The Legacy of the Missing Men
The Long-Run Impact of World War I on Female Labor Force Participation

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Abstract

I explore the pathways underlying the diffusion of women's participation in the labor force across generations at the individual level. I rely on a severe exogenous shock to the adult sex ratio, World War I military fatalities in France, which generated a short-run upward shift in female labor force participation. I find that this shock to female labor transmitted across generations: women residing under the same institutional conditions but born in locations exposed to higher military death rates were more likely to be in the labor force from 1962 to 2012. Three primary mechanisms account for the long-run impact of World War I military fatalities on women's working behavior: vertical intergenerational transmission (from mothers and fathers to daughters), transmission through marriage (from husbands to wives, and from mothers in-law to daughters in-law), and oblique intergenerational transmission (from migrants to non-migrants). Consistent with theories of intergenerational diffusion of female labor force participation, I provide supporting evidence that WWI military fatalities altered preferences and beliefs about female labor in the long run.

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Female labor force participation increased dramatically across industrialized countries after World War II, fundamentally altering the economic roles of women and the family in these societies. In France, while the labor force participation of women aged 30 to 49 held steady at 35 percent through the first half of the twentieth century, it surged in the 1960s, eventually reaching 90 percent.[1] Beyond standard technological explanations, changes in preferences and beliefs about gender roles due to early generations of working women have been pointed out as instrumental for this transformation to materialize.[2] For instance, to account for the endogenous evolution of social norms and female labor force participation, the theoretical framework of Fernández (2013) lays out an intergenerational learning process in which women update their prior beliefs about the payoff from working upon observing women of the previous generation.[3] Alternatively, in the model of Fernández et al. (2004), the men who grow up with a working mother form more progressive views about female labor, making them less averse to marry a working women. This, in turn, provides incentives for women to enter the labor force.

Direct empirical evidence for these intergenerational transmission mechanisms is nonetheless scarce. Indeed, the very factors that induced women to enter the labor force in the first place may well still be at play decades later, making the working behavior of women across generations largely codetermined. Further, the entrance of early generations of women in the labor force may have altered local labor market structures in the long run, making it all the more challenging to identify intergenerational transmission mechanisms independent from confounding changes in the local institutional environment. In this paper, I explore the pathways underlying the diffusion of women's working behavior across three generations in France. I show that the entrance of women in the labor force resulting from World War I (WWI) had long-run implications for later generations of women. Three primary channels

[1] Olivetti and Petrongolo (2016, pp. 407–411) show that the entrance of women in the labor force has been a general trend across all industrialized countries in the second half of the twentieth century. Maruani and Meron (2012) provide an extensive account of the evolution of female labor force participation in France throughout the twentieth century.

[2] Various technological innovations helped women enter the labor force: the greater availability and declining prices for labor-saving consumer durable goods (Greenwood et al. 2005); the advent of oral contraceptives (Goldin and Katz 2002, Bailey 2006); the fall of child care cost induced by the marketization of home-production (Attanasio et al. 2008); improvements in maternal health (Albanesi and Olivetti 2016); the expansion of the service sector driven by the structural transformation of the economy (Olivetti and Petrongolo 2016, Ngai and Petrongolo 2017). Goldin (1990, 2006, 2014), Blau et al. (2017), and Greenwood et al. (2017) provide comprehensive accounts for the causes of long-run trends in women's participation in labor markets.

[3] Hazan and Maoz (2002), Fogli and Veldkamp (2011), and Hiller and Baudin (2016) build related models.

help explain the patterns in the data: vertical intergenerational transmission (from mothers and fathers to daughters), transmission through marriage (from husbands to wives, and from mothers in-law to daughters in-law), and oblique intergenerational transmission (from migrants to non-migrants). Among these mechanisms, the mother-to-daughter channel appears the strongest. Consistent with formal models of intergenerational diffusion of female labor force participation, I provide supporting evidence that World War I military fatalities altered preferences and beliefs about female labor in the long-run.

My empirical strategy relies on a severe exogenous shock to the adult sex ratio: WWI military fatalities in France. While WWI ravaged continental Europe between 1914 and 1918, France suffered an especially high death toll relative to other belligerent countries. Because of a universal conscription system, most French male citizens were drafted throughout the war: out of a population of 10 million men aged 15 to 50 before the war, 8 million were drafted in the army. 1.3 million of them died in combat; a military death rate of 16 percent.[4] As a result, the adult sex ratio dropped from 98 men for every 100 women at the onset the war to 88 men for every 100 women by the end of the war. It was not until after World War II (WWII) that the pre-WWI adult sex ratio was restored (Figure 1).[5] In this paper, I build on my previous work in which I show that WWI military fatalities induced many women to enter the labor force during the interwar period (Boehnke and Gay 2017).

I explore whether this upward shift in female labor force participation persisted across generations at the individual level, long after the reversion of sex ratios to their natural balance. To uncover the legacy of the *missing men* independent from confounding institutional factors, I use an empirical strategy that mirrors the epidemiological approach to culture (Fernández 2011). This approach implies comparing women born in locations that were exposed to varying levels of military death rates, but who reside within the same location, thereby facing similar local institutional constraints when making decisions. With this empirical strategy, identification effectively stems from variations in the working behavior of

[4]The exact number of soldiers who ultimately died as a direct consequence of the war is not known with certainty as some soldiers died a few years after the war because of injuries or illnesses contracted during the conflict. However, the figure of 1.3 million is the consensus among historians. Prost (2008) and Beau (2017) provide a detailed account of the assessment of WWI military fatalities. It is similarly difficult to assess the number of civilian victims during the conflict. When adding up the number of pension requests resulting from civilian fatalities, the number of victims during the bombing of cities near the front—Dunkerque, Calais, Béthunes, Arras, Lens, Reims, Pont-à-Mousson, and Nancy—and Paris, as well as the civilian victims of the commercial fleet, they amount to about 40,000 (Huber 1931, pp. 310–314).

[5]World War II did not affect much the adult sex ratio in France. There were about 400,000 fatalities in France as a result of World War II (Lagrou 2012). 150,000 of them were military fatalities—with most fatalities accounted by colonial soldiers—and 350,000 of them were civilian fatalities—affecting both men and women.

internal migrants. Because the geographical unit of analysis is relatively small, the *département*, internal migrants with respect to these location boundaries make up half of the French population and are similar to non-migrants along observable characteristics.[6] I combine all the French censuses for which microdata are available—the thirteen censuses from 1962 to 2012—and find that women born in départements exposed to high military death rates (20 percent) rather than to low military death rates (10 percent) were 5 percentage points more likely to be working between 1962 and 2012. Regression coefficients are precisely estimated and stable throughout the period, though their magnitude relative to mean levels in female labor force participation fades over time. Estimates relying on variations in the working behavior of women *across*—rather than *within*—départements suggest that individual-level transmission mechanisms account for half of the overall long-run impact of WWI military fatalities on female labor force participation.

Because identification stems from variations in the working behavior of internal migrants, I thoroughly explore whether selective in- and out-migration patterns can account for the results. For instance, using a rich set of residence location fixed effects for smaller aggregation units, I show that the estimates are unchanged when comparing women residing within the same département, within the same local labor market, or within the same municipality, thereby alleviating the possibility of selective in-migration. Other strategies to account for selective migration patterns similarly suggest that these do not drive the results. Replicating the analysis on the combination of all thirty-two annual labor force surveys between 1982 and 2013 yields similar estimates.[7]

To account for these findings, I explore three underlying mechanisms of transmission: vertical intergenerational transmission (from mothers and fathers to daughters), transmission through marriage (from husbands to wives, and from mothers in-law to daughters in-law), and oblique intergenerational transmission (from migrants to non-migrants). To identify vertical intergenerational transmission, I use the extended version of the annual labor force surveys 2005–2012, which contains the départements of birth of respondents' parents. I focus on the sample of second-generation internal migrants and I compare non-migrant women residing within the same département but whose parents were born in départements exposed

[6]French départements are one of the three levels of government below the national level. There were 87 départements before the war, and 90 after the war. The three new départements belonged to Germany before the war. French départements were further subdivided into 95 départements in the second half of the twentieth century.

[7]Only after 1982 do the labor force surveys provide both respondents' départements of residence and départements of birth, thereby allowing the use of the epidemiological approach. These labor force surveys (*Enquêtes Travail*) are collected by the INSEE.

to varying levels of military death rates. I find compelling evidence for a mother-to-daughter transmission channel, as second-generation internal migrant women with mothers born in départements exposed to high military death rates rather than to low military death rates were 13 percentage points more likely to be working. I also find evidence for a father-to-daughter transmission channel, though its magnitude is smaller than that of the mother-to-daughter channel.

Next, matching wives and husbands in the censuses 1962–2012, I explore transmission through marriage. I show that the exposure of husbands' départements of birth to WWI military fatalities is correlated with the working behavior of their wives, as non-migrant women whose husbands were born in départements exposed to high military death rates rather than to low military death rates were 3–5 percentage points more likely to be working. Using the same strategy and dataset as when estimating vertical intergenerational transmission, I further show more directly that mothers in-law participated in the diffusion of the legacy of the missing men, as non-migrant women with mothers in-law born in départements exposed to high military death rates rather than to low military death rates were 1–3 percentage points more likely to be working.

I also explore oblique intergenerational transmission and analyze whether female and male internal migrants diffused the legacy of the missing men to younger non-migrant women in their destination département. I find that the exposure to WWI military fatalities among immigrants' origin départements contributed to change the working behavior of subsequent generations of women in their destination départements, highlighting the role of local interactions in this process.

To account for these mechanisms, I argue that the women who were induced to enter the labor force in the interwar period because of WWI military fatalities altered the preferences and beliefs about female labor of their daughters, of their sons, and of their entourage, and that these changes translated into the working behavior of women in subsequent generations. Because individuals form their preferences and beliefs early in life upon learning and socializing with their parents, peers, and neighbors (Bisin and Verdier 2001, 2011, Fogli and Veldkamp 2011, Fernández 2013, Olivetti et al. 2017), men and women who grew up with a working mother—or in an environment in which many women worked—should form more progressive views about female labor, providing a rationale for the long-run impact of WWI military fatalities on female labor force participation. Indeed, many studies find a strong correlation between both the beliefs about female labor and the working behaviors of mothers and their daughters', of mothers in-law and their daughters in-law's, and of mothers and

their daughters' peers'.[8]

I explore the validity of this argument and investigate the legacy of the missing men for preferences and beliefs about female labor using the French component of the Generation and Gender Survey (GSS) of 2005. Consistent with formal models of intergenerational diffusion of female labor force participation, I find that men and women born in départements exposed to higher levels of military death rates are more likely to hold progressive views toward the role of women in the labor force. I also show that these results do not reflect more progressive attitudes in general beyond those related to female labor.

This paper contributes to our understanding of the mechanisms at play behind the secular rise in female labor force participation across industrialized countries. Related to this paper, Fernández et al. (2004) argue that part of this phenomenon can be explained by the increasing number of men who grew up with a working mother. To provide empirical support for this transmission channel, they follow Acemoglu et al. (2004) and use variations in WWII mobilization rates across U.S. states, which generated an upward shift in female labor force participation and thus an increase in the number of men raised by working mothers. They find that this shock to female labor diffused to the cohorts of women that reached working age right after the war.[9] Consistent with Fernández et al. (2004), I find evidence for such a transmission channel, from mothers in-law to daughters in-law. Beyond this channel, I further uncover a broader set of mechanisms at play behind the diffusion of women's working behavior across generations. Moreover, the empirical strategy I use makes it possible to identify individual-level transmission mechanisms independent from confounding institutional factors. Finally, using WWI rather than WWII as a source of variation provides the opportunity to investigate the diffusion dynamics of changes in female labor force participation over the time span of three generations. In particular, I can trace the diffusion pathways of women's involvement in the labor force from the beginning to the end of the revolution

[8]Farre and Vella (2013) show that the attitudes of mothers in the U.S. toward gender roles and their working behavior is correlated with their own daughters' attitudes when young as well as their working behavior when adults. This phenomenon has also been empirically established for Great Britain (Berrington et al. 2008, Johnston et al. 2014), Mexico (Campos-Vazquez and Velez-Grajales 2014), and Egypt (Gadallah et al. 2017). Moreover, Olivetti et al. (2017) show that the working behavior of the mothers of a woman's friends when growing up affects her own working behavior later in life. Finally, the transmission channel from mothers in-law's labor choices to their daughters in-law's has been empirically verified for the U.S. (Morrill and Morrill 2013), Japan (Kawaguchi and Miyazaki 2009), and Switzerland (Bütikofer 2013).

[9]Besides Fernández et al. (2004) and Acemoglu et al. (2004), Goldin (1991) and Goldin and Olivetti (2013) also analyze the impact of WWII mobilization rates in the U.S. on subsequent female labor force participation. Moreover, Bellou and Cardia (2016) explore the impact of this shock to occupations held by women, and Jaworski (2014) focuses on female educational outcomes.

in female labor—from the 1960s to the 2010s.

This paper also helps clarify some mechanisms underlying the persistence of history. With a methodological focus on a *location-based* aspect of history—how historical events in a given location shape long-run outcomes in that location—, domestic institutions have been pointed out as a primary channel of historical persistence (Acemoglu et al. 2005, Nunn 2014, Michalopoulos and Papaioannou 2017). However, as a result of this methodological tendency, a crucial linkage of historical persistence has received less attention: individuals. Indeed, uncovering how individuals transmit the legacies of history across generations independent from confounding institutional structures requires extracting from a location-based approach to history and shifting toward a *lineage-based* approach to history. Applying this lineage-based approach, Michalopoulos et al. (2016) show in the African context that pre-modern economic lifeways of individuals' ancestors still affect their economic outcomes today. Alternatively, Alesina et al. (2013) show that part of the overall impact of historical plough use on contemporaneous gender-role attitudes is due to the transmission of cultural norms rather than to long-run changes in institutional structures. Consistent with Alesina et al. (2013), I find that this lineage-based aspect accounts for half of the long-run impact of WWI military fatalities on female labor force participation, suggesting an important role of individuals relative to local institutional structures in generating persistence of historical shocks.[10]

Finally, this paper complements the literature that investigates how cultural norms are formed, and how they change over time (Giuliano and Nunn 2017). Various studies explore how historical shocks to the sex ratio alter the economic role of women in subsequent generations (Giuliano 2017). For instance, Teso (2016) finds that sex ratio imbalances generated by the transatlantic slave trade in Africa over four centuries—slaves were predominantly male—induced later generations of women to enter the labor force, especially in higher-ranked occupations. Alternatively, Grosjean and Khattar (2015) show that the relative scarcity of women in Australia throughout the nineteenth century due to the arrival of British male convicts had adverse consequences in the long run for women's position in

[10]Relatedly, this paper contributes to the small literature studying the impact of WWI military fatalities in France, which has focused on marriage market and fertility outcomes in the interwar period (Abramitzky et al. 2011, Vandenbroucke 2014, Vandenbroucke and Knowles 2016). Besides investigating other issues and over a longer time span, my paper uses a more precise and disaggregated measure of military fatalities since it is based on individual-level military records. In contrast, other studies use aggregated measures of military death rates at the region—rather than the département—level from Huber (1931), which were based on estimates made in 1919 (Marin 1920). See Prost (2008) for a discussion of accuracy issues with these aggregate measures.

the labor force as well as for attitudes toward female labor. I similarly find that sex ratio imbalances resulting from WWI military fatalities permanently affected the economic role of women, long after the sex ratio had reverted to its natural level. This case illustrates how even a sharp disruption concentrated within a period of a few years can permanently alter cultural norms.

