

# THE LEGACY OF THE MISSING MEN

## THE LONG-RUN IMPACT OF WORLD WAR I ON FEMALE LABOR FORCE PARTICIPATION

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### Abstract

This article explores the pathways that underlie the diffusion of women's participation in the labor force across generations. I exploit a severe exogenous shock to the sex ratio, World War I in France, which generated a large inflow of women in the labor force after the war. I show that this shock to female labor transmitted to subsequent generations until today. Three mechanisms of intergenerational transmission account for this result: parental transmission, transmission through marriage, and transmission through local social interactions. Beyond behaviors, the war also permanently altered beliefs toward the role of women in the labor force. (*JEL* J16, J22, N34, Z13)

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## 1. Introduction

Women’s involvement in labor markets increased dramatically across industrialized economies after World War II, fundamentally altering the role of women in these societies (Olivetti and Petrongolo, 2016). In France, labor force participation rates of women aged 30 to 49 rose from 40 percent in the early 1960s to 90 percent today. Traditional explanations for this “quiet” revolution have emphasized the role of technological change in increasing both the demand and supply of female labor (Goldin, 2006).<sup>1</sup> More recently, intergenerational transmission mechanisms have been pointed out as instrumental to this secular transformation. For instance, to account for the endogenous evolution of women’s working behaviors and attitudes toward female labor throughout the twentieth century, Fernández (2013) develops a framework of intergenerational learning in which women update their prior beliefs about the payoffs from working by observing women of the previous generation.<sup>2</sup> Alternatively, in Fernández, Fogli and Olivetti’s (2004) model, men who grow up with a working mother form more progressive attitudes toward gender roles. This makes them less averse to having a working wife, thereby providing incentives for women to enter the labor force.

Despite growing consensus that intergenerational transmission mechanisms constitute an important explanation for the revolution of female labor, there is still little empirical evidence that these channels were simultaneously at work throughout the revolutionary period. The main reason concerns challenges to identification. First, most factors that initially induced women to enter the labor force, such as technological change, are strongly persistent. As a result, the working behaviors of women across generations remains largely codetermined. Moreover, the massive entrance of women in the labor force might have altered local labor markets per-

<sup>1</sup>Technological explanations include greater availability and declining prices of labor-saving consumer durable goods (Greenwood, Seshadri and Yorukoglu, 2005), oral contraceptives (Bailey, 2006), the fall in child care cost induced by the marketization of home production (Attanasio, Low and Sánchez-Marcos, 2008), improvements to maternal health (Albanesi and Olivetti, 2016), and the structural transformation (Ngai and Petrongolo, 2017). Goldin (1990; 2006; 2014) provides comprehensive accounts of the mechanisms underlying long-run trends in female labor force participation in the United States. For a historical perspective on France, see Maruani and Meron (2012).

<sup>2</sup>Hazan and Maoz (2002), Fogli and Veldkamp (2011), and Hiller and Baudin (2016) construct related models.

manently, making it challenging to identify intergenerational transmission channels independent from these confounding changes.

In this article, I explore the pathways that underlie the diffusion of women’s working behaviors across three generations in twentieth-century France. I provide direct empirical evidence that three mechanisms of intergenerational transmission were simultaneously at work: parental transmission, transmission through marriage, and transmission through local social interactions. My empirical strategy exploits a severe exogenous shock to the adult sex ratio: World War I in France. Of 8 million French men drafted during the conflict, 1.3 million died because of the war; a military death rate of 16 percent. As a result, it was not until the 1950s that the adult sex ratio recovered its balance (Figure 1).<sup>3</sup> This disruption induced many women to enter the labor force shortly after the war: limited pensions to war widows during the 1920s induced many of them to enter the labor force, and deteriorated marriage market conditions induced many single women to become secondary earners in their families while searching longer for a husband (Boehnke and Gay, 2020).

Did this generation of working women pave the way to later generations of women? This article uncovers the channels of intergenerational transmission of this exogenous shock to female labor throughout the second half of the twentieth century, long after sex ratios had reverted to balance and the short-run mechanisms identified in Boehnke and Gay (2020) had become muted. To identify intergenerational transmission independent from confounding changes to local labor market structures, I use an empirical strategy that mirrors the epidemiological approach to culture (Fernández, 2011). This approach implies comparing women born in locations that experienced different military death rates, and therefore different historical shocks to female labor supply, but who reside in the same location and therefore face similar local institutional constraints when making decisions. Applying this approach to all the censuses for which microdata exist, from 1962 to 2012, I find that women born in *départements* that experienced high (20 percent) rather than low (10 percent) military death rates—equivalent to switching from the 25th to the 75th percentile of the distribution—were 5 percentage points more likely to

<sup>3</sup>World War II affected the adult sex ratio in France only marginally, as 115 thousand French soldiers died because of the war; a military death rate of 1.5 percent (Lagrou, 2002).

be working.<sup>4</sup> Estimates are stable throughout this 50-year period, though their magnitude declines over time relative to rising trends in female labor force participation rates. Applying an “inverted” epidemiological approach and comparing women with identical origins *across* rather than *within* residence locations, I find that intergenerational transmission mechanisms explain half of the long-run impact of WWI military fatalities on female labor force participation.

To account for these findings, I open the black box of intergenerational transmission and explore three channels: parental transmission, transmission through marriage, and transmission through local social interactions. To identify vertical parental transmission, I use the extended annual labor force surveys 2005–2012, which provide origins of respondents’ parents. Focusing on the sample of second-generation internal migrants, I compare women born and residing in the same *département* but whose parents were born in *départements* that experienced different military death rates, and therefore different historical shocks to female labor supply. I find evidence for a strong mother-to-daughter transmission channel: women with mothers born in *départements* that experienced high (20 percent) rather than low (10 percent) military death rates were 11 percentage points more likely to be working. A 2SLS approach reveals that war-induced changes to mothers’ working behaviors drive this maternal transmission. I also find evidence for a father-to-daughter transmission channel, though its magnitude is smaller. Next, I explore transmission through marriage and show that women with husbands born in *départements* that experienced high rather than low military death rates were 2 to 5 percentage points more likely to be working. Consistent with this result, I provide evidence for a strong mother-in-law to daughter-in-law transmission channel. Finally, using municipality-level variation in the exposure to WWI military fatalities among local populations’ lineage, I find that this historical shock to female labor transmitted locally and persisted through social interactions. A comparison of these results suggests that mothers and mothers-in-law were of primary importance in the transmission of the legacy of the missing men.

To provide a rationale for the long-run impact of WWI military fatalities on female labor force participation, I argue that women induced to enter the labor

<sup>4</sup>*Départements* represent the second level of subnational government, between *régions* and *arrondissements*. Metropolitan France was divided into 87 *départements* before the war, and 90 after the war. These were further subdivided into 95 *départements* later on.

force during the interwar period altered preferences and beliefs toward female labor of their daughters, sons, and entourage, and that these changes translated into the working behaviors of women in subsequent generations. Since individuals form preferences and beliefs early in life from learning and socializing with their parents, peers, and neighbors (Hauk and Saez-Marti, 2002; Bisin and Verdier, 2011; Fogli and Veldkamp, 2011; Fernández, 2013; Olivetti, Patacchini and Zenou, 2020), men and women who grew up with a working mother, or in an environment in which many women worked, should form more progressive attitudes toward female labor.<sup>5</sup> Consistent with this argument, I find that men and women born in départements that experienced greater military death rates hold more progressive attitudes toward the role of women in the labor force today.

*Related Literature and Contributions.* To account for the revolution of female labor, models of intergenerational transmission typically highlight one specific mechanism—e.g. transmission from mothers to daughters (Fernández, 2011), from mothers-in-law to daughters-in-law (Fernández, Fogli and Olivetti, 2004), or through local information diffusion (Fogli and Veldkamp, 2011). This article is the first to provide comprehensive empirical evidence that these mechanisms were simultaneously at work throughout the revolutionary period, over three generations. For instance, Fernández, Fogli and Olivetti (2004) argue that one explanation for the revolution of female labor is the increasing number of men who grew up with a working mother. They show that women’s wartime employment during WWII in the United States (proxied by wartime mobilization) propagated to their daughters-in-law after the war—though Rose (2018) nuances these findings.<sup>6</sup> Consistent with

<sup>5</sup>Many studies find a correlation between both beliefs toward female labor and the working behaviors of mothers and their daughters’, of mothers-in-law and their daughters-in-laws’, and of mothers and their daughters’ peers. Farre and Vella (2013) show that US mothers’ attitudes toward gender roles and their working behaviors are correlated with their daughters’ attitudes when young and working behaviors when adults, a phenomenon corroborated for Great Britain (Johnston, Schurer and Shields, 2014) and Mexico (Campos-Vazquez and Velez-Grajales, 2014). Olivetti, Patacchini and Zenou (2020) show that the working behaviors of mothers of a woman’s friends when growing up affect her own working behavior later in life. Transmission from mothers-in-laws’ labor choices to their daughters-in-laws’ has been found for Japan (Kawaguchi and Miyazaki, 2009), Switzerland (Bütikofer, 2013), the United States (Morrill and Morrill, 2013), and China (Chen and Ge, 2018; Li and Liu, 2018).

<sup>6</sup>A large empirical literature suggests that wartime mobilization in WWII U.S. generated an increase in female labor supply after the war (Acemoglu, Autor and Lyle, 2004; Goldin and

this study, I find evidence for a mother-in-law to daughter-in-law transmission channel. But this mechanism constitutes only one among those I am able to identify.<sup>7</sup> Importantly, in contrast to this study and the broader literature, the empirical strategy I use enables to identify intergenerational transmission independent from confounding changes to local labor market structures. Furthermore, using WWI rather than WWII as a source of variation provides the opportunity to investigate the diffusion dynamics of women’s working behaviors across three generations, from the beginning to the end of the revolution of female labor. The case of WWI in France is also particularly advantageous compared to the case of WWII U.S. to explore these mechanisms as black male labor alleviated the consequences of the war on female labor force participation there (Ferrara, 2020).

This article also uncovers mechanisms of historical persistence for which the evidence is still scarce. Due to the methodological focus of the literature on a location-based aspect of history—how historical events in a location shape long-run outcomes in that location—domestic institutions have been pointed out as primary channels of historical persistence (Acemoglu, Johnson and Robinson, 2005; Nunn, 2014; Michalopoulos and Papaioannou, 2017). Partly because of a lack of appropriate data, a crucial vehicle of historical persistence has received less attention: individuals. Understanding how individuals transmit legacies of history across generations requires moving from a location-based approach to a lineage-based approach. Applying this methodology, Michalopoulos, Putterman and Weil (2019) show that pre-modern economic lifeways in Africa still affect individuals’ economic outcomes today.<sup>8</sup> Alesina, Giuliano and Nunn (2013, 524) find that half of the overall impact of historical plough use on contemporaneous gender-role attitudes is due to the transmission of cultural norms from ancestors to descendants rather than to long-run changes to institutional structures. Using a more systematic approach, I also show that lineage aspects account for half of the long-run impact of WWI military fatalities on female labor force participation. This im-

Olivetti, 2013; Doepke, Hazan and Maoz, 2015). Using more accurate measurement, Rose (2018) shows that neither manpower mobilization nor WWII military fatalities affected post-war female labor force participation. Instead, female wartime employment marginally affected the intensive margin of post-war female employment in the durable manufacturing sector.

<sup>7</sup>For instance, Fernández, Fogli and Olivetti (2004, 1266–7) find no evidence for a mother-to-daughter transmission channel.

<sup>8</sup>Nunn and Wantchekon (2011) and Teso (2019, 26–8) use a similar approach.

plies an important role for individuals relative to local institutional structures in generating historical persistence. My results further suggest that local social interactions are not to be neglected to understand how history transmits through individuals. Additionally, another novelty of this article is the use of a lineage approach *within* a country’s *regions* to study the transmission of a historical shock. For instance, some specifications compare second-generation internal migrants that originate from neighboring locations. This reduces potential biases that might arise when comparing movers to stayers, which is oftentimes an issue for studies using a lineage approach.

Finally, this article complements the literature that investigates how cultural norms emerge and change over time (Giuliano and Nunn, 2020). Various studies show that historical shocks alter the economic roles of women in subsequent generations, particularly shocks to sex ratios (Giuliano, 2017, 20–23). Teso (2019) finds that sex ratio imbalances generated by the transatlantic slave trade (slaves were predominantly male) induced current generations of women to enter the labor force. Grosjean and Khattar (2019) show that the scarcity of women in nineteenth-century Australia due to the arrival of predominantly male British convicts had adverse long-run consequences for women’s position in the labor force and for attitudes toward gender roles today. A strand of recent studies further explores the long-run consequences of historical shocks to sex ratios on gender roles today, such as the repercussions of the Tripe Alliance War of 1864–1870 in Paraguay (Alix-Garcia et al., 2020; Boggiano, 2020) or of the Portuguese Colonial War of 1961–1974 (Cardoso and Morin, 2018). I similarly find that historical sex ratio imbalances had permanent implications for the economic roles of women. However, in contrast to these studies, the historical shock I consider is sharper—it was generated over a period of four years—which enables to rule out alternative channels through which it might have translated over the long run. More importantly, two elements differ substantially in the analysis offered in this article compared to the broader literature. First, the use of both the epidemiological as well as the “inverted” epidemiological approaches enable to disentangle the role of culture from that of institutions.<sup>9</sup> Second, by examining outcomes continuously over time from the initial shock to

<sup>9</sup>Although Alix-Garcia et al. (2020) and Boggiano (2020) use a relatively sharp shock to sex ratios, and Teso (2019, 26–8) uses the epidemiological approach.

the present, the long-run exclusion restriction necessary for this type of analysis is much more likely to be satisfied. In particular, results imply that the persistence of the implications of the war has been constant over time and is not dependent upon the time-point selected for the analysis.<sup>10</sup>

In the remainder of the article, I describe the short-run impact of WWI on female labor (Section 2) and show that this shock persisted (Section 3) through mechanisms of intergenerational transmission (Section 4). In Section 5, I show that it also altered attitudes toward female labor. Finally, Section 6 puts the magnitudes of estimates in this article in perspective and concludes. Throughout the article, Figures and Tables indexed by a letter are available in the Online Appendix. A Data Appendix is available on the author’s webpage.

## **2. The Missing Men and Interwar Female Labor Force Participation**

### ***2.1. World War I Military Fatalities***

To construct a local measure of military death rates, I collected individual military records for all 1.3 million French soldiers who died because of the war and extracted their dates and départements of birth.<sup>11</sup> The military death rate in a département is the ratio of deceased soldiers born in the département to the size of its drafted population, which is captured by the male population aged 15 to 44 in 1911—conscription concerned all men aged 20 to 48. The distribution of military death rates is displayed in Figure 2 in the geography of 1914 (Gay, 2021). Military death rates range from 6 percent in Belfort to 29 percent in Lozère. The average is 15 percent, the 25th percentile 10 percent, and the 75th percentile 20 percent. Throughout the article, I interpret regression coefficients by comparing differences in outcomes across individuals from départements that experienced high (20 percent) rather than low (10 percent) military death rates during the war. Echoing national trends displayed in Figure 1, regression analysis confirms that, while dramatic, disruptions to sex ratios remained limited to the interwar period (Figure

<sup>10</sup>Several recent studies have highlighted how the past might have time-varying effects on the present, such as Ochsner and Roesel (2019), Cantoni, Hagemester and Westcott (2020), and Fouka and Voth (2020).

<sup>11</sup>Military records are from the *Mémoire des Hommes* (MDH) archive. The Data Appendix provides more details. This dataset is also used in Boehnke and Gay (2020). Prost (2008) provides a historical account of the assessment of WWI military fatalities in France.



A.1).

Two elements explain the systematic part of the variation in military death rates across départements: the territorial organization of military recruitment and the industrial war effort. The territorial organization of the military structured both recruitment and army corps, which initially comprised soldiers from the same military region.<sup>12</sup> Soldiers from the same region were therefore sent to the same battlefields at the beginning of the war.<sup>13</sup> However, as military fatalities soon accumulated, the military command changed its allocation policy; after five months into the war, soldiers were allocated to depleted army corps by priority, effectively pooling soldiers from different regions (Boulanger, 2001, 253). As a result, military death rates varied greatly across départements, even within regions—military region fixed effects explain only 16 percent of the variation in military death rates across départements.<sup>14</sup>

As the war lingered, the military command's plan to supply troops with war matériel proved dramatically insufficient (Porte, 2005; Bostrom, 2016).<sup>15</sup> To cope with the ongoing war effort, the Ministry of War recalled soldiers with manufacturing skills so that up to 12 percent of soldiers were employed in war factories during the conflict. An additional 8 percent were employed in military administration.<sup>16</sup> As a result, soldiers from industrial and urban areas were less likely to die in combat than those from rural areas. This pattern clearly emerges when regressing military death rates on pre-war characteristics (Table 1): rural départements experienced greater military death rates, where rurality is captured by the share of rural population and the share of population born in the département.<sup>17</sup> Rurality explains 75

<sup>12</sup>This territorial structure was inherited from the reorganization of the army after the Franco-Prussian War of 1870. The structure in place in 1914 was defined by the law of December 22, 1913 (Boulanger, 2001, 16–24).

<sup>13</sup>The mobilization plan (*Plan XVII*), designed in 1912, assigned each army corps to a specific area after invasion by German troops. The structure of this plan was predetermined by the railway network (Gonzalez-Feliu and Parent, 2016).

<sup>14</sup>This measure of military death rates improves upon previous measures used in Abramitzky, Delavande and Vasconcelos (2011) and Vandenbroucke (2014), which are based on Huber (1931) and vary at the level of these 21 military regions.

<sup>15</sup>For example, the Plan XVII procured 13,600 75mm shells per day. Nearly 40,000 were used daily during the Race to the Sea in October 1914. By then, half of the stock of 75mm shells had been depleted (Bostrom, 2016, 264). See also Porte (2005, 73–82).

<sup>16</sup>This allocation policy was enacted by the Dalbiez bill of August 17, 1915. Soldiers were also allocated to steel production and harvesting from 1917 onward.

<sup>17</sup>The census of 1911 defines the share of rural population as the share of population that

percent of the variation in military death rates (column 1). Determinants of subsequent female labor force participation—pre-war female labor force participation, female education, total fertility, personal wealth per inhabitant—as well as additional characteristics are not correlated with military death rates, and only explain an additional 8 percent of their variation (column 2).<sup>18</sup> Including 19 military region fixed effects explains an additional 6 percent (column 3). Throughout the analysis, I rely on the residual variation in military death rates following the specification in column 3. I interpret this residual variation as non-systematic and related to the randomness at which soldiers encountered violence on the battlefield.

## ***2.2. Female Labor Force Participation during the Interwar Period***

To assess the short-run impact of WWI military fatalities on women’s working behaviors, Boehnke and Gay (2020, 11–6) exploit differential changes in female labor force participation rates before (1901–1911) and after (1921–1936) the war across départements that experienced different military death rates. Their results imply that in départements that experienced high (20 percent) rather than low (10 percent) military death rates, female labor force participation rates were 4 percentage points higher during the interwar period, an increase of 12 percent relative to pre-war levels.

The inflow of women in the labor force occurred *after* rather than *during* the war, as départements with greater female wartime employment did not experience a post-war rise in female labor force participation (Boehnke and Gay, 2020, 23–6). Instead, this inflow was driven by increased labor supply by war widows, whose pensions remained limited until the early 1930s, but also by young single women, who had to enter the labor force while searching longer for a husband (Abramitzky et al., 2011; Boehnke and Gay, 2020, 17–21).<sup>19</sup> In contrast, labor demand factors were

resides in municipalities with fewer than 2,000 inhabitants. The share of population born in the département is tied to fundamental aspects of French rurality as a measure of the intensity of the rural exodus during the late nineteenth century.

<sup>18</sup>These additional characteristics include the share of active population in the agricultural sector, in the industrial sector, average height, total population, the share of literate population, and average direct taxes per inhabitant.

<sup>19</sup>Perturbed conditions on the marriage market were however temporary and circumscribed to the interwar period. Using the family survey of 1954, Boehnke and Gay (2020, Appendix H) show that rates of definitive singlehood among women of the cohorts 1899–1908 were similar across départements with different military death rates, suggesting that women only delayed marriage

of second-order importance: comparing female wages across sectors with different substitutability between male and female labor, Boehnke and Gay (2020, 21–3) find that substitution of firms from male labor to female labor was likely limited.

### 3. The Legacy of the Missing Men

#### *3.1. An Epidemiological Approach*

To explore whether this short-run shock to female labor transmitted to later generations, I use an empirical strategy that mirrors the epidemiological approach to culture (Fernández, 2011). Given that the relationship between inherited beliefs and behaviors might be codetermined by institutional factors, this approach identifies intergenerational transmission through the behaviors of individuals with different geographical origins but who reside within the same environment, thereby facing similar constraints when making decisions.<sup>20</sup>

Interwar changes in female labor force participation were driven by increased female labor supply, which slightly depressed female wages in locations that were relatively more affected by the war (Boehnke and Gay, 2020, 21–3). Lower female wages might have incentivized firms to specialize in female labor-intensive activities. Had these changes persisted, the incentive structure faced by women would differ systematically across locations that experienced different military death rates. To identify the portable component of the legacy of the missing men and disentangle intergenerational transmission from confounding institutional factors, I exploit variations in the working behaviors of women who make decisions under similar local labor market conditions but whose geographical origins differ in their exposure to the war.

due to the war.

<sup>20</sup>This approach has been used to identify the role of culture for labor choices of immigrant women to the U.S. (Fernández and Fogli, 2009; Blau, Kahn and Papps, 2011; Gay et al., 2018).

### ***3.2. The Population Censuses (1962–2012)***

I combine all the censuses for which microdata exist, from 1962 to 2012.<sup>21</sup> The necessary information for this study is available for 20 to 25 percent samples of the population (except those of 1962 and 1999, which are 5 percent samples). The baseline regression sample comprises all French internal migrant married women aged 30 to 49, born and residing in metropolitan France—a total of 3.5 million individuals. I focus on this age group to ensure that human capital investments are completed and to abstract from retirement decisions. I restrict the sample to married women because their entrance in the labor force represented the core of the revolution of female labor; the share of working women in this sample increased from 30 percent in the early 1960s to 80 percent in the late 2000s—Figure A.2 displays sample means for labor, fertility, and education outcomes. Internal migrants are individuals who reside in a département that is different from their département of birth. Under this definition, half of married women aged 30 to 49 were internal migrants as of 2012.<sup>22</sup> Moreover, trends in the proportion of married women among internal migrant women are identical to trends in the proportion of married women among all women (Figure A.3). Internal migrant and non-migrant women are broadly alike along observable characteristics: although they are slightly more educated, internal migrant women are equally likely to be working, were born in départements with similar military death rates, and have the same number of children (Figure A.4). This suggests that sample selection through migration is unlikely to drive the correlation between military death rates and labor market outcomes. Further analyses in Section 3.4.1 support this assertion.

<sup>21</sup>Census years are 1962, 1968, 1975, 1982, 1990, 1999, 2007, and 2012. From 2004 onward, French censuses are conducted yearly on a rotating basis for a fifth of the French population. Rigorous comparisons across censuses can therefore only be made five years apart—see, e.g., (Brilhault and Caron, 2016).

<sup>22</sup>Départements are relatively small: their median radius is 43 kilometers. The median migration distance is 150 kilometers. The *Geographical Mobility and Urban Concentration* study of 1961 reports that among married women aged 30 to 49, the primary migration motive is family related for two-fifths of them and work related for another two-fifths (Girard, Bastide and Pourcher, 1964).

### 3.3. Empirical Strategy

I estimate the following specification separately for each census of year  $t$ :

$$(1) \quad \text{employed}_{ibr t} = \beta \text{death\_rate}_b + \alpha \mathbf{X}'_{1911,b} + \gamma_i \cdot \boldsymbol{\delta}_r \cdot \boldsymbol{\mu}_{1914,b} + \varepsilon_{ibr t},$$

where  $\text{employed}_{ibr t}$  denotes whether woman  $i$  born in département  $b$  and residing in département  $r$  is employed.  $\mathbf{X}_{1911,b}$  is a set of pre-war controls that capture the systematic determinants of military death rates and subsequent female labor force participation.<sup>23</sup>  $\gamma_i$  is a set of year of birth indicators. Consistent with the epidemiological approach, I include département of residence fixed effects,  $\boldsymbol{\delta}_r$ . To further reinforce the credibility of the conditional independence assumption, I include military region of birth fixed effects,  $\boldsymbol{\mu}_{1914,b}$  (soldiers from the same military region were initially sent to the same battlefields, making the distribution of military death rates more likely to be idiosyncratic within military regions). I use two-way clustering and cluster standard errors at the levels of départements of birth and residence. Because fixed effects are interacted,  $\beta$  is identified from variations in the working behaviors of internal migrant married women of the same cohort, residing in the same département, but who were born in neighboring départements that experienced different military death rates—this corresponds to 24–34 thousand comparison groups depending on the census.<sup>24</sup>

### 3.4. Results

Estimates are reported in Panel a of Figure 3. They imply that women born in départements that experienced high (20 percent) rather than low (10 percent) military death rates were 5 percentage points more likely to be working between 1962 and 2012. They are significant at the 1 percent level and stable across time. Since base rates increased from 30 percent in the early 1960s to 80 percent in the late 2000s, their relative size declined from 14 percent of the mean in 1962 to 5 percent in 2012 (Panel b).

<sup>23</sup> $\mathbf{X}_{1911,b}$  contains the share of rural population, the share of population born in the département, female labor force participation, a measure of female education, total fertility, and personal wealth per inhabitant, all measured in 1911.

<sup>24</sup>There were 19 military regions in 1914, containing 5 départements on average—they would be fairly close-by, if not strictly neighboring in most cases (Figure 2).

In the short-run, female labor force participation rates increased by 4 percentage points after the war in départements that experienced high (20 percent) rather than low (10 percent) military death rates (Boehnke and Gay, 2020). The ratio 5/4 can therefore be interpreted as an estimate for the intergenerational transmission of working behaviors from women in the interwar period to women in the post-WWII era. This ratio implies that a 1 percentage point initial increase in female labor force participation due to WWI was associated with a 1.25 percentage point increase in the likelihood of a woman working between 1962 and 2012.

*Epidemiological approach vs location-based approach.* What was the role of changes to local labor market structures relative to intergenerational transmission in the persistence of this historical shock? First, consider non-migrants. Their behaviors cumulate implications of both transmission of cultural norms and changes to local labor market structures. Here, I repeat the analysis on the sample of non-migrant married women aged 30 to 49 and estimate:<sup>25</sup>

$$(2) \quad \text{employed}_{irt} = \beta \text{death\_rate}_r + \alpha \mathbf{X}'_{1911,r} + \gamma_i \cdot \boldsymbol{\mu}_{1914,r} + \varepsilon_{irt}.$$

In contrast to the epidemiological approach, this specification does not include residence location fixed effects. As a result,  $\beta$  is identified from variations in the working behaviors of women *across* rather than *within* départements. I report estimates in Panel a of Figure 4. They imply that women born and residing in départements that experienced high (20 percent) rather than low (10 percent) military death rates were 7 to 11 percentage points more likely to be working between 1962 and 2012. A comparison with estimates in Figure 3 suggests that 43 to 62 percent of the legacy of the missing men operated through intergenerational transmission rather than through changes to local labor market structures.

Second, consider the sample of first-generation internal migrant married women aged 30 to 49 and the following “inverted” epidemiological approach:

$$(3) \quad \text{employed}_{ibr} = \beta \text{death\_rate}_r + \alpha \mathbf{X}'_{1911,r} + \gamma_i \cdot \boldsymbol{\omega}_b \cdot \boldsymbol{\mu}_{1914,r} + \varepsilon_{ibr},$$

<sup>25</sup>Similar to specification 1,  $\text{employed}_{irt}$  indicates whether woman  $i$  residing in département  $r$  is employed,  $\mathbf{X}_{1911,r}$  is a set of pre-war controls,  $\gamma_i$  a set of year of birth fixed effects, and  $\boldsymbol{\mu}_{1914,r}$  a set of military region fixed effects. Standard errors are clustered at the level of départements of residence.

where  $\omega_b$  are département of birth fixed effects. Here,  $\beta$  is identified from variations in the working behaviors of women *across* départements but *within* geographical origins. By fixing variations due to départements of birth, the coefficient solely captures the role of changes to local labor market structures. I report estimates in Panel b of Figure 4. They imply that women born in the same département but residing in départements that experienced high (20 percent) rather than low (10 percent) military death rates were 3 to 7 percentage points more likely to be working between 1962 and 2012. These estimates suggest that 39 to 60 percent of the legacy of the missing men operated through intergenerational transmission rather than through changes to local labor market structures.<sup>26</sup>

Although both analyses use alternative samples and sources of identifying variation, they provide similar answers. These magnitudes are also consistent with results of Alesina, Giuliano and Nunn (2013, 524), who find that 35 to 50 percent of the impact of historical plough use on contemporaneous gender-role attitudes is due to the transmission of cultural norms.

