergence it is not observed during all the considered period (see Supplementary Figure 3.3).

The relationship between the composition of the household and economic well-being is obvious, since poverty rates vary dramatically, depending on family characteristics. In Spain, 42.2% of single families were at risk of poverty in 2016, while this percentage was just 25.5% in the case of married couples with children (Survey of Living Conditions 2016). These changes not only affect couples' well-being, but may also have implications for their children's well-being, who receive fewer parental inputs

[151]The institution of the family from different socioeconomic perspectives has been analyzed in detail by Molina (2011, 2013, 2014, 2015), among others.
[152]We note that households reported as being non-nuclear have been excluded in Figure 1.
[153]The proportion of single and couple households has been calculated using data from the Continuous Household Survey (ECH) provided by the Spanish Statistical Institute.

than their counterparts who live with both parents at home (Amato, 2005; McLanahan and Sandefur, 1994; Mencarini et al., 2017). Recent studies have focused on the importance of fathers, who are less likely to be involved in their children's lives when they are divorced, or not married (Hofferth, 2006; Cabrera and Tamis-LeMonda,2014). Moreover, poverty entails challenges and situations that require a greater effort with only one available parent (Oliker, 1995; Edin and Lein, 1997). Thus, it is not beyond the bounds of possibility that household composition not only affects children's economic well-being during their childhood, but also in their adulthood.

The presence of both parents in the household is not the only characteristic of the family that may affect the child's future well-being. In the majority of developed countries, labor markets have also experienced changes. The recent financial and economic crisis has resulted in the destruction of jobs, evidenced by high unemployment rates. Since prior researchers has shown the persistence of economic status between generations, finding that the earnings and educational attainment of parents and their children are positively correlated across countries (Hertz et al., 2008; Solon, 2002), this recent increase in unemployment rates may lead to future consequences for the children. Thus, the present research considers the influence of both emotional and tangible family support during adolescence on future unemployment outcomes, by studying whether the presence of both parents in Spanish households and parental unemployment may affect the probability of becoming unemployed in the future. Although unemployment is a global problem, Spain provides an interesting case study, since it has one of the highest unemployment rates in the EU (EUROSTAT, 2019). Of course, we recognize that these worrying levels of unemployment are a temporary problem due to the current economic context. But even so, examining the determinants of unemployment is important, not only because of direct economic costs, such us financing unemployment benefits or pursuing active labor market policies, but also due to the social impact of joblessness, manifested by increasing crime, mental health problems, violence, drug abuse, social exclusion, and decreasing life satisfaction (Aguilar-Palacio et al., 2015;Buonanno and Montolio, 2008;Colell et al., 2015;Gallie, 1999; Gallie and Russell, 1998;Urbanos-Garridoand Lopez-Valcarcel,2015; Zorrilla, 2009).

We contribute to the literature on the factors that can have an effect on unemployment. Prior researchers mainly focused on examining the impact of unemployment benefits (Blanchard and Jimeno,1995; Jenkins and García-Serrano, 2004), monetary policies (Baccaro and Rei,2007), institutions (Nickell and Layard, 1999), and individual characteristics, such as age, gender, and education (Azmat et al., 2006;Bell and Blanchflower, 2011; Dolado et al., 2000; Kooreman and Ridder, 1983; Gines et al., 2000; Nunez and Livanos, 2010; Verick, 2009). Although all this prior literature has contributed to understanding unemployment outcomes, it cannot explain one of the most important facts in unemployment research, that is, the existence of large differences in unemployment across regions of the same country (OECD, 2005). Additionally, to our knowledge, there is no substantial literature focused on studying the consequences of family characteristics during childhood in labor markets. Our paper is also related to a new literature focused on examining what socio-economic characteristics are transmitted from generation to generation, and to what extent (Brügger et al., 2009; Gauly, 2017; Giménez et al., 2017; Giménez et al., 2018; Marcén, 2014; Molina, 2014; Molina et al., 2011). We add to the question on intergenerational correlation of attitudes between parents and children by studying the vertical transmission of unemployment outcomes.

In our empirical strategy, we follow the conceptual Quantity-Quality model of Becker-Lewis (Becker and Lewis, 1973), using data from the Survey of Living Conditions (2011) provided by the National Statistical Institute (INE) for the Spanish economy, which is the latest year providing information about household composition, when young individuals were 14 years old. Using this methodology, we study whether both the presence of both parents in the household and their labor status can affect subsequent results of children in the labor market. To investigate this phenomenon further, we also extend our work to the study of the relationship between family support during adolescence and other labor characteristics, focusing on self-employment and temporary employment. Since both entrepreneurship and temporary unemployment rates are concerns for the Spanish Government, examining family characteristics as a possible determinant of these labor market outcomes may also lead to interesting conclusions.

The remainder of the paper is organized as follows. In the next section we discuss the relevant theory and review previous studies. In the third section we present the data. Fourth section describes the empirical strategy, and fifth section concludes.

Theoretical and Institutional Background

Different researchers use different definitions of family support, but it is often used to refer to emotional, practical, socializing, advice, and financial support (Fingerman, 2009; Vaux, 1988; Vaux and Harrison, 1985). This paper adopts this view of support. Given that the absence of one of the parents entails receiving fewer parental inputs, and even when both parents are present, financial difficulties imply receiving less support, our goal is to analyze whether this lack of support during childhood has implications for future labor market outcomes.

The importance of family support in adolescent outcomes has drawn the attention of scholars, and there is an extensive literature dealing with this relationship. Studies find that family support significantly predicts academic achievement, delinquency, school misconduct, drug and alcohol abuse, and depression, but none of them focus on future labor market outcomes (Cutrona et al., 1994; Dennis et al., 2005; Dietrich and Kracke, 2009; Keijsers et al., 2009; Parker and Benson, 2004; Patten et al., 1997). The findings from these studies provide evidence of the attachment theory (Bowlby, 1969, 1980), which postulates that bonds with parents determine personality development. Bowlby claims the need of children and young adults to experience a warm, intimate, and continuous relationship with their parents, as well as the importance of economic factors in their relationships. Drawing on attachment theory, Sarason et al. (1990) suggest that young adults receiving family support feel emotionally safe, which results in the development of skills and greater self-confidence. Young individuals from wealthier parents also have strong beliefs in their own abilities through their parents' high expectations of them (Chowdry et al., 2011). At the same time, personal skills, such us self-confidence, may be a determinant of labor success. In fact, some studies have found that gender differences in the labor market can be explained by lower levels of self-confidence in women (Kamas and Preston, 2012). Among the studies focusing on the relationship between self-confidence and employability it is that of McQuaid (2006), who finds that job seekers with greater self-confidence are twice as likely to get a job than those with low self-confidence. Others postulate that women who exhibit a lack of self-confidence in their own abilities are less likely to start and run their own business (Bowen and Hisrich, 1986; Caputo and Dolinsky, 1998), as well as to compete to improve their working status (Kamas and Preston, 2018). Moreover, uncertainty about one's ability may shape labor market outcomes through an indirect effect on task choices. Individuals attempt to learn and perform only those tasks in which they expect to be successful; therefore, those with a high perception of their abilities will choose tasks that are sufficiently challenging (such as educational attainment choices) resulting in positive future results (Weinberg, 2009). Then, it is not beyond possibility that the absence of both financial and emotional support during childhood may have negative consequences on future labor market outcomes through a lack of self-confidence.

The Spanish Government has traditionally encouraged the presence of both parents in the household through fiscal benefits. The approach taken by the Spanish fiscal system is to focus on supporting the traditional family. In 1989, the Constitutional Court introduced joint taxation as an option for legally married couples. This involves offering them the choice between individual and joint taxation, allowing two-earner couples to opt for the advantages of individual taxation (such as privacy in financial issues), and lower-income single-earner couples to benefit from the advantages of being taxed as a unit. For those couples under joint taxation, their hypothetical incomes are calculated as the sum of both incomes divided by two, and the tax threshold is twice this amount. As prior research suggests, this aggregate taxation has a positive effect on children (O' Donoghue and Sutherland, 1998). However, the (optional) aggregation method is not available for unmarried couples, which is of concern in the current scenario of changing traditional roles. Then, policy makers should apply policies to encourage not only households formed by married couples, but also unmarried couples to have the desired effect on less traditional individuals.

Additionally, different measures have been adopted to support children in families with special needs. As a recipient of the Council of Europe Recommendation (Council of Europe 19. (2006), Spain has implemented several positive parenting programmes, focused on encouraging parental behavior based on the best interests of the child. According to the Recommendation, parents and children facing adverse situations (such us low income, low educational background, or domestic violence, among others) should be supported by social services. As Rodrigo et al. (2017) point out, promoting child and adolescent well-being, combining work and family and providing support to families in situations of poverty, are some of the main objectives of these policies.

The allocation of custody after divorce also plays a role in providing family support to children. Joint Custody allows for the involvement of both parents in their children's lives. Since a legal change was introduced in 2005 to facilitate the possibility of joint child custody in Spain, some Autonomous Communities have established the priority of joint custody. However, the level of participation could be higher if Spanish legislation considered joint custody as the preferred option in the whole territory of Spain.