In the remainder of the paper, I first describe the extent of WWI military fatalities and how they generated an upward shift in female labor force participation in the interwar period (section I). Next, I show that this upward shift persisted across generations at the individual level (section II). Then, I uncover three mechanisms of transmission (section III): vertical intergenerational transmission, transmission through marriage, and oblique intergenerational transmission. Finally, I show that this historical shock altered preferences and beliefs about female labor in the long run (section IV). Section V concludes.

I. The Missing Men and Interwar Female Labor Force Participation

A. WWI Military Fatalities

A.1. Measuring Military Death Rates

To build a precise measure of military death rates at the département level, I collected the individual military records of all 1.3 million French soldiers who died because of the war, and extracted their dates of birth and départements of birth.[11] The military death rate in a département is defined as the ratio of the number of deceased soldiers born in the département to the size of its drafted population. Because, at the onset of the war, the organization of the army relied on an egalitarian and universal conscription system for all French male citizens aged 20 to 48, the size of the drafted population in a département is captured by its male population aged 15 to 44 in the census of 1911—the last census before the war.[12] Figure 2 displays the distribution of military death rates across 87 départements. Military death rates range from 6 percent in Belfort to 29 percent in Lozère. The average

[11] These individual military records are available on the *Mémoire des Hommes* (MDH) archive, which is maintained by the French Ministry of Defense. This dataset is also used in Boehnke and Gay (2017)—part of the data description is similar to Boehnke and Gay's (2017). The original archive is accessible at hhtp://www.memoiredeshommes.sga.defense.gouv.fr. See appendix C for more details on this database.

[12] The relevant conscription law during World War I can be found in the *Journal Officiel de la République Française, Lois et Décrets, 35* (81), pp. 1869–1890, dated March 23rd, 1905. Boehnke and Gay (2017) show that this measure is only marginally affected by pre-war internal migration flows and differential pre-war health conditions across départements.

military death rate is about 15 percent, the 25th percentile about 10 percent, and the 75th percentile about 20 percent.

Military fatalities had a dramatic impact on adult sex ratios. Table 1 reports the coefficients from estimating the following first-difference specification across various age groups:

$$\Delta \texttt{sex\_ratio}_{a,d} = \alpha + \beta \, \texttt{death\_rate}_{d} + \varepsilon_{a,d}, \tag{1}$$

where Δ $\texttt{sex\_ratio}_{a,d}$ denotes the change between 1911 and 1921 in the sex ratio of age group a in département d. Because drafted men were 20 to 48 during the war, these age groups experienced the largest declines in sex ratios. For instance, a 10 percentage points increase in military death rates was associated with a 3–6 percentage points decline in the sex ratio of age groups 25–44. As a result, the sex ratio among these age groups dropped on average 15 points between 1911 and 1921.

A.2. Sources of Variation in Military Death Rates Across Départements

In this section, I explore the sources of variation in military death rates across départements. I show that military death rates were not randomly distributed. Instead, their distribution was result of the geographical organization of the army, and of the policies implemented by the Ministry of War to sustain the industrial war effort.

The Geography of the Organization of the Army in 1914. The first source of variation in military death rates across départements stems from the geography of the organization of the army.[13] In 1914, the army was organized into twenty military regions. Both the recruitment of soldiers and the constitution of military units were structured by this territorial organization: at the beginning of the war, military units were constituted by soldiers from the same military region. As a result, soldiers from the same military regions were initially sent to the same battlefields following the French mobilization plan designed in 1912—the *Plan XVII* (Joffre 1932). This mobilization plan assigned each military unit to a predetermined area in the case of an invasion by German troops.[14] However, as military fatalities soon

[13]The basis of this system was given by the law of the general organization of the army of July 24th, 1873. The geography of the army was then only marginally readjusted until WWI. The exact geography that prevailed in August 1914 was fixed by the law of December 22nd, 1913 (Boulanger 2001, pp. 16–24). See the *Journal Officiel de la République Française, Lois et Décrets, 45* (349), pp. 11009–11010, dated December 24th, 1913.

[14]Gonzalez-Feliu and Parent (2016) show that the allocation logic of military units in the Plan XVII was the outcome of an optimization problem in which the objective of the military command was to minimize the travel time of military units between their military regions of origin and the front, with the railroad network as the main constraint. See Joffre (1932) and Le Hénaff (1922) for a historical account of the preparation

accumulated, the military command changed its affectation policy: starting January 1915, soldiers were allocated to any military unit based on each unit's needs, thereby effectively pooling together soldiers from different military regions.[15]

The geography of the organization of the army has two implications. On the one hand, départements that did not belong to the same military region could have had relatively different military death rates because their military units were assigned to different battlefields at the beginning of the war, with presumably different fatality rates. On the other hand, départements that belonged to the same military region could have had relatively similar military death rates, for that same reason. The latter might reduce the extent of the variation in military death rates across départements that were within the same military region. However, the correlation of military death rates across départements within the same military region is small at 0.12, presumably because soldiers from different military regions were pooled into the same military units soon after the beginning of the war.

The Industrial War Effort. As the war lasted longer than anticipated, the military command's plan to supply troops with war matériel—especially artillery—proved dramatically insufficient (Porte 2005, Bostrom 2016).[16] To cope with the ongoing war effort in conjunction with the lack of available civilian labor and the loss of the Northern industrial départements to the German invasion, the Ministry of War soon recalled soldiers with manufacturing skills into war factories.[17] As a result, up to 12 percent of mobilized soldiers were working in war factories instead of fighting on the front lines during the conflict. An additional 8 percent were working in the military administration (see Appendix Table B.1 and Appendix Figure A.1). Hence, soldiers from more industrial and urban areas, or, equivalently, from less rural

and application of the transportation plan of military units along the lines of the Plan XVII.

[15]This change in affectation policy was allowed by the *circulaire* of December 6th, 1913, in the case of war time (Boulanger 2001, p. 253).

[16]For instance, the Plan XVII only planned the production of 13,600 75mm shells per day, while the French army fired nearly 40,000 shells per day during the "Race to the Sea" in October 1914. By then, half of the stocks of 75mm shells had been depleted (Bostrom 2016, p. 264). See also Porte (2005, pp. 73–82).

[17]This allocation policy was allowed by the Dalbiez bill of August 17th, 1915, which stipulated the following: "The Ministry of War is authorized to allocate to corporations, factories, and mines working for the national defense men belonging to a mobilized or mobilizable age class, industrial managers, engineers, production managers, foremen, workers, and who will justify to have practiced their job for at least a year in those corporations, firms and mines, or in comparable corporations, firms, and mines" (art. 6, *Journal Officiel de la République Française, Lois et Décrets*, *47* (223), pp. 5785–5787, dated August 19th, 1915). From 1916 onwards, the military command also allocated soldiers into mines to increase steel production. Horne (1989) nevertheless argues that the recall of soldiers with manufacturing skills had started several months before the Dalbiez bill was enacted.

ones, were less likely to die in combats as a result of the policies implemented by the Ministry of War to support the industrial war effort.[18]

This pattern clearly emerges when regressing military death rates on pre-war département characteristics: more rural départements experienced relatively more military fatalities (Table 2). The rurality of a département can be captured by two characteristics: the *share of rural population*—in the censuses, it is defined as the share of the population that resides in cities with less than 2,000 residents—, and the *share of the residing population born in the département*.[19] These two variables explain most of the variation in military death rates across départements, as each one alone explains over 62 percent of its variance—see columns (1) and (2). In column (3), I regress military death rates on the characteristics that should most likely be correlated with later female labor force participation rates: the contemporaneous female labor force participation rate, a measure of female education, the total fertility rate, and the personal wealth per inhabitant. None is correlated with military death rates. These four variables together explain only 35 percent of the variance in military death rates. When adding the two measures of rurality together with additional characteristics in column (4), only the measures of rurality are correlated with military death rates.[20] Regressing military death rates on these two measures alone in column (5) barely affects the coefficients. Importantly, these two measures of rurality together explain 74 percent of the variation in military death rates across départements, against 80 percent when including eleven additional variables, as in column (4).

Additionally, the distribution of military death rates was not correlated with pre-war trends in female labor force participation. Regressing military death rates on pre-war changes in female labor force participation, I find that départements exposed to higher military death rates had a slight relative decline in female labor force participation before the war, but the coefficients are not significant—see columns (1) and (4) of Appendix Table B.2. Controlling for pre-war changes in rurality in columns (3) and (6) weakens the correlation even more.

Overall, the relationship between military death rates and rurality can be thought of as the result of the policies implemented by the Ministry of War to sustain the industrial war

[18]This phenomenon was eventually mitigated by the mobilization of soldiers into harvesting from 1917 onwards, as provisioned by the Mourier bill of February 20th, 1917 (*Journal Officiel de la République Française, Lois et Décrets*, *49* (51), p. 1408, dated February 21st, 1917).

[19]The *average personal wealth per inhabitant* or the *share of active population working in agriculture* also capture some aspects of rurality, but all the variation in these variables across départements is captured by the *share of rural population* and the *share of the residing population born in the département*.

[20]These additional characteristics consist of average height, population, the share of men working in industry, in agriculture, the share of the literate population, and the average direct taxes per inhabitant.

effort. I interpret the residual variation in military death rates as non-systematic, related to the randomness at which soldiers encountered violence on the battlefield. Many war novels describe this phenomenon. Among others, Erich Maria Remarque writes: "It is by chance that I remain alive, just as it is by chance that I can be hit. In the bombproof shelter, I can be torn to pieces, while in the open under ten hours of the most violent bombardments, I may not receive a scratch" (Remarque 1929).[21]

B. Female Labor Force Participation in the Interwar Period

To assess the short-run impact of WWI military fatalities on women's working behavior, I build on my previous work in which I exploit differential changes in female labor force participation rates before and after the war across départements exposed to varying levels of military death rates (Boehnke and Gay 2017). In this analysis, because no census microdata exist for France before WWII, female labor force participation is measured at the département level using all seven censuses from 1901 to 1936.[22] The short-run impact of WWI military fatalities on female labor force participation is estimated through the following baseline difference-in-differences specification:

$$\texttt{FLFP}_{d,t} = \beta\, \texttt{death\_rate}_d \times \texttt{post}_t + \gamma_d + \delta_t + \varepsilon_{d,t}, \tag{2}$$

where $\texttt{FLFP}_{d,t}$ is the female labor force participation rate in département d in census t, $\texttt{death\_rate}_d$ is the military death rate of département d, $\texttt{post}_t$ is an indicator for $t > 1918$, γ_d is a département fixed effect, and δ_t a census-year fixed effect.

The baseline difference-in-differences estimate implies that in départements exposed to military death rates of 20 percent rather than 10 percent—equivalent to switching from the 25th to the 75th percentile of the distribution—, female labor force participation was 4 percentage points higher after the war.[23] This corresponds to an increase of 12 percent in female labor force participation compared to pre-war levels. Put differently, losing ten men during the war induced on average about two women to enter the labor force. Including time-varying covariates such as measures of rurality do not alter the results.[24] Figure 3 reports year-specific estimates along with 95 percent confidence intervals.

[21] Cited in Guillot and Parent (2015, p. 2).

[22] The censuses are those of 1901, 1906, 1911, 1921, 1926, 1931, and 1936. See Boehnke and Gay (2017, III.A) for a thorough discussion of how female labor force participation is measured in the censuses.

[23] The baseline point estimate is 0.37, with a département-clustered robust standard error of 0.08 (Boehnke and Gay 2017, Table 7, p. 22).

[24] Other determinants of female labor force participation, such as the total fertility rate or female education, are not included in the baseline specification as they are likely to have been affected by military fatalities. As a result, including them as controls could confound the post-treatment relationship between military

These estimates are robust to relaxing the parallel-trends assumption in four ways: control for département-specific time trends; allow for time-varying heterogeneity across groups of départements using grouped fixed effects (Bonhomme and Manresa 2015); exploit randomness in the recruitment process of the army and use an instrumental variables approach combined with the difference-in-differences strategy; run the analysis separately on groups with similar pre-war observable characteristics. All strategies lead to similar results, which are in line with the baseline estimates.[25]

This increase in female labor force participation was due to women who entered the labor force *after* the war rather than *during* the war, and was driven by changes in marriage market conditions: on the one hand, many young single women had to enter the labor force while searching longer for a husband because of the tightness of the post-war marriage market (Abramitzky et al. 2011), and, on the other hand, many older war widows had to enter the labor force to compensate for the loss of their husbands' incomes (Boehnke and Gay 2017, V).

In the reminder of the paper, I interpret this short-run upward shift in female labor force participation as a first-stage in order to explore the long-run intergenerational diffusion pathways of women's involvement in the labor force. While I mostly analyze the reduced-form impact of WWI military fatalities on women's working behavior, I provide some second-stage orders of magnitudes for intergenerational transmission channels.

II. The Persistent Legacy of the Missing Men for Women's Working Behavior

A. The Epidemiological Approach

To assess the legacy of WWI military fatalities for women's working behavior at the individual level, I use an empirical strategy that mirrors the epidemiological approach to culture (Fernández 2011). Because the relationship between inherited norms and behavior may be codetermined by economic and institutional environmental factors, the epidemiological approach identifies the role of culture by analyzing the behavior of individuals with different geographical origins—migrants—residing within the same environment, thereby facing similar local institutional constraints when making decisions. For instance, to identify

fatalities and female labor force participation.

[25] These results are also robust to spatial correlation across départements, to alternative measurements of female labor force participation and military death rates, to differential pre-war health conditions and enlistment rates, and to pre- and post-war migration patterns. Finally, historical data on war destructions and the post-war reconstruction imply that changes in female labor force participation in the départements in which war combats occurred do not display heterogeneous responses.

the role of cultural origins for the working behavior of women independent of confounding institutional factors, a growing body of literature analyzes the working behavior of first- and second-generation female immigrants to the U.S. as a function of female labor force participation rates or other measures of gender roles in their countries of origin (Fernández and Fogli 2009, Alesina et al. 2013, Blau and Kahn 2015, Gay et al. 2017). The underlying assumption of the epidemiological approach is that migrants carry the preferences and beliefs of their origin countries, and transmit them to their children.[26] As a result, while the validity of this strategy is superior to that of cross-country studies, its ability to detect a relationship between inherited norms and behavior is constrained by design. This is not an issue in the case under scrutiny: as I show below, the magnitude of the shock of WWI military fatalities was large enough for intergenerational transmission effects to be detectable even after a century.

Why use the epidemiological approach in this context? World War I military fatalities induced an upward shift in female labor force participation in the interwar period (Boehnke and Gay 2017). Given that this upward shift was due to an increase in the supply of female labor, the price of female labor relative to male labor may have declined, providing firms with incentives to specialize in female labor intensive activities. Should these changes in local labor market conditions have persisted in the long-run, the incentives faced by women when making labor decisions would differ systematically across locations that were exposed to varying levels of military death rates. To identify the portable component of the legacy of the missing men and disentangle intergenerational transmission channels from confounding institutional factors, I leverage on variations in the working behavior of women who make decisions under similar local institutional constraints but whose geographical origins differ in their exposure to WWI military fatalities.

B. Data: The Censuses (1962–2012)

To analyze the long-run reduced-form impact of WWI military fatalities on women's working behavior, I combine all the French censuses for which microdata are available. This is the case for the thirteen censuses between 1962 and 2012.[27] Except for the censuses of

[26] Migrants are also likely to assimilate and acquire local social norms over time. As a result, the association between origin-country norms and behavior should progressively weaken (Abramitzky et al. 2016). This phenomenon may nevertheless be mitigated if migrants self-select into areas where migrants with similar origins are concentrated.