#### *3.4.1. Robustness*

I perform a series of robustness checks that support the credibility of baseline estimates. The full set of results is reported in Appendix B. I also show in Appendix C that World War II military fatalities and destruction do not affect the results.

**Alternative Specifications.** Estimates are robust to the choice of regression model: marginal coefficients from Probit and Logit models are identical to OLS coefficients. They are also similar when the outcome is a labor force participant indicator, when widening age bounds to 25 to 59, and when including women of all marital statuses.

**Selective Migration Patterns.** Because coefficients are identified from behaviors of internal migrants (though originating from neighboring départements), selective migration might account for the results if out-migration patterns were correlated with both military death rates and labor market outcomes. But, as mentioned

<sup>26</sup>I build the denominator by summing coefficients from the epidemiological approach and the inverted epidemiological approach in Panel b of Figure 4.

before, both variables are equal across migration status (Figure A.4). A more systematic approach through regressions of observable characteristics on a migration status indicator confirms that internal migrants and non-migrants are similar along these variables, as well as along fertility. Internal migrants are, however, positively selected in terms of education. This source of selection might bias the results if it was operating differently across individuals that originate from départements that experienced low and high military death rates. Reassuringly, including an interaction term between the internal migrant indicator and the military death rate of individuals' départements of birth reveals that selection along all observable characteristics—including education—does not operate systematically differently across départements of birth. These tests suggest that this source of selection cannot account for the main results.

Beyond selection through out-migration patterns, results might be biased through selective in-migration patterns, that is, through the destination location of internal migrants. In particular, individuals born in départements that experienced greater military death rates might settle in more dynamic labor markets. Reassuringly, removing the ten most urban départements of destination from the sample leaves the results unchanged. Still, in-migration selection might operate within destination départements, with those born in départements that experienced greater military death rates sorting systematically into the more dynamic local labor markets. Comparing internal migrants within their local labor market of residence through employment zones and city fixed effects also leaves baseline estimates unchanged, suggesting that in-migration sorting does not account for the results.

To further alleviate potential issues of selective migration patterns, I control for the relative attractiveness of origin and destination départements through dyadic measures that capture pull and push forces between each pair of départements, together with the distance between them. I also restrict the sample to individuals who migrated at least one decade earlier—the one-and-a-half generation—since they might be subject to less biases due to recent migration. Both strategies generate estimates that are slightly lower than the baseline, though not statistically different. Overall, these robustness checks suggest that selective migration cannot account for the results.



**Inaccurate Assignment of Military Death Rates.** The epidemiological approach requires regressors to be assigned at the level of geographical origin, i.e., the département in which internal migrants' ascendants were residing during the interwar period. However, censuses do not provide ascendants' départements of birth. I am therefore constrained to assume that départements of birth and origin are identical. Here, I relax this assumption by repeating the analysis on the extended labor force surveys 2005–2012, which provide parental geographical origins. I restrict the sample to internal migrants born before the mid-1960s in the same département as both their parents. These restrictions ensure that these individuals' parents were likely born in the 1920s and mid-1930s and that their départements of birth likely trace to the interwar period.<sup>27</sup> Estimates are slightly inflated compared to the baseline—though not significantly different—suggesting that inaccurate assignment of military death rates in the censuses creates some attenuation bias through measurement error.<sup>28</sup>

**Education and Fertility.** Labor market outcomes are endogenous to human capital investment and fertility choices. As a result, these decisions might mediate the relationship between women's working behaviors and WWI military death rates. Controlling for educational attainment and number of children leaves results unchanged, suggesting that the long-run impact of WWI military fatalities was direct rather than mediated by education and fertility choices.

### *3.4.2. Further Results*

Further results are reported in Appendix D. Herein, I show that women born in départements that experienced greater military death rates do not make different fertility or education choices, corroborating that these decisions are not mediators.<sup>29</sup>

<sup>27</sup>The share of French men (women) born in France that remained in their département of birth was 75.0 (75.2) percent in 1921, 74.7 (74.9) percent in 1926, 74.2 (73.5) percent in 1931, and 73.2 (73.2) percent in 1936 according to the censuses, suggesting limited migration movements between the end of the war and the mid-1930s.

<sup>28</sup>A related concern is that départements of birth and childhood might differ. Comparing women with similar migration histories generates results identical to the baseline.

<sup>29</sup>I also ran analyses available upon request showing that women born in départements that experienced greater military death rates do not choose more technical curricula or more male-biased occupations.

These women do not marry at different rates, and when they marry, their husbands do not differ along observable characteristics. This suggests that marriage market disequilibria due to the war highlighted by Abramitzky, Delavande and Vasconcelos (2011) remained circumscribed to the interwar period. I also find little heterogeneity across women with different characteristics (number of children, education, age, marital status). In particular, life-cycle patterns in labor force participation are not affected by WWI military fatalities. I further provide cohort-specific estimates and a placebo test using the male sample.

Next, I combine all thirty-two annual labor force surveys from 1982 to 2013 and run a replication that corroborates results obtained with the censuses.<sup>30</sup> The analysis of labor force surveys further reveals that women born in départements that experienced greater military death rates are more attached to the labor force, but that this influence on the extensive margin does not translate to the intensive margin as they work shorter hours. A final concern is that although there is no evidence of a mediating role of observable educational attainment, results might be driven by *unobserved* heterogeneity in human capital. Should this be the case, it would be reflected in wages. Reassuringly, I find that women born in départements that experienced greater military death rates do not earn higher wages.

## 4. Intergenerational Transmission Mechanisms

To account for these results, I explore three mechanisms of intergenerational transmission: parental transmission (Section 4.1), transmission through marriage (Section 4.2), and transmission through local social interactions (Section 4.3). Overall, mothers and mothers-in-law appear as primary agents in the transmission of the legacy of the missing men.

### 4.1. Parental Transmission

I first explore vertical transmission from parents to daughters. I find that women with parents (especially mothers) born in départements that experienced greater military death rates are more likely to work. 2SLS estimates reveal that war-induced

<sup>30</sup>I run the same specification as the baseline on a different sample of the same underlying population. In that sense, this is a reproduction test (Clemens, 2017, 327).

changes to mothers’ working behaviors drive this maternal transmission.

#### 4.1.1. Empirical Strategy

I again rely on an empirical strategy that mirrors the epidemiological approach to culture. Using the extended annual labor force surveys 2005–2012, which provide départements of birth of respondents’ parents, I focus on the sample of second-generation internal migrant married women aged 30 to 59 with parents born in metropolitan France. More precisely, I restrict second-generation internal migrants to women who reside in their département of birth, but whose mothers and fathers were both born in another département.<sup>31</sup>

Focusing on second- rather than first-generation internal migrants improves the credibility of identification. A typical respondent in the sample has parents born during the 1930s. Their départements of birth therefore plausibly trace to the war (see Footnote 27). Moreover, since the location of second-generation internal migrants was determined prior to their births, results are further less likely to be driven by selective migration.<sup>32</sup> To determine the role of mothers’ origins, I estimate:

$$(4) \quad \text{employed}_{imfr} = \beta \text{death\_rate}_m + \alpha \mathbf{X}'_{1911,m} + \gamma_i + \delta_r + \boldsymbol{\mu}_{1914,m} + \boldsymbol{\omega}_f + \varepsilon_{imfr},$$

where military death rates  $\text{death\_rate}_m$ , historical controls  $\mathbf{X}_{1911,m}$ , and military region fixed effects  $\boldsymbol{\mu}_{1914,m}$  are assigned at the level of mothers’ départements of birth.  $\gamma_i$  is a set of year of birth and survey year indicators. Consistent with the epidemiological approach, I include département of residence fixed effects,  $\delta_r$  (départements of residence and birth are identical as the sample consists of second-generation internal migrants). To neutralize the influence of fathers’ origins, I further include fathers’ département of birth fixed effects  $\boldsymbol{\omega}_f$ . This enables to com-

<sup>31</sup>In the extended labor force surveys, among the 168 thousand married women aged 30 to 59 who reside in their département of birth, 32 thousand (19 percent) have mothers born outside their département of birth, 33 thousand (20 percent) have fathers born outside their département of birth, and 15 thousand (9 percent) have both parents born outside their département of birth.

<sup>32</sup>Second-generation migrants and natives are broadly alike: they are equally likely to be employed, have the same number of children, and their mothers were born in départements with similar military death rates. As with first-generation migrants, second-generation migrants are slightly more educated than natives (Table A.1).

pare women whose fathers were born in the same départements.<sup>33</sup> I cluster standard errors at the levels of départements of residence and mothers' départements of birth.

#### *4.1.2. Results*

I report results in Table 2.<sup>34</sup> In column 1,  $\beta$  is identified from variations in the working behaviors of second-generation internal migrant married women of the same cohort, born and residing in the same département, but whose mothers were born in départements that experienced different military death rates. The estimate is significant at the 1 percent level and implies that women whose mothers were born in départements that experienced high (20 percent) rather than low (10 percent) military death rates were 11 percentage points more likely to be working, 13 percent of the outcome mean. Including fathers' département of birth fixed effects to further isolate the role of mothers' origins decreases the estimate only slightly, suggesting a primary role of maternal relative to paternal transmission (column 2). Restricting the identifying variation to mothers born in neighboring départements through mothers' military region of birth fixed effects similarly has little impact on the estimate (column 3). Finally, I include controls for husband and household characteristics, parental characteristics, as well as respondents' education and number of children (column 4).<sup>35</sup> Again, the estimate changes little, which increases the credibility that economic factors potentially correlated with mothers' origins are not driving the results.

I then reproduce the estimate of column 3 using an alternative definition of second-generation internal migrants—I include women whose mothers were born in another département, but not necessarily their fathers (column 5). The resulting estimate is slightly lower than the baseline. Given that more than half of women in this sample had fathers born in their own département of birth, these “half-natives”

<sup>33</sup>Because the sample size for the extended labor surveys is rather limited—15,095 second-generation internal migrant married women aged 30 to 59—I do not include interacted fixed effects. Doing so generates more than 3,000 comparison groups, leaving too little residual variation for identification.

<sup>34</sup>Results are similar when the outcome is a labor force participant indicator (Table A.2).

<sup>35</sup>Husband and household characteristics consist of husbands' incomes, age, age squared, education, an indicator for home ownership, and the number of rooms in the home; parental characteristics include indicators for parents' occupational status and mothers' labor status; education controls consist of indicators for educational attainment.

probably assimilated the local culture of their département, making the impact of their mothers' origins less influential.

Next, I reproduce the analysis with paternal origins (Table A.3). I estimate a specification analogous to 4 in which variables are assigned at the level of fathers' départements of birth, and where I include mothers' (instead of fathers') département of birth fixed effects. The baseline estimate is significant at the 5 percent level and implies that women whose fathers were born in départements that experienced high (20 percent) rather than low (10 percent) military death rates were 8 percentage points more likely to be working (column 1). Once fixed effects for maternal origins, fathers' military regions of birth, and parental, individual, and household characteristics are included, the estimate is still positive but declines substantially and is rather imprecise (columns 2–4). The lesser role of paternal origins can be rationalized by the fact that while fathers are primary role models for their sons, they are less so for their daughters, especially relative to gender roles (Farre and Vella, 2013).

The role of fathers nevertheless obtains to some extent once both parental origins are simultaneously considered. I modify specification 4 and include military death rates of both parental origins, distinguishing between women whose parents were born in the same département from those whose parents were born in different départements. I also include historical controls and military region of birth fixed effects relative to both parental origins and cluster standard errors at the levels of départements of residence, mothers', and fathers' départements of birth. Results are reported in Table A.4. Estimates in column 1 imply that women with parents born in the same département that experienced high (20 percent) rather than low (10 percent) military death rates were 12 percentage points more likely to be working. Coefficients on mothers' and fathers' independent origins add up to the coefficient when both were born in the same département, suggesting that the impact of each parental origin cumulates linearly, with maternal origins being more important. Including parental regions of birth fixed effects along with various controls does not alter the results (columns 2 and 3).

#### 4.1.3. *The Mother-to-Daughter Channel*

The previous section provides evidence for the primary role of maternal origins. The working hypothesis is that the war altered mothers' behaviors and beliefs, which they transmitted to their daughters. Using a 2SLS strategy, I now explore directly whether war-induced changes to mothers' working behaviors transmitted to their daughters.<sup>36</sup>

I first show that WWI military fatalities induced many mothers to enter the labor force—the first stage. I use the sample of second-generation internal migrant married women aged 30 to 59 from the extended labor force surveys 2005–2012 and estimate Specification 4 with the following outcome: whether a woman's mother was working while she was growing up. I report results in Panel a of Table 3. The estimate in column 1 is significant at the 1 percent level and implies that mothers born in départements that experienced high (20 percent) rather than low (10 percent) military death rates were 14 percentage points more likely to have been working when their daughters were growing up. Comparing women whose fathers have identical origins and including controls for husband and household characteristics, parental characteristics, as well as respondents' education and number of children increases the estimate a little (columns 2 and 3).

Next, I instrument mothers' working behaviors with military death rates of their départements of birth. Second-stage estimates are reported in Panel B of Table 3.<sup>37</sup> These represent estimates of intergenerational transmission from mothers' working behaviors to their daughters'. Estimates controlling for paternal origins imply that a 10 percentage points increase in mothers' labor force participation rates induced by WWI military fatalities generated a 5 percentage points increase in the likelihood of their daughters working (columns 5 and 6). The interpretation arguably relies on the validity of the exclusion restriction as the reduced-form impact of WWI military fatalities might have transmitted from mothers to daughters through channels beyond changes to the working behaviors of mothers. This specification isolates the role of mothers from that of fathers, but other factors might be at work such as

<sup>36</sup>Unfortunately, no dataset contains both parental origins and a measure of parental beliefs about gender roles. As a result, the transmission from mothers' beliefs to their daughters' beliefs and behaviors cannot be explored directly.

<sup>37</sup>Results are similar when the outcome is a labor force participant indicator, though slightly less precise (Table A.5).

changes in mothers’ beliefs toward female labor (see Section 5). Second-stage estimates therefore provide an upper bound for the role of changes to mothers’ working behaviors.

## ***4.2. Transmission Through Marriage***

Fernández, Fogli and Olivetti (2004) argue that sons of working mothers hold more progressive attitudes toward female labor than sons of stay-at-home mothers, making these men less averse to having a working wife, thereby incentivizing women to enter the labor force in the aggregate. Following this line of reasoning, since men born in départements that experienced greater military death rates are more likely to have grown up with a working mother, they should be more likely to have a working wife. Women whose mothers-in-law were born in départements that experienced greater military death rates should therefore be more likely to work. I show below that this transmission channel played a role in the persistence of the legacy of the missing men: by generating a new type of men—those with working mothers—the war established and perpetuated a more progressive social norm toward female labor.

### *4.2.1. Transmission from Husbands to Wives*

To assess the role of husbands’ origins, I regress women’s working behaviors 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 compare women born in the same département but whose husbands were born in different départements. Using the censuses 1962–2012, I restrict the sample to women aged 30 to 49 married with first-generation internal migrant men. I estimate:

$$(5) \quad \text{employed}_{ihbrt} = \beta \text{death\_rate}_h + \alpha \mathbf{X}'_{1911,h} + \gamma_i \cdot \delta_r \cdot \omega_b + \varepsilon_{ihbrt},$$

where  $\text{death\_rate}_h$  denotes the military death rates exposure of the département of birth of husband  $h$  with wife  $i$ .  $\omega_b$  are wives département of birth fixed effects and  $\delta_r$  département of residence fixed effects.

I report estimates in Figure 5.<sup>38</sup> In Panel a, I do not include wives département of birth fixed effects. Coefficients are identified from variations in the working behaviors of first-generation internal migrant married women of the same cohort who reside in the same département but whose husbands were born in départements that experienced different military death rates. Estimates are significant at the 1 percent level and imply that women whose husbands were born in départements that experienced high (20 percent) rather than low (10 percent) military death rates were 4 to 7 percentage points more likely to be working between 1962 and 2012. Including wives département of birth fixed effects to further compare women with identical origins in Panel b decreases estimates by 11 to 41 percent, suggesting a limited role for homogamy in military death rates and assortative matching—I further provide direct evidence for homogamy in military death rates in Appendix E. Including husband and household controls as well as fertility and education barely affects the results (Figure A.6). Moreover, restricting the sample to internal migrant women generates similar estimates (Figure A.7).

Next, I explore the relative role of a woman’s origins vis-à-vis her husband’s. I distinguish women whose husbands were born in the same département from those whose husbands were born in a different département through indicators  $\text{same}_{bh}$  and  $\text{different}_{bh}$ . Moreover, because this analysis applies the epidemiological approach to both husbands and wives, I estimate the following specification on the sample of internal migrant women aged 30 to 49 married with internal migrant men:

$$\begin{aligned}
 \text{employed}_{ibhrt} &= \beta_1 \text{same}_{bh} \cdot \text{death\_rate}_h + \beta_2 \text{different}_{bh} \cdot \text{death\_rate}_b \\
 (6) \quad &+ \beta_3 \text{different}_{bh} \cdot \text{death\_rate}_h \\
 &+ \alpha_1 \mathbf{X}'_{1911,b} + \alpha_2 \mathbf{X}'_{1911,h} + \gamma_i \cdot \delta_r + \varepsilon_{ibhrt}.
 \end{aligned}$$

I use three-way clustering and cluster standard errors at the levels of départements of residence and each spouse’s département of birth. I report estimates in Figure A.8. Focusing on estimates when spouses’ origins are different reveals that women’s own origins are quantitatively twice as important as those of their husbands’— $\hat{\beta}_3$  represents 61 percent of  $\hat{\beta}_2$  on average. Moreover, similar to parental origins, estimates on spouses’ origins linearly cumulates— $\hat{\beta}_1$  about equals the sum of  $\hat{\beta}_2$  and  $\hat{\beta}_3$ .

<sup>38</sup>Results are similar when the outcome is a labor force participant indicator (Figure A.5).



Three mechanisms could account for these results. First, husbands from départements that experienced greater military death rates might marry with women that have a higher propensity to work in the first place because they were born in départements that experienced greater military death rates as well—an assortative matching mechanism. Second, being a working woman might have become a more valuable trait on the marriage market, providing incentives for wives to work in the aggregate. And third, these men might assume a larger share of household production, thereby freeing some time for their wives to enter the labor force. The first mechanism plays a limited role, as eliminating homogamy in military death rates only partially decreases the estimates (Panel b of Figure 5; see also Appendix E). I analyze further the reality of the third mechanism in Appendix F. In particular, I explore therein whether men in couples with women from départements that experienced greater military death rates perform relatively more household and childcare tasks. Using data from the Generation and Gender Survey (GGS) of 2005 over a dozen household chores, I find that this is not the case.<sup>39</sup> The likely remaining explanation for the results in this section is therefore that, consistent with Fernández, Fogli and Olivetti (2004), by creating a new type of men—those with working mothers—the war established and perpetuated a more progressive social norm toward female labor, making women’s participation to the labor force a more valuable trait on the marriage market.

#### *4.2.2. Transmission from Mothers-In-Law to Daughters-In-Law*

I now explore directly the role of mothers-in-law by reproducing the analysis of Section 4.1 on the sample of second-generation internal migrant married women aged 30 to 59. To isolate the role of mothers-in-law from that of own parents and husbands, I augment Specification 4 with fixed effects for both parents’ and husbands’ départements of birth. This enables to compare women whose parents and husbands have identical origins. I report results in Table 4. In column 1, the coefficient is identified from variations in the working behaviors of second-generation internal migrant married women of the same cohort, born and residing in the same

<sup>39</sup>There household tasks include household chores (cooking, dish washing, grocery shopping, ironing, and vacuuming) and childcare (who dresses children, takes them to bed, attends them when they are sick, plays with them, helps them with their homework, and brings them to activities).

département, with husbands born in the same département, but whose mothers-in-law were born in départements that experienced different military death rates. The coefficient implies that women whose mothers-in-law were born in départements that experienced high (20 percent) rather than low (10 percent) military death rates were 13 percentage points more likely to be working. Including own parents' départements of birth fixed effects and restricting the identifying variation to mothers-in-law born in neighboring départements slightly increases the estimate to 1.5 (columns 2 and 3). Including controls for husband and household characteristics, parental characteristics, as well as respondents' education and number of children further increases the estimate to 1.6 (column 4).

Estimates in Tables 2 and 4 suggest that mothers and mothers-in-law are equally important agents of intergenerational transmission. Comparing their relative roles more directly by including military death rates of mothers' and mothers-in-law's origins together through a specification analogous to that of Table A.4 confirms this interpretation. I report results in Table A.6. Estimates in column 1 imply that women with mothers and mothers-in-law born in the same département that experienced high (20 percent) rather than low (10 percent) military death rates were 24 percentage points more likely to be working. Coefficients on mothers' and mothers-in-law's independent origins add up to the coefficient when both come from the same département, suggesting again that the impact of each parental origin cumulates linearly. While both maternal origins appear important, estimates for mothers-in-law are slightly larger than those for own mothers, although they are not significantly different.<sup>40</sup> This result complements those of Fernández, Fogli and Olivetti (2004), who find that mothers-in-law rather than own mothers explain the impact of WWII mobilization rates on female labor force participation in the United States.

### *4.3. Local Social Interactions*

The third set of mechanisms I explore is horizontal and oblique transmission through local social interactions. Culture is a locally embedded process and social interactions in culture might materialize in two ways: first, the cultural composition

<sup>40</sup>The difference between both coefficients in column 1 is 0.05 with a standard error of 0.88; the difference in column 3 is 0.36 with a standard error of 0.73.

of a neighborhood might affect the relative importance of an individual’s own culture as individuals surrounded by many with identical origins might find it easier—or feel pressured—to preserve their culture of origin. Conversely, the cultural composition of a neighborhood might affect individuals’ beliefs through a process of cultural assimilation.

I first explore whether the legacy of the war diffused through cultural assimilation at the local level. For each census and municipality, I construct a measure of cultural composition in military death rates.<sup>41</sup> It is the weighted average military death rates exposure of départements of birth among residents in a municipality:  $\text{death\_rate}_m = \sum_o \text{sh\_res}_{o,m} \times \text{death\_rate}_o$ , where  $\text{sh\_res}_{o,m}$  denotes the share of residents in municipality  $m$  born in département  $o$ . Then, I estimate the following specification on the sample of first-generation internal migrant married women aged 30 to 49:

$$(7) \quad \text{employed}_{ibmilt} = \beta \text{death\_rate}_m + \alpha \mathbf{X}'_{1911,m} + \gamma_i + \delta_l + \omega_b + \varepsilon_{ibmilt},$$

where  $\mathbf{X}_{1911,m}$  contains pre-war characteristics and is constructed in the same way as  $\text{death\_rate}_m$ . To compare individuals across neighboring municipalities and alleviate potential issues of spatial sorting, I include local labor market fixed effects  $\delta_l$ .<sup>42</sup> I also include département of birth fixed effects  $\omega_b$  and cluster standard errors at the levels of départements of birth and residence. Estimates are identified from variations in the working behaviors of first-generation internal migrant married women of the same cohort, born in the same département, but residing in neighboring municipalities with different cultural compositions in military death rates. I report results in Panel a of Figure 6. Estimates imply that women who reside in a municipality in which the average military death rates composition was one percentage point higher were 1 to 3 percentage points more likely to be working

<sup>41</sup>Censuses contain information on individuals in up to 26 thousand municipalities—there are 36 thousand municipalities in France but the remaining 10 thousand municipalities are too small to be sampled in the censuses as they contain less than 200 residents.

<sup>42</sup>Because the independent variable varies at the municipality level, I can use a narrow definition of local labor markets, with the identifying variation restricted to neighboring municipalities. Specifically, I use *canton* fixed effects. Cantons represent the fourth level of subnational government, between *arrondissements* and *communes*. There were about four thousand cantons before 2013, containing nine municipalities on average.

between 1968 and 2012.<sup>43</sup> Including controls for husband and household characteristics as well as respondents' education and number of children has little effect on the estimates (Figure A.9, Panel a).

Next, I analyze whether the legacy of the war was culturally preserved because of geographical clustering of individuals with similar origins. Again, I restrict the identifying variation to neighboring municipalities and estimate:

$$(8) \quad \text{employed}_{ibmlt} = \beta \text{sh\_res}_{b,m} \times \text{death\_rate}_b + \alpha \text{sh\_res}_{b,m} + \gamma_i + \delta_l + \omega_b + \varepsilon_{ibmlt},$$

where  $\text{sh\_res}_{b,m}$  denotes the share of residents in municipality  $m$  born in département  $b$ , the same as the respondent's. This specification includes département of birth fixed effects  $\omega_b$  so that the coefficient on the interaction term is identified from variations in the working behaviors of first-generation internal migrant married women of the same cohort, born in the same département, but residing in neighboring municipalities. It indicates whether the impact of WWI military fatalities was relatively stronger among women surrounded by more people from their own département of birth. I report results in Panel b of Figure 6. Estimates imply that women born in the same département who reside in a municipality in which the share of residents from their own départements of birth was one percentage point higher were 1 to 2 percentage points more likely to be working. Again, including controls has little effect on the estimates (Figure A.9, Panel b).

Results in this section highlight the role of local social interactions for long-run historical processes. While cultural assimilation affects the diffusion aspect of history, cultural preservation affects its persistence. Both channels empirically work toward the manifestation of the legacy of the war in contemporaneous France. These channels need not oppose each other however: merging specifications 7 and 8 results in estimates that change little, suggesting some degree of orthogonality between the two processes (Figure A.10). These results shed a new light on the dichotomy between culture and institutions. Given the local embeddedness of cul-

<sup>43</sup>The coefficient is close to zero and not significant for the census of 1999, the census that contains the least observations in the sample. Because preferences and beliefs are formed while growing up, I assign the cultural composition using the previous census, so the census of 1962 is not part of the analysis. Using contemporaneous measures or a lag of two censuses generates similar results.

ture and mechanisms of horizontal transmission through local social interactions, estimates from a location-based approach—or an “inverted” epidemiological approach (Section 3.4)—might partly capture implications of the local embeddedness of culture rather than solely differences in inherited institutional structures.

## 5. Changes to Preferences and Beliefs Toward Female Labor

To account for results on working behaviors, I argue that women induced to enter the labor force during the interwar period because of WWI altered preferences and beliefs toward female labor of their daughters, sons, and entourage, and that these changes translated into the working behaviors of women in subsequent generations. Since individuals form preferences and beliefs early in life from learning and socializing with their parents, peers, and neighbors (Bisin and Verdier, 2011; Fogli and Veldkamp, 2011; Fernández, 2013; Olivetti, Patacchini and Zenou, 2020), men and women who grew up with a working mother, or in an environment in which many women worked, should form more progressive attitudes toward female labor.

To explore the validity of this argument, I analyze the long-run implications of WWI military fatalities for attitudes toward gender roles. Before delving into contemporaneous data, however, it is worth noting that there were no pre-WWI difference in attitudes toward female labor across départements that experienced different military death rates—at least, no difference as captured by the support to the extension of suffrage and eligibility to women in labor courts (*conseils de prud’hommes*) in 1901 or support to the extension of political suffrage to women in 1914 (see Appendix G for details). Because it contains respondents’ départements of birth and residence, the Generation and Gender Survey (GGS) of 2005 enables the implementation of the epidemiological approach to explore this question—importantly, this is the only survey that exists with this information.<sup>44</sup> Since I study preferences and beliefs rather than behaviors, I do not place age restrictions on the regression sample. To apply the epidemiological approach, I focus on internal migrant respondents: 2,689 individuals, among which 1,105 men and 1,584 women.<sup>45</sup>

<sup>44</sup>See Régnier-Loilier (2016) for a description of the GGS survey. Two other datasets with information on cultural beliefs are the opinion barometer of the DRESS and the International Social Survey (ISSP), but they do not provide respondents’ départements of birth.