Aragón was the first Autonomous Community introducing the legal change followed by Cataluña, Navarra, Valencia, and País Vasco. The law whose objective was to favor giving joint custody after divorce, was enacted on 26th May 2010 (Ley 2/2010). Joint custody means that legal and/or physical custody is shared by both parents. Thus, it involves the parents communicating with each other, sharing parental responsibility and both members compromising on decisions about the child. However, that was only applied in a short period since a new law was enacted on the 21st March 2019 (Ley 6/2019). According to that, a judge only will grant joint custody if she/he thinks it is in the best interests of the child. Otherwise, one of the parents will enjoy sole custody. This could be a better alternative for domestic violence victims. Since cases of domestic violence involve control and fear, joint custody usually is not a good option. An increase in the number of cases adopting joint custody and a decrease in those giving the sole custody to the mother can be observed after the introduction of the first law in Supplementary Figure 3.4. However, joint custody did not seem to be the preferred option even when the priority of joint custody was stablished. Among the 1,366 number of divorces in Aragón in 2018 in which joint custody could appropriately be applied, only 45% ended up with joint custody. In the 51% of cases, the mother enjoyed the sole custody and only in the 3% of them the father was determined as the custodial parent.

Data

We use data from the Survey of Living Conditions (SLC) provided by the Spanish Statistical Institute (INE) for the year 2011, which is the latest year providing information about family characteristics when individuals were teenagers. The SLC provides rich information that allows us to identify individual work status, as well as the specific characteristics of each household during individuals' adolescence, such us the composition of the household and the labor status of the parents. In a first analysis, our main explanatory variable is measured as both parents present in the household during individuals' adolescence. In a second analysis, the variable is defined as the unemployment status of the parents during the individual's adolescence. In this setting, our goal is to study whether individual behaviors in labor markets may be determined, although not exclusively, by the family support received during their teenager years. Our main sample contains 13,489 observations of Spanish individuals aged 26 to 60 years old, who report information about their household composition when they were teenagers and who are in labor force. A reduced sample formed by 3,150 observations has been used in our second analysis. The variation in the sample size is due to the fact that we restrict our sample to those individuals whose parents were in labor force.

Supplementary Table 3.1 presents the summary statistics for the main variables by region using our main sample. The first column shows large variations in the proportion of unemployed individuals across the Spanish regions, ranging from 11% in Navarra, Illes Balears, and País Vasco, to 31% in Canarias and Andalucía. More significant differences can be observed in the proportion of temporary employees by region, in the second column: an average of 23% of individuals report being a temporary employee, with this varying from 15% in País Vasco, to a high of 35% in Andalucía and Extremadura. Similarly, the third column shows dissimilarities among the proportions of self-employed across regions. The lowest percentages are observed among those originating from Ceuta (6%), and the highest among those from Castilla-La Mancha (19%). The fourth column includes the proportion of individuals who were raised with both parents at home. However, by simply comparing this column with the previous three, we cannot deduce a clear relationship between these variables. The same occurs when we compare these columns with the fifth, which includes the proportion of individuals whose parents were unemployed during their adolescence. As can be seen, the majority of the households in our sample were formed by both parents, who were employed, when individuals were teenagers. However, as we explain before, these patterns have suffered major changes in the last years. The raw data also reveals slight dissimilarities across regions in gender composition, the age of the individuals, and the level of education. Male adults are 55% of the sample and the age of the individuals in our sample is around 43 years, on average. Overall, 14% of individuals have completed primary school, with the lowest percentage being from Illes Balears, Madrid and Pais Vasco (8%), and the highest from Ceuta (23%). Regarding those who have completed at least secondary school, the lowest percentages are observed among those from País Vasco (39%), and the highest among those from Comunidad Valenciana (57%). Additionally, 36% of respondents report having completed a university degree, with this ranging from just 22% in the case of individuals from Ceuta, to 53% in the case of those from País Vasco. Finally, Supplementary Table 3.2 presents the summary statistics for the labor status of parents. As can be seen, the percentage of individuals whose father or mother was unemployed during their young hood is quite small (1%). However, as in the case of the household composition, our approach is based on the fact that unemployment rates have varied drastically in the recent years.

Empirical strategy

Our goal is to analyze whether family support, measured through the presence of both parents in the household and parents' labor status, when individuals were teenagers, can influence their current situation as adults in the labor market. Thus, if family characteristics do not play a role here, the presence of both parents in the household during adolescence or the parents' unemployment status should have no impact on individuals' current unemployment situation as adults. On the other hand, if family support does play a role in labor arrangements, we would expect to detect a relationship between the behavior of the respondents and that of their parents during their teenager years. To test this issue, we consider the Quantity-Quality methodology of Becker-Lewis (Becker and Lewis, 1973) and estimate the following Probit model:

$$Unemployed_{ik} = \beta_0 + \beta_1 FS_i + \boldsymbol{X_{ik}}\beta_2 + \delta_k + \varepsilon_{ik} \qquad (1)$$

Where $Unemployed_{ik}$ is a dummy variable taking value 1 if the individual i of region k reports being unemployed. The definition of our variable of interest, that is, family support (FS_i), changes depending on the objective of our analysis. First, to capture the effect of the household composition during adolescence, we define our main explanatory variable as a dummy variable that takes value 1 when both parents were present in the household when individual *i* was a teenager, and 0 otherwise. And second, to measure the effect of the parents' unemployment status, we define a dummy variable that takes value 1 when at least one of the parents was unemployed when individual *i* was a teenager, and 0 otherwise. The vector $\boldsymbol{X_{ik}}$ includes individual characteristics, such as gender, age, and level of education. As prior research has shown, educational differences in unemployment status do exist (Gines et al., 2000; Nunez and Livanos, 2010). The higher the level of education, the lower the probability of being unemployed. Since our sample includes individuals of a variety of educational attainments, the coefficient picking up the impact of family support could be capturing educational differences, in addition to, or rather than, the household composition or the parental unemployment effect. To address this issue, we incorporate three dummies to control for the level of education of the individuals (Primary school, Secondary school, and University degree). Other research indicates that the age of the individuals and their gender can have an effect on unemployment status, for reasons independent of family characteristics (Azmat et al., 2006; Bell and Blanchflower, 2011; Dolado et al., 2000; Kooreman and Ridder, 1983; Verick, 2009). Then, their inclusion in our estimations is also necessary. Although the Survey of Living Conditions reports other individual characteristics, we have not considered them in the analysis because of endogeneity concerns. Because many programs to fight unemployment vary by region, we also include a full set of region fixed effects denoted by δ_k. Standard errors are clustered at the region level in order to account for any within-ethnicity correlation in the error terms.[154]

We note that our work is not limited to the analysis of that relationship only, since we also analyze whether the family support during young hood can affect other labor characteristics in the future. To address this issue, we redefine our main dependent variable using information about whether individuals are temporary employees or self-employed. This methodology is discussed in detail in subsection 4.3.

Results

The effect of both parents present during adolescence on the probability of being unemployed

Supplementary Table 3.3 presents the estimates for our analysis of the effect of household composition on unemployment outcomes of children in the future. As can be seen in column 1, the impact of age appears as a U-shape, which is consistent with the literature suggesting that young individuals are more likely to be unemployed (Bell and Blanchflower, 2011; Dolado et al., 2000; Gines et al., 2000; Kooreman and Ridder, 1983; Nunez and Livanos, 2010; Verick, 2009). Since young people lack skills, work experience and abilities to find a job, they are more likely to be unemployed or employed in more precarious positions. Surprisingly, the estimates for the education level only show a statistically-significant effect of having Secondary school and University degree. Having completed Primary school does not appear to have a significant effect. In any case, our results are consistent with the literature, since reaching a high level of education decreases the probability of being unemployed (Gines et al., 2000; Nunez and Livanos, 2010). The gender of individuals does not appear to be statistically significant. At first sight, these results can be surprising, since prior research has shown discrimination against women in labor markets in Mediterranean countries (Azmat et al., 2006). However, by simply looking at the Spanish employment rate, no differences can be found between the rates of male and female unemployment in our period of study (Labour Force Survey, 2011). Additionally, this result could be explained in terms of female education. Given that young women who participate in the labor market tend to be more educated than men (Labour Force Survey, 2011), their probability of being unemployed is supposed to be less. In any case, the gender differential is not our objective here.

[154] All estimates have been repeated with/without weights and with/without clusters. Results do not vary.

With respect to our variable of interest, the estimated coefficient on the presence of both parents in the household indicates that living with both parents at home when individuals were teenagers is related to a lower probability of being unemployed in the future. We find that the presence of both parents in the household decreases the probability of being unemployed in the future by around 5% (see marginal effects). Although this effect may not be quite important in a sample where only a low proportion of households are not formed by both parents, this can become increasingly important in the currently context where the number of single-parent families has grown up significantly. In the second column, region fixed effects are added to control for unobserved characteristics that may vary at the region level. Although the effect of the presence of both parents is slightly smaller than that obtained before, we still find a negative association between both variables. It is also worth noting that a separate gender analysis has been considered, to mitigate the concerns that gender issues may generate. Although the estimated coefficient is only statistically significant at 10 % level in the case of males, the effect is still detected for females and males, separately, suggesting that gender issues are not driving our results (see columns 3 and 4).