[27] The censuses for which microdata are available are the ones of 1962 (5 percent sample), 1968 (25 percent sample), 1975 (20 percent sample), 1982 (25 percent sample), 1990 (25 percent sample), 1999 (5 percent sample), and every year between 2006 and 2012 (20 percent samples). Microdata for the earlier censuses

1962 and 1999, which are 5 percent samples of the population, the other eleven censuses are 20–25 percent samples of the population. The regression sample consists of internal migrant married women aged 30 to 49, born and residing in metropolitan France.[28] In total, it contains about 6.5 million individuals.

Internal migrants are individuals who reside in a département that is different from their département of birth. Between 1962 and 2012, the share of internal migrants among married women aged 30 to 49 linearly increased from 38 to 50 percent (Appendix Figure A.2). I focus on women aged 30 to 49 to ensure that education investments are completed, and to abstract from retirement considerations. Moreover, the sample is restricted to women born and residing in metropolitan France because information on WWI military fatalities is only available for metropolitan départements. For the same reason, I further exclude individuals born or residing in the three départements that France recovered after WWI—Bas-Rhin, Haut-Rhin, and Moselle, all three hatched on Figure 2. Finally, I restrict the sample to married women in order to perform analyses that include husband and household characteristics, and to explore the role of husbands and mothers in-law in the transmission of the legacy of the missing men.[29] Focusing on married women is also of substantial interest as their entrance in the labor force has been the dominant force behind the revolution in female labor (Goldin 2006). Appendix Figure A.3 displays sample means for labor, fertility, and education variables. The share of working women in the sample has been steadily increasing from 30 percent in the early 1960s to 80 percent in the late 2000s. I report the full set of summary statistics for each census in Appendix Tables D.1–D.13.

How do internal migrants compare to non-migrants? Comparing observable characteristics across migration status, I find that migrant and non-migrant women are broadly alike—although migrant women are slightly more educated than non-migrant women (Appendix Figure A.4).[30] Importantly, migrant and non-migrant women are equally likely to be employed. Moreover, there is no correlation between migration status and military death rates. This suggests that sample selection through migration is unlikely to drive the correlation between military death rates and labor market outcomes. I run below a battery of

(1954, 1946, 1936, 1931, 1926, 1921, 1911, 1906, and 1901) are not available.

[28] Metropolitan France consists of mainland France and Corsica. I also exclude women living in group quarters and those that are not part of an ordinary household.

[29] Because the share of married women aged 30 to 49 has declined from 86 to 63 percent between 1962 and 2012 (Appendix Figure A.2), I also include unmarried women that are in a couple, e.g., those in a civil union. The presence of this type of couple is substantial since the late 1990s (Toulemon 2012).

[30] The last column of the summary statistics tables D.1–D.13 reports the estimate when regressing migration status on a given observable characteristic.

robustness checks to substantiate this assertion. This lack of correlation is hardly surprising. First, about 72 percent of women in the regression sample migrated more than a decade before. As a result, any labor-related shock resulting from migration should have attenuated. Second, most women in the regression sample migrated only a short distance (230 kilometers on average), typically to a neighboring département. Finally, migrant married women in France are still usually tied movers (Pailhé and Solaz 2008).[31]

C. Empirical Strategy

I estimate the following specification separately for each of the thirteen censuses between 1962 and 2012:

$$\texttt{employed}_{ibrt} = \beta\, \texttt{death\_rate}_b + \boldsymbol{\gamma}_1 \mathbf{X}_i' + \boldsymbol{\gamma}_2 \widetilde{\mathbf{X}}_{1911,b}' + \mu_{1914,b} + \delta_r + \varepsilon_{ibrt}, \tag{3}$$

where $\texttt{employed}_{ibrt}$ is an indicator for whether individual i, born in département b, and residing in département r in census t, is employed. Vector $\mathbf{X}_i$ contains a set of year of birth indicators. Vector $\widetilde{\mathbf{X}}_{1911,b}$ is the set of pre-war controls capturing the systematic determinants of military death rates generated by the policies of the Ministry of War—the share of rural population and the share of the residing population born in the département in 1911. It also contains the main pre-war determinants of later female labor force participation—the female labor force participation rate, a measure of female education, the fertility rate, and the personal wealth per inhabitant. $\mu_{1914,b}$ is a fixed effect for individual i's military region of birth. There were twenty military regions in 1914, with four to five départements per military region on average (see Figure 2). Consistent with the epidemiological approach, this specification includes a fixed effect δ_r for individual i's département of residence.

The coefficient of interest β is identified off variations in the working behavior of migrant married women in the same cohort, residing in the same département, but born in neighboring départements exposed to varying levels of military death rates. Because the key regressor varies at the level of the département of birth, the errors ε_{ibrt} may be positively correlated between individuals born in the same département. As a result, default standard errors may be biased downward—this issue is especially salient as the number of observations

[31] To learn more about female internal migration patterns in the mid-twentieth century, I explored the *Geographical Mobility and Urban Concentration* study conducted in 1961 by the INED (Girard et al. 1964). This study provides information about the migration histories of a nationally representative sample, excluding individuals living in Paris. In 1961, migrant married women aged 30 to 49 migrated for the first time at age 23 on average. Moreover, two-fifths of them declare their primary migration motive as family related, and another two-fifths as work related. Finally, one-fifth moved from urban to rural areas, and another one-fifth from rural to urban areas. The rest remained in the same type of area. See Appendix Table D.17.

is very large. Moreover, labor market outcomes may be correlated within départements of residence because individuals residing in the same département are exposed to similar local labor market conditions. This may also lead to correlated errors within départements of residence, although this issue is mitigated by the presence of département of residence fixed effects—they should absorb common shocks driving the within département of residence correlation of errors. To alleviate the potential issue of correlated errors, I use two-way clustering and cluster standard errors both at the level of individuals' départements of birth and départements of residence (Cameron and Miller 2015). As a result, all the regressions contain between 87 and 93 clusters for both départements of birth and départements of residence.[32]

D. Results

This section presents empirical evidence that WWI military fatalities had a persistent impact on women's working behavior from 1962 to 2012. I first report the baseline estimates (section D.1). Then, I run a series of robustness checks, thoroughly exploring the potential role of selective migration patterns (section D.2). Next, I provide other results using the censuses (section D.3): I replicate the analysis with alternative outcomes, run household-level analyses, explore heterogeneity in the labor supply response to WWI military fatalities across categories of women, compute cohort-specific estimates, and run a placebo test on the male sample. Finally, I corroborate the results obtained with the censuses by replicating the analysis on an alternative dataset, the combination of all annual labor force surveys 1982–2013 (section D.4). Using the labor force surveys, I also show that unobserved heterogeneity in human capital do not drive the results through (section D.5).

D.1. Baseline Estimates

Panel A of Figure 4 reports the OLS coefficients from estimating equation 3 separately for each census along with 95 percent confidence intervals. The results are also available in table form in Appendix Tables E.1–E.13. Throughout the analysis, I use the following metric to interpret regression coefficients: I compare women born in départements exposed to high

[32]The increase in the number of départements across time stems from modifications of the administrative geography of the French territory. In 1968, the départements of Seine (75) and Seine-et-Oise (78) were divided into the départements of Paris (75), Yvelines (78), Essonne (91), Hauts-de-Seine (92), Seine-Saint-Denis (93), Vale-de-Marne (94), and Val-d'Oise (95). Corsica was divided into two départements in 1975, Corse-du-Sud (2A) and Haute-Corse (2B). As a result, metropolitan France had 90 départements before 1968, 95 after 1968, and 96 after 1975. The regressions contain 87–93 clusters because I exclude Bas-Rhin (67), Haut-Rhin (68), and Moselle (57) throughout the analysis.

military death rates (20 percent) to women born in départements exposed to low military death rates (10 percent). This roughly corresponds to switching from a median département in the "low" group (25th percentile) to a median département in the "high" group (75th percentile).[33]

The estimates imply that women born in départements exposed to high military death rates (20 percent) rather than to low military death rates (10 percent) were 5 percentage points more likely to be working between 1962 and 2012. The estimates are all significant at the 1 percent level and stable across time. Nevertheless, because the average female employment rate increased from 30 percent in the early 1960s to 80 percent in the late 2000s (Appendix Figure A.3), their magnitude relative to the mean fades over time, from 16 percent of the mean in 1962 to 6 percent in 2012 (Panel B of Figure 4).[34] The results are similar when the outcome is an indicator for whether the individual is in the labor force (Appendix Figure A.6). They are also similar when widening the age bounds to 25–59 instead of 30–49 (Appendix Figure A.7), and when including single, widowed, and divorced women into the sample (Appendix Figure A.8).[35]

In section I.B, I showed that in départements exposed to military death rates of 20 percent rather than 10 percent, female labor force participation was 4 percentage points higher after the war. Combining the results from both analyses provides an idea of the overall magnitude of intergenerational transmission of female labor force participation. The ratio of the coefficients is $0.5/0.4 = 1.25$, suggesting that an increase of 1 percentage point in female labor force participation in the interwar period was associated with an increase of 1.25 percentage point in the likelihood of a woman to be working between 1962 and 2012—again, given the rising trends in female labor force participation, the magnitude of intergenerational transmission effects fades over time.[36]

[33]This metric is similar to the one used in Boehnke and Gay (2017, p. 10), and in Abramitzky et al. (2011, p. 135).

[34]Appendix Figure A.5 reports the magnitude of the baseline estimates with respect to the outcome standard deviation.

[35]With the full sample, controlling for marital status does not change the estimates (Panel B, Appendix Figure A.8).

[36]While this ratio integrates all direct and indirect long-run intergenerational effects from changes in female labor force participation in the interwar period to changes in women's working behavior in the post-WWII period, it may capture other features. For instance, WWI military fatalities could have altered the preferences and beliefs about female labor independent from their impact on short-run female labor force participation—though, using changes in the support to the extension of the suffrage to women in the *Assemblée Nationale* (the French lower house) between 1914 and 1919 as a proxy for changes in beliefs about gender roles, Boehnke and Gay (2017, pp. 49–50) show that this unlikely to be the case in the short run.

How do these results compare when using an approach that does not partial out the role of local institutional structures? I estimate the following specification in which, contrary to the epidemiological approach, I assign military death rates and pre-war controls at the level of the département of residence:

$$\texttt{employed}_{irt} = \beta\, \texttt{death\_rate}_{r} + \boldsymbol{\gamma}_1 \mathbf{X}'_i + \boldsymbol{\gamma}_2 \widetilde{\mathbf{X}}'_{1911,r} + \mu_{1914,r} + \varepsilon_{irt}, \tag{4}$$

where r indexes départements of residence. In order to capture the legacy of the missing men that operated both through individuals and local institutional structures, I use the sample of non-migrant married women aged 30 to 49. In contrast with the previous approach, this specification does not include residence location fixed effects. As a result, the coefficient of interest β is identified off variations in the working behavior of women *across*—rather than *within*—départements. Standard errors are clustered at the level of individuals' départements of residence.

I report the estimates in Figure 5 under the label *Location-based approach* together with the estimates from the previous analysis under the label *Epidemiological approach*. The estimates imply that women residing in départements exposed to high military death rates (20 percent) rather than low military death rates (10 percent) were 7–11 percentage points more likely to be working between 1962 and 2012.

These results suggest that 45–59 percent of the overall legacy the missing men operated directly through individuals rather than through changes in local institutional structures. The magnitude of individual-level transmission channels relative to location-level channels is comparable to the results in Alesina et al. (2013, VIII), as they find that 35–50 percent of the overall impact of historical plough use on contemporaneous gender-role attitudes is due to transmission of cultural norms at the individual level.

D.2. Robustness

I this section, I present a series of robustness checks. I show that the results are not sensitive to the choice of the regression model, that education and fertility choices do not mediate the relationship between WWI military fatalities and women's working behavior, and that selective migration patterns do not drive the results.

Regression model. The baseline coefficients are estimated through a linear probability model. This modeling choice does not affect the results. Panel A of Figure 6 reports the estimates when using different probability models to estimate specification 3. Marginal coefficients evaluated at the mean of the data from a Probit model, a Logit model, and OLS

coefficients are similar.

Education and Fertility. Labor market outcomes of married women are endogenous to their human capital investment and fertility decisions.[37] As a result, these decisions may confound the relationship between women's working behavior and WWI military fatalities. For instance, if women born in départements exposed to higher military death rates held more favorable views toward being a working wife, they may anticipate a longer career from the onset, and thus make larger human capital investments when young. These investments may in turn increase their likelihood to enter the labor force later in life because of higher wage draws. To examine the role of these potential channels, I augment the baseline specification by including indicators for women's educational attainment and controlling for their number of children.[38] These additional controls do not affect the results (Panel B of Figure 6). This suggests that the long-run impact of WWI military fatalities was direct rather than mediated by education and fertility decisions. The coefficients from this specification imply that the labor force participation impact of being born in a département exposed to high military death rates rather than low military death rates is equivalent in magnitude to one third of the impact of graduating from high school, or one half of the impact of having one fewer child.

Selective Migration Patterns. Because coefficients of interest are identified off variations in the behavior of internal migrants, selective migration could be an important driving mechanism if in- and out-migration patterns were correlated with military death rates and women's working behavior. In particular, migrant women could systematically differ from non-migrant women along unobservable characteristics.

Consider first selective out-migration. Suppose that WWI modified local industrial structures in the long run. The resulting industrial structure inherited from WWI could then be sensitive to asymmetrical external shocks, pushing workers disproportionately out of these départements in some periods, thereby generating the correlation with military death rates. I alleviate this concern by effectively comparing individuals born in neighboring départements as these areas presumably share many features, including external shocks and industrial structures. I implement this strategy by including twenty military region of birth fixed effects in the baseline specification, with each military region containing four to five départements on average. This strategy has the additional advantage of making the conditional

[37] See Greenwood et al. (2017) for a recent review of family economics models.

[38] Educational attainment indicators consist of indicators for primary or lower secondary education (excluded), technical secondary education, high school, and higher education. The number of children correspond to the number of own children in the household aged 0 to 6.

independence assumption more plausible, as soldiers from the same military region were sent to similar battlefields, making the distribution of military death rates more likely to be idiosyncratic within military regions.

Consider now selective in-migration. The epidemiological approach requires comparing individuals facing similar economic and institutional conditions. Yet, individuals residing within the same département may not all face similar local labor market structures. If individuals from départements exposed to higher military death rates systematically sorted into the more dynamic local labor markets in a département, then at least part of the long-run impact of WWI military fatalities would be attributable to selective in-migration patterns. To explore the extent to which such patterns may affect the results, I compare individuals residing within the same local labor market. The censuses provide two ways of defining local labor market boundaries. First, they provide a constructed measure of the local labor market respondents reside in. These local labor markets—denominated Zones of Industrial and Urban Population (ZIUP) from 1962 to 1990, and Economic Zones (EZ) from 1999 to 2012—are constructed based on home-work migration patterns for each census.[39] As shown in Table 3, ZIUPs are more numerous than EZs: depending on the census, the regression sample contains 600–800 ZIUPs with 70–800 observations per ZIUP on average, and 300 EZs with 2,000 observations per EZ on average.[40] Second, the censuses provide the city respondents reside in. From 1962 to 1999, this information is detailed at the level of the *commune*—France's smallest administrative level—, and from 2006 to 2012, it is detailed at the level of the *canton-city*—a slightly higher aggregation level. Depending on the census, the regression sample contains 6,000–23,000 communes with 9–23 observations per commune on average, and 3,500 canton-cities with 200 observations per canton-city on average.[41] To assess the extent of selective in-migration, I replicate the baseline specification successively with local labor market and city fixed effects instead of the département of residence fixed effects (Panel C of Figure 6). The coefficients are similar across specifications, suggesting little correlation between WWI military fatalities and in-migration sorting within destination départements. I also show that the results are unchanged when dropping the most urban départements from the analysis—the ones with Paris, Lyon, Marseille, and Nice (Appendix Figure A.9).