<sup>45</sup>As with the censuses, there is no correlation between migration status and origin département

Respondents were proposed three statements related to the roles of women in the labor force and asked whether they “agree,” “somewhat agree,” “do not agree nor disagree,” “somewhat disagree,” or “disagree.” 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 0 to “agree” and 1 to “disagree,” and use 0.25-point increments for responses in between, so that higher values indicate more progressive attitudes toward gender roles. Then, I aggregate statements using a three-point scale, which I standardize to a one-point scale. I report average responses for men and women separately in Table 5. According to the above coding scheme, respondents “somewhat disagree” with the statements on average with an index at 0.75, with no difference between men and women. The survey also contains questions related to preferences and beliefs about religion, marriage, and family. I report average responses relative to these statements in Tables A.8 to A.10.

Applying the same approach as before, I estimate the following specification, where I pool men and women, and further add an interaction term to assess differential influences on beliefs along genders:

$$(9) \quad \text{values}_{ibr} = \beta_1 \text{death\_rate}_b + \beta_2 \text{female}_i + \beta_3 \text{death\_rate}_b \times \text{female}_i \\ + \boldsymbol{\alpha} \mathbf{X}'_{1911,b} + \boldsymbol{\gamma}_i + \boldsymbol{\delta}_r + \varepsilon_{ibr},$$

where  $\text{values}_{ibr}$  denotes the one-point scale gender values index for individual  $i$ , born in département  $b$ , and residing in département  $r$ . Historical controls  $\mathbf{X}_{1911,b}$  are assigned at the level of départements of birth. Consistent with the epidemiological approach, I include département of residence fixed effects  $\boldsymbol{\delta}_r$ . I cluster standard errors at the levels of départements of birth and residence.

I report results in Table 6.  $\beta_1$  is identified from variations in attitudes held by respondents of the same cohort, who reside in the same département, but were born in départements that experienced different military death rates. When the interaction term is not included,  $\hat{\beta}_1$  is significant at the 1 percent level and implies that respondents born in départements that experienced high (20 percent) rather

military death rates, employment status, or fertility. However, internal migrants are more educated than non-migrants (Table A.7).

than low (10 percent) military death rates hold more progressive attitudes toward female labor (column 1); the index is 11 percentage points higher in this case, which corresponds to 15 percent of the mean. Adding the interaction term does not affect  $\hat{\beta}_1$ , but reveals a slightly stronger response of women’s attitudes, though the coefficient is not significant (column 2). Adding parental and household controls and controlling for respondents’ employment status, education, and fertility, does not change results substantially (columns 3–5).

Estimating Specification 9 separately for each component of the gender values index reveals that the effect of military fatalities on preferences and beliefs is driven by two of its three components (Table A.11): whether respondents disagree with the statements according to which “if a woman earns more than her partner, it is detrimental for their relationship”—a strong marker of gender identity norms in relation with female labor supply (Bertrand, Kamenica and Pan, 2015)—and “in an economic crisis, men should keep their jobs in priority”—another important marker of gender norms (Alesina, Giuliano and Nunn, 2013, 524–7).

Finally, to assess whether these results reflect more progressive attitudes in general, I reproduce the analysis for attitudes related to religion, marriage, and family (Table A.12). Consistent with the original interpretation, WWI military fatalities did not impact attitudes beyond those specifically related to the roles of women in the labor force.

## 6. Discussion

One century after the First World War, the legacy of the missing men is still vivid. Comparing women who reside under similar institutional conditions but were born in départements that experienced different military death rates, I provide empirical evidence for a persistent and continued impact of WWI on women’s working behaviors. I uncover three channels of intergenerational transmission: parental transmission, transmission through marriage, and transmission through local social interactions. Consistent with formal models of intergenerational transmission, I find that men and women born in départements that experienced greater military death rates hold more progressive attitudes toward the role of women in the labor force today.

To take stock of these findings and put their magnitudes in perspective, I report

the main estimates of this article together in Table 7, where I take the median whenever there are multiple estimates over time for a given specification. Finding a common ground for comparison is challenging as samples and sources of identification differ throughout. One possibility is to standardize estimates in terms of residual standard deviations. That is, rely on the effective variation in the treatment variable used for identification once fixed effects are taken into account, multiply raw estimates with these residual standard deviations, then divide them with the residual standard deviation of the outcome variable calculated in the same way (Mummolo and Peterson, 2018). To make this exercise somewhat meaningful, I compare regression coefficients estimated across samples of the same generation: first-generation migrants in Panel A, and second-generation migrants in Panel B.

Comparing magnitudes of overall effects from the epidemiological approach to those from the “inverted” epidemiological approach from Section 3.4 confirms that the legacy of the missing men operated roughly equally through intergenerational transmission than through changes to local labor market structures, echoing results from Alesina, Giuliano and Nunn (2013, 524). This also highlights the importance of the epidemiological approach in disentangling both processes. Second, another important finding is the role of marriage as an important mechanism of persistence of this historical shock, as the magnitude of the coefficient through husbands’ origins is substantial (Section 4.2.1). Third, both mechanisms of social interactions appear relatively (and equally) important for persistence—though their source of variation remains markedly different from that of other analyses in this article, as it relies on cross-municipality composition variation (Section 4.3). Finally, magnitudes on preferences and beliefs are large, suggesting that changes to attitudes of both men and women are an important precondition for changes to behaviors (Section 5). Turning to analyses relying on second-generation migrants, magnitudes of estimates on mothers and mothers-in-law confirm that they were equally important agents in the transmission of the legacy of the missing men, echoing results in Fernández, Fogli and Olivetti (2004).<sup>46</sup> In contrast, fathers appear to play a limited role in this transmission process (Sections 4.1 and 4.2.2).

Overall, these findings elucidate intergenerational diffusion pathways of women’s

<sup>46</sup>The fact that these are larger than “overall” effects might be the result of the smaller amount of measurement error in these analyses, as results in Table B.2 attest.



market involvement. They suggest that the entrance of women in the labor force during early phases of the revolution of female labor paved the way for subsequent generations of women, and especially their daughters and daughters-in-law. I interpret results in this article as evidence for a process of cultural diffusion and change by which women induced to enter the labor force during the interwar period because of WWI military fatalities altered preferences and beliefs about female labor of their daughters, sons, and entourage, and that these changes translated into the working behaviors of women in subsequent generations. Fernández (2013) models such a mechanism of cultural change through a framework in which women endogenously learn about the long-run payoffs of working by observing women of the previous generation. This gives rise to a sigmoid-shaped process for behaviors and beliefs about female labor.<sup>47</sup> Providing direct empirical evidence for this feedback process is challenging as no survey traces to the interwar period. Finding innovative ways to build measures of preferences and beliefs toward female labor far back in the past to explore further this process of cultural change is a promising avenue of research.

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<sup>47</sup>See also Hazan and Maoz (2002), Fogli and Veldkamp (2011), and Hiller and Baudin (2016) for related models.

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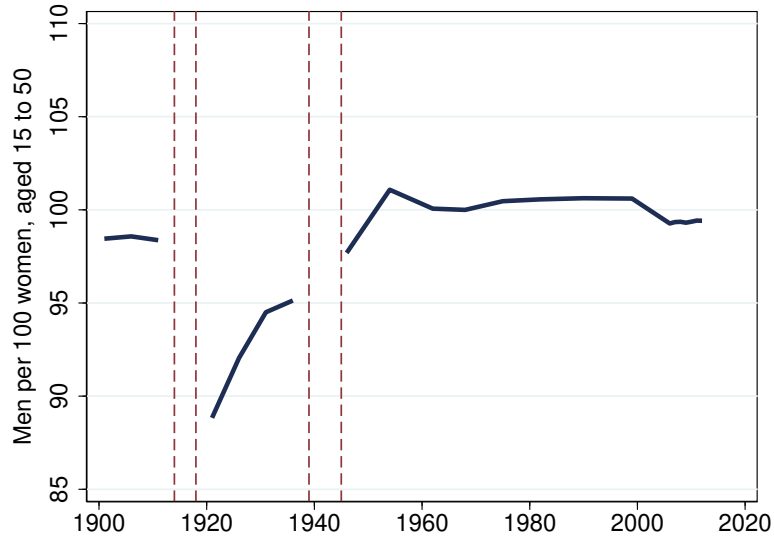


Figure 1. Adult Sex Ratio (1900–2012)

*Notes:* This figure displays the sex ratio among French adults aged 15 to 50. Data are from the censuses 1901–2012. Vertical lines indicate WWI (1914–1918) and WWII (1939–1945).

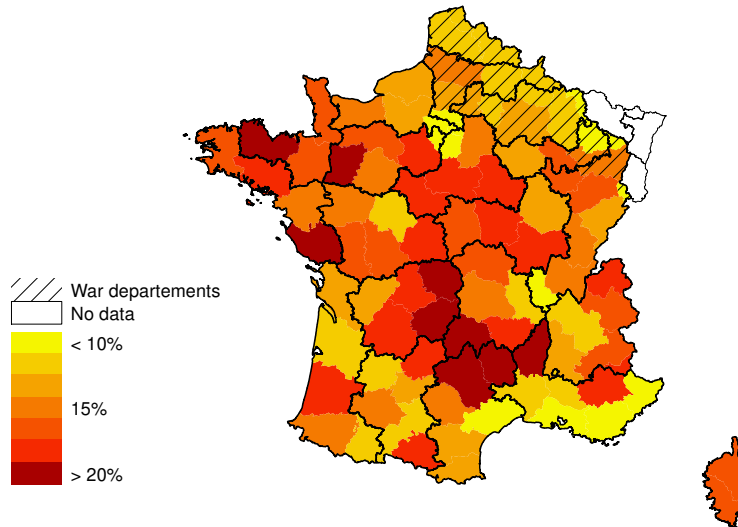
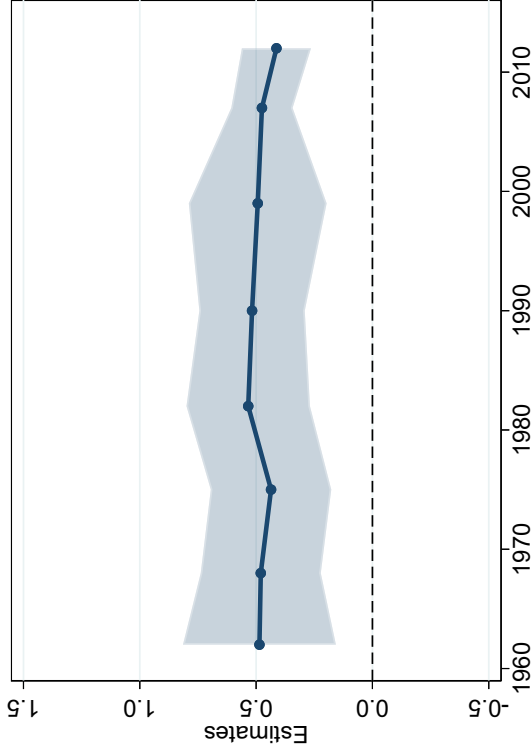
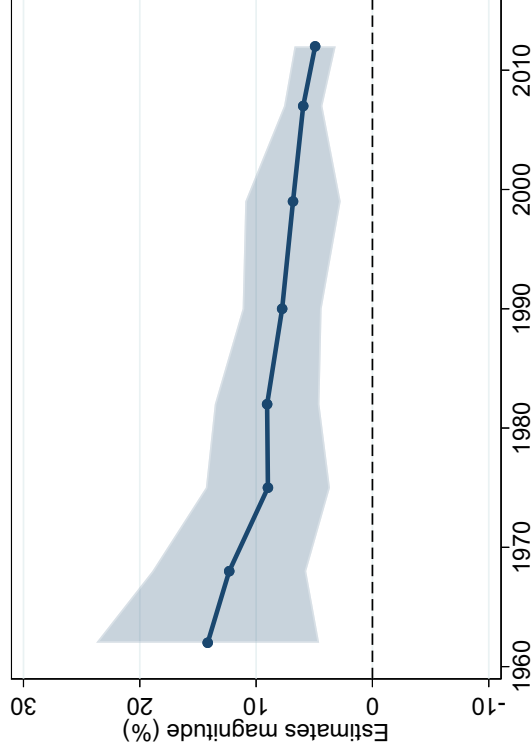


Figure 2. Military Death Rates Across 87 Départements

*Notes:* Data are missing for the three départements that belonged to Germany before WWI—Bas-Rhin, Haut-Rhin, and Moselle. Shaded areas indicates départements in which war combats occurred. 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), 8546–8547, September 26, 1913. Shapefiles are from Gay (2021).



(a) Baseline Estimates

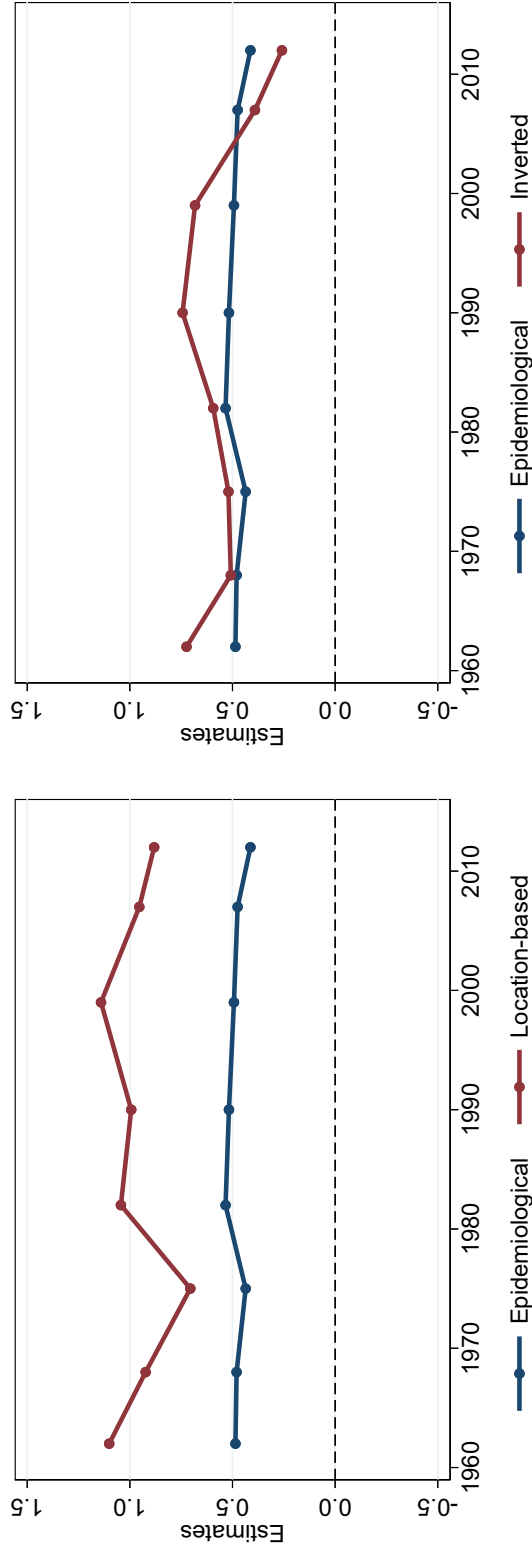


(b) Magnitude Relative to the Mean

Figure 3. The Impact of WWI Military Fatalities on FLFP  
Dependent Variable: Employed

Notes: Panel a reports OLS coefficients from estimating Specification 1 along with 95 percent confidence intervals. The dependent variable is an indicator for whether the individual is employed. All regressions contain interacted cohort, département of residence, and military region of birth fixed effects, as well as the set of historical controls measured at the level of individuals' départements of birth in 1911. They consist of the share of rural population, the share of population born in the département, the female labor force participation rate, total fertility, the share of girls aged 5 to 19 who go to primary or secondary school, and personal wealth per inhabitants in France. 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 B.1 for details about sample sizes for each census year. Panel b reports the magnitude of the coefficients from panel a with respect to the outcome mean. It is the share of the mean in the dependent variable explained by switching from being born in a département that experienced low (10 percent) rather than high (20 percent) military death rates. Estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).





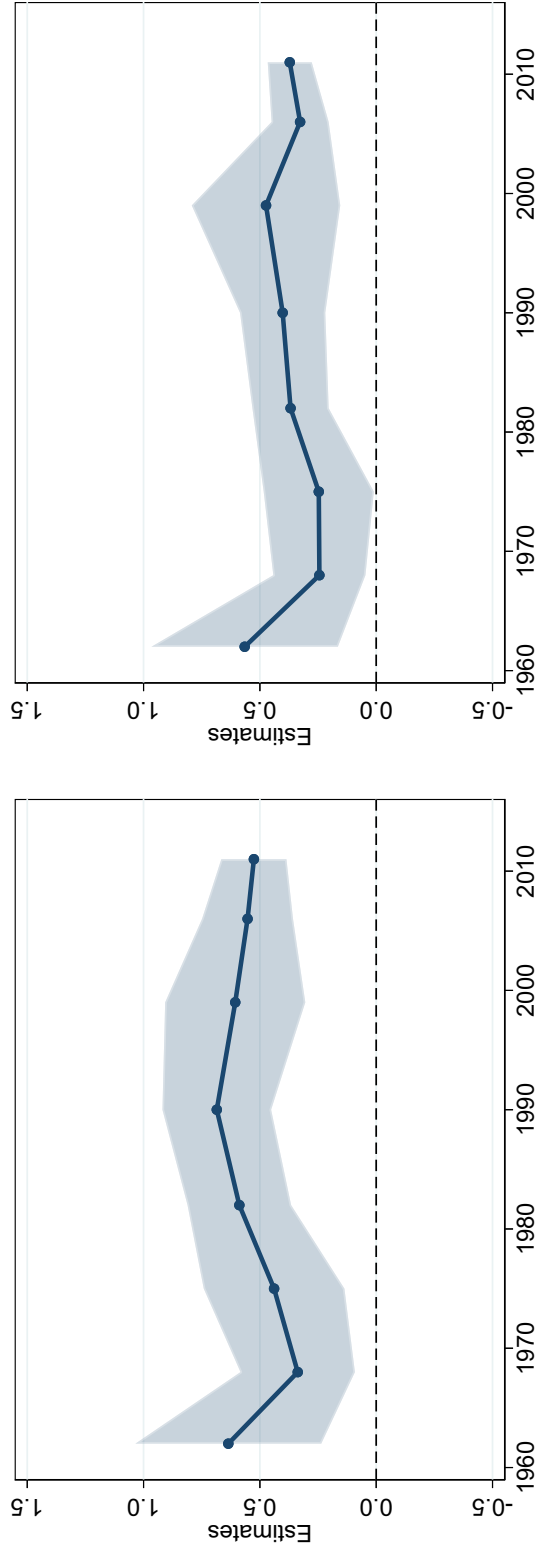
(a) Location-Based Approach  
 (b) Inverted Epidemiological Approach

Dependent Variable: Employed

Figure 4. Epidemiological versus Location-Based Approach

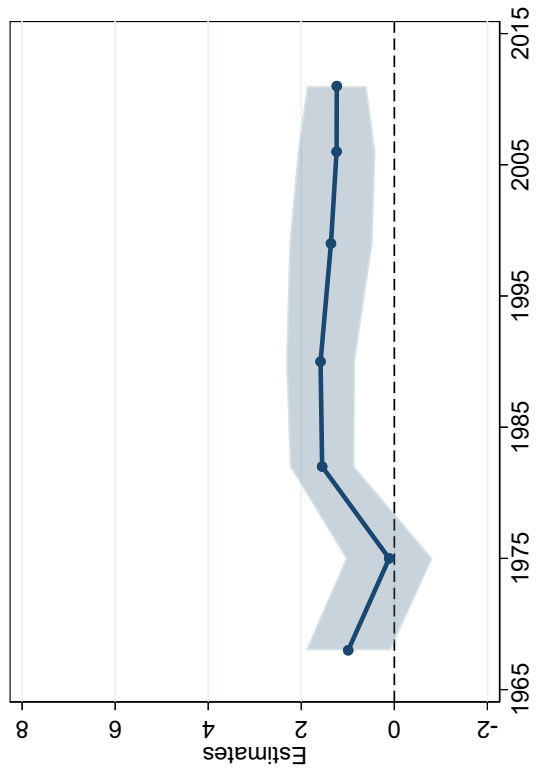
*Notes:* This figure reports OLS coefficients from estimating Specifications 2 and 3. All regressions contain interacted cohort and military region of residence fixed effects, as well as the set of historical controls measured at the level of individuals' départements of residence in 1911. Standard errors are clustered at the level of individuals' départements of residence. The sample consists of non-migrant married women aged 30 to 49 in Panel a, and internal migrant married women aged 30 to 49 in Panel b. Estimates are computed using the sample weights provided in the censuses. This figure also reports estimates from Figure 3 for comparison. Data from the censuses (1962–2012).

- significant at the 1 percent level.

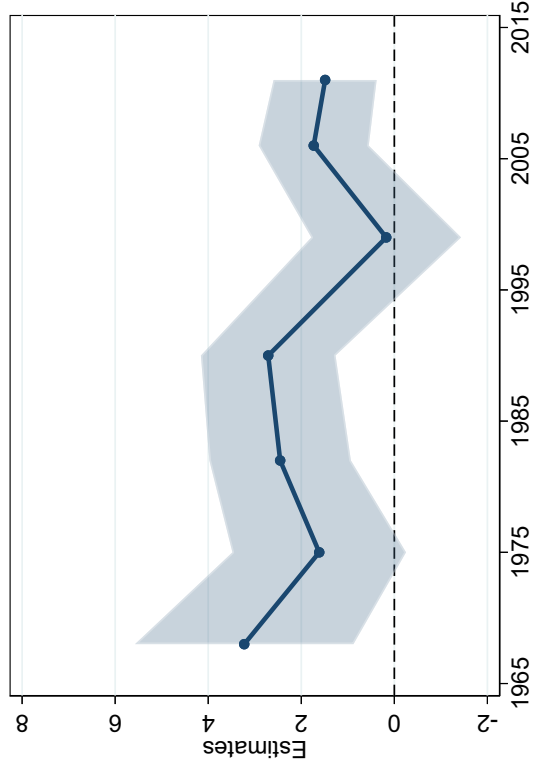


(a) No Wife Birth Département FE  
 (b) Wife Birth Département FE  
 Figure 5. Transmission from Husbands to Wives  
 Dependent Variable: Employed

*Notes:* This figure reports OLS coefficients from estimating Specification 5 along with 95 percent confidence intervals. The dependent variable is an indicator for whether the individual is employed. All regressions contain interacted cohort and département of residence fixed effects, as well as the set of historical controls measured at the level of individuals husbands' départements of birth in 1911. Panel b further includes interacted départements of birth fixed effects. Standard errors are clustered at the level of individuals' départements of residence and husbands' départements of birth. The sample consists of women aged 30 to 49 married with internal migrant men. Estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).



(a) Assimilation



(b) Preservation

Figure 6. Local Social Interactions  
Dependent Variable: Employed

Notes: Panel a reports OLS coefficients on  $\text{death\_rate}_m$  from estimating Specification 7, and Panel b, OLS coefficients on the interaction  $\text{sh\_res}_{b,m} \times \text{death\_rate}_b$  from estimating Specification 8, along with 95 percent confidence intervals. Standard errors are clustered at the level of individuals' départements of birth and residence. The sample consists of first-generation internal migrant married women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1968–2012).

Table 1. Military Death Rates and Pre-War Characteristics

Dependent variable	Military death rate		
	(1)	(2)	(3)
Share rural population	0.12*** [0.01]	0.12*** [0.02]	0.14*** [0.03]
Share born in département	0.12*** [0.03]	0.13*** [0.03]	0.16*** [0.04]
Female labor force participation		-0.02 [0.04]	0.04 [0.04]
Share girls aged 5–19 in school		0.09 [0.07]	0.10 [0.08]
Total fertility rate		0.00* [0.00]	0.00* [0.00]
Personal wealth (thousand francs)		0.00** [0.00]	0.00 [0.00]
Other characteristics	No	Yes	Yes
Military region FE	No	No	Yes
Départements	87	87	87
R <sup>2</sup>	0.745	0.825	0.887

*Notes:* This table reports OLS coefficients from regressing military death rates on various pre-war département characteristics measured in 1911. *Other characteristics* include 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. The coefficient on total fertility rate is a precise zero (0.00002, standard error of 0.00001). 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 2. Transmission from Mothers to Daughters  
Extended Labor Force Surveys 2005–2012

Dependent variable	Employed				
	(1)	(2)	(3)	(4)	(5)
Military death rate (mother)	1.05*** [0.37]	0.93** [0.40]	1.11*** [0.40]	1.24*** [0.35]	0.94*** [0.34]
Father birth département FE	No	Yes	Yes	Yes	No
Mother birth region FE	No	No	Yes	Yes	No
Other controls	No	No	No	Yes	No
Clusters					
Own birth-residence	95	95	95	95	95
Mother birth	95	95	95	95	95
Observations	15,095	15,095	15,095	15,095	32,099
Outcome mean	0.81	0.81	0.81	0.81	0.79
Outcome s.d.	0.39	0.39	0.39	0.39	0.40

*Notes:* This table reports the OLS coefficients from estimating Specification 4. All regressions contain cohort, département of birth and residence, and survey-year fixed effects, as well as the set of historical controls measured at the level of individuals' mothers' départements of birth in 1911. *Other controls* include parental characteristics (indicators for parents' occupational status and mothers' labor status), husband and household characteristics (husbands' incomes, age, age squared, educational attainment, an indicator for home ownership, and the number of rooms in the home), and individuals' education and number of children. Standard errors are clustered at the level of départements of residence and mothers' départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose mothers and fathers were born in another département in columns 1–4, and whose mothers (but not necessarily fathers) were born in another département in column 5. Estimates are computed using the sample weights provided in the extended labor force surveys.

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

Table 3. Transmission from Mothers to Daughters, 2SLS  
Extended Labor Force Surveys 2005–2012

Dependent variable	Mother worked			Employed		
	A. First Stage			B. Second Stage		
	(1)	(2)	(3)	(4)	(5)	(6)
Military death rate (mother)	1.39*** [0.53]	1.94*** [0.64]	1.80*** [0.61]			
Mother worked				0.76** [0.38]	0.49** [0.23]	0.49** [0.24]
Father birth département FE	No	Yes	Yes	No	Yes	Yes
Other controls	No	No	Yes	No	No	Yes
Clusters						
Own birth-residence	95	95	95	95	95	95
Mother birth	95	95	95	95	95	95
Observations	15,095	15,095	15,095	15,095	15,095	15,095
Outcome mean	0.59	0.59	0.59	0.81	0.81	0.81
Outcome s.d.	0.49	0.49	0.49	0.39	0.39	0.39
F-statistic	29.70	44.38	38.49			

*Notes:* All regressions contain cohort, département of birth and residence, and survey-year fixed effects, as well as the set of historical controls measured at the level of individuals' mothers' départements of birth in 1911. *Other controls* include parental characteristics (indicators for parents' occupational status and mothers' labor status), husband and household characteristics (husbands' incomes, age, age squared, educational attainment, an indicator for home ownership, and the number of rooms in the home), and individuals' education and number of children. Standard errors are clustered at the level of the départements of birth and mothers départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose mothers and fathers were born in another département. The estimates are computed using the sample weights provided in the extended labor force surveys.

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

Table 4. 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)	1.28* [0.75]	1.20* [0.61]	1.48** [0.65]	1.64** [0.66]
Own parents birth département FE	No	Yes	Yes	Yes
Mother-in-law birth region FE	No	No	Yes	Yes
Other controls	No	No	No	Yes
Clusters				
Own birth-residence	94	94	94	94
Mother -in-law birth	94	94	94	94
Observations	13,389	13,389	13,389	13,389
Outcome mean	0.81	0.81	0.81	0.81
Outcome s.d.	0.39	0.39	0.39	0.39

*Notes:* This table reports the OLS coefficients from estimating Specification 4 augmented with fixed effects for both own parents' and husbands' départements of birth. All regressions contain cohort, département of birth and residence, husband birth département, and survey-year fixed effects, as well as the set of historical controls measured at the level of individuals' mothers-in-law's départements of birth in 1911. *Other controls* include parental characteristics (indicators for parents' occupational status and mothers' labor status), husband and household characteristics (husbands' incomes, age, age squared, educational attainment, an indicator for home ownership, and the number of rooms in the home), and individuals' education and number of children. Standard errors are clustered at the level of départements of residence and mothers-in-law's départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose mothers and fathers were born in another département. Estimates are computed using the sample weights provided in the extended labor force surveys.