In terms of robustness, we consider whether our findings are maintained when utilizing different subsamples and incorporating additional observable characteristics at the region level. For further evidence that our results are not affected by heterogeneity across regions, we have repeated the analysis by including controls for observable characteristics of the regions, which may affect participation in labor markets. Our results are maintained after adding GDP per capita and the unemployment rate, by region (see column 5).[155] We also run some simple robustness checks, including and excluding those regions with the highest number of observations and with the highest and lowest proportion of individuals living with both parents in the household during their adolescence. In the sixth column, we drop Andalusians from our sample, because they are the largest group. In columns 7 and 8, we repeat the analysis without those from Extremadura and Murcia, representing the highest proportion, and without those from Galicia, with the lowest proportion, respectively. Our findings do not vary. It is comforting that any changes appear to be found after running our estimations without Ceuta and Melilla, which, despite constituting part of the national territory, are considered autonomous cities (see column 9). Finally, last column includes controls for some

[155]Data for unemployment rate and GDP pc by region comes from the Spanish Statistical Institute for the year 2011.

parents' characteristics, such as the age and a dummy accounting for whether they have a high level of education.[156] Results do not change. All the results described in this section suggest that the unemployment situation of individuals may be determined by their household composition during their adolescence.

The effect of parental unemployment during adolescence on the probability of being unemployed

We find that family support measured through both parents living in the household during adolescence does play a role in the individuals' future labor situation. Our findings in this section concern another way by which parents can affect their children's future labor status, that is, the cultural transmission of unemployment. It is widely accepted that cognitive and non-cognitive skills are important determinants of labor market outcomes (Heckman et al., 2006). But how do individuals obtain their attitudes and abilities? And to what extent are those attributes similar to the attitudes and abilities of their parents or forebears? Prior research has found a positive correlation between the earnings and educational attainment of parents and that of their children (Hertz et al., 2008; Solon, 2002) and this correlation may be partly explained by the cultural transmission of attitudes and skills from parents to their children (Bowles and Gintis, 2002; Gauly, 2017). Then, it seems plausible to analyze whether unemployment outcomes during adulthood are determined by the previous unemployment situation of their parents.

In this section, we focus on a specific country, in our case Spain, to study the transmission of unemployment status over two generations by analyzing the impact of the labor status of parents on the future labor situation of children. As explained above, we define our main explanatory variable as a dummy variable that takes value 1 when at least one of the parents was unemployed when individual i was a teenager, and 0 otherwise. Thus, our goal here is to show that the behavior of individuals in our sample is similar to the behavior of their parents. Then, if there is inter-generational transmission of unemployment outcomes, we would expect that individuals whose parents were unemployed will be more likely themselves to be unemployed.

Supplementary Table 3.4 presents the results.[157] Our estimates show evidence of parents' unemployment status during the individual's adolescence as an important factor

[156] The variation in the sample size is due to the availability of information for parents' individual characteristics.
[157]The variation in our sample size is due to the restriction of those individuals reporting information about parents' labor status during their adolescence.

in future unemployment outcomes of children. In this case, the lack of family support measure by the unemployment situation of one of the parents during young individuals' adulthood, increases their probability of being unemployed in the future by around 11% (see marginal effects). This effect is statistically significant at 1% level even when we control for observable and unobservable characteristics by regions and for parents' characteristics (see columns 1, 2 and 3). Comparing regions, individuals living in Aragón are 1 percentage points less likely to be unemployed in the future because of the unemployment situation of one of the parents than individuals living in a region with a high proportion of unemployed parents such as Ceuta.

The most interesting results are found in the rest of the columns, when we examine father's and mother's unemployment status separately. In column 4, we analyze the transmission of unemployment outcomes through fathers to their children. As can be observed, the fathers' unemployment situation does not appear to play a role in their children's labor market status. However, different results are found in the case of mothers. Our results show a significant role of inter-generational transfer of unemployment though mothers to their children, at least from first- to second-generation (see columns 5 to 9). We find that the fact that the mother was unemployed during the individual's adolescence increases their probability of being unemployed during adulthood by almost 22% (see marginal effects). Although there are variations in the magnitude of the effect, our conclusions are maintained after running certain robustness checks. It is reassuring that the impact of the mother's unemployment status remains statistically significant and positive after separating the sample by gender, adding the fixed effects at region level, and controls for observable characteristics and parents' characteristics. These results are consistent with the previous literature on the relationship between mothers' labor status and their offspring' behavior. Belsky and Eggebeen (1991) suggest that extensive maternal employment fosters precocious independence of children, which can positively affect them. Psychological and behavioral developments that typically occur later in children's lives are developmentally beneficial when they take place earlier. Thus, it is possible that this may be also one of the mechanisms through which maternal unemployment affects their offspring behavior in labor markets in the future.

Of course, we recognize that this is not a full-proof method of identifying the transmission of unemployment outcomes, since we cannot distinguish whether unemployment is a temporary or a permanent situation. In any case, it is comforting that our results suggest that individuals are sensitive to their mothers' unemployment situation in that specific time period, which gives us additional empirical evidence that household characteristics can affect the children's future labor status.

The effect of family support on other labor characteristics

So far, we have focused on studying the consequences of family support in terms of levels of employment. Nevertheless, since the Spanish government liberalized temporary contracts by extending their use to hiring employees doing regular activities, and involving much lower dismissal costs than regular permanent contracts, the quality of employment is also very much a concern. As we explain before, self-confidence plays an important role in determining the goals that individuals set for themselves and women willingness to develop their careers (Kamas and Preston, 2018; Weinberg, 2009). Thus, we expect to find a positive relationship between family support and the quality of job, at least in case of women. To tackle this issue, we re-estimate equation (2), by redefining the dependent variable as the probability of being a temporary employee. Supplementary Table 3.5 presents the results. While the unemployment status of parents does not appear to have an effect on the probability of being a temporary employee (see column 1), living with both parents at home when individuals were young has a negative and statistically-significant effect on the probability of being a temporary employee in the future (see column 2). In particular, there is a decrease of 4% in that probability (see marginal effects). In line with prior literature, we find gender differences. While males do not appear to be affected by household composition, our results are maintained when we only include females in our sample, and the magnitude of the effect is somewhat greater than that obtained earlier (see columns 3 and 4). We find that family support, captured through the presence of both parents in the household, decreases women's probability of being a temporary employee in the future by around 6.3%. These findings are consistent with prior literature suggesting that women rely more on family support than do men for increasing their self-efficacy and learning skills (Chu, 2010). Since both emotional and tangible family support, appear to play a bigger role in women's educational attainments, compared to men, our results are considered to be reasonable.

Similarly, we extend our work to the study of the effect of family support on the probability of being self-employed. Since policy-makers and researchers alike consider self-employment as an alternative to unemployment and a path out of poverty, this analysis may lead us to interesting results. A recent paper by Saridakis et al. (2018) shows that current family circumstances can be predictors of self-employment choices As we mention before, self-confidence is also a major determinant in the career development of female entrepreneurs (Bowen and Hisrich, 1986; Caputo and Dolinsky, 1998). Given that, the presence of both parents in the household reinforce their children' self-esteem, it is expected to have an effect on their future self-employment choices. In this case, parents' unemployment status does seem to play a major role, since we find that parental unemployment decreases individuals' probability of being self-employed in the future by around 11% (see marginal effects in column 5).[158] Focusing on the specific case of Aragón, we find that individuals living in this region are 1 percentage points less likely to be self-employed in the future because of the unemployment situation of one of the parents than individuals living in Ceuta.

Our findings also point to family support as being one of the channels through which entrepreneurial activity can be promoted in Spain. We find that the presence of both parents in the household increases the probability of being self-employed in the future by around 3.3% (see marginal effects in column 6). As we expected, our results on self-employment suggest that household composition is an important factor in female entrepreneurial decisions, but not in the case of males (see marginal effects in columns 7 to 8). All these results reinforce our conclusions, suggesting that family support when individuals are teenagers can influence their situation as adults in the labor market. Of course, we recognize that these results may not be extensible to other countries where the absence of both parents in the household may be due to reasons other than changing family roles.

