Between Homefront and Battlefront: The Role of WWI Dependency Deferments in Shaping Women's Labor Force Participation

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Abstract

During U.S. participation in World War I (1917-18), nearly 37 percent of draft registrants were granted dependency deferments by local (county) boards with considerable variation in rates across regions. In an environment of increased demand for workers, I test the hypothesis that these deferments suppress the labor force participation of women who were dependent on draft eligible men. I find that a one percentage point increase in dependency deferments in a county corresponds to a 0.44 percentage point decrease in the labor force participation rate for married women but a 0.86 percentage point increase for single women. The study informs current debates about the potential inclusion of women in registration for the draft and the subsequent implications for labor force dynamics and family welfare.

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1 Introduction

Since 2016, women have been eligible for combat roles in the U.S. military, reigniting a latent policy discussion about requiring women to register for the draft. These discussions are disconnected from the historical context that saw American women, who were predominantly financially dependent on men throughout the 20th century, excluded from conscription. As contemporary society grapples with evolving gender roles, this paper aims to provide historical insights from World War I (WWI) to inform the debate on the implications of a gender-neutral draft on American families.

Specifically, I study the World War I (WWI) draft in the United States (1917-18) during which men could be granted deferments from being drafted for having dependents who relied on them to work for financial support. I test the hypothesis that dependency deferments from the draft suppressed the labor force participation of women who were dependent on the income of draft eligible men. In an environment of increased demand for women workers due to mobilization of men and increased wartime production, I predict that dependency deferments will have a distributional effect: single women's labor force participation will increase and married women's labor force participation will decrease. I use data from the decennial census and administrative records from the Selective Service System to understand the effect of the draft policy on women's labor force participation. My sample includes all 2,923 counties that were enumerated in both the Selective Service System administrative records and the decennial Census. The study period is 1910–1920.

Local boards, typically responsible for entire counties, classified registrants between the ages of 21–30 based on their dependents.[1][2] These had full authority to exercise discretion over the granting of dependency deferments, and rates varied widely. See Figures 1 and 2 for the distribution of dependency rates by county, which ranged from 0 percent to nearly 80 percent of draft registrants. Among those who did not receive deferments, men were drafted in order of draft number, determined in a national lottery.

Three main channels could increase women's labor force participation during WWI: shortage of men from enlistment and the draft, increased demand in war related industries, and an added worker effect for families who lost men's civilian wages when men left for war.[3] Dependency deferments could counteract these effects for women who depend on young men's income. These deferments could help maintain pre-war men's civilian incomes and reduce the need for women to seek employment in response to the wartime labor market dynamics. I proxy for the level of women's dependence by marital status. I assume decreasing dependency for married, widowed, divorced, and single women. I test these hypotheses by using a first difference with

[1] Local boards were comprised of three civilian leaders per county. In counties with more than 30,000 residents, multiple boards were created.

[2] Subsequent steps of the draft enabled local businesses to request deferments for workers in essential war industry.

[3] Although military service could reduce household income and push women into the labor market as an "added worker effect," this was partially mitigated by military allotments provided to soldiers' wives.