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

Table 5. Preferences and Beliefs About Female Labor

Higher values mean disagreement with the statement

	Sex of respondent		
	All	Men	Women
1 If a woman earns more than her partner, it is detrimental for their relationship	0.78 (0.29)	0.80 (0.27)	0.76 (0.31)
2 Women should not decide how to spend the money they earned without asking their partners	0.73 (0.34)	0.70 (0.35)	0.76 (0.34)
3 In an economic crisis, men should keep their jobs in priority	0.74 (0.35)	0.72 (0.35)	0.76 (0.35)
Gender values index (three-point scale)	2.25 (0.64)	2.22 (0.63)	2.27 (0.65)
Gender values index (one-point scale)	0.75 (0.21)	0.74 (0.21)	0.76 (0.22)
Observations	2,689	1,105	1,584

*Notes:* This table reports summary statistics for preferences and beliefs about female labor on the sample of internal migrant respondents. Higher values indicate disagreement with the statement. Standard deviations are in parenthesis. Data from the GGS (2005).



Table 6. The Impact of WWI Military Fatalities on Beliefs

Dependent variable	Gender values index (one-point scale)				
	(1)	(2)	(3)	(4)	(5)
Military death rate	1.14*** [0.21]	1.04*** [0.31]	0.95*** [0.32]	0.96*** [0.32]	1.00*** [0.33]
Female	0.02* [0.01]	-0.01 [0.03]	-0.01 [0.03]	-0.01 [0.03]	-0.01 [0.03]
Military death rate $\times$ Female		0.16 [0.21]	0.20 [0.20]	0.17 [0.20]	0.22 [0.21]
Controls					
Parental	No	No	Yes	Yes	Yes
Household	No	No	No	Yes	Yes
Individual	No	No	No	No	Yes
Clusters					
Residence	95	95	95	95	95
Birth département	88	88	88	88	88
Observations	2,688	2,688	2,688	2,688	2,688
Outcome mean	0.75	0.75	0.75	0.75	0.75

*Notes:* This table reports the OLS coefficients from estimating Specification 9. All regressions contain cohort and département of residence fixed effects, as well as the set of historical controls measured at the level of respondents' départements of birth in 1911. Household controls include 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, and an indicator for whether the respondent has a partner present in the household. Parental controls include the labor status of the respondent's mother, and educational attainment indicators for both parents. Individual controls include employment status, educational attainment, and the number of children in the household. Standard errors are clustered at the level of départements of birth and of residence. The sample consists of internal migrants. The estimates are computed using the sample weights provided in the GSS. Data from the GSS (2005).

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

Table 7. Estimates Magnitudes

Analysis	Dataset	Year	Source of variation	Estimate			Reference
				Raw	Standardized	Residual	
Overall	Censuses	1962–2012	Birth <i>dép.</i>	0.48***	0.046***	0.011***	Figure 3, Panel a
Inverted	Censuses	1962–2012	Residence <i>dép.</i>	0.56**	0.044**	0.010**	Figure 4, Panel b
Husbands	Censuses	1962–2012	Husband birth <i>dép.</i>	0.37***	0.036***	0.006***	Figure 5, Panel b
Assimilation	Censuses	1968–2012	Residence <i>municip.</i>	1.73***	0.113***	0.006***	Figure 6, Panel a
Preservation	Censuses	1968–2012	Residence <i>municip.</i>	1.24***	0.037***	0.009***	Figure 6, Panel b
Attitudes	GGS	2005	Birth <i>dép.</i>	1.04***	0.196***	0.066***	Table 6, Column 2

Analysis	Dataset	Year	Source of variation	Estimate			Reference
				Raw	Standardized	Residual	
Mother	Labor surveys	2005–2012	Mother birth <i>dép.</i>	1.10***	0.120***	0.030***	Table 2, Column 3
Father	Labor surveys	2005–2012	Father birth <i>dép.</i>	0.51	0.054	0.015	Table A.3, Column 3
Mother-in-law	Labor surveys	2005–2012	Mother-in-law birth <i>dép.</i>	1.48**	0.145**	0.029**	Table 4, Column 3

*Notes:* This table reports the main estimates in this article. *dép.* stands for *département*, and *municip.*, for municipality. *Standardized estimates* correspond to raw estimates multiplied by the sample standard deviation in the independent variable, then divided by the sample standard deviation in the dependent variable. *Residual estimates* correspond to raw estimates multiplied by the residual standard deviation in the independent variable, then divided by the residual standard deviation in the dependent variable. Variables are residualized with respect to specification-specific fixed effects. When multiple estimates are available for a given specification, due to multiple time points, estimates correspond to the median.

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

THE LEGACY OF THE MISSING MEN  
THE LONG-RUN IMPACT OF WORLD WAR I ON  
FEMALE LABOR FORCE PARTICIPATION

Victor Gay\*

September 2021

APPENDIX  
FOR ONLINE PUBLICATION

<b>A Appendix Figures and Tables</b>	<b>1</b>
<b>B Robustness of Baseline Estimates</b>	<b>23</b>
B.1 Alternative Specifications . . . . .	23
B.2 Selective Migration Patterns . . . . .	23
B.3 Inaccurate Assignment of Military Death Rates . . . . .	26
B.4 Education and Fertility . . . . .	27
<b>C The Role of World War II</b>	<b>36</b>
C.1 World War II Military Fatalities . . . . .	36
C.2 World War II Destruction . . . . .	40
<b>D Further Results</b>	<b>43</b>
D.1 Alternative Outcomes . . . . .	43
D.2 Household-Level Analysis . . . . .	43
D.3 Heterogeneity Across Categories of Women . . . . .	44
D.4 Cohort-Specific Estimates . . . . .	44
D.5 Placebo Test with the Male Sample . . . . .	45

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D.6 Evidence from the Labor Force Surveys (1982–2013) . . . . .	45
D.7 Unobserved Heterogeneity in Human Capital . . . . .	46
<b>E Homogamy in Military Death Rates</b>	<b>58</b>
<b>F The Distribution of Household Tasks</b>	<b>60</b>
<b>G Pre-War Differences in Attitudes Toward Gender Roles</b>	<b>65</b>

## A. Appendix Figures and Tables

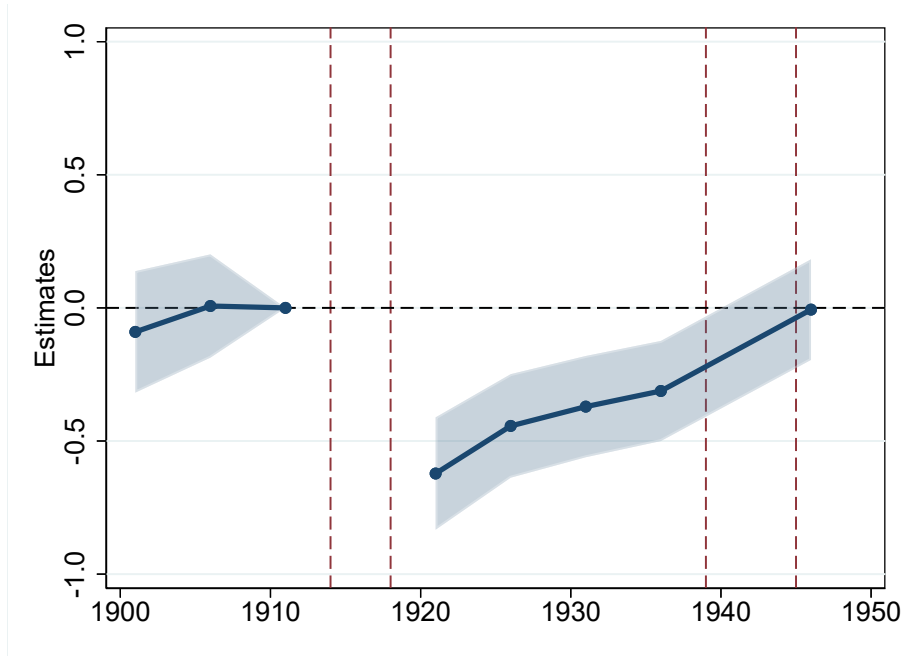
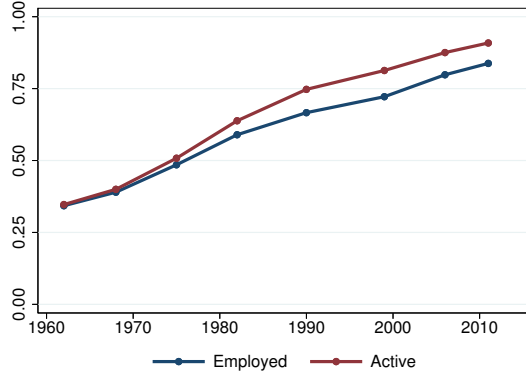
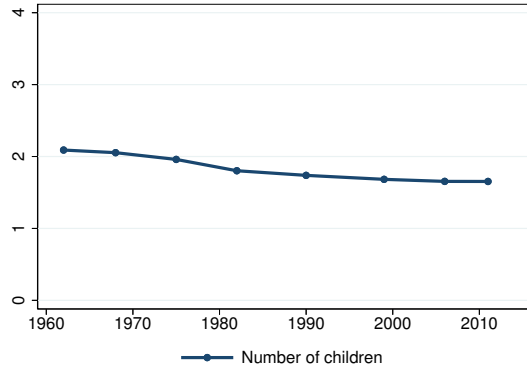


Figure A.1. Impact of WWI Military Death Rates on Adult Sex Ratios

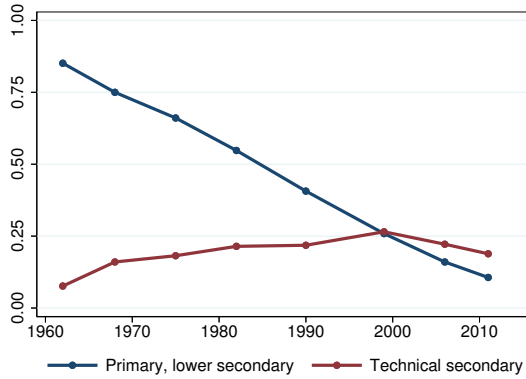
*Notes:* This figure displays coefficients from estimating the following difference-in-differences specification on département-level census data between 1901 and 1946, where 1911 was the last census conducted before the war:  $\text{sex\_ratio}_{a,d,t} = \sum_{\tau \neq 1911} \beta_{\tau} \text{death\_rate}_{a,d} \times \text{year}_{\tau} + \gamma_d + \delta_t + \mu_a + \varepsilon_{a,d,t}$ , where  $\text{sex\_ratio}_{a,d,t}$  denotes the sex ratio among age group  $a$  in département  $d$  and year  $t$  in percentage points, and  $\text{year}_{\tau}$ , a set of indicator variables for each year between 1901 and 1946. This specification also includes fixed effects  $\mu_a$  for age groups 20–29, 30–39, and 40–49, as well as département fixed effects,  $\gamma_d$ , and year fixed effects,  $\delta_t$ . Standard errors are clustered at the département and year level through two-way clustering. Shaded areas represent 95 percent confidence intervals.



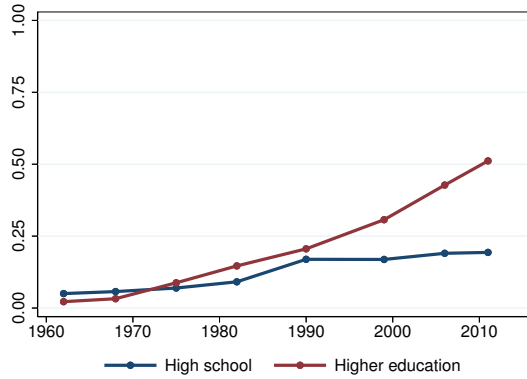
(a) Labor Force Participation



(b) Number of Children



(c) Educational Attainment



(d) Educational Attainment

Figure A.2. Labor, Fertility, and Education Outcomes

*Notes:* This figure reports means of labor, fertility, and education outcomes across the censuses 1962–2012. The sample consists of internal migrant married women aged 30 to 49. Means are computed using sample weights provided in the censuses. *Employed* and *Active* are indicator variables for whether the respondent is working or in the labor force, respectively. *Number of children* corresponds to the number of children of the respondent’s family in the household. *Educational attainment* corresponds to indicator variables for the highest diploma obtained. Data from the censuses (1962–2012).

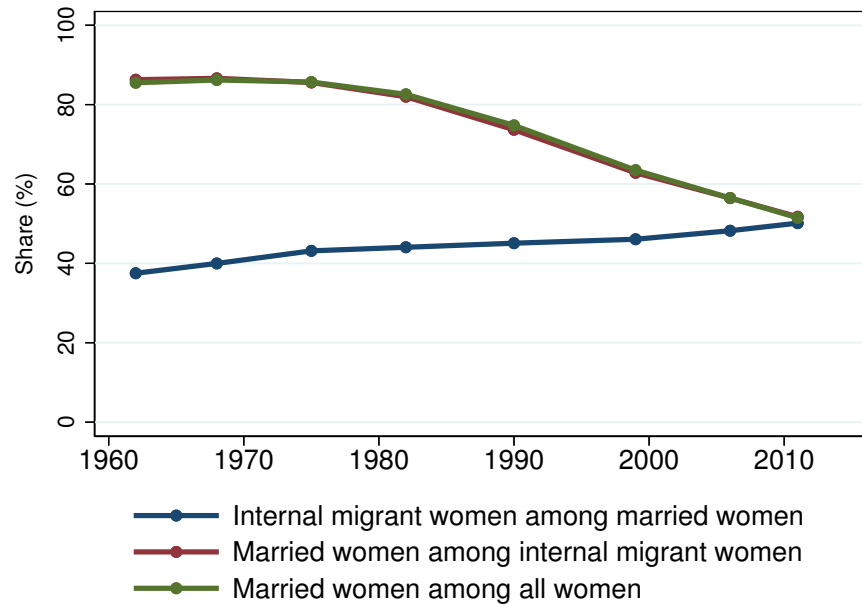
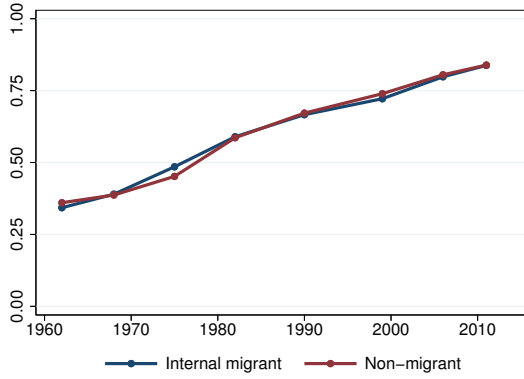
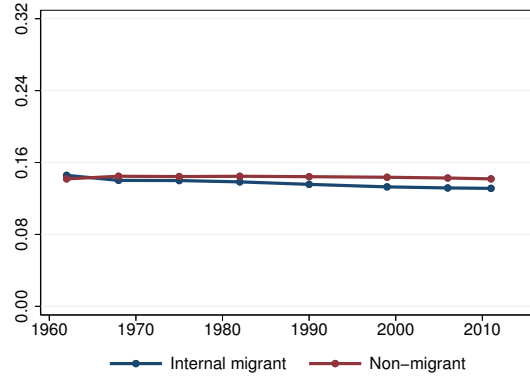


Figure A.3. Internal Migrant and Married Women Aged 30 to 49

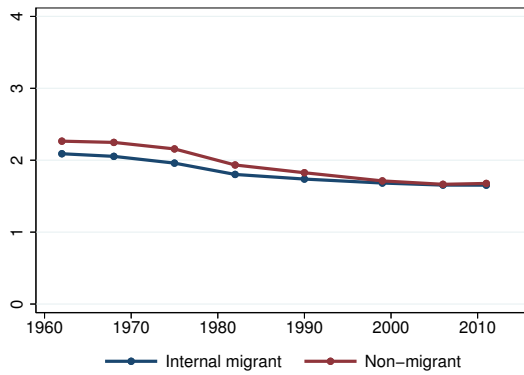
*Notes:* The blue line displays the share of internal migrant women among all French married women born in metropolitan France, aged 30 to 49. The red line displays the share of women married with a French husband born in metropolitan France among all French internal migrant women born in metropolitan France, aged 30 to 49, and residing in metropolitan France. The green line displays the share of women married with a French husband born in metropolitan France among all French women born in metropolitan France, aged 30 to 49, and residing in metropolitan France. Data from the censuses (1962–2012).



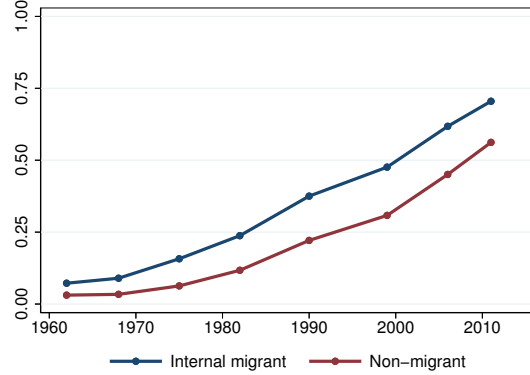
(a) Employed



(b) Military Death Rate



(c) Number of Children

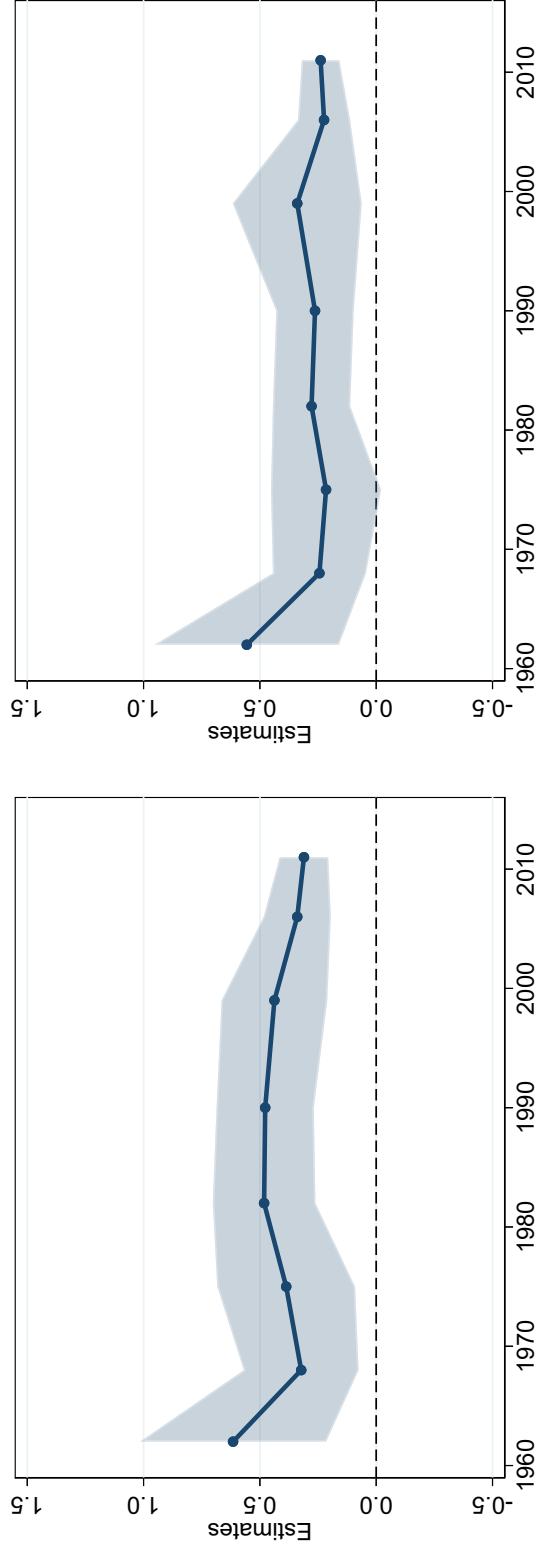


(d) High School and Above

Figure A.4. Characteristics across Migration Status

*Notes:* This figure reports the means of various observable characteristics across migration status. *Employed* is an indicator variables for whether the respondent is working. *Number of children* corresponds to the number of children of the respondent's family in the household. *High School and Above* corresponds to an indicator variable for whether the respondent achieved at least high school. The sample consists of internal migrant and non-migrant married women aged 30 to 49. Means are computed using sample weights provided in the censuses. Data from the censuses (1962–2012).



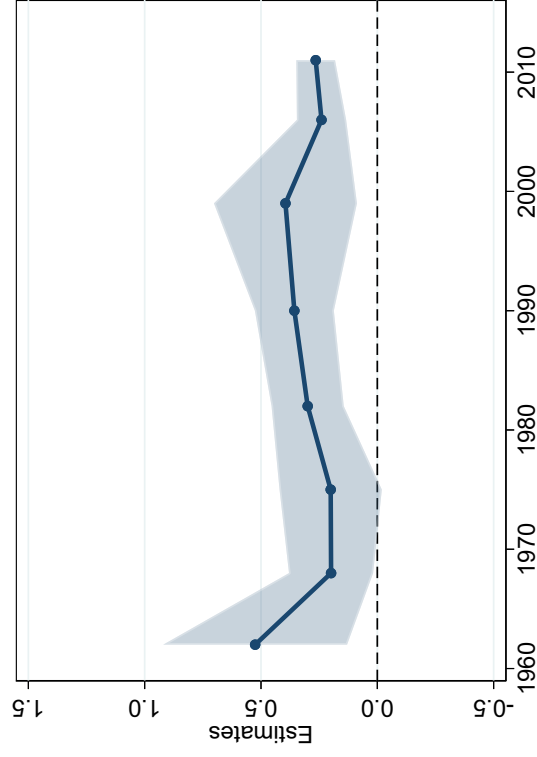


(a) No Wife Birth Département FE

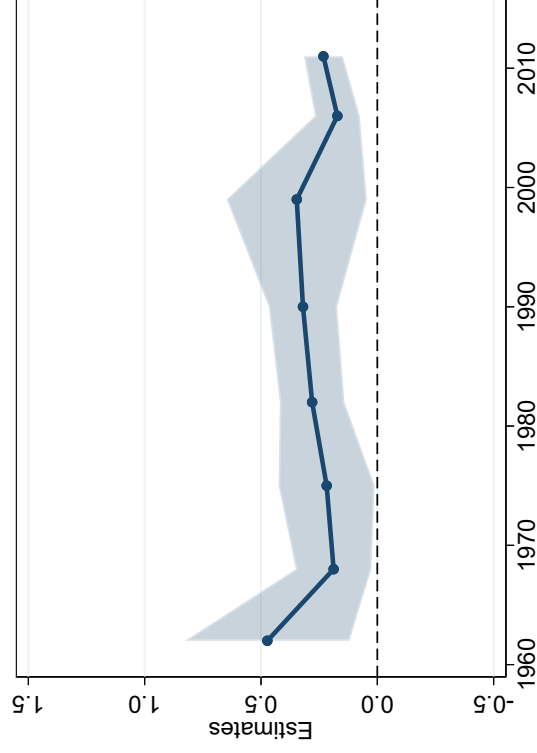
(b) Wife Birth Département FE

Figure A.5. Transmission from Husbands to Wives  
Dependent Variable: Active

*Notes:* This figure reports OLS coefficients from estimating Specification 5 along with 95 percent confidence intervals. The dependent variable is an indicator for whether the individual is employed. All regressions contain interacted cohort and département of residence fixed effects, as well as the set of historical controls measured at the level of individuals husbands' départements of birth in 1911. Panel b further includes interacted départements of birth fixed effects. Standard errors are clustered at the level of individuals' départements of residence and husbands' départements of birth. The sample consists of women aged 30 to 49 married with internal migrant men. Estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).



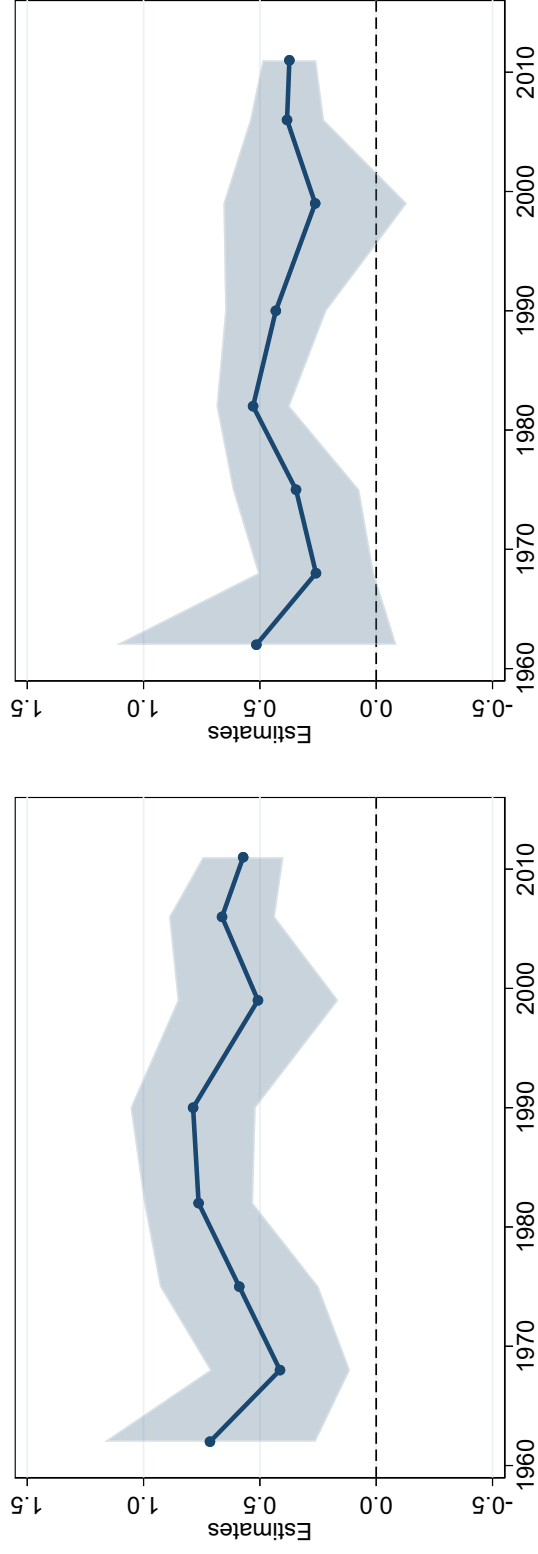
(a) Add Husband and Household Controls



(b) Add Education and Fertility Controls

Figure A.6. Transmission from Husbands to Wives  
Dependent Variable: Employed

*Notes:* This figure reports OLS coefficients from estimating Specification 5 along with 95 percent confidence intervals. The dependent variable is an indicator for whether the individual is employed. All regressions contain interacted cohort and département of residence fixed effects, as well as the set of historical controls measured at the level of individuals husbands' départements of birth in 1911. Panel b further includes interacted départements of birth fixed effects. Husband and household controls consist of husbands' incomes, ages, age squared, education, an indicator for home ownership, and the number of rooms in the home; education controls consist of indicators for educational attainment; fertility consists of the number of children in the home. Standard errors are clustered at the level of individuals' départements of residence and husbands' départements of birth. The sample consists of women aged 30 to 49 married with internal migrant men. Estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).



(a) No Wife Birth Département FE  
 (b) Wife Birth Département FE  
 Figure A.7. Transmission from Husbands to Internal Migrant Wives  
 Dependent Variable: Employed

*Notes:* This figure reports OLS coefficients from estimating Specification 5 along with 95 percent confidence intervals. The dependent variable is an indicator for whether the individual is employed. All regressions contain interacted cohort and département of residence fixed effects, as well as the set of historical controls measured at the level of individuals husbands' départements of birth in 1911. Panel b further includes interacted départements of birth fixed effects. Standard errors are clustered at the level of individuals' départements of residence and husbands' départements of birth. The sample consists of internal migrant women aged 30 to 49 married with internal migrant men. Estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).