Conclusions

The aim of this paper is to show how recent changes suffered by Spanish households can affect the future unemployment situation of children. The dramatic consequences for the Spanish labor market after the recent economic crisis show the importance of studying patterns of unemployment, and how they can affect subsequent generations. Additionally, it is increasingly common to find single-parent or divorced families, and prior research has found negative consequences for children's well-being of not living with both parents at home. In our study, we focus on children's future well-being. We find that individuals' success in labor markets may be determined by their family characteristics when they were teenagers. Specifically, our results show that those individuals living with their

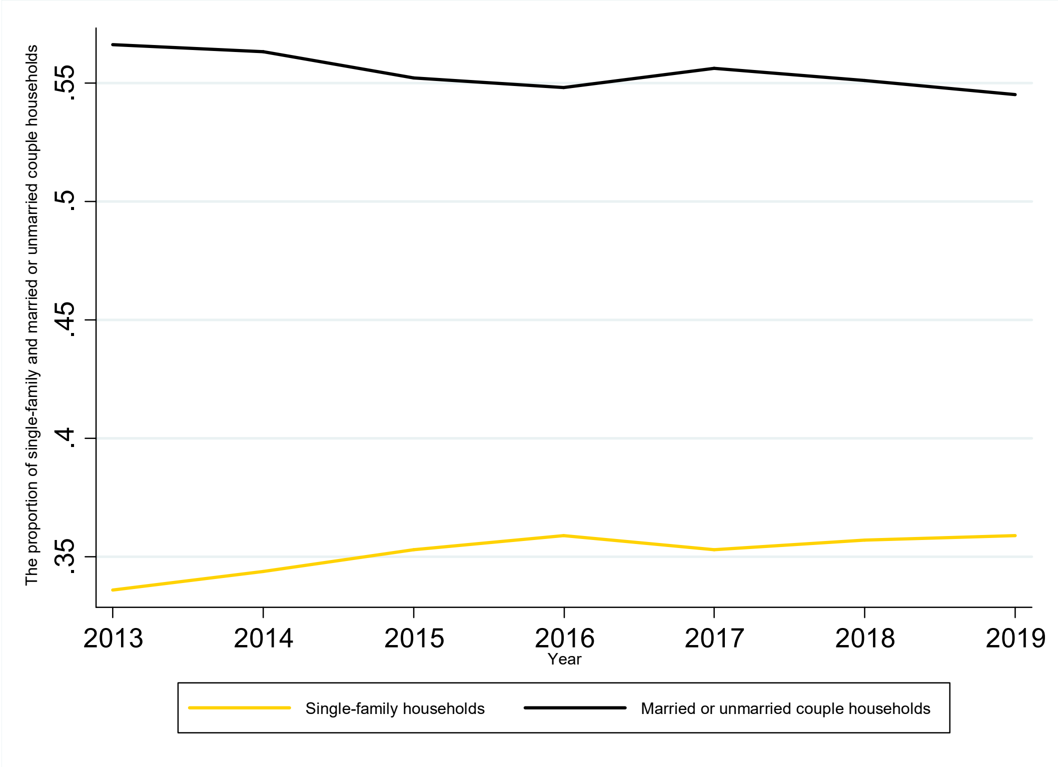
[158] A separate gender analysis can be performed because of convergence problems.

parents during childhood are less likely to become unemployed in the future, and those whose mother was unemployed during their adolescence are more likely to be unemployed. We make use of the Attachment Theory postulated by Bowlby (1969, 1980) to explain the channel through which adolescent' outcomes in the labor market may be determined by the family support received in the past.

For further evidence that the future of children in labor markets can be determined by the characteristics of the household during individuals' adolescence, we extend our work to an examination of the possible effects of family support on the other labor characteristics. Our results point to household composition as an important factor in the probability of being employed in a temporary capacity and self-employed. Individuals living in regions with a high proportion of households with both parents present during young hood, such as Aragón, are associated with a fewer probability of being a temporary employee and a higher probability of being self-employed in the future than those living in regions with a low proportion. Similarly, those individuals whose father or mother was unemployed appears to be less likely to becoming self-employed in the future.

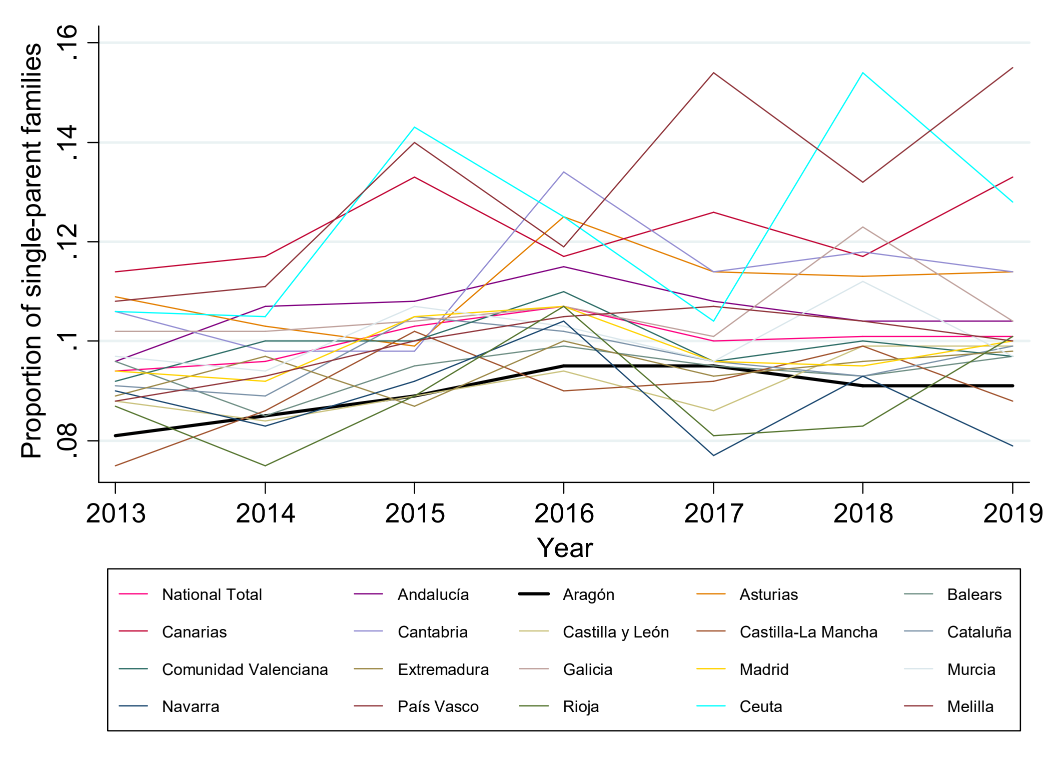
Examining the determinants of unemployment is important because governments frequently devise and apply policies to reduce it. Thus, our results may be interpreted as evidence of one of the mechanisms through which unemployment can be reduced. Additionally, the study of the consequences of the changing family roles in the current context where the number of single-parent families has grown up significantly may have important policy implications. Since single-parent families are presumed to be at greater risk of poverty, and unemployment outcomes are vertically transmitted, we can also interpret our results as evidence of the Intergenerational Transmission of Poverty in Spain. In this setting, policy-makers should consider these results, in order to combat the social inequality emanating from intergenerational persistence of socio-economic status, by promoting households formed by both parents, as well as couples' involvement in their children's lives. The effectiveness of some family policies has been previously observed, such as that firstly enacted in Aragón in 2010. This law seems to have had the desirable effect, since there was a progressive increase in the number of divorces ended up with joint custody during the period of applicability. However, today, this policy has been partially removed in some of the few regions where it was implemented (such as Aragón and Comunidad Valenciana).

Supplementary Figure 3.1: Proportion of single-family and married and unmarried couple households from 2013 to 2019



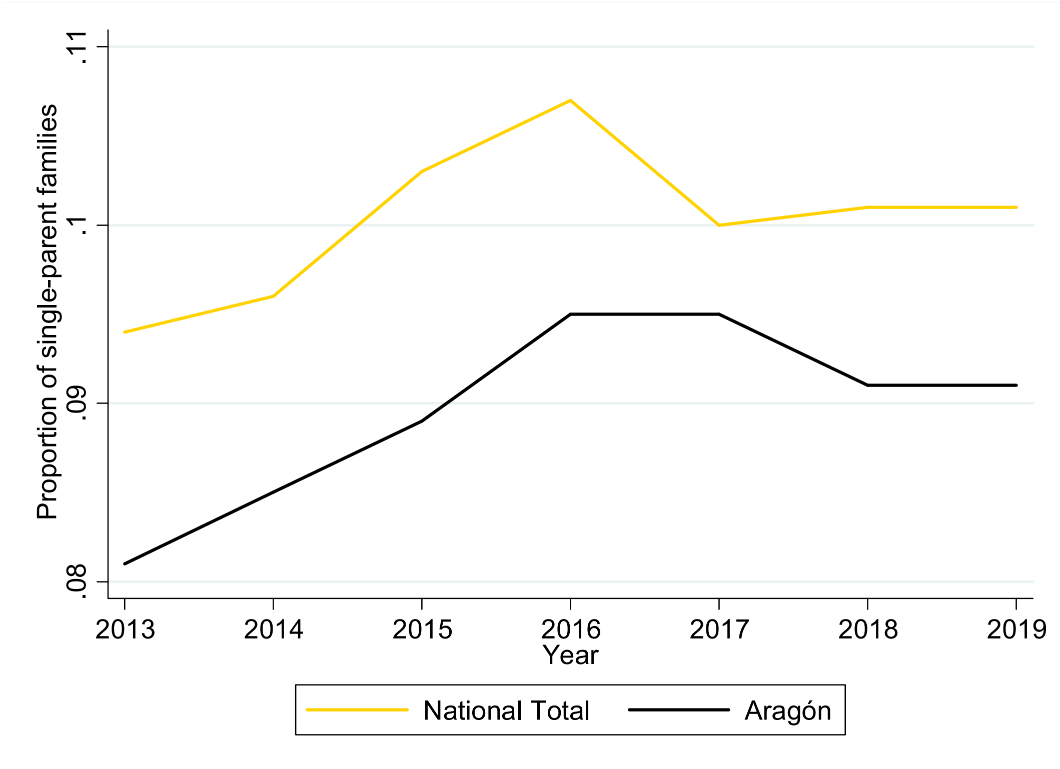
Notes: Data come from the Continuous Household Survey (ECH) provided by the Spanish Statistical Institute. The proportion of single and couple households represented in this figure has been calculated for all the period with available data.