[39]See appendix C for more details on how ZIUPs and EZs are constructed.

[40]Moreover, ZIUPs do not cover the full territory as some rural areas are not included in a ZIUP—84–96 percent of respondents in the regression sample reside in a ZIUP.

[41]Communes are such a small level of aggregation that several thousand observations are singletons, i.e., they are the only observations in a given commune—this is the case for 3,000–8,000 observations depending on the census. These observations are effectively dropped in regressions using commune fixed effects.

To further assess whether labor-related migrations affect the results, I control for the relative attractiveness of individuals' origin and destination départements. I build two types of measures: one that is département specific, and one that is dyadic. The département-specific measures are the share of immigrants among the population residing in an individual's destination département, and the share of emigrants among the population born in her origin département. The first measure attempts to capture the pull force of destination départements, and the second measure the push force of origin départements. The dyadic measures are specific to each pair of départements. The first dyadic measure is the share of immigrants born in an individual's origin département among the population of immigrants in her destination département. It attempts to capture the pull force of destination départements specifically toward each origin département. Conversely, the second dyadic measure is the share of emigrants in an individual's destination département among the population of emigrants born in her origin département. It attempts to capture the push force of origin départements specifically toward each destination département. Because labor-related migrations usually peak early in the life-cycle (White and Lindstrom 2005), I build these measures relative to the time when individuals were aged 25.[42] Moreover, I build these measures relative to the female population of working age to better capture female labor-related migration dynamics.[43] Together with the bilateral distance between origin and destination départements, these four variables are likely to capture a substantive part of the bias introduced by labor-related migration patterns.

I also estimate the baseline specification on the subsample of internal migrants who were already present in their current département of residence in the previous census—the "one-and-a-half" generation.[44] This subsample may be less subject to biases due to selective migration as it contains individuals who migrated at least one decade earlier.

Overall, the bias introduced by labor-related migrations may not be as serious an issue as département of residence fixed effects control for the permanent relative attractiveness of a département, and because the concentration of population into départements with more dynamic labor markets—the more urban départements—has been low in the second half of

[42]The censuses do not provide information on the timing of migration except whether respondents migrated more than a decade before.

[43] For the decades 1960 to 2010, these measures are calculated using the censuses 1962–2006. For earlier decades, I use information on bilateral migration flows between départements in the censuses of 1911 and 1946—these are the only censuses before 1962 for which this information is available. Because the administrative geography of the French territory underwent various modifications before 1962, some former départements cannot be mapped into newly created ones, such as the département of Seine-et-Oise. As a result, some respondents cannot be assigned migration controls, especially in the earlier censuses.

[44]This information is not available in the censuses after 2008.

the twentieth century. Instead, this type of labor-related migrations primarily occurred in the late nineteenth and early twentieth centuries (Combes et al. 2011). Moreover, World War I did not altered migration patterns across départements with varying levels of military death rates (Boehnke and Gay 2017). Panel D of Figure 6 reports the results. Including the migration controls or estimating the baseline specification on the "one-and-a-half" generation of migrants only slightly decreases the estimates.[45] This suggests that selective migration is not a primary mechanism that can explain the patterns in the data. All the results are similar when the outcome is an indicator for whether the individual is in the labor force (Appendix Figure A.10). The full set of results for both outcomes is available in table form in Appendix Tables E.1–E.26.

Inaccurate Assignment of Military Death Rates. A potential measurement concern arises when using census microdata from 1962 onwards together with the epidemiological approach to assess the long-run impact of WWI military fatalities. The epidemiological approach requires the key regressor to be assigned at the level of migrants' cultural origins. Here, military death rates should be assigned at the level of the département in which migrants' ancestors were residing right after WWI, when the scarcity of men induced an upward shift in female labor force participation. Unfortunately, the censuses do not provide parental origins. As a result, it is necessary to assume that migrants' départements of birth correspond to their départements of origin, i.e., the départements in which their ancestors were residing right after WWI. While the regression sample for the census of 1962 contains individuals born from the 1910s to the 1930s, the assumption that migrants' départements of birth corresponds to their départements of origin is increasingly stringent over time, as about half of the married female population aged 30 to 49 between 1962 and 2012 was residing outside of their département of birth (Appendix Figure A.2).

I relax this assumption and replicate the analysis using the extended version of the labor force surveys 2005–2012, as they provide the départements of birth of respondents' parents. In particular, I restrict the sample to migrant married women whose parents were born in the same département as them. A typical respondent in this regression sample has parents who were born in the 1930s. As a result, it is all the more plausible to assume that the assignment of geographical origins traces back to the interwar period. I provide the results in Appendix Table B.3. They are in line with the ones when using the censuses: they imply that women

[45]For earlier censuses, the baseline estimates and those controlling for migration are not fully comparable as the sample is different; the migration controls are not defined for a substantive portion of the sample because of changes in the administrative geography of the French territory throughout the twentieth century (see footnote 43).

born—and both whose parents were born—in départements exposed high military death rates (20 percent) rather than to low military death rates (10 percent) were 8 percentage points more likely to be working between 2005 and 2012. This suggests that the potential inaccurate assignment of military death rates using the censuses creates a slight attenuation bias in the baseline estimates.

A related potential concern is that the département of birth of a respondent may not correspond to the département in which she grew up. If socialization with the surrounding environment beyond own parents is an important driving mechanism, then assigning the département of birth as a respondent's cultural origin may underestimate the long-run impact of WWI military fatalities on women's working behavior. To explore the extent of this potential issue, I use information about where respondents were residing in the previous census—this information is only available in the censuses 1962–1999—and replicate the baseline analysis when including fixed effects for the département of residence in the previous census. This enables to effectively compare women with similar migration histories. I report the results in Appendix Figure A.11. They are nearly identical to the baseline estimates, suggesting that alternative migration histories do not bias the results.

D.3. Other Results Using the Censuses

Alternative Outcomes. As discussed above, fertility and education choices do not appear to mediate the relationship between WWI military fatalities and women's working behavior. To assess this possibility more directly, I estimate the baseline specification for various fertility and education outcomes (Appendix Figures A.12 and A.13). As expected, women born in départements exposed to higher military death rates did not make different fertility or education choices.[46] Moreover, they do not marry at different rates (Appendix Figure A.14).

Household-Level Analysis. It is possible to match husbands and wives in the censuses, thereby enabling a household-level analysis. I estimate the baseline specification when including husband and household characteristics. Husband characteristics include husbands age and age squared, indicators for their educational attainment, and an indicator for whether they are employed.[47] Household characteristics include an indicator for whether the house-

[46] I also ran analyses showing that women born in départements exposed to higher military death rates do not choose more technical curricula, or chose more male-biased occupations. These analyses are available upon request.

[47] Educational attainment indicators include primary or lower secondary education (excluded), technical sec-

hold owns its housing, the number of rooms in the home, and a measure of housing quality. These variables attempt to capture how wealthy a household is.[48] I report the results in Appendix Figure A.15. The estimates are similar to the baseline, suggesting that women born in départements exposed to higher military death rates did not choose husbands that differed along these characteristics.

Heterogeneity Across Categories of Women. To assess the extent of heterogeneity in the labor supply response to WWI military fatalities across categories of women, I estimate the baseline specification along with a set of interaction terms. I analyze heterogeneity along four types of characteristics: the number of children in the household, the level of education, the position in the life cycle, and the marital status. First, I explore whether women with more children respond more to WWI military fatalities. I augment the baseline specification with the number of children in the household together with an interaction term. I report the results in Panel A of Appendix Figure A.16. As expected, women with more children are less likely to be employed. However, their labor supply does not respond more to WWI military fatalities.[49] Similarly, I find no heterogeneity in the impact of WWI military fatalities on the labor supply of women aged 40 to 49 relative to those aged 30 to 39 (Panel C), or of married women relative to unmarried women (Panel D). However, the labor supply of high school graduates did respond more to WWI military fatalities from the 1960s to the 1980s: while women without a high school degree born in départements exposed to high military death rates (20 percent) rather than low military death rates (10 percent) were 4 percentage points more likely to be working on average between 1962 and 1982, those with a high school degree were 11 percentage points more likely to be working. Nevertheless, this heterogeneous impact concerned very few women as only 14 percent of them were high school graduates during this period.

Cohort-Specific Estimates. I estimate the baseline specification separately on each decennial cohort present in the censuses—the cohorts 1910–1970—, where I pool all the censuses

ondary education, high school, and higher education.

[48]The censuses do not contain explicit wealth, income, or wage measures. See Appendix C for more details on how the measure of housing quality is constructed.

[49]The labor supply of women with more children does respond slightly more to WWI military fatalities in the 2000s. However, this differential impact is small: while women with no children born in départements exposed to high military death rates (20 percent) rather than low military death rates (10 percent) were 4 percentage points more likely to be working on average between 2006 and 2012, those at the mean of the data (1.7 children) were 5 percentage points more likely to be working.

together. I include census-year fixed effects in all regressions. Appendix Table B.4 reports the results. Consistent with the baseline results, the estimates for each cohort are stable around 0.5 and significant at the 1 percent level. The magnitude of the long-run impact of WWI military fatalities relative to the mean nevertheless linearly declines across cohorts.

Placebo Test Using the Male Sample. I replicate the baseline analysis using the sample of married men aged 30 to 49. Consistent with my interpretation, I find that while WWI military fatalities had a long-run impact on female labor force participation, they did not affect male labor force participation—the estimates are precisely zero (Appendix Figure A.17).

D.4. Corroborative Evidence From the Labor Force Surveys (1982–2013)

To corroborate the results obtained with the censuses, I combine all thirty-two annual labor force surveys between 1982 and 2013. They provide respondents' départements of residence and départements of birth. These surveys have both drawbacks and advantages over the censuses. On the one hand, information about respondents' départements of birth is not available in the labor force surveys prior to 1982, while it is available from 1962 onwards in the censuses. Moreover, the sample size of the labor force surveys is considerably smaller than that of the censuses: while most censuses are 20–25 percent samples of the population, the labor force surveys are 1.5–3 percent samples of the population. On the other hand, the labor force surveys contain a wider range of labor market outcomes: besides the labor status of the respondent, they contain her weekly hours worked, whether she ever worked, the number of months since she has been working in her current firm, and her monthly wage rate. Summary statistics are available in Appendix Table D.16.

I pool all thirty-two labor force surveys and estimate the baseline specification on the sample of migrant married women aged 30 to 49, together with survey-year fixed effects. The results are reported in Appendix Table B.5. They are similar to those when using the censuses: for instance, the coefficient for the *Employed* outcome is 0.57 (standard error of 0.15) compared to an average coefficient of 0.52 in analogous regressions using the censuses 1982–2012.

The labor force surveys provide other interesting results. While they are more likely to be in the labor force, there is no evidence that women born in départements exposed to high military death rates are more likely to have been previously working: the coefficient on *Ever worked* is close to zero and not significant. Moreover, conditional on being working, women born in départements exposed to high military death rates (20 percent) rather than to low

military death rates (10 percent) work 1.3 less hours per week (4 percent of mean hours), and remain 16 months longer in their firm (13 percent of mean months in firm). These results suggest that women born in higher death rate départements have a higher attachment to the labor force, but that this impact on the extensive margin does not translate into the intensive margin, as these women work shorter hours.

D.5. Unobserved Heterogeneity in Human Capital

Although there is no evidence that WWI military fatalities had a long-run impact on women's educational attainment—so that observed heterogeneity in human capital cannot account for the results—, the results could still be driven by heterogeneity in unobserved human capital.[50] For instance, women born in départements exposed to higher military death rates could have better information about the payoffs from working and about labor markets in general, making them more likely to get a high wage draw and enter the labor force. To assess this possibility, I estimate the baseline specification with log monthly wage rates as the dependent variable on the restricted sample of working women using the labor force surveys 1982–2013. I report the results in Appendix Table B.6. The coefficient on military death rates is close to zero and not significant. Controlling for measures of educational attainment does not alter the results. I replicate the analysis using a Heckman selection model where husbands' characteristics are used to control for selection into the labor force—husbands age and age squared, education level and employment status.[51] The results are similar to the ones obtained with the restricted sample. Overall, there is no evidence that heterogeneity in unobserved human capital helps explain the long-run impact of WWI military fatalities on women's working behavior.

III. Intergenerational Transmission Mechanisms

In this section, I explore three mechanisms underlying the historical persistence of the impact of WWI military fatalities on women's working behavior: vertical intergenerational transmission (section A), transmission through marriage (section B), and oblique intergenerational transmission (section C).[52] While I find supporting empirical evidence for all three

[50]Fernández and Fogli (2009) run a similar set of robustness checks when analyzing the role of origin country female labor force participation for the labor force participation of second generation immigrant women to the U.S.

[51]The results are similar when using the number of children in the selection equation.

[52]Identifying each transmission channel independent from confounding institutional factors requires using samples that differ from the ones used in section II. As a result, the results in section III may not fully relate

transmission channels, the mother-to-daughter channel appears quantitatively as the most important mechanism of persistence among all examined.

A. Vertical Intergenerational Transmission

I first explore whether the legacy of the missing men persisted through vertical intergenerational transmission—from parents to daughters. Among others, Farre and Vella (2013) provide suggestive evidence that both the beliefs and working behavior of mothers translate into their daughters working behavior when adults. In this section, I show that this mechanism is also at play in France and that married women with parents born in départements exposed to higher levels of military death rates, and especially mothers, are more likely to work. I also show that war-induced changes in the working behavior of mothers is a primary underlying force behind vertical intergenerational transmission.

A.1. Empirical Strategy

The extended version of the annual labor force surveys 2005–2012 contains the départements of birth of respondents' parents. Although the years for which this information is available are scarce, this dataset provides a unique opportunity to put the theory of vertical intergenerational transmission to a direct test. Again, I use an empirical strategy that mirrors the epidemiological approach to culture. Different from previous analyses in the paper, the availability of parental origins enables to focus on second-generation migrants instead of first-generation migrants. I restrict the regression sample to *non-migrant* married women aged 30 to 59 with parents born in a metropolitan département that is different from their own département of birth.[53]

Focusing on second- rather than first-generation migrants further improves the credibility of the identification strategy. First, a typical respondent in the regression sample has parents who were born in the 1930s. As a result, the assignment of geographical origins plausibly traces back to the interwar period. Second, because the location of second-generation migrants was determined prior to their birth, the results are unlikely to be driven by selective

to those in section II. Nevertheless, they are still informative as the characteristics of women in each of the sample used to analyze intergenerational transmission mechanisms are very similar, which comforts the idea that transmission channels at play in one sample are also at play in other samples.

[53] More specifically, when studying vertical transmission through mothers, I restrict the sample to non-migrant women whose mothers were born in a metropolitan département that is different from their own. Similarly, when studying vertical transmission through fathers, I restrict the sample to non-migrant women whose fathers were born in a metropolitan département that is different from their own. I increase the age bounds from 49 to 59 to increase the sample size.

migration patterns. Moreover, parental origins are available for both parents. It is thus possible to assess whether the transmission of the legacy of the war occurred primarily through mothers, or through fathers.