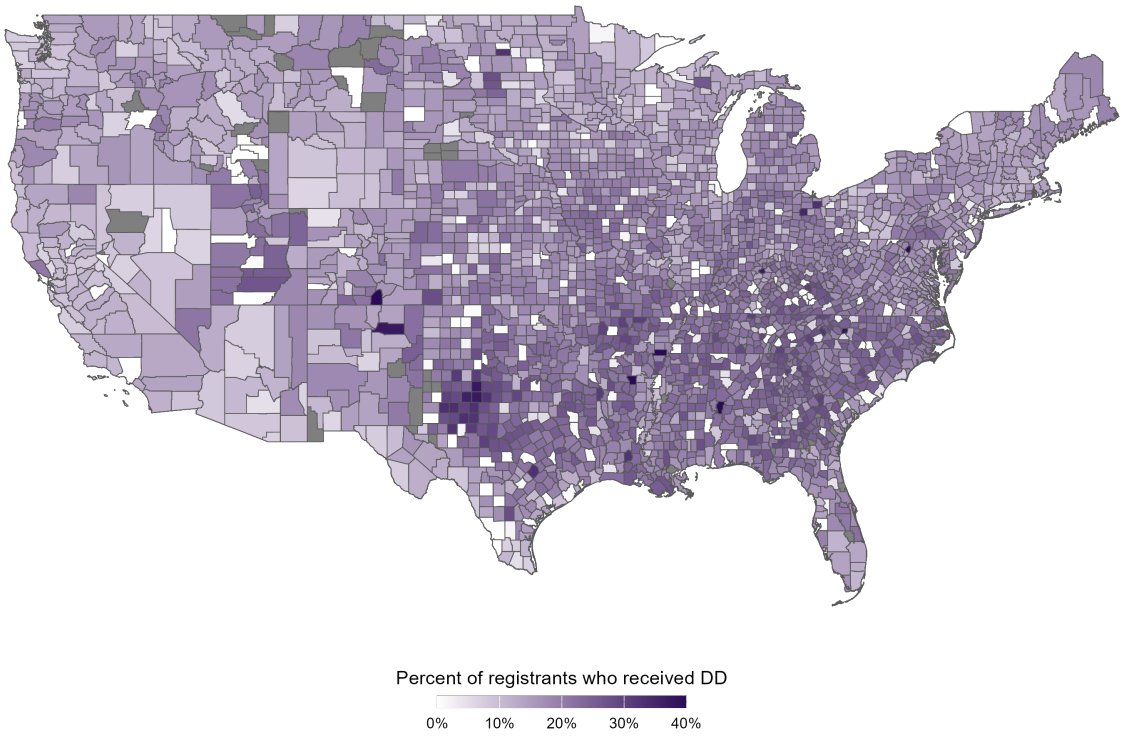


Figure 1: This map shows that draft boards (counties) varied widely in the rate of dependency deferments granted to draft registrants.
Source: Second report of the provost marshal general to the secretary of war on the operations of the Selective service system to December 20, 1918. *Note:* For the map only, data have been topcoded at 40 percent due to two extreme outliers. Autagua county, Alabama granted dependency deferments 77.3 percent of registrants. Jefferson, West Virginia granted dependency deferments to 51.2 percent of registrants.

an IV specification to measure the impact of the rate of dependency deferment in a county on the change in women's labor force participation from 1910-1920. Variation in the rate of dependency deferments could be driven by variation in eligibility, so I instrument using the share of men who were married or fathers prior to the war.

I find that a one-percentage-point increase in dependency deferments led to an 0.44 percentage-point decrease in the labor force participation rate of married women but a 0.86 percentage point increase in the labor force participation rate of single women. This effectively confirms the hypothesis that dependency deferments counteracted the increased labor demand for women workers during the war.