Supplementary Figure 3.2: The proportion of single-parent families by Spanish regions



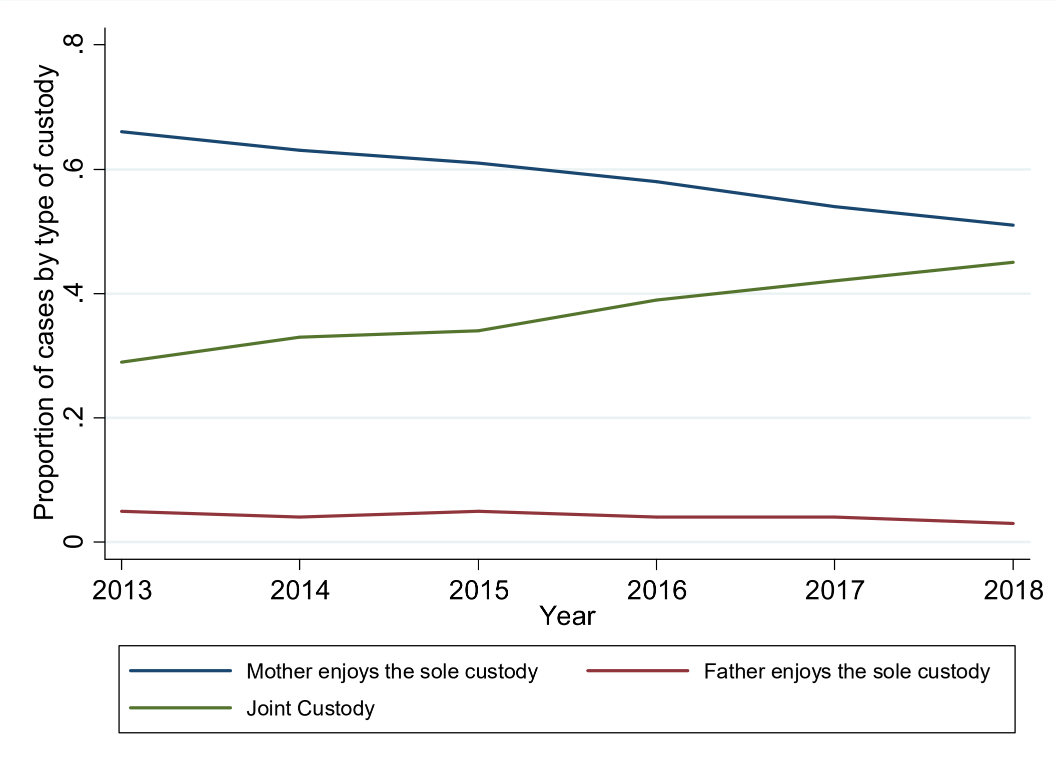
Notes: Data come from the Continuous Household Survey (ECH) provided by the Spanish Statistical Institute. The proportion of single-parent families represented in this figure has been calculated for all the period with available data.

Supplementary Figure 3.3: A comparation between the proportion of single-parent families in Aragón and the average proportion of single-parent families in Spain



Notes: Data come from the Continuous Household Survey (ECH) provided by the Spanish Statistical Institute.

Supplementary Figure 3.4: The evolution of the proportion of cases by type of custody in Aragón from 2013 to 2018



Notes: Data come from the Spanish Statistical Institute for all the period with available data.

Supplementary Table 3.1: Summary statistics

Region	Proportion of unemployed	Proportion of temporary employed	Proportion of self-employed	Both parents present	Age	Man	Primary school	Secondary school	University degree	Obs
Andalucía	0.31	0.35	0.11	0.89	42.55	0.55	0.19	0.48	0.31	1,592
Aragón	0.12	0.20	0.13	0.93	43.55	0.56	0.10	0.52	0.37	646
Asturias	0.17	0.23	0.14	0.89	43.42	0.54	0.09	0.56	0.36	517
Illes Balears	0.11	0.20	0.14	0.88	42.84	0.51	0.18	0.53	0.28	422
Canarias	0.31	0.34	0.10	0.86	42.96	0.52	0.17	0.48	0.31	682
Cantabria	0.14	0.23	0.15	0.88	43.16	0.53	0.07	0.54	0.39	403
Castilla y León	0.14	0.20	0.14	0.89	43.96	0.57	0.12	0.52	0.36	816
Castilla - La Mancha	0.17	0.24	0.19	0.90	42.31	0.61	0.15	0.54	0.30	729
Cataluña	0.15	0.16	0.11	0.92	42.87	0.55	0.17	0.45	0.35	1,443
Comunidad Valenciana	0.21	0.21	0.11	0.93	42.30	0.55	0.10	0.57	0.33	1,077
Extremadura	0.24	0.35	0.15	0.95	43.87	0.58	0.19	0.48	0.30	504
Galicia	0.19	0.22	0.15	0.85	43.37	0.52	0.17	0.46	0.37	851
Madrid	0.15	0.17	0.08	0.89	42.97	0.51	0.08	0.47	0.45	1,394
Murcia	0.23	0.30	0.10	0.95	41.83	0.59	0.20	0.56	0.23	494
Navarra	0.11	0.17	0.11	0.91	43.20	0.52	0.13	0.40	0.47	446
País Vasco	0.11	0.15	0.14	0.90	43.58	0.52	0.08	0.39	0.53	741
La Rioja	0.14	0.16	0.17	0.87	43.17	0.55	0.12	0.53	0.34	473
Ceuta	0.22	0.31	0.06	0.90	40.95	0.62	0.23	0.54	0.22	138
Melilla	0.17	0.29	0.11	0.90	42.49	0.59	0.18	0.46	0.28	121
Mean	0.19	0.23	0.12	0.90	42.97	0.55	0.14	0.49	0.36	
Std. Dev.	0.39	0.42	0.33	0.30	9.28	0.50	0.34	0.50	0.48	

Notes: Data come from the Survey of Living Conditions (SLC) provided by the Spanish Statistical Institute for the year 2011. The sample contains 13,489 observations of individuals aged 26 to 60 who are in labor force.

Supplementary Table 3.2: Summary statistics for parents' labor force

Region	Unemployed parents	Unemployed father	Unemployed mother	Observations
Andalucía	0.03	0.02	0.02	322
Aragón	0.01	0.01	0.01	134
Asturias	0.00	0.00	0.00	120
Illes Balears	0.01	0.01	0.00	134
Canarias	0.03	0.02	0.02	174
Cantabria	0.01	0.01	0.00	116
Castilla y León	0.01	0.01	0.01	148
Castilla - La Mancha	0.00	0.00	0.00	96
Cataluña	0.00	0.00	0.00	420
Comunidad Valenciana	0.01	0.00	0.00	265
Extremadura	0.02	0.02	0.00	81
Galicia	0.02	0.00	0.02	254
Madrid	0.01	0.01	0.01	325
Murcia	0.00	0.00	0.00	111
Navarra	0.00	0.00	0.00	97
País Vasco	0.01	0.01	0.01	190
La Rioja	0.00	0.00	0.00	140
Ceuta	0.08	0.08	0.00	13
Melilla	0.00	0.00	0.00	10
Mean	0.01	0.01	0.01	
Std. Dev.	0.11	0.08	0.08	

Notes: Data come from the Survey of Living Conditions (SLC) provided by the Spanish Statistical Institute for the year 2011. The sample contains 3,150 observations of individuals aged 26 to 60 who are in labor force and whose parents were in labor force too.