To determine the role of mothers' origins in vertical intergenerational transmission, I estimate the following specification:

$$\begin{aligned} \texttt{employed}_{ihjmflrt} &= \beta\, \texttt{death\_rate}_m + \boldsymbol{\gamma}_1 \mathbf{X}'_i + \boldsymbol{\gamma}_2 \mathbf{X}'_{hj} + \boldsymbol{\gamma}_3 X_f \\ &+ \boldsymbol{\gamma}_4 \widetilde{\mathbf{X}}'_{1911,m} + \delta_r + \eta_t + \omega_{fl} + \varepsilon_{ihjmflrt}, \end{aligned} \tag{5}$$

where m indexes individual i's mother, f, her father, and l, her mother and father in-law. Historical controls are assigned at the level of the départements of birth of mothers ($\widetilde{\mathbf{X}}_{1911,m}$). Husband and household characteristics $\mathbf{X}_{hj}$ contain husbands' incomes together with husbands' age, age squared and educational attainment, an indicator for whether the household owns its housing, and the number of rooms in the home.[54] To capture individuals' social background, I include indicator X_f for whether their fathers were employed in a high status occupation. Following the epidemiological approach, specification 5 contains fixed effect δ_r for individual i's département of residence—because the sample consists of non-migrants, individuals' départements of residence and départements of birth are identical. η_t is a survey-year fixed effect. To neutralize the impact of other parental origins, I further include father, mother in-law, and father in-law département of birth fixed effects, ω_{fl}. This enables to effectively compare women whose fathers and parents in-law were born in the same départements. I use two-way clustering and cluster standard errors at the level of individuals' départements of birth (and residence), and at the level of their mothers' départements of birth. To study the role of fathers' origins, I estimate a similar specification in which the key variables are assigned at the level of fathers' départements of birth.

A.2. Results

I report the results in Table 4. In column (1), the coefficient of interest is identified off variations in the working behavior of second-generation migrant married women in the same cohort, born and residing in the same département, but whose mothers were born in départements exposed to varying levels of military death rates. The estimate is significant at the 1 percent level and implies that women whose mothers were born in départements exposed to high military death rates (20 percent) rather than to low military death rates (10 percent) were 14 percentage points more likely to be working. Including husband and household controls in column (2) does not change this estimate. In column (3), comparing

[54]Unlike the censuses, the labor force surveys do not contain information on housing quality.

women whose fathers and parents in-law have identical origins and thereby isolate the role of mothers' origins even more only slightly decreases the estimate.

Next, I replicate this exercise with fathers' origins. I find that fathers matter for the transmission of the legacy of the war, but to a smaller extent than mothers do: the estimate in column (4) implies that women whose fathers were born in départements exposed to high military death rates (20 percent) rather than to low military death rates (10 percent) were 12 percentage points more likely to be working. However, including husband and household characteristics as well as mother and parents in-law département of birth fixed effects makes the estimate decrease, rendering it non-significant in column (6). This suggests a prominent role of mothers relative to fathers in the vertical intergenerational transmission of the legacy of the war.[55]

The results are similar when the outcome is an indicator for whether the individual is in the labor force (Appendix Table B.7). Augmenting the specification with the potentially endogenous education and fertility controls does not alter the results (Appendix Table B.8).

A.3. The Mother-to-Daughter Channel

Did war-induced changes in the working behavior of mothers transmitted to their daughters' working behavior? It is illustrative to explore this question through 2SLS. Using the extended version of the labor force surveys 2005–2012, I first analyze the impact of WWI military fatalities on mothers' working behavior when their daughters were growing up—the first-stage. I use the sample of second-generation internal migrant married women aged 30 to 59, and estimate a specification similar to specification 3:[56]

$$(6)\quad \texttt{worked}^{\texttt{mother}}_{irmflt} = \beta\, \texttt{death\_rate}_m + \boldsymbol{\gamma}_1 \mathbf{X}'_i + \boldsymbol{\gamma}_2 \mathbf{X}'_{hj} + \boldsymbol{\gamma}_3 \widetilde{\mathbf{X}}'_{1911,m} + \delta_r + \eta_t + \omega_{fl} + \varepsilon_{irmflt},$$

[55] Assessing the magnitude of vertical intergenerational transmission in the overall historical persistence of WWI military fatalities on female labor force participation is difficult. For instance, this cannot be done in the sample of second-generation migrants as the identifying variation comes from parental origins only. One possibility is to replicate the baseline estimates from section II with the sample from the restricted version of the labor force surveys, then add mothers' département of birth fixed effects to neutralize the vertical intergenerational transmission channel occurring through mothers. Re-estimating the baseline specification generates a coefficient of 0.48, which is significant at the 5 percent level (standard error of 0.22). Adding mothers' département of birth fixed effects decreases the coefficient to 0.15, suggesting that mothers' origins play a crucial role in the persistence of the legacy of the missing men.

[56] Because I am only taking mothers' origins into account, I restrict the sample to non-migrant women whose mothers were born in a different département than their own département of birth.

where $\texttt{worked}^{\texttt{mother}}_{irmflt}$ is an indicator for whether individual i's mother was working when i was growing up.[57] Military death rates $\texttt{death\_rate}_m$ and the vector of pre-war controls $\widetilde{\mathbf{X}}_{1911,m}$ are assigned at the level of mothers' départements of birth. δ_r is a département of residence (and birth) fixed effect, and η_t a survey-year fixed effect. I further include father, mother in-law, and father in-law département of birth fixed effects, ω_{fl}, to effectively compare women whose fathers and parents in-law were born in the same départements. I use two-way clustering and cluster standard errors at the level of individuals' départements of residence (and birth), and at the level of their mothers' départements of birth.

I report the results in column (1), Panel A of Table 5. The estimate implies that mothers born in départements exposed to high military death rates (20 percent) rather than to low military death rates (10 percent) were 16 percentage points more likely to have been working when their daughters were growing up.[58] In column (2), comparing women whose fathers and parents in-law have identical origins yields similar results.

Next, I estimate through 2SLS the impact of changes in mothers' working behavior induced by WWI military fatalities on their daughters' working behavior. More precisely, I estimate the following specification, where $\texttt{worked}^{\texttt{mother}}_{irmflt}$ is instrumented by $\texttt{death\_rate}_m$:

$$(7)\quad \texttt{employed}_{irmflt} = \beta\, \texttt{worked}^{\texttt{mother}}_{irmflt} + \boldsymbol{\gamma}_1 \mathbf{X}'_i + \boldsymbol{\gamma}_2 \mathbf{X}'_{hj} + \boldsymbol{\gamma}_3 \widetilde{\mathbf{X}}'_{1911,m} + \delta_r + \eta_t + \omega_{fl} + \varepsilon_{irmflt}.$$

The reduced form reported in columns (3) and (4)—the impact of the military death rates of mothers' départements of birth on their daughters' working behavior—corresponds to the estimates in columns (2) and (3) of Table 4. All the results are similar when the outcome is an indicator for whether the individual is in the labor force (Appendix Table B.9).

The second-stage estimates are reported in Panel C. Under the exclusion restriction, the baseline estimate implies that a 10 percentage point increase in mothers' labor force par-

[57] In the labor force surveys, the relevant variable is OPROFM, which corresponds to the answer of the following question: "What was your mother's occupation? Indicate the mother's occupation at the time when the respondent completed her education."

[58] This corresponds to 28 percent of the mean—in the sample, 56 percent of daughters report having a working mother when growing up, which is the female labor force participation rate in the mid-1970s. Given that women in the sample were born between the 1960s and the 1980s, their mothers were most likely born between the 1930s and the 1950s—the labor force surveys do not report parents' ages, but the average age of childbearing was 27 in the 1970s (Daguet 2002). As a result, these mothers would have been mostly present in the censuses of 1962, 1968, and 1975. For these censuses, I found in section II a magnitude for the legacy of the war of 10–15 percent of the mean. One possibility to explain this discrepancy is that women over-report having a working mother in the labor force surveys: the labor force surveys ask for the occupation of respondents' mothers at the time they completed their education. However, it may well be the case that respondents answered instead whether they had a mother that had been working at some point in time because of imperfect recall. This would result in larger estimates.

ticipation rates induced by WWI military fatalities generated a 9 percentage point increase in their daughters' likelihood to be working. At the risk of comparing different samples, the magnitude of this intergenerational transmission channel (0.88) is large compared to the magnitude of overall intergenerational transmission found in section II (1.25), suggesting a crucial role for mothers' working behavior in diffusing changes in female labor through their daughters' working behavior.

This interpretation relies on the validity of the exclusion restriction. Indeed, the reduced-form impact of WWI military fatalities may have transmitted from mothers to daughters through other channels than changes in the working behavior of mothers. While this specification isolates the role of mothers from that of fathers and parents in-law as well as confounding changes in local institutional structures, other factors may explain the correlation between mothers' origins and their daughters' working behavior, such as changes in the beliefs about female labor held by mothers (see section IV). As a result, the estimates in Panel C likely provide an upper bound for the role of changes in mothers' working behavior in vertical intergenerational transmission. They nevertheless illustrate one important mechanism through which vertical intergenerational transmission occurred.

B. Transmission Through Marriage

I now turn to transmission through marriage as a source of historical persistence of the legacy of the missing men. Fernández et al. (2004) argue in the context of post-WWII U.S. that the sons of working mothers hold more progressive views about female labor than the sons of stay-at-home mothers, making these men less averse to have a working wife, thereby providing women with incentives to enter the labor force. Should this mechanism be at play in France as well, because men born in départements exposed to higher levels of military death rates are more likely to have been growing up with a working mother, there should be some degree of homogamy in military death rates, as individuals with similar views are more likely to marry one another (section B.1). Moreover, men born in départements exposed to higher levels of military death rates should be more likely to have a working wife (section B.2). Finally, and more directly, women whose mothers in-law were born in départements exposed to higher levels of military death rates should be more likely to work (section B.3). I show below that these mechanisms indeed had a role in the persistence of the legacy of the missing men: by generating a new type of men—those with a working mother—, the war contributed to establish and perpetuate a stable progressive norm regarding female labor.[59]

[59]Identifying the causal impact of a husbands' origins on their wives' working behavior is, however, difficult. Should such men induce their wives to be more likely to work—for instance by doing a larger share of

B.1. Homogamy in Military Death Rates

I first provide evidence of homogamy in military death rates. That is, women born in départements exposed to high military death rates are more likely to marry with men born in départements exposed to high military death rates, and vice versa. For consistency with the rest of the analysis, I restrict the sample to migrant married women aged 30 to 49. Using the censuses 1962–2012, I estimate the following specification:

$$\begin{aligned} \texttt{death\_rate}^{\texttt{husb}}_{ijhbrt} &= \beta\, \texttt{death\_rate}_b + \boldsymbol{\gamma}_1 \mathbf{X}'_i + \boldsymbol{\gamma}_2 \mathbf{X}'_{hj} + \boldsymbol{\gamma}_3 \widetilde{\mathbf{X}}'_{1911,b} + \boldsymbol{\gamma}_4 \widetilde{\mathbf{X}}'_{1911,h} \\ &+ \delta_r + \eta\, \texttt{Same}_{bh} + \mu\, \texttt{ldist}_{bh} + \varepsilon_{ijhbrt}, \end{aligned} \tag{8}$$

where $\texttt{death\_rate}^{\texttt{husb}}_{ijhbrt}$ is the military death rate exposure of the département of birth of husband h of wife i in household j. Vector $\mathbf{X}_{hj}$ contains the same set of husband and household characteristics as those used in section II: husbands' age, age squared, indicators for their educational attainment, an indicator for their employment status, an indicator for housing ownership, the number of rooms in the home, and a measure for housing quality. Vectors $\widetilde{\mathbf{X}}_{1911,b}$ and $\widetilde{\mathbf{X}}_{1911,h}$ are the set of pre-war controls corresponding to wives' and husbands' départements of birth, respectively. Wives' and husbands' military death rates will be positively correlated as individuals born in the same département are more likely to marry with one another—this is the case for 17–37 percent of couples in the regression sample, with a downward trend from 1962 to 2012. To assess the extent of homogamy in military death rates beyond marriages between individuals born in the same département, I include an indicator variable ($\texttt{Same}_{bh}$) for whether spouses were born in the same département as well as the log distance between wives' and husbands' départements of birth ($\texttt{ldist}_{bh}$). This specification also includes fixed effect δ_r for individual i's département of residence.[60] I use three-way clustering and cluster standard errors at the level of wives' départements of birth, départements of residence, and also at the level of their husbands' départements of birth.

I report the results in Figure 7. There is a positive correlation between spouses' birth départements military death rates: in the baseline specification, each additional percentage point in military death rates exposure of wives' départements of birth is associated with an increase of 0.27–0.50 percentage point in the military death rate exposure of their husbands', with a downward trend from 1962 to 2012. I later provide suggestive evidence that one potential reason behind of such homogamy in military death rates is the more progressive

household production—, then women expecting to marry such men should anticipate and invest in market-related skills, making them more likely to work in the first place.

[60] Contrary to the analysis in section II, I do not include military region of birth fixed effects $\mu_{1914,b}$ to allow for more variation in the set of potential matches between wives and husbands.

views toward female labor held by women whose lineage was exposed to relatively more military fatalities (see section IV).

B.2. Transmission from Husbands to Wives

To assess the role of husbands' origins for the persistence of the legacy of the missing men more directly, I regress wives' working behavior on the military death rates exposure of their husbands' départements of birth. I isolate the role of husbands' origins from that of their wives' by including wives' département of birth fixed effects. This enables to effectively compare women born in the same département—and thus whose lineage was exposed to the same levels of military death rates—but whose husbands were born in départements exposed to varying levels of military death rates. Again, I implement an empirical strategy that mirrors the epidemiological approach to culture and estimate the following specification on the sample of migrant married women aged 30 to 49:

$$\texttt{employed}_{ijhbrt} = \beta\, \texttt{death\_rate}_{h} + \boldsymbol{\gamma}_1 \mathbf{X}'_i + \boldsymbol{\gamma}_2 \mathbf{X}'_{hj} + \boldsymbol{\gamma}_3 \widetilde{\mathbf{X}}'_{1911,h} + \delta_r + \omega_b + \varepsilon_{ijhbrt}, \tag{9}$$

where $\texttt{death\_rate}_h$ is the military death rate exposure of the département of birth of husband h of wife i in household j, and ω_b is a wife département of birth fixed effect. The other variables are the same as in specification 8, and include household and husband characteristics. I use two-way clustering and cluster standard errors at the level of wives' départements of residence and at the level of their husbands' départements of birth.

I report the estimates along with 95 percent confidence intervals in Figure 8.[61] In Panel A, I do not include wives départements of birth fixed effects. Hence, the coefficients of interest are identified off variations in the working behavior of migrant married women in the same cohort, residing in the same département, but whose husbands were born in départements exposed to varying levels of military death rates. The estimates imply that women whose husbands were born in départements exposed to high military death rates (20 percent) rather than to low military death rates (10 percent) were 3–5 percentage points more likely to be working between 1962 and 2012. Including wives départements of birth fixed effects to effectively compare women with identical origins slightly decreases the estimates, which remain significant at conventional levels. Including fertility and education controls barely changes the results, suggesting again that these are not channels of transmission (Appendix Figure A.18).

How quantitatively important is this marriage channel in explaining the long-run persistence of the legacy of the missing men? I re-estimate the baseline results from section II

[61]The results from Figure 8 can be found in table form in Appendix Tables E.27–E.39.

and include husbands départements of birth fixed effects to isolate the role of wives' origins from that of their husbands. This enables to effectively compare women whose husbands were born in the same départements and therefore to neutralize to some extent the role of marriage as a channel of persistence.[62] I report the results in Appendix Figure A.19. Including husbands' départements of birth fixed effects makes the estimates decrease by 15 percent on average, suggesting that part of the legacy of the missing men at the individual level persisted through a marriage channel.