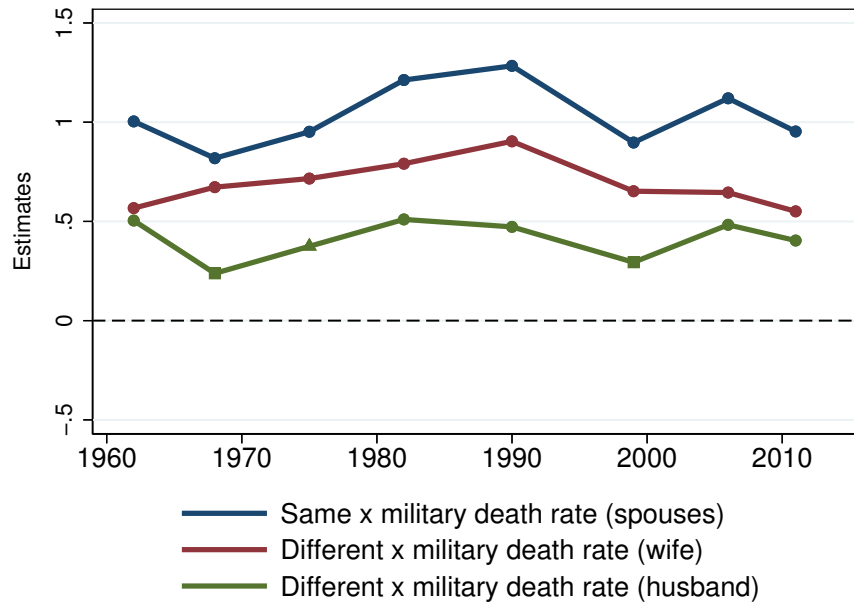
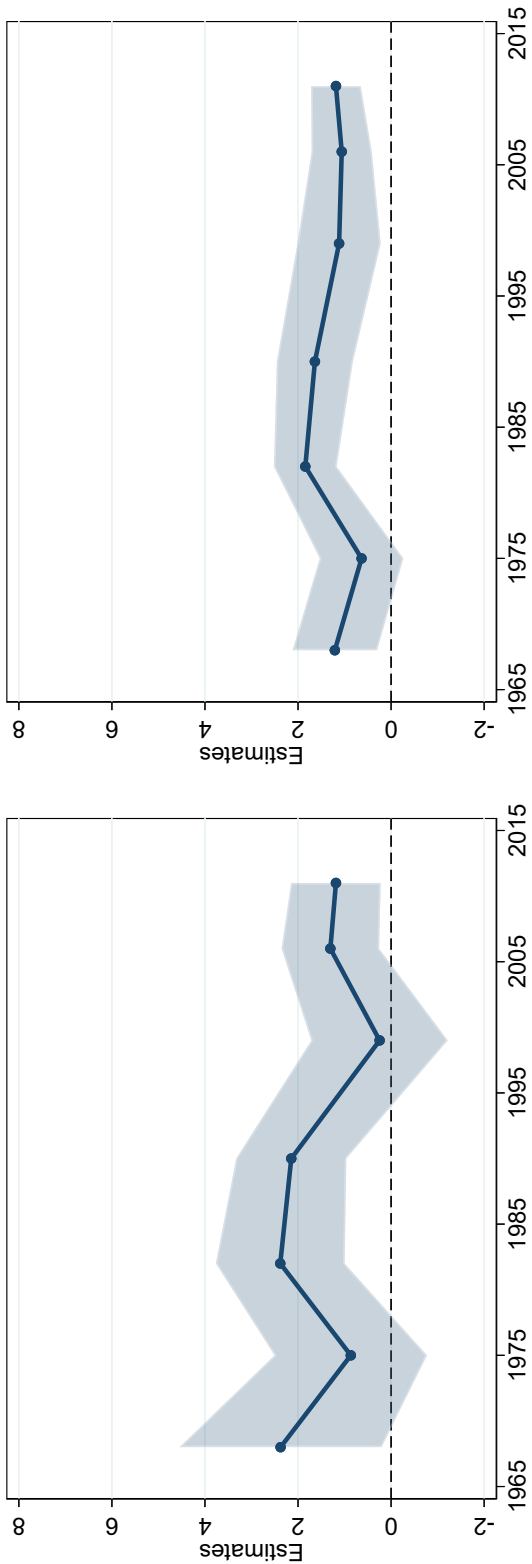


Figure A.8. Wives' versus Husbands' Origins  
Dependent Variable: Employed

*Notes:* This figure reports OLS coefficients from estimating Specification 6. Standard errors are clustered at the level of individuals' départements of residence, wives' départements of birth and husbands départements of birth. The sample consists of internal migrant women aged 30 to 49 married with an internal migrant man. The estimates are computed using the sample weights provided in the censuses (1962–2012).

● significant at the 1 percent level. ▲ significant at the 5 percent level. ■ significant at the 10 percent level.



(a) Assimilation

(b) Preservation

Figure A.9. Local Social Interactions  
 Dependent Variable: Employed  
 Control for husband, household, and respondent characteristics

Notes: Panel A reports OLS coefficients on  $\text{death\_rate}_m$  from estimating Specification 7, and Panel B, OLS coefficients on the interaction  $\text{sh\_res}_{b,m} \times \text{death\_rate}_b$  from estimating specification 8, along with 95 percent confidence intervals. Standard errors are clustered at the level of individuals' départements of birth and residence. The sample consists of migrant women aged 30 to 49 who are married with migrant men. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1968-2012).

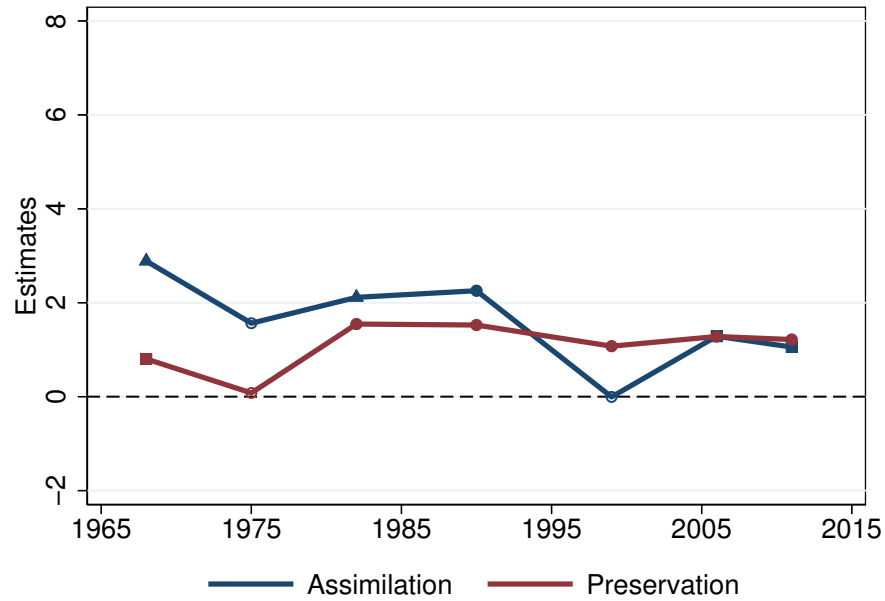


Figure A.10. Local Social Interactions  
Dependent Variable: Employed

*Notes:* This figure reports OLS coefficients from estimating Specifications 7 and 8 together. 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 non-migrant women aged 30 to 49 who are married with migrant men. The estimates are computed using the sample weights provided in the censuses (1962–2012).

● significant at the 1 percent level. ▲ significant at the 5 percent level. ■ significant at the 10 percent level.

Table A.1. Characteristics Across Migration Status  
 Extended Labor Force Surveys 2005–2012

Characteristic	Employed	Death rate	Children	High school
	(1)	(2)	(3)	(4)
2nd Generation Migrant	-0.00 [0.01]	0.00 [0.00]	0.02 [0.02]	0.08*** [0.01]
Observations	132,478	132,478	132,478	132,478
Natives outcome mean	0.78	0.15	1.27	0.36

*Notes:* This table reports estimates from regressing observable characteristics on a second-generation migrant status indicator, where second-generation migrants corresponds to non-migrant married women aged 30 to 59 whose mothers and fathers were born in another département. The baseline comparison group consists of natives, i.e., married women aged 30 to 59 who were born in their département of residence as well as both their parents. *Employed* is an indicator for whether the individual is working, *Death rate*, the military death rate of her mother’s département of birth, *Children*, the number of children in her household, and *High school*, an indicator for whether she achieved at least high school. To remain as close as possible to Specification 4, these estimates are calculated through the following specification:  $Y_{imfr} = \beta \text{migrant}_i + \alpha \mathbf{X}'_{1911,m} + \gamma_i + \delta_r + \mu_{1914,m} + \omega_f + \varepsilon_{imfr}$ , where  $\text{migrant}_i$  is an indicator for whether the individual is a second generation migrant, where historical controls  $\mathbf{X}_{1911,m}$ , and military region fixed effects  $\mu_{1914,m}$  are assigned at the level of mothers’ départements of birth,  $\gamma_i$  is a set of year of birth and survey year indicators,  $\delta_r$ , département of residence fixed effects, and  $\omega_f$ , fathers’ département of birth fixed effects. Standard errors are reported in brackets and are clustered at the level of départements of residence and mothers’ départements of birth.

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

Table A.2. Transmission from Mothers to Daughters  
Extended Labor Force Surveys 2005–2012

Dependent variable	Active				
	(1)	(2)	(3)	(4)	(5)
Military death rate (mother)	0.98** [0.41]	0.77* [0.42]	1.01** [0.45]	1.13** [0.44]	0.99*** [0.30]
Father birth département FE	No	Yes	Yes	Yes	No
Mother birth region FE	No	No	Yes	Yes	No
Other controls	No	No	No	Yes	No
Clusters					
Own birth-residence	95	95	95	95	95
Mother birth	95	95	95	95	95
Observations	15,095	15,095	15,095	15,095	32,099
Outcome mean	0.85	0.85	0.85	0.85	0.83
Outcome s.d.	0.36	0.36	0.36	0.36	0.38

*Notes:* This table reports the OLS coefficients from estimating Specification 4. All regressions contain cohort, département of birth and residence, and survey-year fixed effects, as well as the set of historical controls measured at the level of individuals' mothers' départements of birth in 1911. *Other controls* include parental characteristics (indicators for parents' occupational status and mothers' labor status), husband and household characteristics (husbands' incomes, age, age squared, educational attainment, an indicator for home ownership, and the number of rooms in the home), and individuals' education and number of children. Standard errors are clustered at the level of départements of residence and mothers' départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose mothers and fathers were born in another département in columns 1–4, and whose mothers (but not necessarily fathers) were born in another département in column 5. Estimates are computed using the sample weights provided in the extended labor force surveys.

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



Table A.3. Transmission from Fathers to Daughters  
Extended Labor Force Surveys 2005–2012

Dependent variable	Employed			
	(1)	(2)	(3)	(4)
Military death rate (father)	0.76** [0.33]	0.47 [0.34]	0.29 [0.48]	0.16 [0.49]
Mother birth département FE	No	Yes	Yes	Yes
Father birth region FE	No	No	Yes	Yes
Other controls	No	No	No	Yes
Clusters				
Own birth-residence	95	95	95	95
Mother birth	95	95	95	95
Observations	15,095	15,095	15,095	15,095
Outcome mean	0.81	0.81	0.81	0.81
Outcome s.d.	0.39	0.39	0.39	0.39

*Notes:* This table reports the OLS coefficients from estimating Specification 4, but where variables at the level of fathers' départements of birth. All regressions contain cohort, département of birth and residence, and survey-year fixed effects, as well as the set of historical controls measured at the level of individuals' fathers' départements of birth in 1911. *Other controls* include parental characteristics (indicators for parents' occupational status and mothers' labor status), husband and household characteristics (husbands' incomes, age, age squared, educational attainment, an indicator for home ownership, and the number of rooms in the home), and individuals' education and number of children. Standard errors are clustered at the level of départements of residence and fathers' départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose mothers and fathers were born in another département. Estimates are computed using the sample weights provided in the extended labor force surveys.

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

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

Dependent variable	Employed		
	(1)	(2)	(3)
Same $\times$ military death rate (parents)	1.19*** [0.42]	1.08* [0.60]	1.09* [0.60]
Different $\times$ military death rate (mother)	0.73* [0.43]	0.86* [0.47]	0.94** [0.45]
Different $\times$ military death rate (father)	0.46 [0.34]	0.13 [0.60]	0.07 [0.60]
Parents birth region FE	No	Yes	Yes
Other controls	No	No	Yes
Clusters			
Own birth-residence	95	95	95
Mother birth	95	95	95
Father birth	95	95	95
Observations	15,095	15,095	15,095
Outcome mean	0.81	0.81	0.81
Outcome s.d.	0.39	0.39	0.39

*Notes:* This table reports the OLS coefficients from estimating a modified version of Specification 4 augmented with an indicator for whether individuals' parents were born in their département of residence, and where variables related to both parents are included (except parental origins fixed effects), but where variables at the level of fathers' départements of birth. All regressions contain cohort, département of birth and residence, and survey-year fixed effects, as well as the set of historical controls measured at the level of individuals' parents' départements of birth in 1911. *Other controls* include parental characteristics (indicators for parents' occupational status and mothers' labor status), husband and household characteristics (husbands' incomes, age, age squared, educational attainment, an indicator for home ownership, and the number of rooms in the home), and individuals' education and number of children. Standard errors are clustered at the level of départements of residence, mothers', and fathers' départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose mothers and fathers were born in another département. Estimates are computed using the sample weights provided in the extended labor force surveys.

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

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

Dependent variable	Mother worked			Active		
	A. First Stage			B. Second Stage		
	(1)	(2)	(3)	(4)	(5)	(6)
Military death rate (mother)	1.39*** [0.53]	1.94*** [0.64]	1.80*** [0.61]			
Mother worked				0.68* [0.40]	0.40* [0.24]	0.39 [0.24]
Father birth département FE	No	Yes	Yes	No	Yes	Yes
Other controls	No	No	Yes	No	No	Yes
Clusters						
Own birth-residence	95	95	95	95	95	95
Mother birth	95	95	95	95	95	95
Observations	15,095	15,095	15,095	15,095	15,095	15,095
Outcome mean	0.59	0.59	0.59	0.85	0.85	0.85
Outcome s.d.	0.49	0.49	0.49	0.36	0.36	0.36
F-statistic	29.70	44.38	38.49			

*Notes:* All regressions contain cohort, département of birth and residence, and survey-year fixed effects, as well as the set of historical controls measured at the level of individuals' mothers' départements of birth in 1911. *Other controls* include parental characteristics (indicators for parents' occupational status and mothers' labor status), husband and household characteristics (husbands' incomes, age, age squared, educational attainment, an indicator for home ownership, and the number of rooms in the home), and individuals' education and number of children. Standard errors are clustered at the level of the départements of birth and mothers départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose mothers and fathers were born in another département. The estimates are computed using the sample weights provided in the extended labor force surveys.

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

Table A.6. Transmission from Mothers to Daughters  
Extended Labor Force Surveys 2005–2012

Dependent variable	Employed		
	(1)	(2)	(3)
Same $\times$ military death rate (mothers)	2.49*** [0.89]	2.83*** [0.81]	3.09*** [0.72]
Different $\times$ military death rate (own mother)	1.17** [0.46]	1.28*** [0.44]	1.26*** [0.41]
Different $\times$ military death rate (mother-in-law)	1.22 [0.75]	1.40** [0.64]	1.62*** [0.60]
Fathers birth département FE	No	Yes	Yes
Mothers birth region FE	No	Yes	Yes
Other controls	No	No	Yes
Clusters			
Own birth-residence	94	94	94
Mother birth	94	94	94
Mother-in-law birth	94	94	94
Observations	13,389	13,389	13,389
Outcome mean	0.81	0.81	0.81
Outcome s.d.	0.39	0.39	0.39

*Notes:* This table reports the OLS coefficients from estimating a modified version of Specification 4 augmented with an indicator for whether individuals' mothers and mothers-in-law were born in their département of residence, and where variables related to both mothers are included (except mothers origins fixed effects), but where variables are assigned at the level of mothers' départements of birth. All regressions contain cohort, département of birth and residence, husbands birth département, and survey-year fixed effects, as well as the set of historical controls measured at the level of individuals' mothers' départements of birth in 1911. *Other controls* include parental characteristics (indicators for parents' occupational status and mothers' labor status), husband and household characteristics (husbands' incomes, age, age squared, educational attainment, an indicator for home ownership, and the number of rooms in the home), and individuals' education and number of children. Standard errors are clustered at the level of départements of residence, mothers', and fathers' départements of birth. The sample consists of non-migrant married women aged 30 to 59 whose mothers and fathers were born in another département. Estimates are computed using the sample weights provided in the extended labor force surveys.

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

Table A.7. Characteristics Across Migration Status  
Gender and Generation Survey 2005

Characteristic	Employed	Death rate	Children	High school
	(1)	(2)	(3)	(4)
Internal Migrant	-0.00 [0.01]	0.00 [0.00]	-0.04 [0.02]	0.17*** [0.02]
Observations	6,764	6,764	6,764	6,764
Natives outcome mean	0.57	0.14	0.83	0.32

*Notes:* This table reports estimates from regressing observable characteristics on an internal migrant status indicator, where internal migrants corresponds to individuals who reside in another département than their département of birth. The baseline comparison group consists of natives, i.e., individuals who reside in their département of birth. *Employed* is an indicator for whether the individual is working, *Death rate*, the military death rate of their département of birth, *Children*, the number of children in their household, and *High school*, an indicator for whether they achieved at least high school. To remain as close as possible to Specification 9, these estimates are calculated through the following specification:  $Y_{ibr} = \beta_1 \text{migrant}_i + \beta_2 \text{female}_i + \alpha \mathbf{X}'_{1911,b} + \gamma_i + \delta_r + \varepsilon_{ibr}$ , where  $\text{migrant}_i$  is an indicator for whether the individual is an internal migrant, where historical controls  $\mathbf{X}_{1911,b}$  are assigned at the level of their départements of birth,  $\gamma_i$  is a set of year of birth indicators, and  $\delta_r$ , département of residence fixed effects. Standard errors are reported in brackets and are clustered at the level of départements of residence and birth.

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

Table A.8. Preferences and Beliefs About Religion

Higher values mean disagreement with the statement

		Sex of respondent		
		All	Men	Women
1	A religious event is important for a newborn	0.44 (0.40)	0.44 (0.40)	0.44 (0.41)
2	A religious marriage is important for those who marry	0.51 (0.39)	0.51 (0.39)	0.52 (0.40)
3	A religious event is important for a funeral	0.36 (0.38)	0.36 (0.38)	0.35 (0.39)
	Religious values index (three-point scale)	1.30 (1.04)	1.30 (1.04)	1.30 (1.05)
	Religious values index (one-point scale)	0.43 (0.35)	0.43 (0.35)	0.43 (0.35)
	Observations	2,689	1,105	1,584

*Notes:* This table reports summary statistics for preferences and beliefs about religion on the sample of internal migrant respondents. Higher values indicate disagreement with the statement. Standard deviations are in parenthesis. Data from the GGS (2005).

Table A.9. Preferences and Beliefs About Marriage

Higher values mean disagreement with the statement

	Sex of respondent		
	All	Men	Women
1 Marriage is not an outdated institution <sup>a</sup>	0.28 (0.34)	0.28 (0.34)	0.28 (0.34)
2 Unmarried couple shouldn't live together if they do not intend to get married <sup>b</sup>	0.78 (0.28)	0.77 (0.28)	0.78 (0.29)
3 Even if individuals in a couple are unhappy, they shouldn't divorce <sup>c</sup>	0.82 (0.26)	0.79 (0.27)	0.85 (0.25)
4 Marriage is a lifelong commitment that should never be broken	0.43 (0.39)	0.44 (0.38)	0.43 (0.39)
Marriage values index (four-point scale)	2.31 (0.82)	2.28 (0.81)	2.34 (0.82)
Marriage values index (one-point scale)	0.58 (0.20)	0.57 (0.20)	0.59 (0.21)
Observations	2,689	1,105	1,584

*Notes:* This table reports summary statistics for preferences and beliefs about marriage on the sample of internal migrant respondents. Higher values indicate disagreement with the statement. Standard deviations are in parenthesis. Data from the GGS (2005).

<sup>a</sup> Original statement reversed. It originally reads: Marriage is an outdated institution.

<sup>b</sup> Original statement reversed. It originally reads: It is good for an unmarried couple to live together even if they do not intend to get married.

<sup>c</sup> Original statement reversed. It originally reads: If individuals are unhappy as a couple, they may divorce, even if they have children.

Table A.10. Preferences and Beliefs About the Family

Higher values mean disagreement with the statement

	Sex of respondent		
	All	Men	Women
1 To thrive, a woman must have children	0.34 (0.34)	0.31 (0.32)	0.37 (0.36)
2 To thrive, a man must have children	0.37 (0.35)	0.33 (0.34)	0.40 (0.35)
3 To grow up happy, a child needs a home with a mother and a father	0.13 (0.23)	0.11 (0.20)	0.15 (0.25)
4 If parents divorce, it is better for the child to stay with the mother rather than with the father	0.55 (0.31)	0.58 (0.32)	0.53 (0.31)
5 A woman cannot have and raise a child by herself if she does not want a stable relationship with a man <sup>a</sup>	0.58 (0.34)	0.59 (0.34)	0.57 (0.34)
Family values index (five-point scale)	1.98 (0.99)	1.92 (0.95)	2.03 (1.02)
Family values index (one-point scale)	0.40 (0.20)	0.38 (0.19)	0.41 (0.20)
Observations	2,689	1,105	1,584

*Notes:* This table reports summary statistics for preferences and beliefs about the family on the sample of internal migrant respondents. Higher values indicate disagreement with the statement. Standard deviations are in parenthesis. Data from the GGS (2005).

<sup>a</sup> Original statement reversed. It originally reads: A woman can have and raise a child by herself if she doesn't want to have a stable relationship with a man.



Table A.11. The Impact of WWI Military Fatalities on Cultural Beliefs  
Individual Questions

Dependent variable	Individual gender values questions <sup>a</sup>					
	1		2		3	
	(1)	(2)	(3)	(4)	(5)	(6)
Military death rate	5.97*** [1.63]	5.77*** [2.04]	-4.14** [1.92]	-2.79 [2.68]	3.54* [1.88]	3.88* [2.03]
Female	-0.18*** [0.04]	-0.22 [0.14]	-0.21*** [0.06]	0.08 [0.23]	0.16*** [0.06]	0.23 [0.19]
Military death rate × Female		0.32 [1.07]		-2.09 [1.75]		-0.52 [1.23]
Clusters						
Residence	95	95	95	95	95	95
Birth	88	88	88	88	88	88
Observations	2,688	2,688	2,688	2,688	2,688	2,688
Outcome mean	4.11	4.11	2.08	2.08	3.96	3.96

*Notes:* This table reports the OLS coefficients from estimating Specification 9 separately on the questions that compose the gender values index from Table 6. All regressions contain cohort and département of residence fixed effects, as well as the set of historical controls measured at the level of respondents' départements of birth in 1911. Standard errors are clustered at the level of départements of birth and of residence. The sample consists of internal migrants. The estimates are computed using the sample weights provided in the GSS. Data from the GSS (2005).

<sup>a</sup> The meaning of each question is available in Table 5.

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

Table A.12. The Impact of WWI Military Fatalities on Cultural Beliefs  
Religion, Marriage, and the Family

Dependent variable	Cultural values index (one-point scale)					
	Religion		Marriage		Family	
	(1)	(2)	(3)	(4)	(5)	(6)
Military death rate	-0.30 [0.54]	-0.32 [0.58]	0.18 [0.31]	0.11 [0.34]	-0.13 [0.31]	0.00 [0.32]
Female	-0.00 [0.01]	-0.00 [0.06]	0.01 [0.01]	-0.00 [0.02]	0.02** [0.01]	0.05 [0.03]
Military death rate $\times$ Female		0.03 [0.40]		0.11 [0.13]		-0.20 [0.18]
Clusters						
Residence	95	95	95	95	95	95
Birth	88	88	88	88	88	88
Observations	2,688	2,688	2,688	2,688	2,688	2,688
Outcome mean	0.43	0.43	0.58	0.58	0.40	0.40

*Notes:* This table reports the OLS coefficients from estimating Specification 9 on the religion, marriage, and family values indexes. All regressions contain cohort and département of residence fixed effects, as well as the set of historical controls measured at the level of respondents' départements of birth in 1911. Standard errors are clustered at the level of départements of birth and of residence. The sample consists of internal migrants. The estimates are computed using the sample weights provided in the GSS. Data from the GSS (2005).

\*\* Significant at the 5 percent level.

## B. Robustness of Baseline Estimates

I present a series of robustness checks that support the credibility of baseline estimates in Section 3. Estimates are robust to the choice of regression model and alternative sample-selection criteria (Section B.1), selective migration patterns (Section B.2), and inaccurate assignment of military death rates (Section B.3). Moreover, education and fertility choices do not mediate the relationship between WWI military fatalities and women’s working behaviors (Section B.4).

### *B.1. Alternative Specifications*

Baseline coefficients are estimated through a linear probability model. This modeling choice does not affect the results, as marginal coefficients evaluated at the mean of the data from Probit and Logit models are similar to OLS coefficients (Figure B.1, Panel a). Estimates are also similar—though slightly lower in the 2000s—when the outcome is a labor force participant indicator, when widening age bounds to 25 to 59, and when including women of all marital statuses (Figure B.1, Panels b–d).

### *B.2. Selective Migration Patterns*

I first explore whether selective out-migration patterns can account for the results. To that end, I analyze differences in observable characteristics across migration status through a set of regressions. To remain as close as possible to Specification 1 and assess the potential biases that might affect baseline estimates, I estimate the following specification, separately for each census year  $t$ , on the sample of all married women aged 30 to 49 born and residing in metropolitan France—a total of 7 million individuals:

$$(B.1) \quad Y_{ibt} = \beta \text{migrant}_i + \alpha \mathbf{X}'_{1911,b} + \gamma_i \cdot \delta_r \cdot \boldsymbol{\mu}_{1914,b} + \varepsilon_{ibt},$$

where  $\text{migrant}_i$  is an indicator for whether the individual is an internal migrant.  $Y_{ibt}$  corresponds to four observable characteristics: whether the individual is employed, the military death rate of her département of birth, the number of children in her household, and whether she has gone through high school or above. Estimates are

reported in Figure B.2. Results point toward an absence of selection into internal migration along the two main variables of interest: employment and military death rates. There is similarly little selection along fertility. Internal migrant women are however positively selected in terms of education: internal migrants are on average 7 percentage points more likely to have gone through at least high school compared to non-migrants. This source of selection could be worrying if it was operating differently across individuals that originate from départements that experienced low and high military death rates. To see whether this is the case, I augment Specification B.1 with an interaction term between the internal migrant indicator and the military death rate of individuals' départements of birth. To enable a comparison across estimates within the same specification, I report standardized estimates in Figure B.3. Reassuringly, selection along all observed characteristics—including education—does not operate systematically differently across départements of birth, suggesting that this source of selection cannot explain the main results.

Beyond selection through out-migration patterns, results might be biased through selective in-migration patterns, that is, through the destination location of internal migrants. In particular, individuals born in départements that experienced greater military death rates might settle in more dynamic labor markets. To assess whether this is the case, I estimate Specification 1 when removing the ten most urban départements of destination from the sample.<sup>1</sup> Results are similar to baseline estimates (Figure B.4, Panel a).

Still, in-migration selection might operate within destination départements, with those born in départements that experienced greater military death rates sorting systematically into the more dynamic local labor markets. To assess the extent of this type of selection, I first compare individuals who reside in the same local labor market. The censuses provide two definitions of local labor market boundaries: (1) explicit local labor markets constructed using home-work migration patterns—Zones of Industrial and Urban Population (ZIUP) from 1962 to 1990, and Economic Zones (EZ) from 1999 to 2012<sup>2</sup>—and (2) cities respondents

<sup>1</sup>More precisely, I remove the départements in which the ten largest French cities are located: Paris (75), Marseille (13), Lyon (69), Toulouse (31), Nice (06), Nantes (44), Montpellier (34), Strasbourg (67), Bordeaux (33), and Lille (59).

<sup>2</sup>ZIUPs are more numerous than EZs: the sample contains 600 to 900 ZIUPs with 70 to 800 observations per ZIUP, and 300 EZs with 300 to 2,000 observations per EZ. ZIUPs do not cover the full territory since some rural areas are not included in a ZIUP—88 to 97 percent of respondents

reside in—from 1962 to 1999, this information is detailed at the level of *municipalities*, France’s smallest administrative unit, and from 2006 to 2012, at the level of *canton-cities*, a slightly larger level of aggregation.<sup>3</sup> Table B.1 provides information on the number of these units in the sample. I replicate the baseline specification successively with local labor market and city fixed effects instead of département of residence fixed effects (Figure B.1, Panel b). Note that because residence location, year of birth, and military region of birth fixed effects are interacted, many singletons are dropped from the regressions. Hence, I keep the sample constant across specifications so that estimates remain comparable, explaining why baseline estimates are slightly different from those in Figure 1. Coefficients are similar across specifications, suggesting little correlation between military death rates and in-migration sorting within destination départements.

To further alleviate potential issues of selective migration patterns, I control for the relative attractiveness of origin and destination départements. I build two types of measures: a département-specific measure and a dyadic measure. Département-specific measures are the share of immigrants among the population residing in destination départements and the share of emigrants among the population born in origin départements. The first measure captures the pull force of destination départements and the second measure, the push force of origin départements. Dyadic measures are specific to each pair of départements. The first dyadic measure is the share of immigrants born in an origin département among the population of immigrants in a destination département. It captures 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 captures 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 25.<sup>4</sup> I build these measures relative to the female population of

in the sample reside in a ZIUP.