Supplementary Table 3.3: The effect of both parents present during adolescence on the probability of being unemployed

Dependent variable: Unemployed	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Both parents	-0.185***	-0.183***	-0.180*	-0.181***	-0.192***	-0.219***	-0.190***	-0.191***	-0.183***	-0.168***
present	(0.054)	(0.055)	(0.107)	(0.068)	(0.057)	(0.053)	(0.061)	(0.059)	(0.055)	(0.041)
Age	-0.079***	-0.083***	-0.096***	-0.066	-0.083***	-0.087***	-0.079***	-0.082***	-0.084***	-0.083***
	(0.020)	(0.020)	(0.028)	(0.047)	(0.020)	(0.024)	(0.023)	(0.021)	(0.020)	(0.020)
$Age^2/100$	0.078***	0.083***	0.098***	0.063	0.083***	0.088***	0.079***	0.082***	0.084***	0.083***
	(0.024)	(0.023)	(0.031)	(0.056)	(0.023)	(0.028)	(0.027)	(0.025)	(0.023)	(0.023)
Man	-0.065	-0.067			-0.068	-0.019	-0.055	-0.056	-0.066	-0.066
	(0.050)	(0.050)			(0.050)	(0.033)	(0.054)	(0.053)	(0.050)	(0.044)
Primary school	-0.123	-0.135	-0.155	-0.143	-0.115	0.009	-0.244*	-0.123	-0.137	-0.317*
	(0.146)	(0.163)	(0.150)	(0.246)	(0.159)	(0.157)	(0.147)	(0.171)	(0.164)	(0.168)
Secondary school	-0.504***	-0.494***	-0.523***	-0.504**	-0.459***	-0.384**	-0.586***	-0.470***	-0.497***	-0.628***
	(0.141)	(0.147)	(0.139)	(0.211)	(0.143)	(0.156)	(0.133)	(0.153)	(0.147)	(0.163)
University degree	-0.918***	-0.894***	-0.901***	-0.936***	-0.845***	-0.767***	-1.004***	-0.886***	-0.896***	-1.042***
	(0.156)	(0.156)	(0.138)	(0.232)	(0.154)	(0.148)	(0.149)	(0.162)	(0.158)	(0.176)
Mother' age										-0.010*
										(0.006)
Father' age										0.010*
										(0.006)
Father with high										-0.015
level of education										(0.081)
Mother with high										0.080
level of education										(0.101)
Unemployment rate					0.038***					
					(0.008)					
GDP per capita					0.001					
					(0.011)					
				Marginal effects						
Both parents	-0.050	-0.047	-0.047	-0.047	-0.050	-0.053	-0.047	-0.050	-0.047	-0.043
present	0.012	0.014	0.028	0.017	0.015	0.013	0.015	0.015	0.014	0.010
Region fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Observations	13,489	13,489	7,373	6,116	13,489	11,897	11,640	12,638	13,230	11,893

Note: The dependent variable is de probability of being unemployed. Controls for parents' characteristics have been included in last column. The variation in the sample size is due to the availability of this information. Estimates are weighted. Robust standard errors, clustered by region, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Supplementary Table 3.4: The effect of parental unemployment during adolescence on the probability of being unemployed

Dependent variable: Unemployed	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Father or mother unemployed	0.433***	0.472***	0.525***						
	(0.152)	(0.144)	(0.166)						
Unemployed father				0.066					
				(0.256)					
Unemployed mother					0.837***	0.726**	1.086***	0.917***	0.838***
					(0.306)	(0.362)	(0.423)	(0.296)	(0.321)
Age	-0.035	-0.029	-0.028	-0.037	-0.034	-0.033	-0.038	-0.028	-0.027
	(0.025)	(0.024)	(0.027)	(0.024)	(0.025)	(0.047)	(0.044)	(0.024)	(0.027)
$Age^2/100$	0.038	0.031	0.030	0.040	0.036	0.029	0.050	0.029	0.029
	(0.030)	(0.029)	(0.034)	(0.029)	(0.030)	(0.052)	(0.052)	(0.029)	(0.034)
Man	-0.065	-0.069	-0.039	-0.063	-0.067			-0.070	-0.039
	(0.060)	(0.057)	(0.066)	(0.060)	(0.060)			(0.057)	(0.065)
Primary school	0.450	0.440	0.323	0.463	0.456	0.344	0.719**	0.445	0.326
	(0.329)	(0.320)	(0.307)	(0.324)	(0.331)	(0.496)	(0.344)	(0.322)	(0.310)
Secondary school	0.029	0.028	-0.028	0.037	0.032	-0.174	0.376	0.029	-0.026
	(0.263)	(0.266)	(0.259)	(0.260)	(0.263)	(0.381)	(0.398)	(0.266)	(0.259)
University degree	-0.184	-0.178	-0.282	-0.176	-0.185	-0.390	0.159	-0.181	-0.281
	(0.305)	(0.300)	(0.319)	(0.300)	(0.307)	(0.421)	(0.392)	(0.301)	(0.320)
Mother' age			-0.006						-0.005
			(0.009)						(0.009)
Father' age			0.001						0.001
			(0.009)						(0.010)
Father with high			-0.159						-0.162
level o education			(0.164)						(0.166)
Mother with high			0.215						0.216

Supplementary Table 3.4 continued									
level of education			(0.161)						(0.162)
Unemployment rate		0.046***						0.047***	
		(0.011)						(0.011)	
GDP per capita		0.002						0.002	
		(0.015)						(0.015)	
			Marginal effects						
Father or mother	0.111***	0.122***	0.132***						
unemployed	(0.039)	(0.039)	(0.041)						
Unemployed mother					0.214***	0.182**	0.278***	0.237***	0.210***
					(0.078)	(0.090)	(0.107)	(0.076)	(0.079)
Region fixed effects	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Observations	3,150	3,150	2,884	3,150	3,150	1,570	1,580	3,150	2,884

Note: The sample, obtained from Spanish Living Conditions Survey (2011), consists of individuals aged 26 to 60 who are in labor force. The variation in the sample size is due to the fact that our sample has been restricted to those individuals whose parents were in labor force. We lose around 10,000 of individuals whose mothers were not in labor force during their adolescence. Column 6 only includes males and column 7 only includes females. The variation in the sample size in the last column is due to the availability of information for parents' characteristics. Estimates are weighted. Robust standard errors, clustered by region, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Supplementary Table 3.5: The effect of family support on other labor characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployed	0.068				-0.610***			
father or mother	(0.167)				(0.219)			
Both parents		-0.140***	-0.078	-0.208***		0.183**	0.160	0.246***
present		(0.048)	(0.079)	(0.061)		(0.078)	(0.128)	(0.093)
Age	-0.125***	-0.070***	-0.082***	-0.056***	0.076**	0.064***	0.077***	0.044
	(0.023)	(0.012)	(0.026)	(0.018)	(0.036)	(0.022)	(0.020)	(0.034)
$Age^2/100$	0.105***	0.041***	0.054*	0.026	-0.061	-0.051**	-0.065***	-0.028
	(0.027)	(0.015)	(0.031)	(0.019)	(0.045)	(0.026)	(0.025)	(0.038)
Man	-0.178***	-0.181***			0.225***	0.339***		
	(0.032)	(0.022)			(0.062)	(0.040)		
Primary	-0.331	-0.247*	-0.255	-0.256	0.671**	0.143	0.133	0.172
school	(0.462)	(0.131)	(0.170)	(0.244)	(0.306)	(0.233)	(0.291)	(0.172)
Secondary	-0.624	-0.585***	-0.600***	-0.584***	0.730*	0.262	0.320	0.141
school	(0.394)	(0.120)	(0.170)	(0.212)	(0.420)	(0.285)	(0.331)	(0.264)
University	-0.853*	-0.916***	-0.971***	-0.876***	0.607	0.170	0.236	0.046
degree	(0.438)	(0.128)	(0.190)	(0.225)	(0.458)	(0.268)	(0.301)	(0.286)
Marginal effects								
Unemployed					-0.111***			
father or mother					(0.040)			
Both parents		-0.040***		-0.063***		0.033**		0.034***
present		(0.014)		(0.018)		(0.014)		(0.013)
Region Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,150	13,489	7,373	6,116	3,150	13,489	7,373	6,116

Note: The sample, obtained from Spanish Living Conditions Survey 2011, consists of individuals aged 26 to 60. We study the effect of living with both parents present on the probability of being a temporary employee in columns 1 to 4. The probability of being self-employed has been analyzed in columns 5 to 8. Columns 3 and 7 only incorporate males, and columns 4 and 8 only incorporate females. The dependent variable is defined as a dummy variable taking value 1 if the individual is a temporary employee in columns 1 to 4 and as the probability of being self-employed in columns 5 to 8. Estimates are weighted. Robust standard errors, clustered by region, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

References

Aguilar-Palacio, I., Carrera-Lasfuentes, P., and Rabanaque, M. J. (2015).“Youth unemployment and economic recession in Spain: influence on health and lifestyles in young people (16–24 years old)”, *International journal of public health*, 60(4), 427-435.

Amato, P. R. (2005). “The Impact of Family Formation Change on the Cognitive, Social, and Emotional Well-Being of the Next Generation”, *Future of Children,* 15(2), 75–96.

Azmat, G., Güell, M., and Manning, A. (2006). “Gender gaps in unemployment rates in OECD countries”, *Journal of Labor Economics*, 24(1), 1-37.

Baccaro, L., and Rei, D. (2007). “Institutional determinants of unemployment in OECD countries: Does the deregulatory view hold water?”, *International Organization*, 61(3), 527-569.