B.3. Transmission from Mothers In-Law to Daughters In-Law

Finally, I explore directly whether mothers in-law had a role in diffusing the legacy of the missing men to the working behavior of their daughters in-law. Using the extended version of the annual labor force surveys 2005–2012, I replicate the analysis of section A and regress daughters' in-law working behavior on the military death rate exposure of the départements of birth of their mothers in-law, following specification 5.

I report the results in Table 6. The coefficient of interest is identified off variations in the working behavior of second-generation migrant married women in the same cohort, born and residing in the same département, but whose mothers in-law were born in départements exposed to varying levels of military death rates. The baseline coefficient is significant at the 5 percent level and implies that women whose mothers in-law were born in départements exposed to high military death rates (20 percent) rather than to low military death rates (10 percent) were 3 percentage points more likely to be working. This result is less robust than with own parents as including own parents and fathers in-law départements of birth fixed effects decreases both the estimates and their significance. They are nevertheless positive, suggesting that mothers in-law may have played a role in the diffusion of the legacy of the missing men, but only to some limited extent. This result contrasts with Fernández et al.'s (2004), as they find that mothers in-law—rather than own mothers—explain the impact of WWII mobilization rates on female labor force participation in the U.S. The results are similar when the outcome is an indicator for whether the individual is in the labor force (Appendix Table B.10).

[62] This strategy can only neutralize part of the role of marriage as a channel of persistence: if women anticipated marrying such men, then they would make decisions prior to marriage that would make them more attractive to these men. This strategy therefore neutralizes the post-marriage impact of husbands' origins, such as the distribution of tasks within the household. It is therefore likely to be a lower bound.

C. *Oblique Intergenerational Transmission*

The third mechanism of historical persistence I explore is oblique intergenerational transmission: whether internal migrants had a role in the diffusion of the legacy of the missing men. Given that individuals form their preferences and beliefs about gender roles when growing up upon observing their peers (Olivetti et al. 2017), I analyze the impact of the presence of internal migrants on the working behavior of non-migrants. For each census and each département, I construct an *immigrant norm* as the weighted average military death rate exposure among immigrants in a département:

$$\texttt{death\_rate}_r^{\texttt{norm}} = \sum_{o \neq r} \texttt{sh\_imi}_{o,r} \times \texttt{death\_rate}_o,$$

where $\texttt{sh\_imi}_{o,r}$ represents the share of immigrants from département o residing in département r.[63] Because women are more likely to use other working women as role models when growing up, I use female immigrants of working age to compute the immigrant norm, and assign the norm of the preceding census.[64] The regression sample consists of non-migrant married women aged 30 to 49. I estimate the following specification:

$$\begin{aligned} \texttt{working}_{ijhrt} &= \beta\, \texttt{death\_rate}_{r,t-1}^{\texttt{norm}} + \boldsymbol{\gamma}_1 \mathbf{X}_i' + \boldsymbol{\gamma}_2 \mathbf{X}_{hj}' + \\ &+ \boldsymbol{\gamma}_2 \widetilde{\mathbf{X}}_{1911,r,t-1}^{\prime\texttt{norm}} + \gamma_3\, \texttt{sh\_imi}_{r,t-1} + \varepsilon_{ijhrt}, \end{aligned} \tag{10}$$

where $\widetilde{\mathbf{X}}_{1911,r,t-1}^{\texttt{norm}}$ is a vector of pre-war characteristics calculated in the same way as the immigrant norm in military death rates $\texttt{death\_rate}_{r,t-1}^{\texttt{norm}}$. I also control for the share of immigrants in a département in the previous census, $\texttt{sh\_imi}_{r,t-1}$. I cluster standard errors at the level of individuals' départements of residence. As a results, each regression contains 92 clusters.

I report the results in Figure 9.[65] The estimates imply that women residing in départements in which the immigrant military death rate norm was one percentage point higher in the preceding census were 3–4 percentage points more likely to be working between 1968 and 2012. The estimates are broadly similar when assigning the immigrant norms to two censuses before (Appendix Figure A.20), or when the outcome is an indicator for whether the individual is in the labor force (see Appendix Figure A.21). These results highlight the

[63] This methodology is analogous to Daudin et al.'s (2016), which studies the diffusion of a low fertility norm in France in the nineteenth century.

[64] As a result, the census of 1962 is not part of the analysis. For the censuses 2006–2012, I use the immigrant norm computed with the census of 1999. Using male internal migrants of working age to compute the immigrant norm generates slightly weaker results (see Appendix Figure A.22).

[65] The full set of results in table form is available in Appendix Tables E.40–E.51.

role of local interactions in explaining the diffusion of female labor force participation across the economy (Fogli and Veldkamp 2011).

IV. Changes in Preferences and Beliefs About Female Labor

So far, I have provided empirical evidence that WWI military fatalities had a persistent impact on women's working behavior, and explored various channels of transmission to explain the patterns in the data. To account for these mechanisms, I argue that the women who were induced to enter the labor force in the interwar period because of WWI military fatalities altered the preferences and beliefs about female labor of their daughters, of their sons, and of their entourage, and that these changes translated into the working behavior of women in subsequent generations. Because individuals form their preferences and beliefs early in life upon learning and socializing with their parents, peers, and neighbors (Bisin and Verdier 2001, 2011, Fogli and Veldkamp 2011, Fernández 2013, Olivetti et al. 2017), men and women who grew up with a working mother—or in an environment in which many women worked—should form more progressive views about female labor, providing a rationale for the long-run impact of WWI military fatalities on female labor force participation.

I explore the validity of this argument by analyzing whether WWI military fatalities altered preferences and beliefs about female labor in the long run. I use the first wave of the French component of the Generation and Gender Survey (GSS), which was conducted in 2005.[66] It contains a nationally representative sample of ten thousand individuals aged 18 to 79. Among the datasets that contain information on cultural beliefs for France, the GSS is the only one that provides both respondents' départements of birth and départements of residence, thus enabling the epidemiological approach.[67] Moreover, it contains information on respondents' parents, though not their geographical origins.

I restrict the regression sample to French individuals that are in a couple. Because I study preferences and beliefs rather than working behavior, I do not put restrictions on age in the sample selection. As before, I focus on internal migrants born in metropolitan France, and drop those born or residing in the three départements that did not belong to France before WWI. I also drop respondents who did not grew up with their mothers and fathers. The regression sample contains 1,797 observations, with 1,007 women and 790 men (see Appendix Tables D.17 and D.18 for summary statistics).

[66] See Régnier-Loilier (2016) for a comprehensive presentation of this survey.

[67] The two main other datasets with information on cultural beliefs are the opinion barometer of the DRESS (2000–2013) and the French component of the International Social Survey Program (ISSP). However, they do not provide respondents' départements of birth.

GSS respondents were proposed three statements directly related to their views about the role of women in the labor force, and were asked whether they "agree", "somewhat agree", "do not agree nor disagree", "somewhat disagree", or "disagree" with them. These statements were: (1) "If a woman earns more than her partner, it is bad for their relationship", (2) "Women should not be able to decide how to spend the money they earned without asking their partners", and (3) "In an economic crisis, men should keep their jobs in priority". I assign a value of 0 to "agree", a value of 1 to "disagree", and use 0.25 point increments for responses in between. As a result, higher values indicate more progressive views toward gender roles. I report in Table 7 average responses for men and women separately. Three-quarter of respondents "somewhat disagree" with the statements. There is no notable difference between men and women in their attitudes. Next, I aggregate these statements on a three-points scale index. For ease of interpretation, I standardize this aggregate on a one-point scale.[68] The survey also contains questions related to preferences and beliefs about religion, marriage, and the family. I report average responses relative to these statements in Appendix Tables B.11–B.13.

To estimate the long-run impact of WWI military fatalities on preferences and beliefs about the role of women in the labor force, I use the epidemiological approach. I pool men and women together, and add an interaction term to assess the potentially differential impact of WWI military fatalities on women's beliefs. I estimate the following specification:

$$\begin{aligned} \texttt{values}_{ijhmfbr} &= \beta_1 \, \texttt{death\_rate}_b + \beta_2 \, \texttt{female}_i + \beta_3 \, \texttt{death\_rate}_b \times \texttt{female}_i \\ &+ \boldsymbol{\gamma}_1 \mathbf{X}'_i + \boldsymbol{\gamma}_2 \mathbf{X}'_{jh} + \boldsymbol{\gamma}_3 \mathbf{X}'_{fm} + \boldsymbol{\gamma}_4 \widetilde{\mathbf{X}}'_{1911,b} + \delta_r + \varepsilon_{ijhmfbr}, \end{aligned} \tag{11}$$

where $\texttt{values}_{ijhmfbr}$ is the one-point scale cultural index for individual i with partner j in household h, mother m, father f, born in département b, and residing in département r. $\mathbf{X}_i$ contains a set of year of birth indicators. $\mathbf{X}_{jh}$ contains the following set of partner and household controls: an indicator for whether the respondent's home is a house rather than an apartment, the number of rooms in the home, an indicator for whether the respondent owns her housing, the age of her partner, indicators for her partner's educational attainment, and her partner's monthly (log) income. $\mathbf{X}_{fm}$ contains a set of indicators for the educational attainment of respondents' mothers and fathers, an indicator for whether their fathers were employed in a high status occupation, and an indicator for whether their mothers were working when growing up. The set of historical controls $\mathbf{X}_{1911,b}$ is assigned at the level

[68] The survey contains a fourth question that somewhat relates to preferences and beliefs about the role of women in the labor force: "Taking care of one's home or family is as fulfilling as working for pay". On average, 27 percent of men and 36 percent of women disagree with this statement. The results presented in Table 8 are similar when integrating this question into the cultural index (Appendix Table B.14).

of respondents' départements of birth. Consistent with the epidemiological approach, this specification includes a département of residence fixed effect, δ_r. I use two-way clustering and cluster standard errors at the level of individuals' départements of birth and départements of residence.

I report the results in Table 8. The coefficient of interest β_1 is identified off variations in the beliefs held by respondents in the same cohort, residing in the same département, but born in départements exposed to varying levels of military death rates. Column (1) reports the results when not including the interaction term. The coefficient of interest is significant at the 1 percent level and implies that respondents born in départements exposed to high military death rates (20 percent) rather than to low military death rates (10 percent) hold more progressive cultural beliefs about female labor, as the aggregate is 14 percentage points higher in this case. This corresponds to 18 percent of mean beliefs. Women appear to hold more progressive beliefs than men, but the coefficient is not significant. Adding the interaction term in column (2) reveals that WWI military fatalities had a slightly stronger impact on women's beliefs, but the coefficient is not significant either. Adding parental, partner, and household controls, and controlling for respondents' employment, education, and fertility does not substantially change the results.

To verify that these results do not reflect more progressive attitudes in general, I replicate the analysis for other cultural indexes—those related to beliefs about religion, marriage, and the family (Appendix Table B.15). Consistent with my interpretation, the results reveal that WWI military fatalities did not impact cultural beliefs beyond those related to the role of women in the labor force.[69]

V. Conclusion

Did the upward shift in female labor force participation generated by WWI military fatalities persist across generations? I find that one century after WWI, the legacy of the missing men is still vivid. Comparing women residing under the same institutional setting but born in départements differentially exposed to military death rates, I provide empirical evidence for the persistent impact of WWI military fatalities on women's working behavior at the individual level. I uncover three mechanisms at play behind the diffusion of women's working behavior: vertical intergenerational transmission, transmission through marriage, and oblique intergenerational transmission. Consistent with formal models of intergenerational diffusion of female labor force participation, I provide supportive evidence that men

[69]The GSS survey also contains questions related to the distribution of tasks in the household. In Appendix E.4, I show that WWI military fatalities had no impact on the distribution of tasks in the household.

and women born in départements exposed to higher levels of military death rates are more likely to hold progressive views toward the role of women in the labor force.

These findings shed light on the long-run intergenerational diffusion pathways of women's involvement in the labor force. They suggest that the entrance of women in the labor force during the early phase of the secular rise in female labor force participation paved the way for subsequent generations of women. I interpret the results in this paper as evidence for a process of cultural diffusion and cultural change by which women induced to enter the labor force in the interwar period because of WWI military fatalities altered the preferences and beliefs about female labor of their daughters, of their sons, and of their entourage, and that these changes translated into the working behavior of women in subsequent generations. Fernández (2013) explicitly models such a mechanism of cultural change.[70] She builds a framework in which married women endogenously learn about the long-run costs of working by observing the working behavior of women in the previous generation. This then gives rise to a sigmoid-shaped process for both female labor force participation and preferences and beliefs about female labor. Providing direct empirical evidence for this feedback process is, however, difficult: besides the dataset used in this paper, there exists—to my knowledge—no other survey data that could allow the implementation of the epidemiological approach. Finding innovative ways to build measures of preferences and beliefs about female labor far back in time in order to explore the endogenous process between observed behavior and beliefs throughout the twentieth century could be a fertile avenue of research in order to improve our understanding of the revolution of female labor.

While most explanations for the revolution of female labor focus on technological factors, the empirical results in this paper suggest a crucial role for changes in preferences and beliefs about gender roles. When first analyzing the structural transformation of the economy, Kuznets (1966, p. 7) pointed out the necessity for a shift in cultural beliefs for this process to realize its full potentialities: "the effect of an epochal innovation on the beliefs of men [sic] is a major feature of an epoch; some changes in the older beliefs, shaped largely by the earlier and more limited experience, are prerequisites for the institutional modifications." Although he highlighted necessary changes in beliefs in the context of urbanization and industrialization, one can similarly assert that a large shift in cultural beliefs about female labor was necessary for the "epochal innovation" of female labor to materialize.

[70] See also Hazan and Maoz (2002), Fogli and Veldkamp (2011), and Hiller and Baudin (2016) for related models.

VI. Tables

Table 1—The Impact of WWI Military Fatalities on Sex Ratios (1911–1921)

Dependent variable	Change in sex ratio, 1911–1921						
Age group	20–24	25–29	30–34	35–39	40–44	45–49	50–54
Military death rate	0.61	-0.46**	-0.58***	-0.37***	-0.32**	-0.09	0.00
	[0.95]	[0.19]	[0.13]	[0.13]	[0.13]	[0.14]	[0.12]
Départements	87	87	87	87	87	87	87
R^2	0.006	0.061	0.170	0.089	0.101	0.008	0.000
Mean sex ratio 1911	107	99	100	100	99	99	97
Mean sex ratio 1921	86	80	82	84	91	96	95

Notes: This table reports the OLS coefficients from estimating specification 1. The dependent variable is the change in sex ratio between 1911 and 1921 for a given age group. Sex ratios are defined as the ratio of the male population to the female population in percents. Robust standard errors are in brackets. See appendix C for details about variables sources and definitions.

*** Significant at the 1 percent level. ** Significant at the 5 percent level.

Table 2—Military Death Rates and Département Characteristics (1911)

Dependent variable	Military death rate				
	(1)	(2)	(3)	(4)	(5)
Share rural population	0.18***			0.12***	0.12***
	[0.02]			[0.02]	[0.01]
Share born in département		0.26***		0.13***	0.12***
		[0.03]		[0.03]	[0.03]
Female labor force participation rate			-0.09	-0.02	
			[0.06]	[0.04]	
Share girls aged 5–19 in school			0.13	0.09	
			[0.08]	[0.07]	
Total fertility rate			0.00***	0.00*	
			[0.00]	[0.00]	
Personnal wealth (thousand francs)			-0.00	0.00**	
			[0.00]	[0.00]	
Other demographic characteristics	No	No	No	Yes	No
Other economic characteristics	No	No	No	Yes	No
Départements	87	87	87	87	87
R^2	0.686	0.624	0.350	0.800	0.739

Notes: This table reports the OLS coefficients from regressing military death rates on various pre-war département characteristics. The *other demographic* and *economic* characteristics are average height, population, the share of men working in industry, in agriculture, the share of the literate population, and the average direct taxes per inhabitant. See appendix C for details about variables sources and definitions. Robust standard errors are in brackets.

*** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Table 3—Residence Location Units
Censuses 1962–2006

		A. Local labor markets				B. Cities			
Census	Obs	Def	Units	% in sample	Obs / unit	Def	Units	Singletons	Obs / unit
1962	64,145	ZIUP	801	83.94	67	Commune	5,883	3,099	10
1968	419,366	ZIUP	790	88.40	469	Commune	17,636	7,489	23
1975	337,463	ZIUP	857	90.44	356	Commune	15,692	7,397	21
1982	464,979	ZIUP	859	92.96	503	Commune	20,625	6,413	22
1990	501,485	ZIUP	596	96.05	808	Commune	22,916	5,915	22
1999	106,067	EZ	331	100.00	320	Commune	11,276	8,387	9
2006	660,780	EZ	331	100.00	1,996	Canton-city	3,575	1	185

Notes: This table describes the types of residence location units available in the censuses besides the département of residence. The sample consists of migrant married women aged 30 to 49. *% in sample* corresponds to the share of observations in the original regression sample that reside in a ZIUP. *Singletons* correspond to the number of observations that are the only ones to reside in a given commune or canton-city. These observations are effectively dropped in the regressions using city fixed effects. See appendix C for a definition of ZIUPs, EZs, communes, and canton-cities. The censuses 2007–2012 contain a similar number of households and units as the census of 2006. Acronyms: ZIUP = Zone of Industrial and Urban Population; EZ = Economic Zone; Obs = Observations; Def = Definition.

Table 4—Transmission from Parents to Daughters
Extended Labor Force Surveys 2005–2012

Dependent variable	Employed					
	A. Mother			B. Father		
	(1)	(2)	(3)	(4)	(5)	(6)
Military death rate, parent origin	1.39***	1.37***	1.10**	1.25***	0.83*	0.57
	[0.48]	[0.47]	[0.48]	[0.45]	[0.42]	[0.46]
Birth year FE	Yes	Yes	Yes	Yes	Yes	Yes
Birth and residence département FE	Yes	Yes	Yes	Yes	Yes	Yes
Husband and household controls	No	Yes	Yes	No	Yes	Yes
Parental controls						
Father high social class	Yes	Yes	Yes	Yes	Yes	Yes
Mother pre-war controls (1911)	Yes	Yes	Yes	No	No	No
Father pre-war controls (1911)	No	No	No	Yes	Yes	Yes
Mother birth département FE	No	No	No	No	No	Yes
Father birth département FE	No	No	Yes	No	No	No
Mother in-law birth département FE	No	No	Yes	No	No	Yes
Father in-law birth département FE	No	No	Yes	No	No	Yes
Clusters						
Birth-residence département	92	92	92	92	92	92
Mother's département of birth	92	92	92			
Father's département of birth				92	92	92
Observations	17,258	17,258	17,258	17,995	17,995	17,995
Outcome mean	0.83	0.83	0.83	0.83	0.83	0.83

Notes: This table reports the OLS coefficients from estimating specification 5. All regressions include survey-year indicators as well as an indicator for whether both parents were born in the same département. Husbands and household controls include husbands' incomes, age, age squared, educational attainment, an indicator for whether the household owns its housing, and the number of rooms in the home. Standard errors are clustered at the level of the individuals' départements of birth and at the level of their mothers' or fathers' départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose parents were born in another département. The estimates are computed using the sample weights provided in the labor force surveys. See appendix C for details about variables sources and definitions.

*** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Table 5—Transmission from Mothers to Daughters, 2SLS
Extended Labor Force Surveys 2005–2012

Dependent variable	Mother worked		Employed			
	A. First-Stage		B. Reduced Form		C. Second-Stage	
	(1)	(2)	(3)	(4)	(5)	(6)
Military death rate, mother origin	1.57***	1.84***	1.37***	1.10**		
	[0.55]	[0.58]	[0.47]	[0.48]		
Mother worked					0.88**	0.60**
					[0.38]	[0.27]
Birth year FE	Yes	Yes	Yes	Yes	Yes	Yes
Birth and residence département FE	Yes	Yes	Yes	Yes	Yes	Yes
Husband and household controls	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls						
Father high social class	Yes	Yes	Yes	Yes	Yes	Yes
Mother pre-war controls (1911)	Yes	Yes	Yes	Yes	Yes	Yes
Father birth département FE	No	Yes	No	Yes	No	Yes
Mother in-law birth département FE	No	Yes	No	Yes	No	Yes
Father in-law birth département FE	No	Yes	No	Yes	No	Yes
Clusters						
Birth-residence département	92	92	92	92	92	92
Mother's département of birth	92	92	92	92	92	92
Observations	17,258	17,258	17,258	17,258	17,258	17,258
Outcome mean	0.56	0.56	0.83	0.83	0.83	0.83
Cragg-Donald Wald F	39.48	49.39				
Kleibergen-Paap Wald rk F	8.04	10.97				

Notes: This table reports the coefficients from estimating specifications 6 (panel A), 5 (panel B), and 7 (panel C). All regressions include survey-year indicators and an indocator for whether both parents were born in the same département. Husband and household controls include husbands' income, age, age squared, educational attainment, an indicator for whether the household owns its housing, and the number of rooms in the home. Standard errors are clustered at the level of the respondents' départements of birth and at the level of their mothers' départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose mothers were born in another département. The estimates are computed using the sample weights provided in the labor force surveys. See appendix C for details about variables sources and definitions.

*** Significant at the 1 percent level. ** Significant at the 5 percent level.

Table 6—Transmission from Mothers In-Law to Daughters In-Law
Extended Labor Force Surveys 2005–2012

Dependent variable	Employed			
	(1)	(2)	(3)	(4)
Military death rate, mother in-law origin	0.29**	0.27**	0.25**	0.13
	[0.14]	[0.13]	[0.13]	[0.16]
Birth year FE	Yes	Yes	Yes	Yes
Birth and residence département FE	Yes	Yes	Yes	Yes
Husband and household controls	No	Yes	Yes	Yes
Education and fertility controls	No	No	Yes	Yes
Parental controls				
Father high social class	Yes	Yes	Yes	Yes
Mother in-law pre-war controls (1911)	Yes	Yes	Yes	Yes
Mother birth département FE	No	No	No	Yes
Father birth département FE	No	No	No	Yes
Father in-law birth département FE	No	No	No	Yes
Clusters				
Birth-residence département	92	92	92	92
Mother in-law's département of birth	92	92	92	92
Observations	29,896	29,896	29,896	28,559
Outcome mean	0.84	0.84	0.84	0.84

Notes: This table reports the OLS coefficients from estimating specification 5. All regressions contain survey-year indicators. Husband and household controls include husbands' income, age, age squared, educational attainment, an indicator for whether the household owns its housing, and the number of rooms in the home. Standard errors are clustered at the level of the individuals' départements of birth and at the level of their mothers in-law départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose mothers in-law were born in another département. The estimates are computed using the sample weights provided in the labor force surveys. See appendix C for details about variables sources and definitions.

** Significant at the 5 percent level.

TABLE 7—PREFERENCES AND BELIEFS ABOUT FEMALE LABOR (GSS 2005)
INTERPRETATION: HIGHER VALUES INDICATE DISAGREEMENT WITH THE STATEMENT

	Statement	Men	Women
1	If a woman earns more than her partner, it is bad for their relationship	0.80 (0.27)	0.78 (0.30)
2	Women should not be able to decide how to spend the money they earned without asking their partners	0.69 (0.35)	0.75 (0.34)
3	In an economic crisis, men should keep their jobs in priority	0.70 (0.35)	0.75 (0.35)
	Cultural values index (four-points scale)	2.20 (0.64)	2.28 (0.64)
	Cultural values index (one-point scale)	0.73 (0.21)	0.76 (0.21)
	Observations	790	1,007

Notes: This table presents summary statistics for the cultural beliefs variables constructed using the GSS dataset. Disagreement with the statement implies higher values. Standard deviations are in parenthesis. The sample consists of French internal migrants born in metropolitan France. See appendix C for details about variables sources and definitions.

Table 8—The Impact of WWI Military Fatalities on Cultural Beliefs
GSS 2005

Dependent variable	Cultural values index (one-point scale)				
	(1)	(2)	(3)	(4)	(5)
Military death rate	1.36***	1.22***	1.09**	1.14**	1.15**
	[0.35]	[0.45]	[0.47]	[0.47]	[0.47]
Female	0.02	-0.01	-0.02	-0.02	-0.02
	[0.01]	[0.04]	[0.04]	[0.04]	[0.04]
Military death rate × Female		0.22	0.27	0.25	0.31
		[0.24]	[0.24]	[0.25]	[0.25]
Birth year, residence département FE	Yes	Yes	Yes	Yes	Yes
Pre-war controls (1911)	Yes	Yes	Yes	Yes	Yes
Partner and household controls	No	No	No	Yes	Yes
Employment, education, fertility controls	No	No	No	No	Yes
Parental controls					
Mother active	No	No	Yes	Yes	Yes
Father high social class	No	No	Yes	Yes	Yes
Mother education	No	No	Yes	Yes	Yes
Father education	No	No	Yes	Yes	Yes
Clusters					
Residence département	94	94	94	94	94
Birth département	86	86	86	86	86
Observations	1,808	1,808	1,808	1,808	1,808
Outcome mean	0.75	0.75	0.75	0.75	0.75

Notes: This table presents the OLS coefficients from estimating specification 11. Partner and household controls contain an indicator for whether the respondent's home is a house rather than an apartment, the number of rooms in the home, an indicator for whether the respondent owns her housing, the age of her partner, indicators for her partner's educational attainment, and her partner's monthly log income. Standard errors are clustered at the level of the individuals' départements of birth and départements of residence. The sample consists of migrants in a couple. The estimates are computed using the sample weights provided in the GSS dataset. See appendix C for details about variables sources and definitions.

*** Significant at the 1 percent level. ** Significant at the 5 percent level.

VII. Figures

Figure 1. The Impact of WWI on the Adult Sex Ratio (1901–2012)

Notes: This figure displays the adult sex ratio for the age group 15 to 50 among the French population. The data are from all the French censuses between 1901 and 2012. The first set of vertical rays (1914–1918) indicates WWI. The second set of vertical rays (1939–1945) indicates WWII.

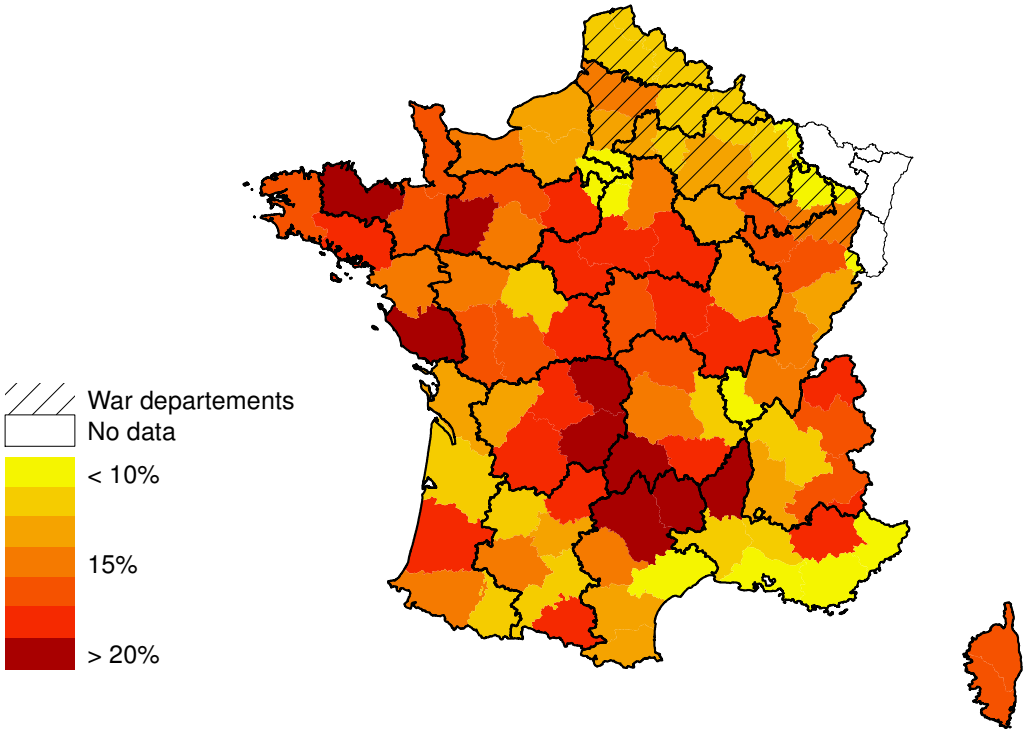


FIGURE 2. MILITARY DEATH RATES ACROSS 87 DÉPARTEMENTS

Notes: The data are missing for the three départements that belonged to Germany before WWI—Bas-Rhin, Haut-Rhin, and Moselle. Shaded areas indicates the départements in which war combats occurred. The darker lines indicate military region boundaries. The composition of each military region is from the *Journal Officiel de la République Française, Lois et Décrets, 45* (261), pp. 8546–8547, dated September 26th, 1913.

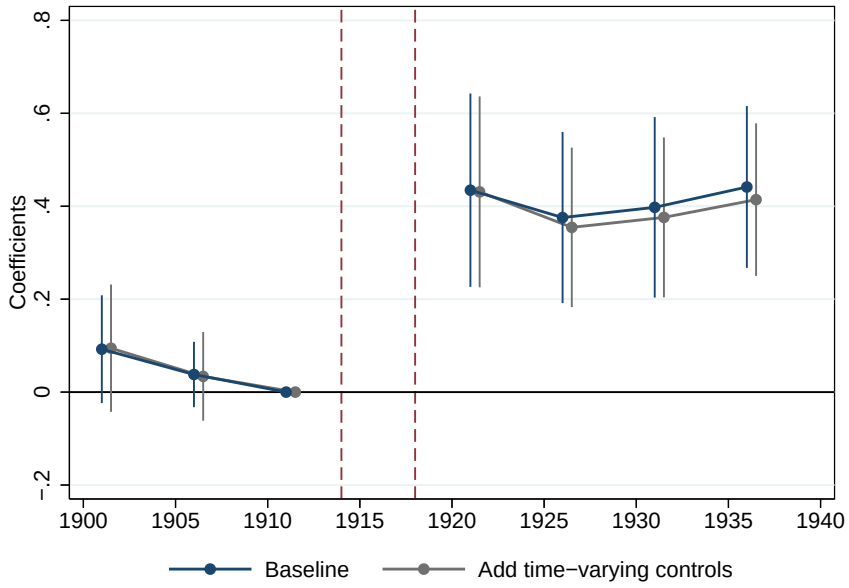
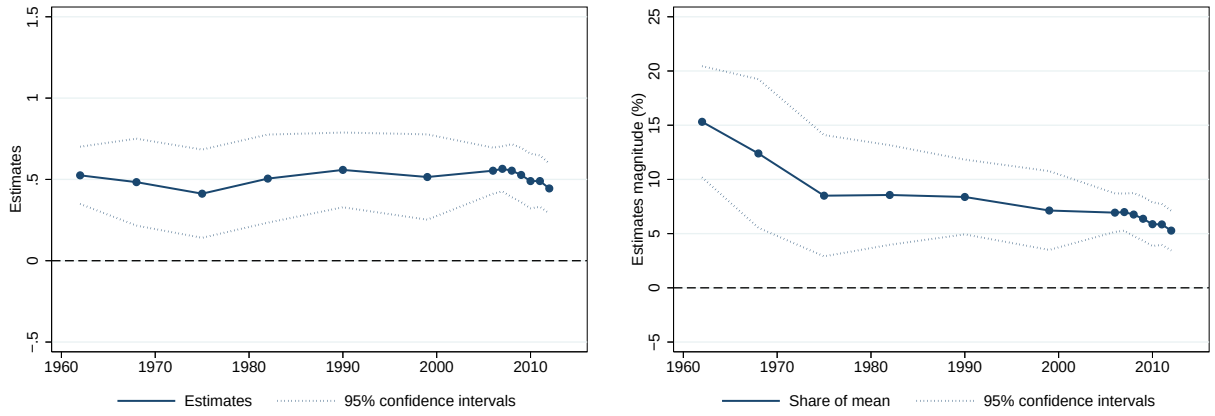


FIGURE 3. THE IMPACT OF WWI MILITARY FATALITIES ON INTERWAR FLFP

Notes: Each dot corresponds to a year-specific coefficient resulting from the estimation of the following specification: $\texttt{FLFP}_{d,t} = \sum_{t=1901, t\neq 1911}^{1936} \beta_t \, \texttt{death\_rate}_d \times \texttt{year}_t + \gamma_d + \delta_t + \varepsilon_{d,t}$. The gray dots correspond to the estimates when augmenting the specification with a time-varying vector containing the share of rural population, and the share of the residing population born in the département. Standard errors are clustered at the département level. The vertical lines represent 95 percent confidence intervals around the estimates. This figure corresponds to Figure 5 in Boehnke and Gay (2017).