<sup>3</sup>The sample contains 6,000 to 23,000 municipalities with 9 to 23 observations per commune, and 3,500 canton-cities with 200 observations per canton-city.

<sup>4</sup>Censuses do not provide information on the timing of migration except whether respondents migrated more than a decade earlier.

working age to better capture female labor-related migration dynamics.<sup>5</sup> Together with the bilateral distance between origin and destination départements, these four variables are likely to capture a large part of the bias introduced by labor-related migration patterns. I further estimate the baseline specification on the subsample of internal migrants who were already present in their département of residence in the previous census—the one-and-a-half generation.<sup>6</sup> This subsample might be less subject to biases due to selective migration as it contains individuals who migrated at least one decade earlier. Panel c of Figure B.1 reports the results. Including migration controls or estimating the baseline specification on the one-and-a-half generation decreases estimates only slightly. This suggests that selective migration is not a primary mechanism that can explain the patterns in the data.

### ***B.3. Inaccurate Assignment of Military Death Rates***

The epidemiological approach requires regressors to be assigned at the level of geographical origin, i.e., the département in which internal migrants' ascendants were residing during the interwar period. However, censuses do not provide ascendants' départements of birth. I am therefore constrained to assume that départements of birth and origin are identical. Here, I relax this assumption by repeating the analysis on the extended labor force surveys 2005–2012, which provide parental origins. I first restrict the sample to internal migrants born in the same département as both their parents—this is the case for one third of them. I report results in column 2 of Table B.2, along with a replication of the baseline estimate in column 1. The baseline estimate is in line with the one obtained using the census of 2006, at 0.50. Restricting the sample to individuals born in the same département as their parents inflates the coefficient to 0.87. Although this difference is itself not significant, we can interpret it as the result of an inaccurate assignment of military death rates in the baseline sample, which creates some attenuation bias through measurement error. Does this method ensure that départements of birth trace to the interwar

<sup>5</sup> For decades 1960 to 2010, these measures are calculated using the censuses 1962 to 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 underwent various modifications, some former départements cannot be mapped into newly created ones, such as Seine-et-Oise. As a result, some respondents cannot be assigned migration controls, especially in earlier censuses.

<sup>6</sup>This information is not available in the censuses after 2008.

period in individuals' lineage? Not entirely. Because the mean age of mothers at the birth of their children was 26–29 in the 1950s–1980s, parents of respondents in the sample were likely born in the 1920s–1950s (Toulemon, 2001). To make the assumption more plausible, I therefore further restrict the sample to cohorts born before the mid-1960s, so that their parents were likely born during the 1920s and the mid-1930s.<sup>7</sup> I report results in column 4 of Table B.2, along with a replication of the baseline estimate in column 3. The estimate is larger than the baseline at 1.04, though not significantly different, suggesting again that the inaccurate assignment of military death rates in the baseline sample creates attenuation bias.

A related concern to the one highlighted above is that départements of birth and childhood might differ. If socialization with the surrounding environment beyond own parents is an important mechanism, assimilating départements of birth with cultural origins might underestimate the long-run impact of WWI military fatalities on women's working behaviors. Using information about residence locations in the previous census, I repeat the analysis when further interacting départements of residence, military regions of birth, and years of birth fixed effects with fixed effects for départements of residence in the previous census.<sup>8</sup> This enables a tight comparison of women of the same cohort with similar migration histories. I report results in Panel d of Figure B.4. They are nearly identical to baseline estimates, suggesting that alternative migration histories do not bias results.

#### ***B.4. Education and Fertility***

Labor market outcomes are endogenous to human capital investment and fertility decisions.<sup>9</sup> As a result, these decisions might mediate the relationship between women's working behaviors and WWI military fatalities. For example, if women born in départements that experienced greater military death rates held more favorable views toward being a working wife, they might anticipate longer careers from the onset and make greater human capital investments when young. These

<sup>7</sup>The share of French men (women) born in France that remained in their département of birth was 75.0 (75.2) percent in 1921, 74.7 (74.9) percent in 1926, 74.2 (73.5) percent in 1931, and 73.2 (73.2) percent in 1936 according to the censuses, suggesting limited migration movements between the end of the war and the mid-1930s.

<sup>8</sup>This information is only available in the censuses of 1962 to 1999.

<sup>9</sup>See Greenwood, Guner and Vandenbroucke (2017) for a recent review of family economics models.

investments might 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 with educational attainment indicators and the number of children in the household.<sup>10</sup> I report results in Figure B.5. These additional controls do not affect results. This suggests that the long-run impact of WWI military fatalities was direct rather than mediated by education and fertility decisions. Coefficients from this specification imply that the labor force participation impact of being born in a département that experienced high (20 percent) rather than low (10 percent) 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.

<sup>10</sup>Educational attainment indicators consist of primary or lower secondary education (excluded), technical secondary education, high school, and higher education. Number of children corresponds to the number of own children in the household aged 0 to 6.



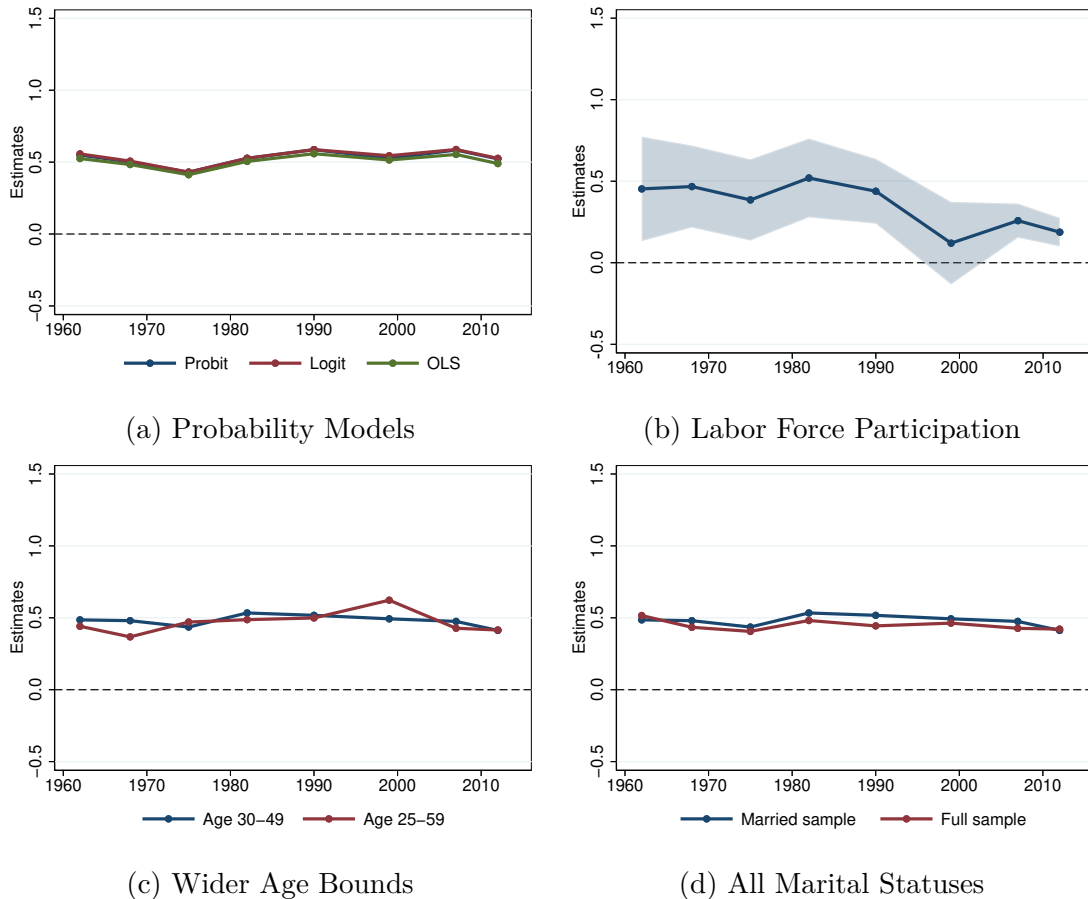


Figure B.1. The Impact of WWI Military Fatalities on FLP  
 Alternative Specifications  
 Dependent Variable: Employed

*Notes:* Panel a reports estimates from estimating Specification 1 using three different probability models. For Probit and Logit models, I report marginal coefficients evaluated at the mean of the data. For computation efficiency, regressions in this panel only do not employ interacted fixed-effects as in Specification 1. Panels b, c, and d report OLS coefficients from estimating specification 1. In Panel b, the dependent variable is an indicator for whether the individual is in the labor force. In Panel c, the sample uses wider age bounds: internal migrant married women aged 25 to 59 instead of internal migrant married women aged 30 to 49. In Panel d, the sample consists of women of all marital statuses. Data from the censuses (1962–2012).

● significant at the 1 percent level.

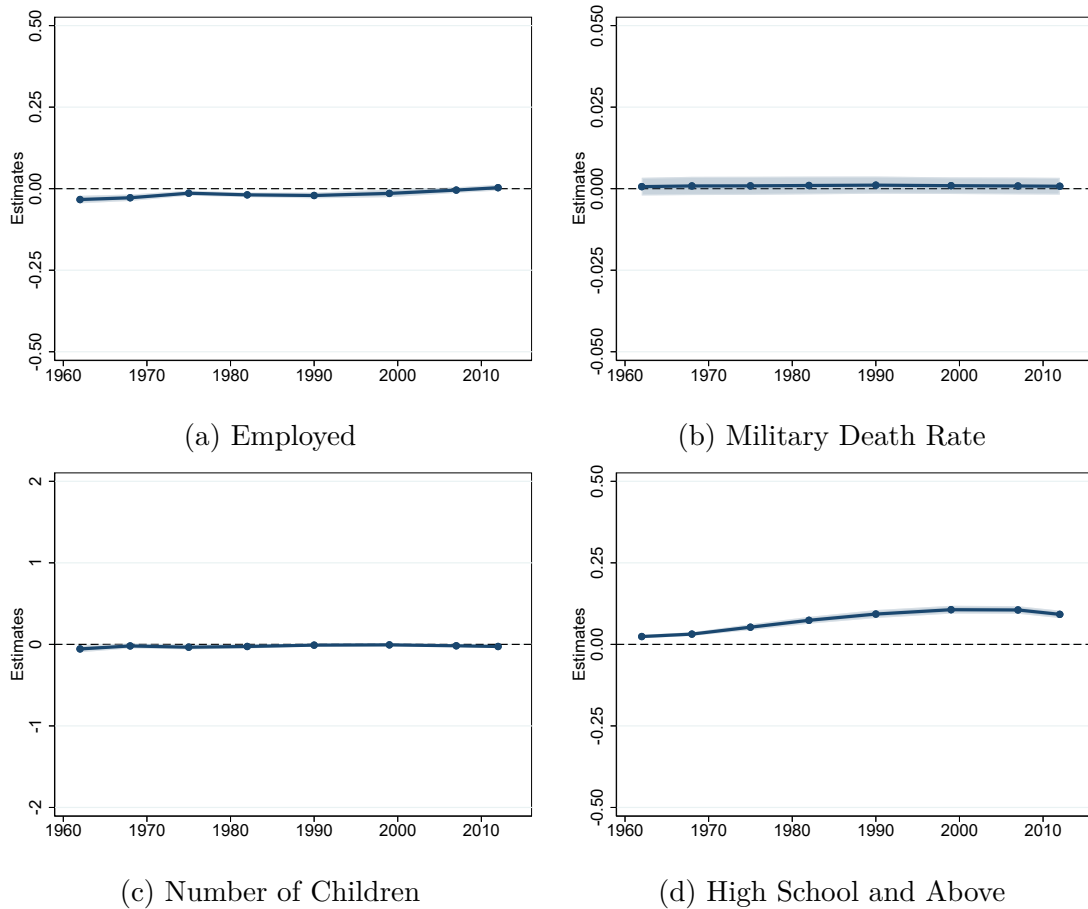
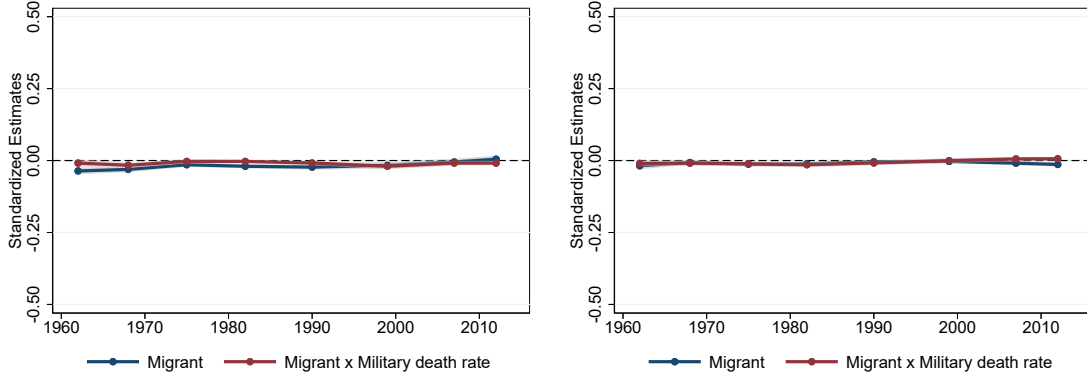


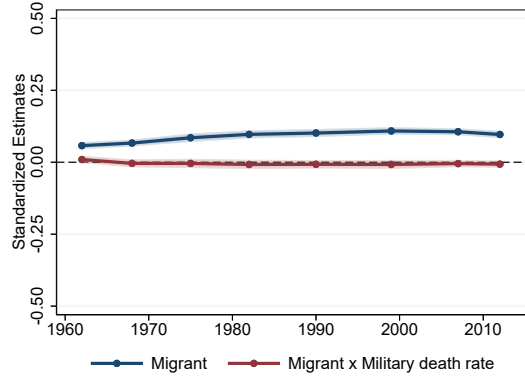
Figure B.2. Characteristics across Migration Status

*Notes:* This figure reports OLS coefficients from estimating Specification B.1 along with 95 percent confidence intervals on the sample of all married women aged 30 to 49 born and residing in metropolitan France. The outcome in Panel a is an indicator variables for whether the respondent is working, in Panel b, the military death rate of respondents' départements of birth, in Panel c, the number of children of the respondent's family in the household, and in Panel d, an indicator variable for whether the respondent achieved at least high school. The size of the y-axis on each panel broadly corresponds to one standard deviation in the outcome variable. Data from the censuses (1962–2012).



(a) Employed

(b) Number of Children



(c) High School and Above

Figure B.3. Characteristics across Migration Status

*Notes:* This figure reports standardized OLS coefficients from estimating Specification B.1 augmented with an interaction between migration status and military death rates of individuals' départements of birth, along with 95 percent confidence intervals on the sample of all married women aged 30 to 49 born and residing in metropolitan France. The outcome in Panel a is an indicator variables for whether the respondent is working, in Panel b, the number of children of the respondent's family in the household, and in Panel c, an indicator variable for whether the respondent achieved at least high school. The size of the y-axis on each panel corresponds to one standard deviation in the outcome variable, which one—all variables are standardized. Data from the censuses (1962–2012).

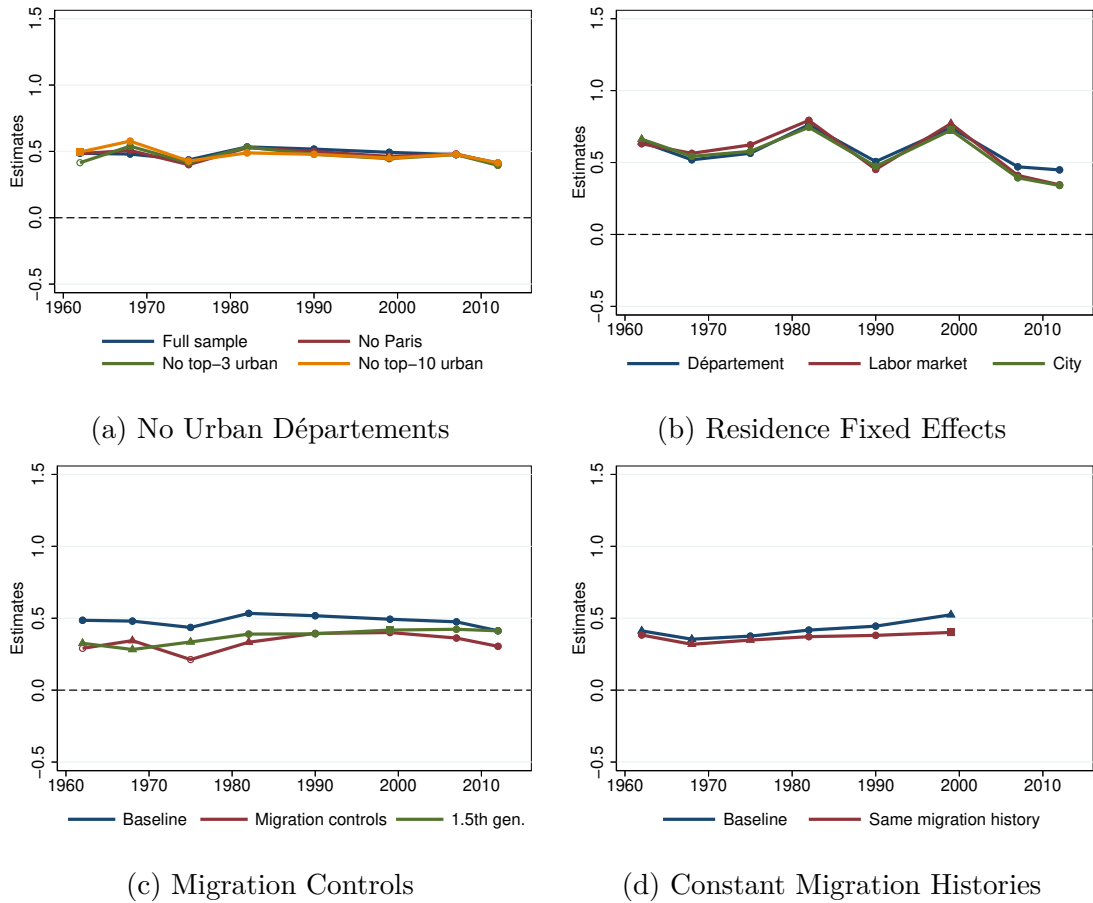


Figure B.4. The Impact of WWI Military Fatalities on FLEP  
 Robustness  
 Dependent Variable: Employed

*Notes:* This figure report OLS coefficients from estimating Specification 1. In Panel a, individuals who reside in the ten most urban départements are removed from the sample: Paris (75), Marseille (13), Lyon (69), Toulouse (31), Nice (06), Nantes (44), Montpellier (34), Strasbourg (67), Bordeaux (33), and Lille (59). In Panel b, the specification successively includes département of residence fixed effects, local labor market fixed effects (ZIUP and EZ), and city fixed effects (municipality and canton-city). Because residence location, year of birth, and military region of birth fixed effects are interacted, many singletons are dropped from the regressions. Hence, I keep the sample constant across specifications so that estimates remain comparable. The second specification in Panel c is augmented with the bilateral distance between origin and destination départements and with the département-specific and dyadic migration controls. The third specification in Panel c 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. Panel d includes individuals for which the département of residence in the preceding census is available—this is not the case for censuses after 2006. Data from the censuses (1962–2012).

● significant at the 1 percent level. ▲ significant at the 5 percent level. ■ significant at the 10 percent level.

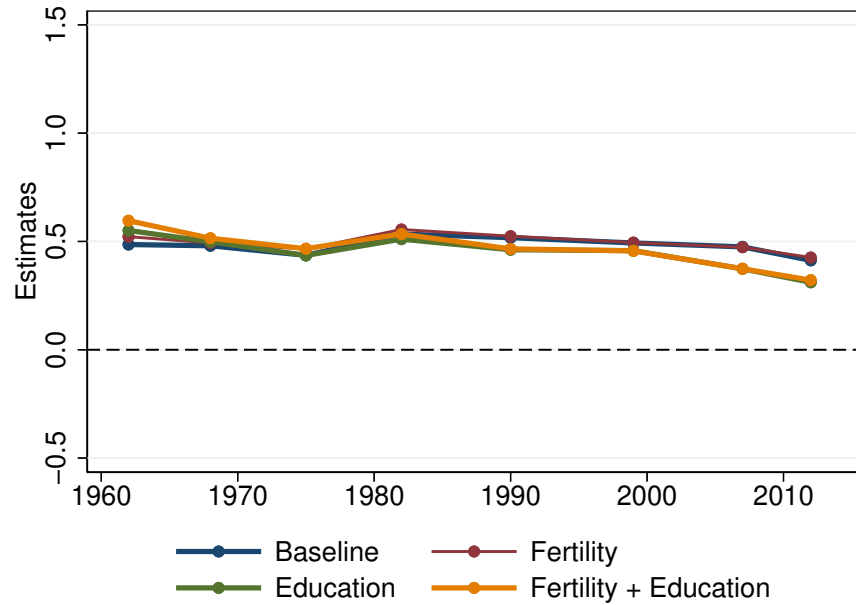


Figure B.5. The Impact of WWI Military Fatalities on FLP  
 Control for Fertility and Education  
 Dependent Variable: Employed

*Notes:* This figure reports the OLS coefficients from estimating baseline Specification 1 augmented with education indicators and fertility controls. Educational attainment indicators consist of primary or lower secondary education (excluded), technical secondary education, high school, and higher education. Number of children corresponds to the number of children of the respondent's family in the household. Standard errors are clustered at the level of individuals' départements of birth and residence. The sample consists of internal migrant married women aged 30 to 49. Estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).

● significant at the 1 percent level.

Table B.1. Residence Location Units  
Censuses 1962–2012

Census	Obs	A. Local labor markets				B. Cities		
		Def	Units	In sample	Obs/unit	Def	Units	Obs/unit
1962	53,841	ZIUP	801	88	67	Commune	5,883	10
1968	370,699	ZIUP	790	90	469	Commune	17,636	23
1975	305,198	ZIUP	857	92	356	Commune	15,692	21
1982	432,227	ZIUP	859	94	503	Commune	20,625	22
1990	481,676	ZIUP	596	97	808	Commune	22,916	22
1999	106,067	EZ	331		320	Commune	11,276	9
2007	660,780	EZ	331		1,996	Canton-city	3,575	185
2012	659,636	EZ	292		2,259	Canton-city	3,573	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. *Com.* corresponds to *communes*, and *Cant.* to *canton-cities*. Data from the censuses (1962–2006). See the Data Appendix for a definition of ZIUPs, EZs, communes, and canton-cities. Acronyms: ZIUP = Zone of Industrial and Urban Population; EZ = Economic Zone; Obs = Observations; Def = Definition.

Table B.2. The Impact of WWI Military Fatalities on FLFP  
 Parents and Daughters Born in the Same Département  
 Extended Labor Force Surveys 2005–2012

Dependent variable	Employed			
	1946–1982		1946–1966	
Cohorts	(1)	(2)	(3)	(4)
Military death rate	0.50** [0.22]	0.87** [0.36]	0.76** [0.29]	1.04** [0.41]
Département of birth = parents'	No	Yes	No	Yes
Clusters				
Birth	92	92	92	91
Residence	92	92	92	92
Observations	167,179	51,391	94,504	30,862
Outcome mean	0.77	0.78	0.74	0.75
Outcome s.d.	0.42	0.41	0.44	0.43
	(2) – (1)		(4) – (3)	
Difference	0.37 [0.42]		0.28 [0.50]	

*Notes:* This table reports the OLS coefficients from estimating specification 1. All the regressions contain survey-year and quarter indicators, pre-war controls, and interacted year of birth, département of residence, and military region of birth fixed effects. Standard errors are clustered at the level of individuals' départements of birth and residence. The sample consists of internal migrant married women. In columns 1 and 3, the sample is unrestricted, while in columns 2 and 4, the sample is restricted to women who were born in the same département as both their parents. The estimates are computed using the sample weights provided in the labor force surveys. Data from the extended version of the labor force surveys (2005–2012).

\*\* Significant at the 5 percent level.

## C. The Role of World War II

In this section, I show that military fatalities (Section C.1) and war destruction (Section C.2) from WWII had no role in the estimated long-run impact of WWI military fatalities on female labor force participation.

### *C.1. World War II Military Fatalities*

Consider first WWII military death rates. Should these be correlated with WWI military death rates, part of the estimated long-run impact of WWI military fatalities on female labor force participation would be attributable to WWII military fatalities. While this is possible, the magnitude of WWII military fatalities relative to those from WWI implies that this part should be marginal at best. Indeed, about 115,000 French soldiers born in metropolitan départements died during WWII—ten times fewer than WWI military fatalities (1.3 million).<sup>11</sup>

To explore this possibility in more details, I collected the number of French soldiers who died because of WWII for each département from the *Mémoire des Hommes* (MDH) archive. Analogous to WWI military death rates, the WWII military death rate in a département is the ratio of the number of deceased soldiers born in the département to its male population aged 15 to 44 in the census of 1936. WWII military death rates range from 0.7 percent in Alpes-Maritimes to 3.8 percent in Finistère. The average WWII military death rate is 1.5 percent, the 25th percentile, 1 percent, and the 75th percentile, 2 percent. WWII military death rates are one order of magnitude lower than WWI military death rates.

I first analyze whether WWI and WWII military death rates are correlated. The systematic variation in WWI military death rates across départements was due to policies implemented by the Ministry of War to sustain the industrial war effort. As a result of these policies, rurality was a strong predictor of WWI military death rates. It was also the case for WWII military fatalities, but to a smaller extent.<sup>12</sup> I report estimates from regressing WWII military death rates on pre-WWI

<sup>11</sup>According to recent estimates (Lagrou, 2002), 150,000 French soldiers died during WWII—slightly lower than the traditional estimate of 170,000 from the report of the *Commission Consultative des Dommages et des Réparations* (1951). This includes 40,000 French soldiers from Alsace-Lorraine forcibly enrolled in the *Wehrmacht* who died on the Eastern Front. Among these 150,000 military fatalities, 25,000 were from Overseas France.

<sup>12</sup>About 650,000 French soldiers were affected to war factories at the mobilization in Septem-



characteristics in columns 3 and 4 of Table C.1. Columns 1 and 2 report estimates with an analogous specification for WWI military death rates. Because at least part of the systematic variation in WWII military death rates across départements was due to similar factors than that in WWI military death rates, both measures are correlated: départements that experienced high (20 percent) rather than low (10 percent) WWI military death rates experienced 0.7 percentage point greater WWII military death rates (column 5). While this correlation is statistically significant, including pre-WWI characteristics in column 6 renders it null. As a result, it is unlikely that part of the estimated long-run impact of WWI military fatalities on female labor force participation is driven by WWII military fatalities.

To support this assertion, I directly estimate the impact of WWII military fatalities on female labor force participation, using Specification 1 with WWII military death rates as the regressor instead of WWI military death rates. I report results in Panel a of Figure C.1 along with baseline estimates. None of the estimates relative to WWII are significant at conventional levels. Unsurprisingly, when including military death rates relative to both WWI and WWII, estimates relative to WWI are identical to baseline results (Figure C.1, Panel b).

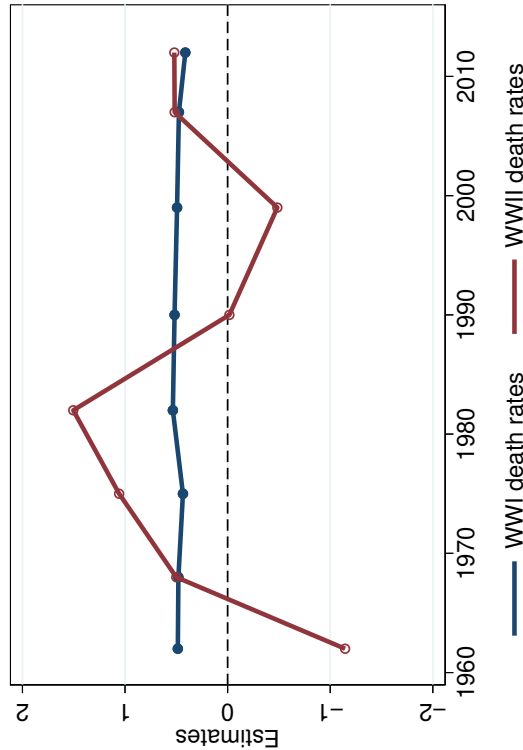
ber 1939, representing 14 percent of the 4.7 million mobilized soldiers (Garraud, 2005). This is comparable to the share of recalled soldiers into war factories during WWI.