Becker, G., and Lewis, H.G. (1973). “On the interaction between the quantity and quality of children”, *Journal of Political Economy,* 81(2), 279-288.

Bell, D. N., and Blanchflower, D. G. (2011), “Young people and the Great Recession”, *Oxford Review of Economic Policy*, 27(2), 241-267.

Belsky, J., and Eggebeen, D. (1991). “Early and extensive maternal employment and young children’s socioemotional development: Children of the National Longitudinal Survey of Youth”, *Journal of Marriage and the Family*, 53(4), 1083-1098.

Blanchard, O., and Jimeno, J. F. (1995). “Structural unemployment: Spain versus Portugal”, *The American Economic Review,* 85(2), 212-218.

Bliss, C. I. (1934). “The method of probits-a correction”, *Science*, 79(2053), 409-410.

Bowen, D. D., and Hisrich, R. D. (1986). “The female entrepreneur: A career development perspective”, *Academy of management review*, 11(2), 393-407.

Bowlby, J. (1969), *Attachment and loss: Volume 1, Attachment*, Basic Books, New York, NY.

Bowlby, J. (1980), *Attachment and loss: Volume 3, Loss, sadness and depression*, Basic Books, New York, NY.

Bowles, S., and Gintis, H. (2002). “The inheritance of inequality”, *The Journal of Economic Perspectives*, 16(3), 3–30.

Brügger, B., Lalive, R., and Zweimüller, J. (2009). "Does culture affect unemployment? Evidence from Röstigraben", IZA Discussion Papers 4283, Institute for the Study of Labor (IZA), Germany.

Buonanno, P., and Montolio, D. (2008). "Identifying the socio-economic and demographic determinants of crime across Spanish provinces", *International Review of law and Economics*, 28(2), 89-97.

Caputo, R. K., and Dolinsky, A. (1998). "Women's choice to pursue self-employment: The role of financial and human capital of household members", *Journal of Small Business Management*, 36(3), 8.

Council of Europe 19. (2006). "Recommendation of the Committee of Ministers to member states on policy to support positive parenting", available at: https://wcd.coe.int/ViewDoc.jsp?id=1073507Daly

Cutrona, C. E., Cole, V., Colangelo, N., Assouline, S. G., and Russell, D. W. (1994). "Perceived parental social support and academic achievement: An attachment theory perspective", *Journal of personality and social psychology*, 66(2), 369.

Cabrera, N. J., and Tamis-LeMonda, C. S. (2014). "Handbook of Father Involvement: Multidisciplinary Perspectives", Lawrence Erlbaum Associates, Mahwah, NJ.

Cherlin, A. (2002). "The Marriage Problem: How Our Culture Has Weakened Families", *Population and Development Review,* 28(3), 566-568.

Chu, R. J. C. (2010). "How family support and Internet self-efficacy influence the effects of e-learning among higher aged adults–Analyses of gender and age differences", *Computers & Education*, 55(1), 255-264.

Colell, E., Sánchez-Niubò, A., Delclos, G. L., Benavides, F. G., and Domingo-Salvany, A. (2015). "Economic crisis and changes in drug use in the Spanish economically active population", *Addiction*, 110(7), 1129-1137.

Chowdry, H., Crawford, C., and Goodman, A. (2011). "The role of attitudes and behaviours in explaining socio-economic differences in attainment at age 16", *Longitudinal and Life Course Studies*, 2(1), 59-76.

Dennis, J. M., Phinney, J. S. and Chuateco, L. I. (2005). “The role of motivation, parental support, and peer support in the academic success of ethnic minority first-generation college students”, *Journal of college student development*, 46(3), 223-236.

Dietrich, J., and Kracke, B. (2009). “Career-specific parental behaviors in adolescents’ development”, *Journal of Vocational Behavior*, 75(2), 109-119.

Dolado, J. J., Felgueroso, F., and Jimeno, J. F. (2000). “Youth labour markets in Spain: Education, training, and crowding-out”, *European Economic Review*, 44(4-6), 943-956.

Edin, K., and Lein, L. (1997), “Making Ends Meet: How Single Mothers Survive Welfare and Low Wage Work”, Russell Sage Foundation, New York, NY.

EUROSTAT (2019), *Unemployment statistics*, available at: http://ec.europa.eu/eurostat/data/database

Fingerman, K., Miller, L., Birditt, K., and Zarit, S. (2009). “Giving to the good and the needy: Parental support of grown children”, *Journal of Marriage and Family*, 71(5), 1220-1233.

Gallie, D. (1999). “Unemployment and social exclusion in the European Union”, *European Societies*, 1(2), 139-167.

Gallie, D. and Russell, H. (1998). “Unemployment and life satisfaction: A cross-cultural comparison”, *European Journal of Sociology,* 39(2), 248-280.

Gauly, B. (2017). “The Intergenerational Transmission of Attitudes: Analyzing Time Preferences and Reciprocity”, *Journal of Family and Economic Issues*, 38(2), 293-312.

Giménez, J.I., Molina, J.A., and Ortega, R. (2017). “Like my parents at home? Gender differences in childrens’ housework in Germany and Spain”, *Empirical Economics*, 52(4), 1143-1179.

Giménez, J.I., Molina, J.A., and Zhu, Y. (2018). “Intergenerational mobility of housework time in the United Kingdom”, *Review of Economics of the Household*, 16(4), 911-937.

Gines, J., Garcia, J., and Garcia, A. (2000). “Higher education and graduate employment in Spain”, *European Journal of Education*, 35(2), 229-237.

Heckman, J. J., Stixrud, J., and Urzua, S. (2006). "The effects of cognitive and non-cognitive abilities on labor market outcomes and social behavior. *Journal of Labor Economics*, 24(3), 411–482.

Hertz, T., Jayasundera, T., Piraino, P., Selcuk, S., Smith, N., and Verashchagina, A. (2008). "The inheritance of educational inequality: International comparisons and fifty-year trends", *The B.E. Journal of Economic Analysis & Policy*, 7(2), 1-48.

Hofferth, S. L. (2006). "Residential Father Family Type and Child Well-Being: Investment Versus Selection", *Demography,* 43(1), 53–77.

INE (2011), *Labour Force Survey*, Spanish Statistical Institute, available at: https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176918&menu=ultiDatos&idp=1254735976595

INE (2011, 2016), *Survey of Living Conditions, Spanish Statistical Institute,* available at:
https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176807&menu=resultados&secc=1254736194824&idp=1254735976608

INE (2014, 2015, 2016, 2017), *Continuous Household Survey*, Spanish Statistical Institute*, available at:*
http://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176952&menu=resultados&idp=1254735572981

Jenkins, S. P., and García-Serrano, C. (2004). "The relationship between unemployment benefits and re-employment probabilities: evidence from Spain", *Oxford Bulletin of Economics and Statistics*, 66(2), 239-260.

Kamas, L., and Preston, A. (2012). "The importance of being confident; gender, career choice, and willingness to compete", *Journal of Economic Behavior and Organization*, 83(1), 82-97.

Kamas, L., and Preston, A. (2018). "Competing with confidence: The ticket to labor market success for college-educated women", *Journal of Economic Behavior and Organization,* 155, 231-252.

Keijsers, L., Frijns, T., Branje, S. J., and Meeus, W. (2009). "Developmental links of adolescent disclosure, parental solicitation, and control with delinquency: Moderation by parental support", *Developmental psychology*, 45(5), 1314

Kooreman, P., and Ridder, G. (1983). "The effects of age and unemployment percentage on the duration of unemployment: Evidence from aggregate data", *European Economic Review*, 20(1-3), 41-57.

Manning, W. D., Brown, S. L., and Payne, K. K. (2014). "Two Decades of Stability and Change in Age at First Union Formation", *Journal of Marriage and Family,* 76(2), 247–260.

Marcén, M. (2014). "The role of culture on self-employment", *Economic Modelling,* 44(1), 20-32.

McQuaid, R. W. (2006). "Job search success and employability in local labor markets", *Annals of Regional Science*, 40(2), 407-421.

McLanahan, S., and Sandefur, G. (1994). "Growing up with a single parent: What hurts, what helps", *Harvard University Press,* Cambridge, MA.

Mencarini, L., Pasqua, S., and Romiti, A. (2017). "Single-mother families and the gender gap in children's time investment and non-cognitive skills", *Review of Economics of the Household*, 17(1), 149-176.

Molina, J.A. (2011), *Household Economic Behaviors*, Springer, New York, NY.

Molina, J.A. (2013). "Altruism in the household: in-kind transfers in the context of kin selection", *Review of Economics of the Household*, 11, 309-312.

Molina, J.A. (2014). "Altruism and monetary transfers in the household: inter- and intra-generation issues", *Review of Economics of the Household*, 12(3), 407-410.

Molina, J.A. (2015). "Caring within the family: reconciling work and family life", *Journal of Family and Economic Issues*, 36(1), 1-4.