(A) Baseline Estimates (B) Magnitude Relative to the Mean

Figure 4. The Impact of WWI Military Fatalities on FLFP
Dependent Variable: Employed Censuses 1962–2012

Notes: Panel A reports the OLS coefficients from estimating equation 3. The dependent variable is an indicator for whether the individual is employed. All regressions contain cohort, département of residence, and military region of birth fixed effects, as well as a set of historical controls measured at the level of individuals' départements of birth in 1911. They consist in the share of rural population, the share of the residing population born in the département, the female labor force participation rate, the total fertility rate, the share of girls aged 5 to 19 who go to primary or secondary school, and the average private wealth per inhabitants in Francs. Standard errors are clustered both at the level of individuals' départements of birth and départements of residence. The sample consists of migrant married women aged 30 to 49. See Table 3 for details about sample sizes for each census year. Appendix Tables E.1–E.13 report the results for each census year separately. Panel B reports the magnitude of the coefficients from Panel A with respect to the outcome mean. The magnitude is interpreted as the share of the mean in the dependent variable explained by switching from being born in a département exposed to a military death rate of 10 percent to a département exposed to a military death rate of 20 percent. See appendix C for details about variables sources and definitions.

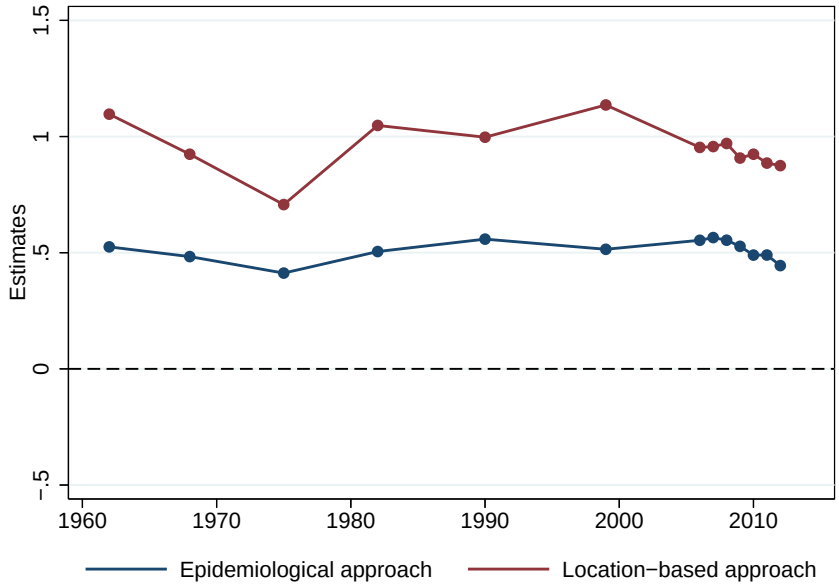
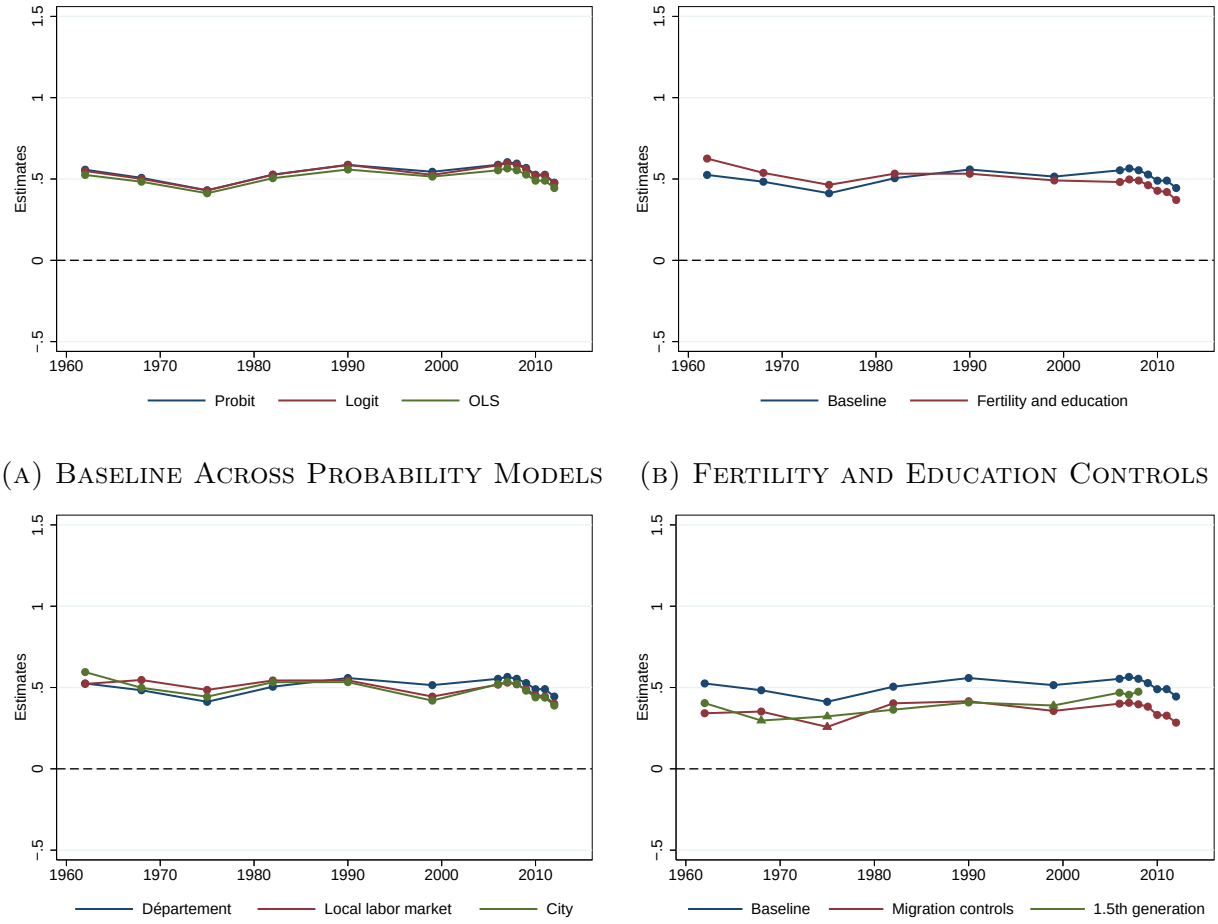


FIGURE 5. EPIDEMIOLOGICAL VERSUS LOCATION-BASED APPROACH
DEPENDENT VARIABLE: EMPLOYED CENSUSES 1962–2012

Notes: This figure reports the OLS coefficients from estimating equation 4. All regressions contain cohort and military region of residence fixed effects, as well as the set of historical controls measured at the level of individuals' départements of residence in 1911. Standard errors are clustered at the level of individuals' départements of residence. The sample consists of non-migrant married women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. This figure also reports the estimates from Figure 4 for comparison. See appendix C for details about variables sources and definitions.
• significant at the 1 percent level.



(A) Baseline Across Probability Models (B) Fertility and Education Controls

(C) Baseline Across Residence FE (D) Migration Controls

Figure 6. The Impact of WWI Military Fatalities on FLFP, Robustness
Dependent Variable: Employed Censuses 1962–2012

Notes: Panel A reports the OLS coefficients from estimating specification 3 with three different probability models. For the Probit and the Logit models, I report the marginal coefficients evaluated at the mean of covariates. Panel B augments the baseline specification with educational attainment indicators (primary or lower secondary education (excluded), technical secondary education, high school, and higher education) and the number of own children in the household aged 0 to 6. Panel C reports the OLS coefficients from estimating specification 3 with successively département of residence fixed effects, local labor market fixed effects (ZIUP and EZ), and city fixed effects (commune and canton-city). Panel D restricts the sample to migrants who were residing in their département of residence in the previous census—this information is only available until the census of 2008. It also augments the baseline specification with the bilateral distance between origin and destination départements and with the département-specific and dyadic migration controls. See appendix C for details about variables sources and definitions.

• significant at the 1 percent level. ▲ significant at the 5 percent level.

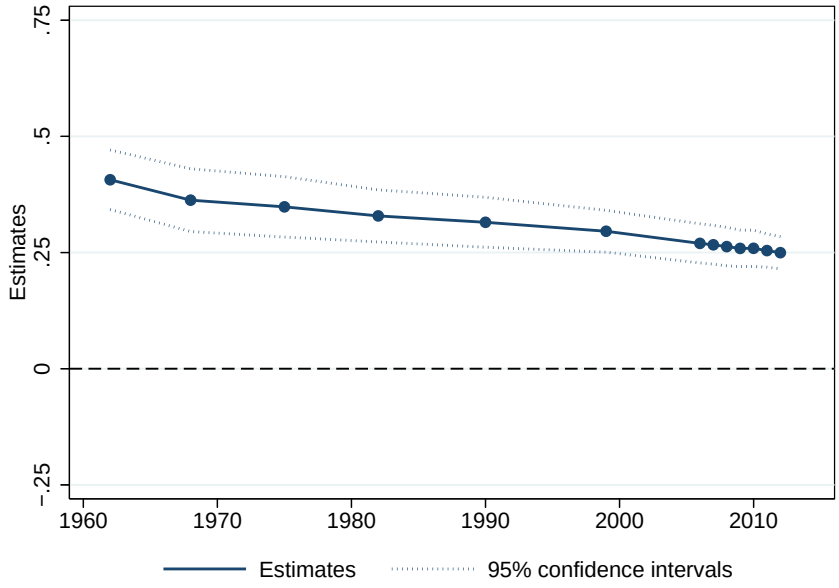
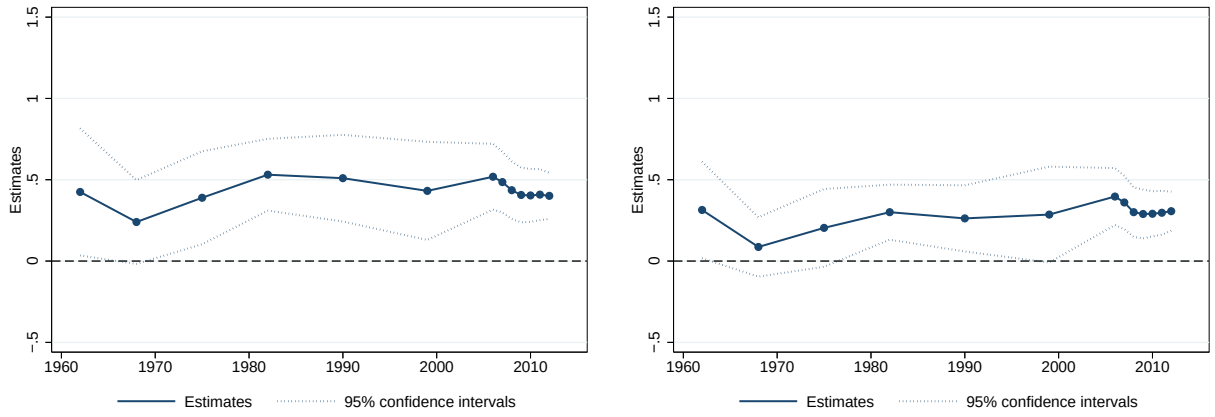


FIGURE 7. HOMOGAMY IN MILITARY DEATH RATES
CENSUSES 1962–2012

Notes: This figure reports the OLS coefficients from estimating specification 8. Standard errors are clustered at the level of wives' départements of birth, départements of residence, and also at the level of their husbands' départements of birth. The sample consists of migrant women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. See appendix C for details about variables sources and definitions.



(A) No Wife Birth Département FE (B) Wife Birth Département FE

Figure 8. Transmission from Husbands to Wives
Dependent Variable: Employed Censuses 1962–2012

Notes: This figure reports the OLS coefficients from estimating specification 9. All regressions include household and husband controls. Standard errors are clustered at the level of individuals' départements of residence and at the level of their husbands' départements of birth. The sample consists of migrant married women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. See appendix C for details about variables sources and definitions.

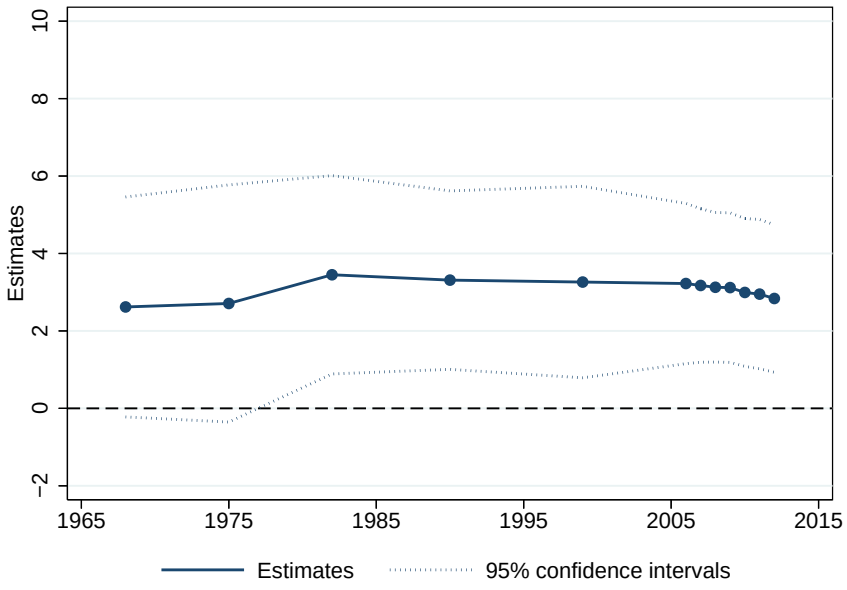


FIGURE 9. TRANSMISSION FROM FEMALE MIGRANTS TO NON-MIGRANTS
DEPENDENT VARIABLE: EMPLOYED CENSUSES 1968–2012

Notes: This figure reports the OLS coefficients from estimating specification 10. Standard errors are clustered at the level of individuals' départements of residence. The sample consists of non-migrant women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. See appendix C for details about variables sources and definitions.

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