Table C.1. WWI and WWII Military Death Rates

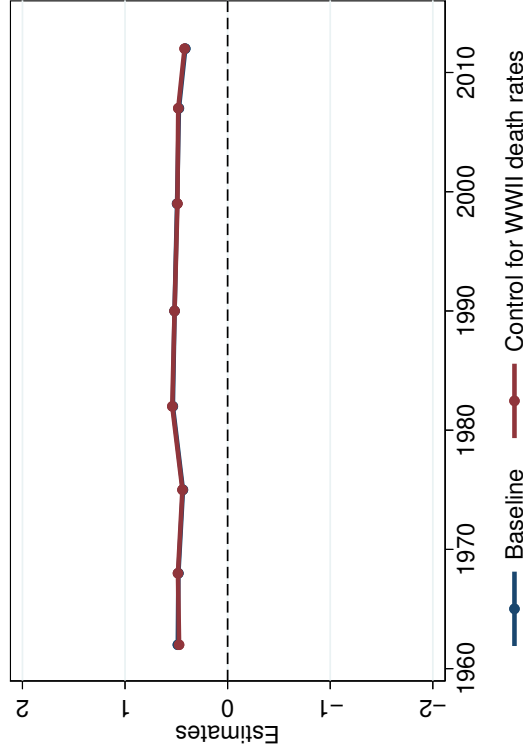
Dependent variable:	Military death rate					
	WWI		WWII			
	(1)	(2)	(3)	(4)	(5)	(6)
WWI military death rate					0.07*** [0.02]	-0.01 [0.02]
Pre-WWI characteristics						
Share rural population	0.12*** [0.01]	0.14*** [0.03]	0.01* [0.00]	0.00 [0.00]		0.01 [0.00]
Share born in département	0.12*** [0.03]	0.16*** [0.04]	0.01** [0.01]	0.00 [0.00]		0.00 [0.01]
Other characteristics	No	Yes	No	Yes	No	Yes
Départements	87	87	87	87	87	87
R <sup>2</sup>	0.745	0.887	0.298	0.900	0.269	0.901
Outcome mean	0.16	0.16	0.02	0.02	0.02	0.02

*Notes:* This table reports OLS coefficients from regressing WWI and WWII military death rates on various pre-WWI département characteristics. *Other characteristics* include the female labor force participation rate, the share of girls aged 5–19 in school, the total fertility rate, the average personal wealth per inhabitant in thousand francs, average height, population, the share of men working in industry, in agriculture, the share of literature population, and the average direct taxes per inhabitant. All these variables are measured in 1911, except the average personal wealth which is measured in 1908. Robust standard errors are in brackets.

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



(a) WWI versus WWII



(b) Controlling for WWII

Figure C.1. The Impact of WWI and WWII Military Fatalities on FLFP  
Dependent Variable: Employed

Notes: Panel a reports OLS coefficients from estimating Specification 1 separately with WWI military death rates and WWII military death rates as regressors. Panel b reports OLS coefficients when using WWI military death rates as regressor and controlling for WWII military death rates. Standard errors are clustered at the level of individuals' départements of birth and residence. The sample consists of internal migrant married women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).

- significant at the 1 percent level. ○ not significant at conventional levels.

### *C.2. World War II Destruction*

Next, consider WWII destruction. Contrary to WWI, destruction resulting from WWII affected most of the territory. While combats in May–June 1940 occurred mostly in the North-East of the territory, combats in 1944 affected both the South-East and the North-West. While the baseline empirical strategy uses département of residence fixed effects, it could still be problematic if WWI military death rates were correlated with WWII destruction. First, losses of physical capital in some départements could have induced a relative decline in the demand for labor in these départements, biasing downward the estimated impact of WWI military fatalities on female labor force participation in these départements. Alternatively, the reconstruction effort in these départements could have induced a relative increase in the demand for labor, biasing estimates upward. The net impact on estimates would then depend on the relative intensity of war destruction vis-à-vis the reconstruction effort, and on the extent of the correlation with WWI military fatalities.

To analyze the potential role of WWII destruction on the estimated long-run impact of WWI military fatalities on female labor force participation, I collected data that capture the extent of destruction from WWII at the département level: the share of a département’s area that needed to be cleared from land mines, the share of a département’s buildings that were partially or totally destroyed, and the share of a département’s factories that were destroyed. The first two variables are from the *Commission Consultative des Dommages et des Réparations* (1951) and the third is from Flaus (1947). Table C.2 provides summary statistics for destruction measures. Table C.3 presents correlations between WWI military death rates and WWII destruction. Départements with relatively more WWII destruction experienced relatively less WWI military fatalities. However, the correlation vanishes when including pre-WWI characteristics (column 5).

To further explore whether WWII destruction could bias the estimated long-run impact of WWI military fatalities on female labor force participation, I replicate baseline Specification 1 and include measures of WWII destruction as controls. I report results in Figure C.2. They imply that WWII destruction do not affect baseline estimates.

Table C.2. Summary Statistics: World War II Destructions

	Mean	S.d.	Min	Max
Share land with mines	0.01	0.01	0.00	0.10
Share buildings partially destroyed	0.01	0.02	0.00	0.11
Share buildings totally destroyed	0.03	0.04	0.00	0.28
Share buildings destroyed	0.04	0.06	0.00	0.40
Share factories destroyed	0.01	0.02	0.00	0.12

*Notes:* This table reports summary statistics for WWII destructions across all 87 départements for which WWI military fatalities are available. *Share buildings destroyed* is the sum of the share of buildings partially and totally destroyed.

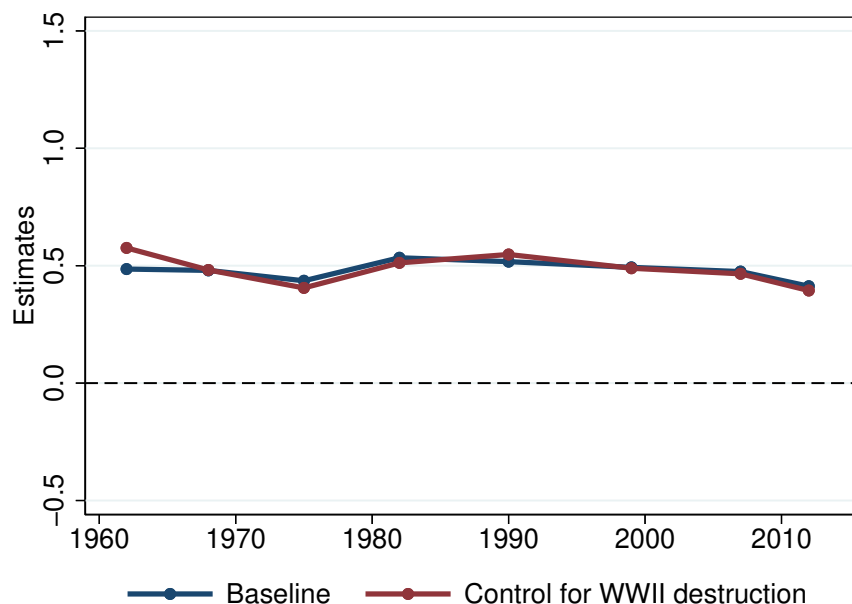


Figure C.2. The Impact of WWI Military Fatalities on FLFP  
Control for WWII Destruction  
Dependent Variable: Employed

*Notes:* This figure reports the OLS coefficients from estimating baseline Specification 1 and controlling for the following measures of WWII destruction: the share of land with mines, the share of buildings partially or totally destroyed during the war, and the share of factories destroyed during the war. Standard errors are clustered at the level of individuals' départements of birth and residence. The sample consists of migrant women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).

• significant at the 1 percent level.

Table C.3. WWI Military Death Rates and WWII Destructions

Dependent variable:	WWI military death rates				
	(1)	(2)	(3)	(4)	(5)
WWII destruction measures					
Share land with mines	-0.97*** [0.30]			-0.78** [0.35]	0.09 [0.20]
Share buildings destroyed		-0.09 [0.06]		0.04 [0.07]	0.01 [0.05]
Share factories destroyed			-0.50** [0.19]	-0.38* [0.23]	-0.02 [0.15]
Pre-WWI characteristics (1911)					
Share rural population					0.15*** [0.03]
Share born in département					0.16*** [0.05]
Other characteristics	No	No	No	No	Yes
Military region FE	No	No	No	No	Yes
Départements	87	87	87	87	87
R <sup>2</sup>	0.139	0.021	0.105	0.182	0.887

*Notes:* This table reports the OLS coefficients from regressing WWI military death rates on WWII destructions measures and various pre-WWI département characteristics. *Other characteristics* include the female labor force participation rate, the share of girls aged 5–19 in school, the total fertility rate, and the average personal wealth per inhabitant in thousand francs. All these variables are measured in 1911, except the average personal wealth which is measured in 1908. Robust standard errors are in brackets.

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

## D. Further Results

### *D.1. Alternative Outcomes*

As discussed in Section 3.4, fertility and education choices do not appear to mediate the relationship between WWI military fatalities and women’s working behaviors. To assess this possibility more directly, I estimate the baseline specification for various fertility and education outcomes (Figures D.1 and D.2). As expected, women born in départements that experienced greater military death rates do not make different fertility or education choices.<sup>13</sup> Moreover, they do not marry at different rates (Figure D.3). Replicating the analysis on the labor force surveys 1982–2013 generates similar results (Table D.1).<sup>14</sup>

### *D.2. Household-Level Analysis*

Husbands and wives can be matched in the censuses, which enables a household-level analysis. I estimate the baseline specification when including husband and household characteristics as controls. Husband characteristics include husbands age and age squared, indicators for their educational attainment, and indicators for their migratoin employment status.<sup>15</sup> Household characteristics include an indicator for home ownership, the number of rooms in the home, and a measure of housing quality. These variables attempt to capture how wealthy a household is.<sup>16</sup> I report results in Figure D.4. Estimates are close to the baseline, suggesting that women born in départements that experienced greater military death rates do not choose husbands that differ along these characteristics.

This is broadly confirmed by repeating the analysis with husband and household characteristics as outcomes (Figure D.5). With one caveat: households with women born in départements that experienced high (20 percent) rather than low (10 percent) military death rates are on average 5.5 percentage points more likely

<sup>13</sup>I also ran analyses, available upon request, showing that women born in départements that experienced greater military death rates do not choose more technical curricula or more male-biased occupations.

<sup>14</sup>For more details on the labor force surveys 1982–2013, see Section D.6 below.

<sup>15</sup>Educational attainment indicators include primary or lower secondary education (excluded), technical secondary education, high school, and higher education.

<sup>16</sup>The censuses do not contain explicit wealth, income, or wage measures. See the Data Appendix for more details on how the measure of housing quality is constructed.

to own their home, which represents 10 percent of the mean. Because there is no substitution between wives' and husbands' market work—husbands of women born in départements that experienced greater military death rates are not more likely to be working—this can be rationalized by the fact that these households are richer due to women working more.<sup>17</sup>

### *D.3. 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 augmented with a set of interaction terms. I analyze heterogeneity along four types of characteristics: the number of children in the household, education, age, and marital status. To make comparisons more amenable, I report standardized coefficients in Figure D.6. Women's labor supply does not respond differently to WWI military fatalities across these characteristics. An exception is education, with the labor supply of high school graduates responding statistically significantly more in the 1960s and 1970s. The magnitude of this dimension of heterogeneity remains however small, with a standardized coefficient on the interaction term close to 0.01 between 1962 and 1982.

### *D.4. Cohort-Specific Estimates*

I estimate the baseline specification separately on each decennial cohort present in the censuses—cohorts 1910 to 1970. I pool all censuses together and include census-year fixed effects. Panel a of Figure D.7 reports the results. Consistent with baseline results, 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 base rates nevertheless linearly declines across cohorts (panel b).

<sup>17</sup>Figure D.5 reveals that husbands of women born in départements that experienced greater military death rates are more likely to be working during the 2000s. Nevertheless, the magnitudes of coefficients are small at 0.1, suggesting that husbands of women born in départements that experienced high (20 percent) rather than low (10 percent) military death rates were 1 percentage point more likely to be working between 2006 and 2012—94 percent of these men were employed during that period.



### ***D.5. Placebo Test with the Male Sample***

I replicate the baseline analysis using the sample of married men aged 30 to 49. Consistent with the original 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—estimates are precisely zero (Figure D.8).

### ***D.6. Evidence from the Labor Force Surveys (1982–2013)***

To corroborate results obtained with the censuses, I combine all thirty-two annual labor force surveys from 1982 to 2013. They provide respondents' départements of residence and birth. Labor force surveys have both drawbacks and advantages over the censuses. On the one hand, information about respondents' départements of birth is not available in the surveys prior to 1982, while it is available from 1962 onward in the censuses. Moreover, the sample size of the surveys is smaller than that of the censuses: while most censuses represent 20 to 25 percent samples of the population, the labor force surveys represent 1.5 to 3 percent samples. On the other hand, the labor force surveys contain a wider range of labor market outcomes: besides labor status, they contain weekly hours worked, ever worked status, the number of months since in current firm, and the monthly wage rate.

I pool all thirty-two labor force surveys and estimate the baseline specification on the sample of internal migrant married women aged 30 to 49 together with survey-year fixed effects. Results are reported in Table D.2. They are similar to those when using the censuses: for instance, the coefficient for *Employed* is 0.50 (standard error of 0.15) compared to an average coefficient of 0.52 in analogous regressions using the censuses 1982 to 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 that experienced greater military death rates are more likely to have been previously working: the coefficient on *Ever worked* is close to zero and non-significant. Moreover, conditional on being working, women born in départements that experienced high (20 percent) rather than low (10 percent) military death rates are 5 percentage points less likely to work full time, implying that they work 1.3 less hours per week (4 percent of mean hours). Moreover, they have been employed for 16 months longer (13 percent of mean months in firm). All estimates exhibit similar

magnitudes, with standardized coefficients all close to 0.05. These results suggest that women born in départements that experienced greater military death rates have higher attachment to the labor force, but that this impact on the extensive margin does not translate to the intensive margin, since these women work shorter hours.

### *D.7. 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 heterogeneity in *observed* human capital cannot account for the results—these could be driven by heterogeneity in *unobserved* human capital. For instance, women born in départements that experienced greater military death rates could have better information about the payoffs from working and about labor market conditions in general, making them more likely to get a higher 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 sample of married women aged 30 to 49 in the labor force surveys 1982–2013 through a Heckman selection model in which husbands’ characteristics are used to control for selection into the labor force—husbands ages and age squared, education levels and employment status.<sup>18</sup> I report results in Table D.3. The coefficient on military death rates is close to zero and non-significant. Controlling for educational attainment does not alter results. 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 behaviors.

<sup>18</sup>Results are similar when using number of children in the selection equation.

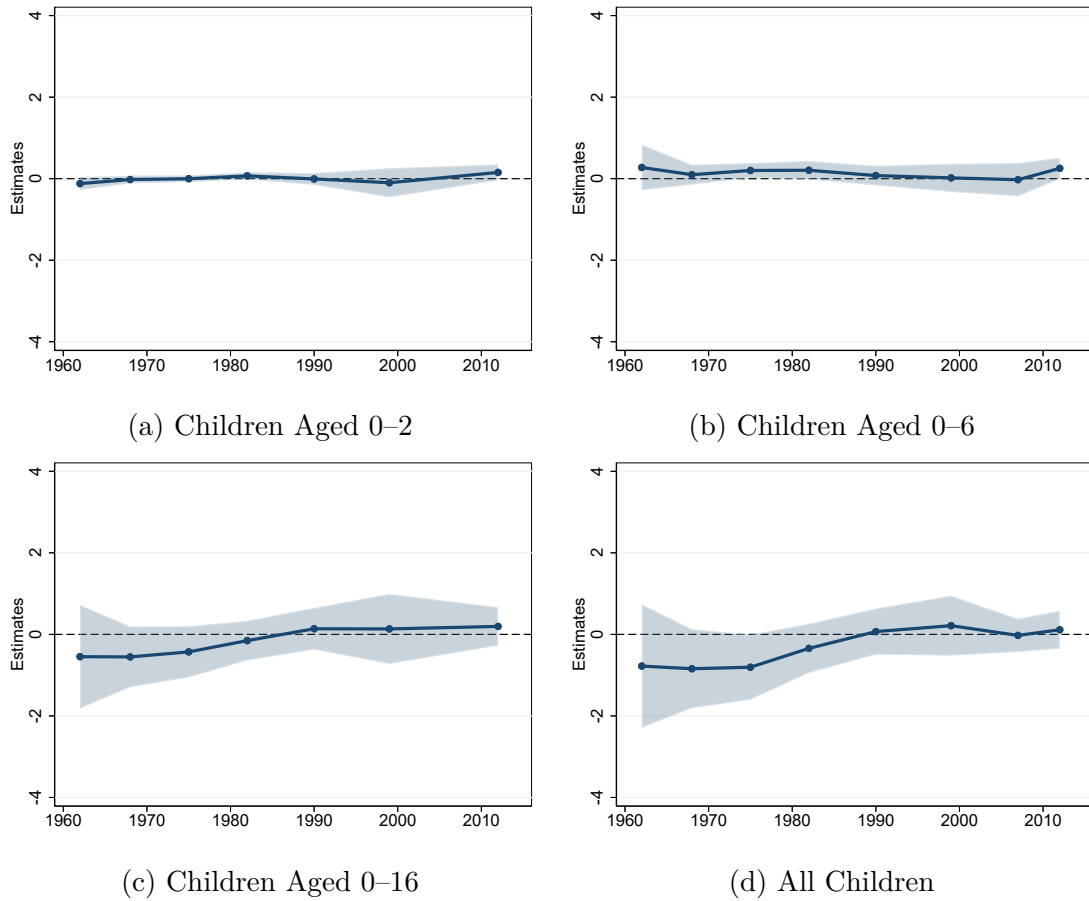


Figure D.1. Number of Children

*Notes:* This figure presents OLS coefficients from estimating Specification 1 with the number of own children in the household as outcomes along with 95 percent confidence intervals. The census of 2006 do not provide the number of children by age, so it is excluded from Panels a, b, and c. In panel a, the number of children is for ages 0–3 for the censuses of 1990 and 2012. In Panel c, the number of children is for ages 0–18 for the censuses of 2012. Standard errors are clustered both at the level of the individuals' départements of birth and départements of residence. The sample consists of internal migrant married women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).

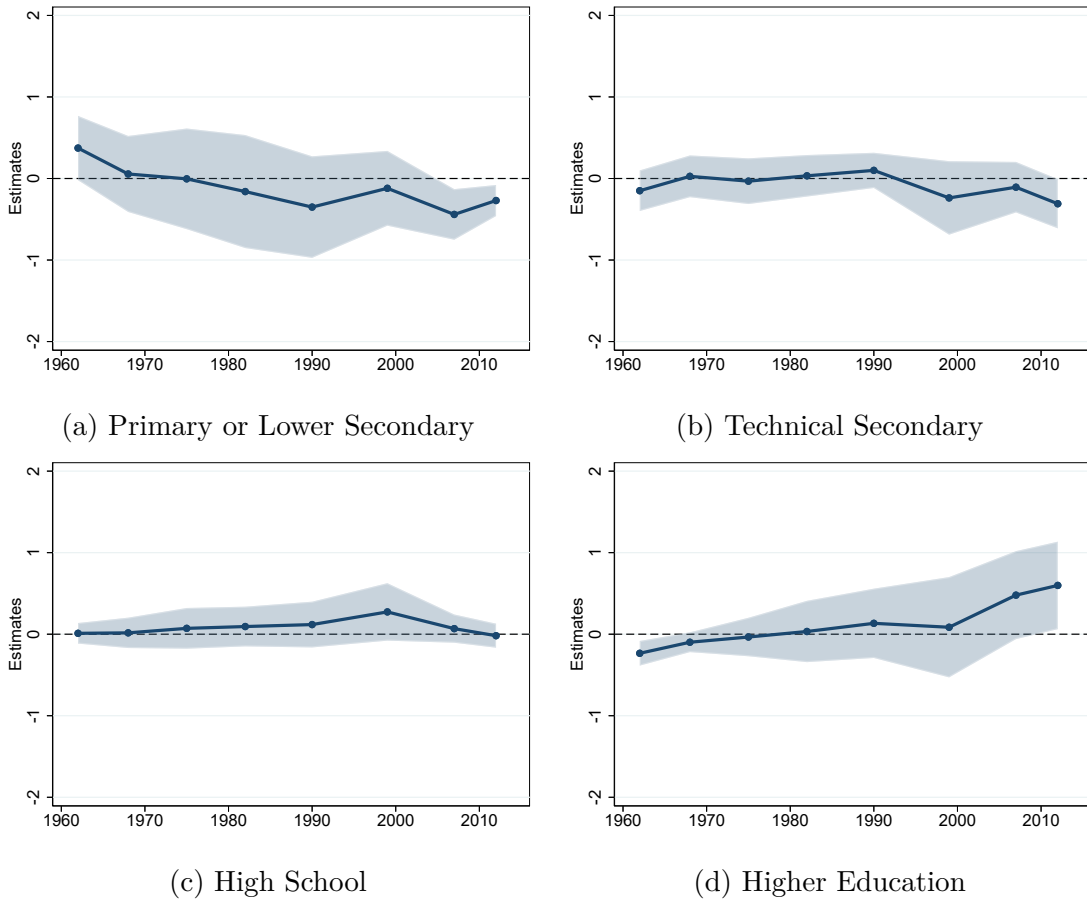


Figure D.2. Education

*Notes:* This figure presents OLS coefficients from estimating Specification 1 with indicators for educational attainment as outcome along with 95 percent confidence intervals. Standard errors are clustered both at the level of the individuals' départements of birth and départements of residence. The sample consists of internal migrant married women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).

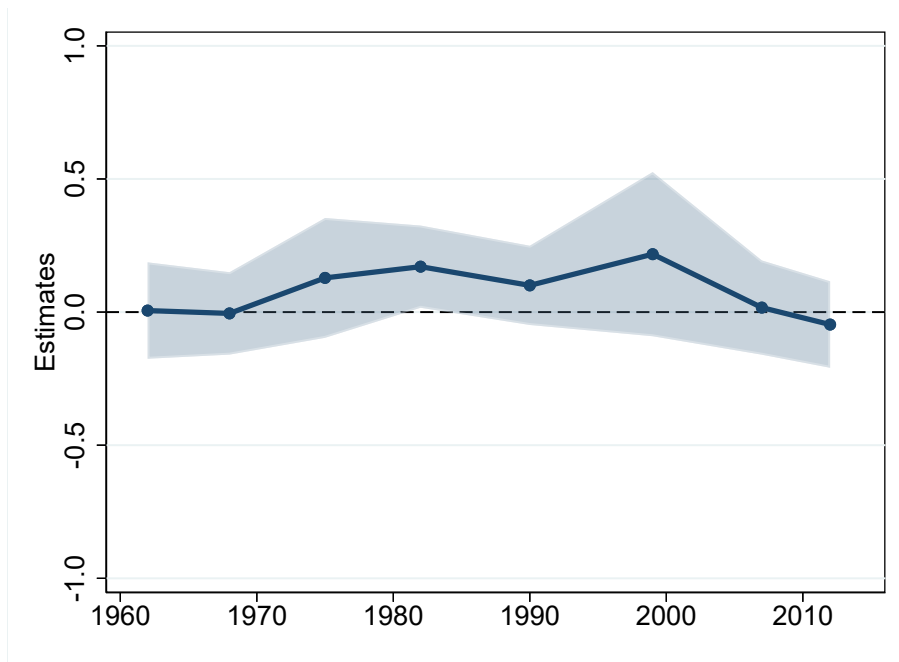


Figure D.3. Marital Status

*Notes:* This figure presents OLS coefficients from estimating Specification 1 with an indicator for being married as the outcome along with 95 percent confidence intervals. Standard errors are clustered both at the level of the individuals' départements of birth and départements of residence. The sample consists of internal migrant women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).

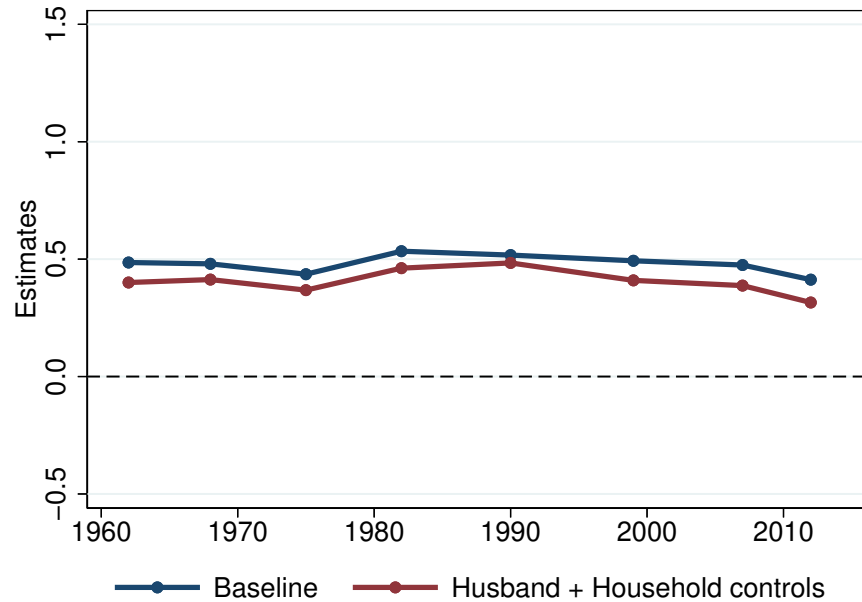


Figure D.4. Household and Husband Controls

*Notes:* This figure reports OLS coefficients from estimating Specification 1 when adding household and husband controls. Husband characteristics include husbands age and age squared, indicators for their educational attainment, and an indicator for whether they are employed. Household controls include an indicator for whether the household owns its housing, the number of rooms in the home, and a measure of housing quality. 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. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).

• significant at the 1 percent level.

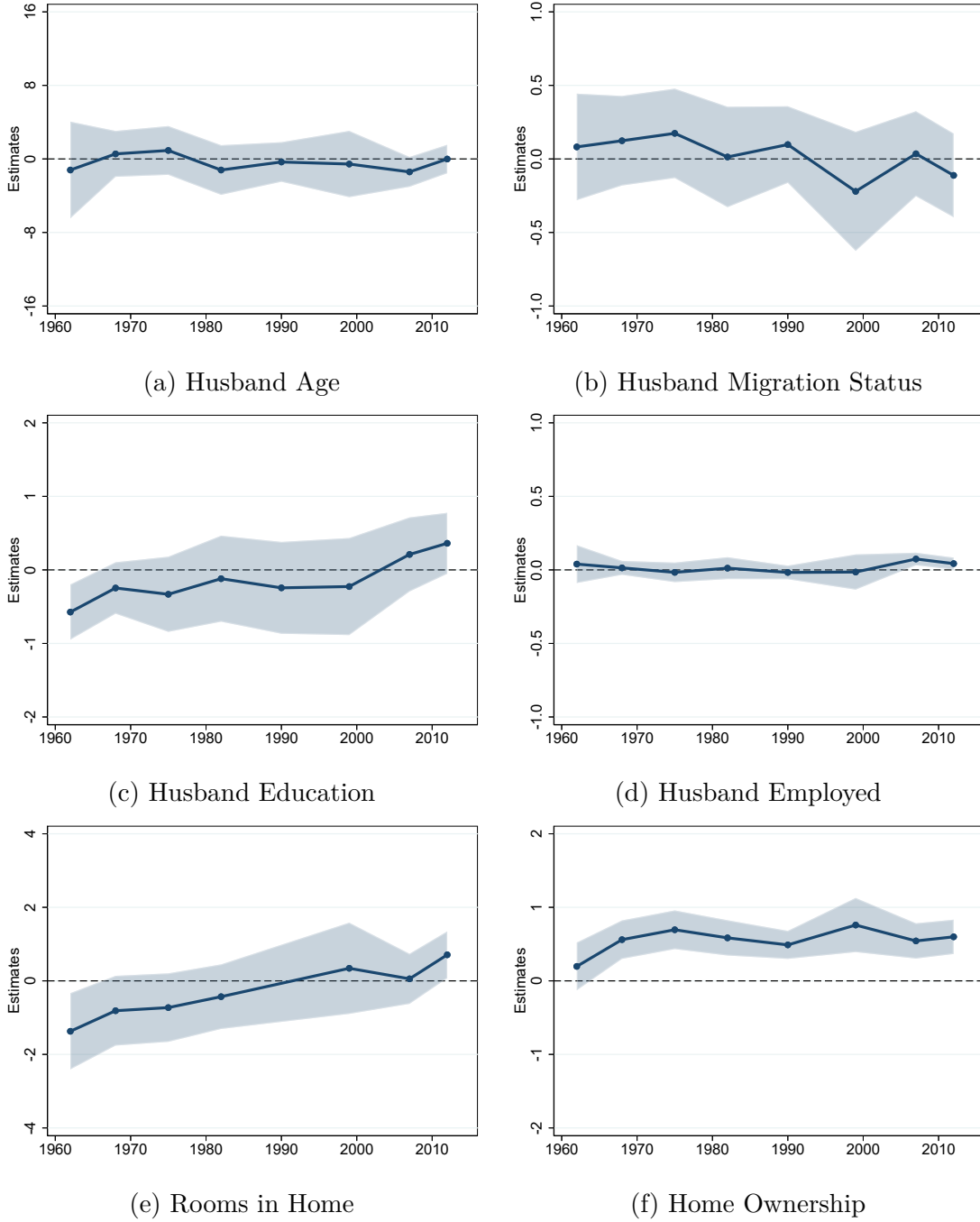


Figure D.5. Husband and Home Characteristics

*Notes:* This figure reports OLS coefficients from estimating Specification 1 along with 95 percent confidence intervals. Outcomes are husbands' age in Panel a, indicators for whether husbands are internal migrants in Panel b, have at least gone through high school in Panel c, and are employed in Panel d, the number of rooms in the home in Panel e, and an indicator for whether the household owns their home in Panel f. The sample consists of households that include a migrant married women aged 30 to 49. Data from the censuses (1962–2012).