Molina, J.A., Navarro, M. and Walker, I. (2011). "Intergenerational well-being mobility in Europe", *Kyklos*, 64(2), 253-270.

Nickell, S., and Layard, R. (1999). "Labor market institutions and economic performance", *Handbook of labor economics*, 3(46), 3029-3084.

Nunez, I., and Livanos, I. (2010). “Higher education and unemployment in Europe: an analysis of the academic subject and national effects”, *Higher Education*, 59(4), 475-487.

O' Donoghue, C., and Sutherland, H. (1998). *Accounting for the family: the treatment of marriage and children in European income tax systems*, UNICEF International Child Development Centre, Florence, Italy.

OECD (2005). “How Persistent are Regional Disparities in Employment?”, *in OECD Employment Outlook 2005*, OECD Publishing, Paris.

Oliker, S. J. (1995). “The Proximate Contexts of Workfare and Work: A Framework for Studying Poor Women’s Economic Choices”, *Sociological Quarterly,* 36 (2), 251–272.

Parker, J. S., and Benson, M. J. (2004). “Parent-adolescent relations and adolescent functioning: self-esteem, substance abuse, and delinquency”, *Adolescence*, 39(155), 519-530

Patten, C. A., Gillin, J. C., Farkas, A. J., Gilpin, E. A., Berry, C. C. and Pierce, J. P. (1997). “Depressive symptoms in California adolescents: Family structure and parental support”, *Journal of Adolescent health*, 20(4), 271-278.

Rodrigo, M. J., Byrne, S., and Álvarez, M. (2017). “Interventions to promote positive parenting in Spain”, in M. Israelashvili, and J.L. Romano (Eds), *Cambridge Handbook of International Prevention Science*, Cambridge, UK, 929–956.

Sarason, B. R., Pierce, G. R. and Sarason, I. G (1990). “Social support: The sense of acceptance and the role of relationships”, in B. R. Sarason, I. G. Sarason, and G. R. Pierce (Eds.), *Social support: An interactional view*, Wiley, New York, 97-128

Saridakis, G., Mohammed, A. M., García-Iglesias, J. M. and Torres, R. I. M. (2018), “Economy and Divorces: Their Impact Over Time on the Self-Employment Rates in Spain”, *Journal of Family and Economic Issues*, Vol.39 No. 3, pp. 422-435

Solon, G. (2002). “Cross-country differences in intergenerational earnings mobility”, *The Journal of Economic Perspectives*, 16(3), 59–66.

Urbanos-Garrido, R. M., and Lopez-Valcarcel, B. G. (2015).“The influence of the economic crisis on the association between unemployment and health: an empirical analysis for Spain”, *The European Journal of Health Economics,* 16(2), 175-184.

Vaux, A. (1988). *Social support: Theory, research, and intervention*, Praeger, New York.

Vaux, A., and Harrison, D. (1985). "Support network characteristics associated with support satisfaction and perceived support", *American Journal of Community Psychology,* 13(3), 245-265.

Verick, S. (2009). "Who Is Hit Hardest during a Financial Crisis? The Vulnerability of Young Men and Women to Unemployment in an Economic Downturn (No. 4359)", *Institute for the Study of Labor (IZA).*

Weinberg, B. A. (2009). "A model of overconfidence", *Pacific Economic Review*, 14(4), 502-515.

Zorrilla, B., Pires, M., Lasheras, L., Morant, C., Seoane, L., Sanchez, L. M. and Durbán, M. (2009). "Intimate partner violence: last year prevalence and association with socio-economic factors among women in Madrid, Spain", *European Journal of Public Health,* 20(2), 169-175.

Conclusions

The aim of this thesis is to provide research in demographic and family economics. In particular, all chapters share the same research interest, that is, to show empirical evidence of the effect of social norms/culture on individuals' decisions. There is a growing literature studying how social and gender norms shape individuals' behavior, which is an important field of research within the economics of the family. This thesis contributes to this body of research on the effect of culture on socioeconomic and demographic outcomes.

To examine this issue in Chapter 1, we utilize data on first-generation immigrants who arrived in the United States at or before the age of 5 and follow an epidemiological approach. Dissimilarities in the behavior of young-arrival immigrants originating from different countries, who grew up and live in the same country, can be interpreted as evidence of the existence of a cultural effect. Our results suggest that culture matters in women fertility decisions, couples' choice of living together (as a married or unmarried couple) as well as the home-ownership decision. Additionally, we present evidence of different mechanisms of transmission of culture, which reinforces our results on the cultural effect.

We also show empirical evidence of the relationship between cultural differences across countries and the location choice of migrants in Chapter 2. We find a negative and statistically significant relationship between the cultural differences between home and host-countries (measured for observable characteristics, such as fertility, marriage, and employment, among others) and the migration flow. Additionally, cultural differences may also affect the extent to which legal changes affect the migration decisions of some individuals. We observe that the legalization of same-sex marriage not only has a positive effect on the interstate migration flow of homosexuals to states having same-sex marriage, but also generate outflow migration of those non-native migrants originating from intolerant countries. Thus, cultural differences regarding homosexuality may be of significance in the migration decisions of some individuals.

Finally, we focus on gender stereotyping in sports in Chapter 3. We present correlational evidence suggesting that the extent to which boys and girls break stereotypes when choosing which sports to practice during high school depends on how women are viewed in society. We also identify fathers' time investments as being an important cultural-transmission mechanism through which gender stereotypical patterns in the choice of sports may be passed on and maintained.

In conclusion, all the results described in the different chapters point to the importance of social norms in determining individuals' behavior. Given the importance of all outcomes analyzed throughout the thesis, understanding these associations can point towards future research on individuals' differences in fertility, marriage or cohabitation, homeownership, migration and gender differences in sport choices, and inform a public policy issue of first-order importance.

Conclusiones

El objetivo de esta tesis es proporcionar investigación en el campo de estudio de la economía familiar y la demografía. En particular, todos los capítulos comparten el mismo interés, mostrar evidencia empírica del efecto de las normas sociales/cultura en las decisiones de los individuos. Existe una literatura cada vez más amplia que estudia cómo las normas sociales y los roles de género moldean el comportamiento de los individuos, lo que constituye un campo de investigación importante dentro de la economía de la familia. Esta tesis contribuye a esta literatura sobre el efecto de la cultura en distintas variables socioeconómicos y demográficas.

Para examinar esta cuestión en el Capítulo 1, utilizamos datos sobre inmigrantes de primera generación que llegaron a Estados Unidos a la edad de 5 años o menos y seguimos un enfoque epidemiológico. Las diferencias en el comportamiento de los inmigrantes que llegaron a este país siendo muy jóvenes, originarios de diferentes países, y que han crecido y viven en el mismo país de residencia, pueden interpretarse como evidencia de la existencia de un efecto cultural. Nuestros resultados sugieren que la cultura importa en las decisiones de tener hijos de las mujeres, la elección de las parejas de vivir juntas (como pareja casada o soltera), así como las decisiones de tener una vivienda en propiedad. Adicionalmente, presentamos evidencias de diferentes mecanismos de transmisión de la cultura, lo que refuerza nuestros resultados sobre el efecto cultural.

También mostramos evidencia empírica de la relación que existe entre las diferencias culturales entre países y la elección del país de destino de los migrantes en el Capítulo 2. Encontramos una relación negativa y estadísticamente significativa entre las diferencias culturales entre los países de origen y de destino (medidas por características observables, como la natalidad, matrimonio y empleo, entre otros) y el flujo migratorio. Además, las diferencias culturales también pueden afectar a la medida en que los cambios legales afectan las decisiones migratorias de algunas personas. Observamos que la legalización del matrimonio entre personas del mismo sexo no solo tiene un efecto positivo en el flujo migratorio interestatal de homosexuales hacia estados que legalizan el matrimonio homosexual, sino que también genera un flujo de salida de aquellos migrantes no nativos provenientes de países poco tolerantes con la homosexualidad. Lo que nos indica que las diferencias culturales con respecto a la homosexualidad también pueden ser importantes en las decisiones migratorias de algunas personas.

Finalmente, nos centramos en estudiar como los estereotipos de género afectan a la práctica de deportes en el Capítulo 3. Presentamos evidencia correlacional que sugiere que la medida en que los niños y niñas rompen los estereotipos al elegir qué deportes practicar durante la escuela secundaria depende de cómo se ve a las mujeres en la sociedad. También identificamos el tiempo que los padres invierten en los hijos como un importante mecanismo de transmisión cultural a través del cual los estereotipos de género en la elección de deportes pueden transmitirse y mantenerse a lo largo del tiempo.

En conclusión, todos los resultados descritos en los diferentes capítulos apuntan a la importancia de las normas sociales para determinar el comportamiento de los individuos. Dada la importancia de todos los resultados analizados a lo largo de la tesis, comprender estas asociaciones puede apuntar hacia futuras investigaciones sobre los diferentes patrones seguidos en natalidad, matrimonio o cohabitación, propiedad de vivienda, migración y en las diferencias de género en la elección de deportes, así como informar sobre un tema de política pública de importancia de primer orden.