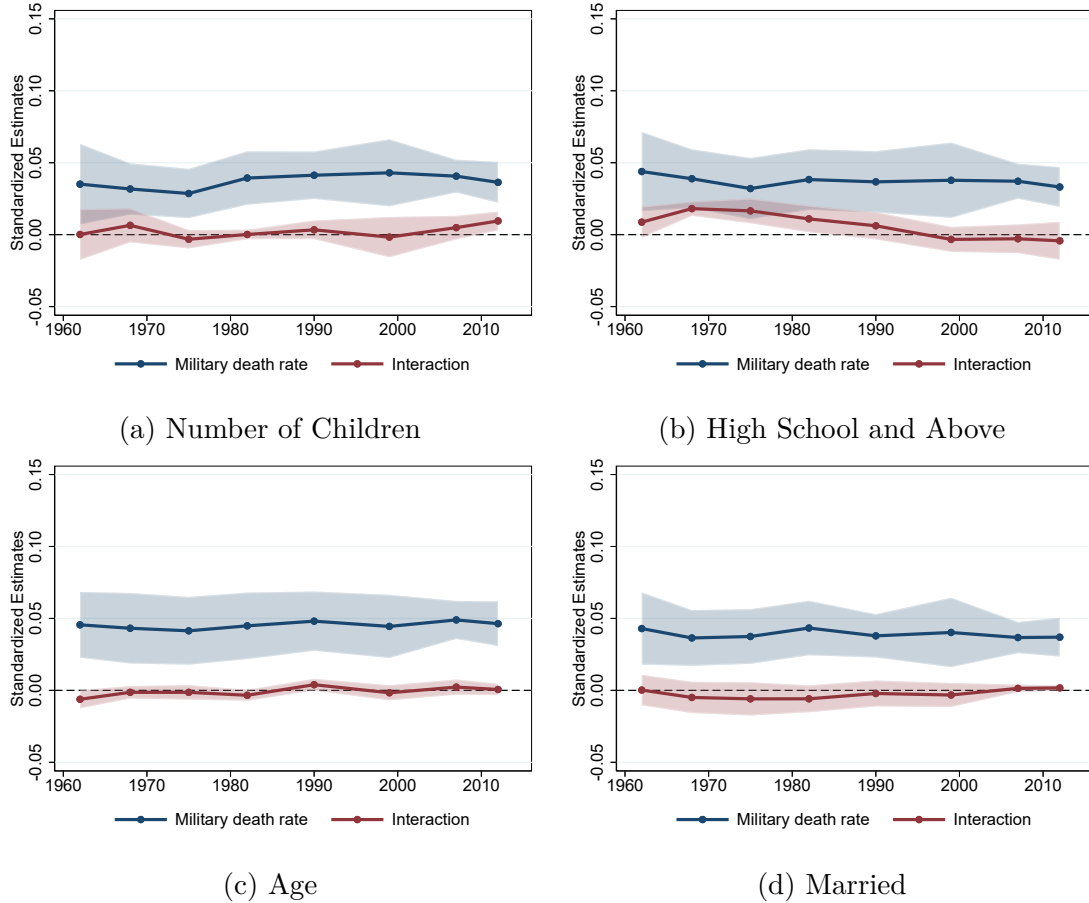
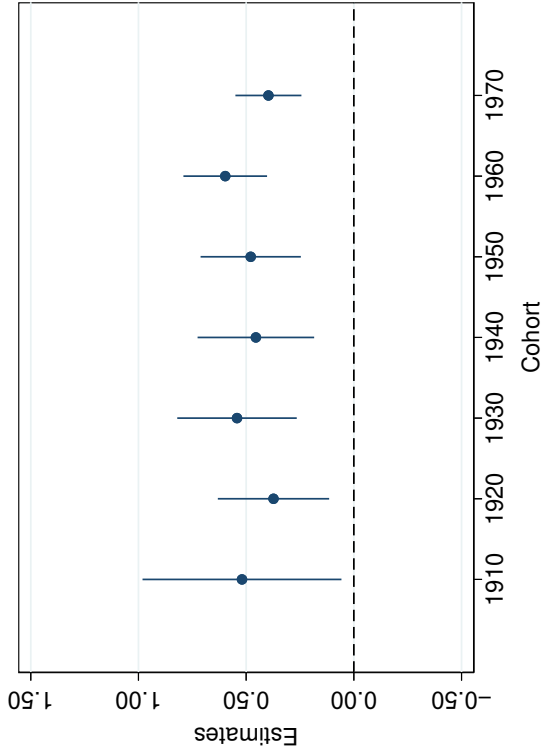


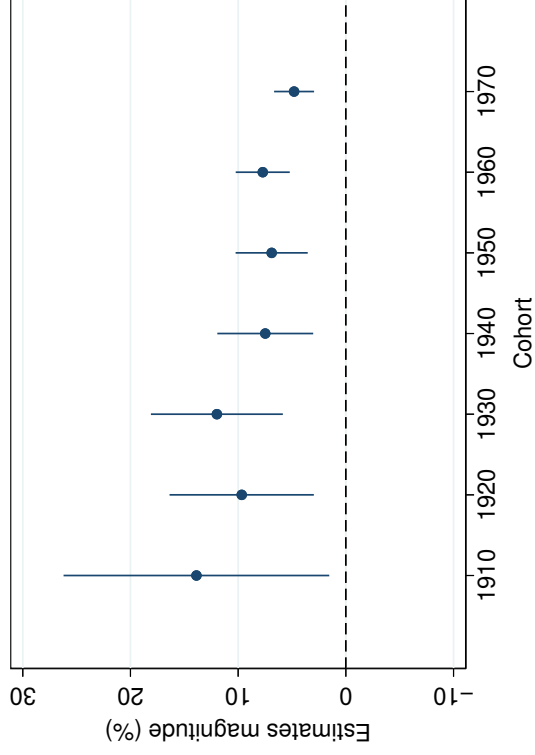
Figure D.6. Heterogeneity Across Characteristics

*Notes:* This figure presents OLS coefficients from estimating Specification 1 together with interactions for various characteristics. In Panel a, the baseline specification is augmented with the number of own children in the household and the interaction between the number of children and the military death rate exposure of the département of birth of the respondent; in Panel b, the specification adds an indicator variable for whether the respondent is a high school graduate together with the interaction term; in Panel c, the specification controls for age together with the interaction term (age fixed effects are not included); in Panel d, the specification adds an indicator variable for whether the respondent is married together with the interaction term. Standard errors are clustered both at the level of the respondents' départements of birth and départements of residence. The sample consists of migrant married women aged 30 to 49, except in panel d, where the sample consists of all migrant women aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).





(a) Estimates



(b) Magnitude Relative to the Mean

Figure D.7. Cohort-Specific Estimates

*Notes:* Panel a reports OLS coefficients from estimating Specification 1 separately for each cohort on the pooled censuses 1962–2012 along with 95 percent confidence intervals around the estimates. All regressions include census-year fixed effects. The dependent variable is an indicator for whether the individual is working. Standard errors are clustered both at the level of individuals’ départements of birth and départements of residence. The sample consists of internal migrant married women aged 30 to 49. Panel b reports the magnitude of 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. Data from the censuses (1962–2012).

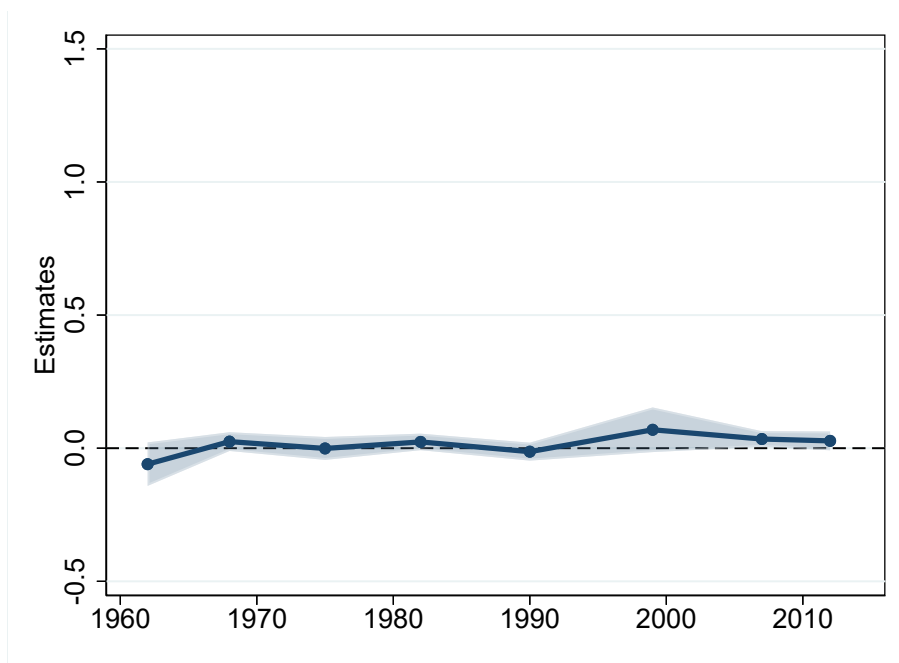


Figure D.8. Male Placebo

*Notes:* This figure presents OLS coefficients from estimating Specification 1 on the male sample along with 95 percent confidence intervals. Standard errors are clustered both at the level of the individuals' départements of birth and départements of residence. The sample consists of internal migrant married men aged 30 to 49. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).

Table D.1. The Impact of WWI Military Fatalities on Fertility and Education  
Labor Force Surveys 1982–2013

Dependent variable	Number of children				Educational attainment			
	0–3 (1)	0–6 (2)	0–18 (3)	All (4)	Primary (5)	Tech. sec. (6)	High sch. (7)	Higher ed. (8)
Military death rate	0.33 [0.37]	0.63 [0.73]	-0.82 [0.86]	-0.59 [0.86]	-0.04 [0.55]	0.31 [0.58]	0.08 [0.40]	-0.35 [0.67]
Clusters								
Départements of birth	92	92	92	92	92	92	92	92
Départements of residence	92	92	92	92	92	92	92	92
Observations	343,863	343,863	343,863	343,863	343,863	343,863	343,863	343,863
Outcome mean	0.18	0.44	1.46	1.69	0.16	0.22	0.18	0.44

*Notes:* This table reports the OLS coefficients from estimating Specification 1 for the number of children in the household and educational attainment indicators as outcomes. All regressions include pre-war controls and interacted year of birth, département of residence, and military region of birth fixed effects. *Primary:* primary education; *Tech. Sec.:* technical secondary education; *High sch.:* high school; *Higher ed.:* higher education. All regressions include survey-year fixed effects. Standard errors are in brackets and are clustered both at the level of respondents' départements of birth and départements of residence. The sample consists of internal migrant married women aged 30 to 49. The estimates are computed using the sample weights provided in the labor force surveys. Data from the labor force surveys (1982–2013).

Table D.2. The Impact of WWI Military Fatalities on FLFP  
Labor Force Surveys 1982–2013

Dependent variable	Employed	Active	Ever worked	Full time	Hours	Months in firm
	(1)	(2)	(3)	(4)	(5)	(6)
Military death rate	0.50*** [0.15]	0.43*** [0.13]	0.02 [0.06]	-0.47** [0.21]	-13.4*** [4.9]	154*** [39]
Sample	All	All	All	Employed	Employed	Employed
Clusters						
Birth	92	92	92	92	92	92
Residence	92	92	92	92	92	92
Observations	244,001	244,001	244,001	170,383	170,383	170,383
Outcome mean	0.77	0.82	0.98	0.69	35.3	117
Outcome s.d.	0.42	0.38	0.14	0.46	10.9	91
Standardized coef.	0.05*** [0.01]	0.04*** [0.01]	0.01 [0.02]	-0.04** [0.02]	-0.05*** [0.02]	0.07*** [0.02]

*Notes:* This table reports the OLS coefficients from estimating Specification 1 across various labor market outcomes. All regressions include survey-year fixed effects, pre-war controls, and interacted year of birth, département of residence, and military region of birth fixed effects. Standard errors are in brackets and are clustered both at the level of respondents' départements of birth and départements of residence. The sample consists of internal migrant married women aged 30 to 49. The estimates are computed using the sample weights provided in the labor force surveys. Data from the labor force surveys (1982–2013).

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

Table D.3. The Impact of WWI Military Fatalities on Wage Labor Force Surveys 1982–2013

Dependent variable	<i>Log</i> monthly wage rate		
	(1)	(2)	(3)
Military death rate	-0.05 [0.26]	-0.13 [0.17]	-0.22 [0.16]
Years of education	No	Yes	No
Education category FE	No	No	Yes
Clusters			
Birth	92	92	92
Residence	92	92	92
Observations	179,183	179,183	179,183
Censored observations	73,767	73,767	73,767
Outcome mean	8.69	8.69	8.69

*Notes:* This table presents the coefficients from estimating Specification 1 with the log monthly wage rate as the outcome through a Heckman selection model. All regressions include survey-year fixed effects as well as birth year, département of residence, and military regions of birth fixed effects. Education categories consist of no schooling (excluded), primary education, secondary education, and higher education. The selection equation includes the following husband characteristics: husband age and age squared, education level, and employment status. Standard errors are in brackets and are clustered both at the level of respondents' départements of birth and départements of residence. The sample consists of internal migrant married women aged 30 to 49. The estimates are computed using the sample weights provided in the labor force surveys. Data from the labor force surveys (1982–2013).

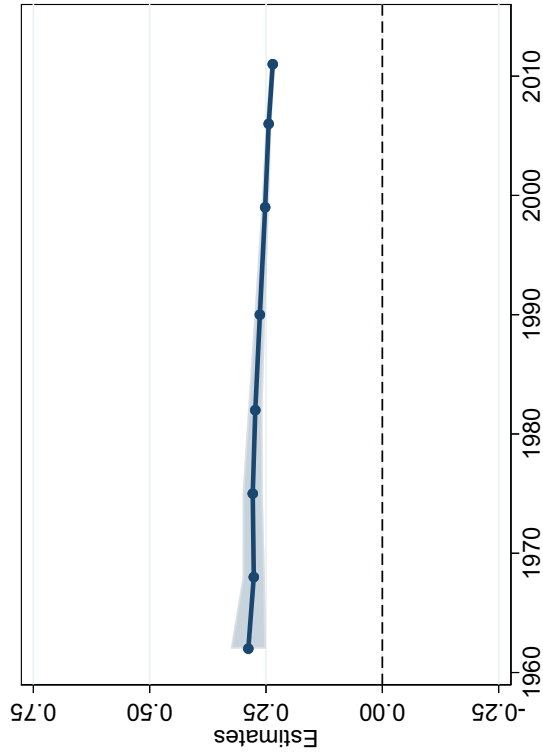
## E. Homogamy in Military Death Rates

In this appendix, I provide evidence for homogamy in military death rates. That is, women born in départements that experienced greater military death rates are more likely to marry men born in départements that experienced greater military death rates, and vice versa. Using the censuses 1962 to 2012, I estimate the following specification on the sample of married women aged 30 to 49:

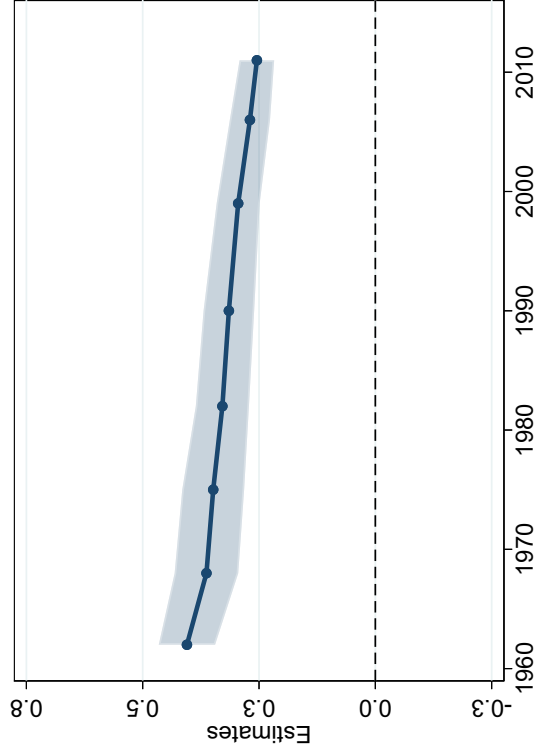
$$(E.1) \quad \begin{aligned} \text{death\_rate}_{ihbrt}^{\text{husb}} &= \beta \text{death\_rate}_b + \alpha_1 \mathbf{X}'_{1911,b} + \alpha_2 \mathbf{X}'_{1911,h} + \gamma_i \cdot \delta_r \\ &+ \eta \text{Same}_{bh} + \mu \text{ldist}_{bh} + \varepsilon_{ihbrt}, \end{aligned}$$

where  $\text{death\_rate}_{ihbrt}^{\text{husb}}$  denotes the military death rates exposure of the département of birth of husband  $h$  of wife  $i$ .  $\mathbf{X}_{1911,b}$  and  $\mathbf{X}_{1911,h}$  contain the set of pre-war controls corresponding to wives' and husbands' départements of birth, respectively. Wives' and husbands' military death rates are positively correlated as individuals born in the same département are more likely to marry with one another—this is the case for 43 to 57 percent of couples, with a downward trend over the period. To assess the extent of homogamy in military death rates beyond marriages between individuals born in the same département, I include an indicator variable ( $\text{Same}_{bh}$ ) for whether spouses were born in the same département. I also include the log distance between wives' and husbands' départements of birth ( $\text{ldist}_{bh}$ ) and département of residence fixed effects,  $\delta_r$ . I cluster standard errors at the levels of wives' départements of birth and residence, and also at the level of their husbands' départements of birth.

I report results in Panel a of Figure E.1. There is a positive correlation between spouses birth départements' military death rates: each additional percentage point in military death rates exposure of wives' départements of birth is associated with an increase of 0.24 to 0.29 percentage point in the military death rates exposure of their husbands', with a downward trend from 1962 to 2012. The correlation is slightly larger for internal migrant couples—from 0.26 to 0.41 percentage point (Panel b). In Section 5, I provide evidence that one potential reason behind such homogamy is the more progressive views toward female labor held by women and men whose lineage was exposed to greater military death rates.



(a) All Wives and Husbands



(b) Internal Migrant Wives and Husbands

Figure E.1. Homogamy in Military Death Rates

*Notes:* This figure reports OLS coefficients from estimating Specification E.1 along with 95 percent confidence intervals. 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 all women aged 30 to 49 in Panel a, and internal migrant women aged 30 to 49 married to internal migrant men in Panel b. The estimates are computed using the sample weights provided in the censuses. Data from the censuses (1962–2012).

## F. The Distribution of Household Tasks

In this appendix, I explore whether men in couples with women from départements that experienced greater military death rates perform relatively more household and childcare tasks, thereby freeing some time for their wives to enter the labor force. I use the Generation and Gender Survey (GGS) of 2005 as it contains questions related to the distribution of two types of household tasks for individuals with a partner present in the household, along with their départements of residence and birth: household chores (cooking, dish washing, grocery shopping, ironing, vacuuming) and child care (who dresses children, takes them to bed, stays with them when they are sick, plays with them, helps them with their homework, brings them to activities). Respondents were asked who performed these tasks: “always me,” “mostly me,” “as much me as my partner,” “mostly my partner,” and “always my partner.” When the respondent is a woman, I assign 0 to “always me” and 1 to “always my partner,” and use 0.25-point increments for responses in between. I use the opposite coding scheme when the respondent is a man, so that higher values indicate a more progressive distribution of tasks in the household (men doing a larger share of household chores). Finally, I aggregate these statements linearly and standardize them on a one-point scale.

I report summary statistics for the household chores index in Table F.1 and for the childcare index in Table F.2 for the sample of internal migrant respondents with a partner in the household. According to the above coding scheme, women “mostly” perform household tasks, with an index at 0.28. While women still perform most childcare tasks, men share a larger burden of these activities than household chores, with an index at 0.44.

To assess whether men in couples with women from départements that experienced greater military death rates perform relatively more household and childcare tasks, I estimate the following specification on the sample of internal migrant respondents with a partner in the household (and with children for the childcare index), where I include an interaction between the military death rate of respondents’ département of birth and their gender:

$$(F.1) \quad \begin{aligned} \text{index}_{ibr} &= \beta_1 \text{death\_rate}_b + \beta_2 \text{Male}_i + \beta_3 \text{death\_rate}_b \times \text{Male}_i \\ &+ \boldsymbol{\alpha} \mathbf{X}'_{1911,b} + \gamma_i + \delta_r + \varepsilon_{ibr}, \end{aligned}$$



where  $\text{index}_{ibrt}$  is the household chores or the childcare index,  $\mathbf{X}_{1911,b}$ , a set of pre-war controls assigned at the level of the respondent's département of birth,  $\gamma_i$ , cohort fixed effects, and, consistent with the epidemiological approach,  $\delta_r$ , département of residence fixed effects. I use two-way clustering and cluster standard errors at the levels of départements of birth and residence.  $\beta$  is identified from variations in household tasks performed by internal migrant respondents of the same gender, of the same cohort, residing in the same département, but who were born in départements that experienced different military death rates. Table F.3 reports the results. Estimates imply that women are generally more likely to perform household tasks—the magnitude of the estimate is close to half a standard deviation in the outcome. However, WWI military fatalities have no impact on the distribution of tasks in the household for either gender.

Table F.1. Distribution of Household Chores

Higher values mean women do less chores

		Sex of respondent		
		All	Men	Women
1	Cooking	0.24 (0.27)	0.27 (0.28)	0.20 (0.26)
2	Washing Dishes	0.36 (0.29)	0.40 (0.29)	0.32 (0.28)
3	Buying Groceries	0.35 (0.28)	0.40 (0.29)	0.31 (0.27)
4	Ironing	0.15 (0.25)	0.17 (0.26)	0.13 (0.23)
5	Vacuuming	0.32 (0.29)	0.35 (0.29)	0.29 (0.28)
	Household chores index (five-point scale)	1.41 (0.88)	1.59 (0.91)	1.25 (0.82)
	Household chores index (one-point scale)	0.28 (0.18)	0.32 (0.18)	0.25 (0.16)
	Observations	2,074	916	1,158

*Notes:* This table reports summary statistics for the distribution of household chores on the sample of internal migrant respondents with a partner present in the household. Higher values indicate that women do less chores. Standard deviations are in parenthesis. Data from the GGS (2005).

Table F.2. Distribution of Childcare  
Higher values mean women do less childcare

	Sex of respondent		
	All	Men	Women
1 Dressing children	0.30 (0.21)	0.34 (0.20)	0.28 (0.23)
2 Putting children to bed	0.40 (0.21)	0.44 (0.20)	0.37 (0.21)
3 Attending children when sick	0.28 (0.25)	0.34 (0.24)	0.23 (0.25)
4 Playing with children	0.45 (0.17)	0.48 (0.16)	0.44 (0.18)
5 Aiding children with homework	0.39 (0.21)	0.40 (0.19)	0.38 (0.22)
6 Bringing children to activities	0.38 (0.24)	0.42 (0.22)	0.35 (0.25)
Childcare index (five-point scale)	2.22 (0.80)	2.42 (0.70)	2.04 (0.84)
Childcare index (one-point scale)	0.44 (0.16)	0.48 (0.14)	0.41 (0.17)
Observations	762	324	438

*Notes:* This table reports summary statistics for the distribution of childcare on the sample of internal migrant respondents with a partner present in the household. Higher values indicate that women do less chores. Standard deviations are in parenthesis. Data from the GGS (2005).

Table F.3. The Impact of WWI Military Fatalities on Household Tasks

Dependent variable	Household tasks index			
	Chores		Childcare	
	(1)	(2)	(3)	(4)
Military death rate	-0.25 [0.27]	-0.16 [0.27]	-0.09 [0.33]	-0.09 [0.42]
Female	-0.08*** [0.01]	-0.05* [0.03]	-0.08*** [0.01]	-0.08* [0.05]
Military death rate $\times$ Female		-0.17 [0.20]		-0.00 [0.31]
Clusters				
Residence	94	94	94	94
Birth	86	86	77	77
Observations	2,070	2,070	746	746
Outcome mean	0.28	0.28	0.44	0.44

*Notes:* This table reports the OLS coefficients from estimating Specification F.1 with the household chores and the childcare indexes as outcomes. All regressions include pre-war controls as well as cohort and département of residence fixed effects. Standard errors are clustered at the level of départements of birth and of residence. The sample consists of internal migrant respondents. The estimates are computed using the sample weights provided in the Generation and Gender Survey. Data from the GGS (2005).

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

## G. Pre-War Differences in Attitudes Toward Gender Roles

In this appendix, I explore whether there were pre-war differences in attitudes toward female labor and gender roles across départements that experienced different military death rates. To capture local attitudes toward women, I rely on legislative behaviors of *députés* in the Assemblée Nationale, France's lower house, and analyze two important political elements: support to the extension of suffrage and eligibility to women in labor courts (*conseils de prud'hommes*) in 1901, and support to the extensions of political suffrage to women in 1914. The former captures pre-war men's beliefs about women's abilities as workers, as parliamentary debates were specifically focused on this issue (Willemez, 2015). The second captures a more general aspect of men's belief about gender roles. While support to the bill of 1901 can be directly observed through roll-call votes, support to the bill of 1914 can only be observed through an open letter written by several women's rights organizations in June 1914—the bill was to be voted on in August 1914, but the war interrupted the process.<sup>19</sup>

To assess whether local attitudes toward gender roles were correlated with the distribution of WWI military fatalities, I regress military death rates on département-level supports for each of these two bills along with the determinants of military death rates (Table G.1). Results imply that neither was correlated with the residual variation in military death rates used through the article, suggesting that results in Section 5 are not driven by pre-war differences in attitudes toward gender roles.

<sup>19</sup>The bill was eventually voted on in May 1919. While 32 percent of *députés* supported female suffrage in 1914, 79 percent did so in 1919. The bill was rejected by the Sénat in 1922, France's upper house.

Table G.1. Military Death Rates and Pre-War Attitudes

Dependent variable	Military death rate		
	(1)	(2)	(3)
Support to suffrage (1901)	0.20 [0.77]		0.47 [0.91]
Support to suffrage (1914)		-1.26 [0.99]	-1.38 [1.13]
Pre-war controls	Yes	Yes	Yes
Military region FE	Yes	Yes	Yes
Départements	86	86	86
R <sup>2</sup>	0.825	0.831	0.829

*Notes:* This table reports OLS coefficients from regressing military death rates on pre-war supports to the extension of female suffrage. *Support to suffrage (1901)* denotes average votes in favor of the extension of the suffrage to women for labor courts in 1901 in percent; *Support to suffrage (1914)*, average support to the bill extending the political suffrage to women in June 1914 in percent; *Pre-war characteristics* includes the share of rural population, the share of population born in the département, the female labor force participation rate, total fertility, the share of girls aged 5 to 19 who go to primary or secondary school, and personal wealth per inhabitants in Francs. Robust standard errors are in brackets.

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