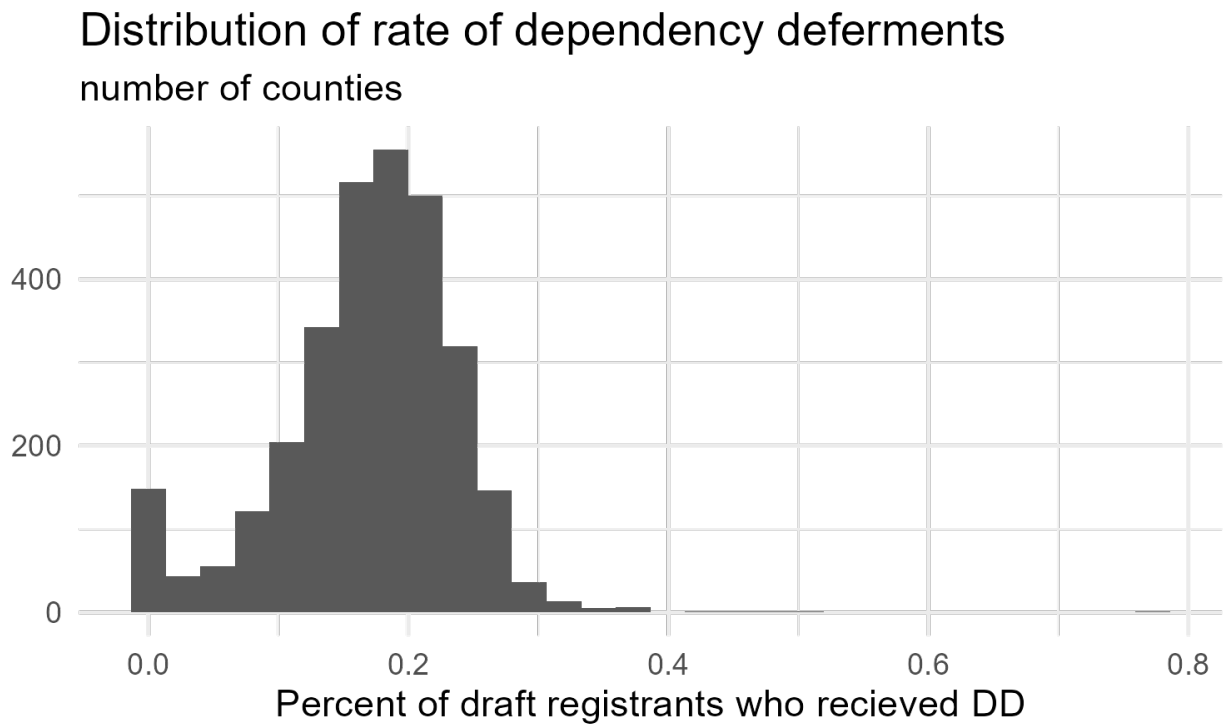


Figure 2: This histogram shows that draft boards (counties) varied widely in the rate of dependency deferments granted to draft registrants.
Source: See Figure 1 notes.

This paper contributes to three strands of literature. First, it addresses the impact of social norms on married women's labor force participation. Societies that historically practiced plough agriculture—requiring significant upper body strength and typically operated by men—developed norms that restrict women's roles to the domestic sphere. A one-standard-deviation increase in historical plough use is associated with a decrease of 7.82 percentage points in female labor force participation, which is equal to 15.1 percent of the sample average for women's labor force participation. (Alesina, Giuliano and Nunn, 2013). During industrialization (mid 1800s through early 1900s), the nature of work in the United States shifted from home-based and agricultural work, where many women were involved, to factory and industrial jobs that were predominantly male-dominated. Rising men's wages allowed women to work less, an income effect reinforced by social norms stigmatizing wives' work. The slower rise in women's educational attainment compared to men's also contributed to the decline in participation through a weak substitution effect (Goldin, 1995). Yet, black women's labor force participation remained high due to poverty and a legacy of labor during slavery (Boustan and Collins, 2014). After 1940, a significant determinant of the gradual but steady increase in women's involvement in the formal labor market was the growing number of men who were raised in families where their mothers worked. Yet, WWII increased women's labor supply by eroding the social norms that

wives should not work. For married women without (with) children, states with a high mobilization rate had a 30 (17) percent increase in labor force participation rate (Goldin and Olivetti, 2013). Those women also transmitted more permissive beliefs to their sons. If a man's mother worked during WWII, his wife was 24 to 32 percentage points more likely to work in 1980 (Fernandez, Fogli and Olivetti, 2004). Yet, beliefs that mothers should not work persist today because people systematically overestimate the gender conservativeness of their peers. By providing people with accurate information about peer beliefs, individuals were less likely to recommend that a mother reject a job offer and stay home with her child (Cortés et al., 2022). These papers show the effect of evolving social norms on changes in women's labor force participation and provides mechanisms for intergenerational transmission of gender norms. My paper contributes to the literature on social norms and women's labor force participation by examining how policy can perpetuate the norm of wives low labor force participation even in the presence of a positive supply shock of war.

Second, this paper contributes to the literature on the role of policy in women's labor force participation. Fertility significantly influences women's labor supply, so access to family planning, childcare, and paid leave affects women's labor force participation. The 15 percent decline in the cost of childcare for women born in the 1940s cohort, relative to the 1930s cohort, increased women's labor force participation from 47 percent to 68 percent (Attanasio, Low and Sánchez-Marcos, 2008). Women's labor force participation also increases with increasing the generosity of maternity leave up to 30 weeks (Del Rey, Kyriacou and Silva, 2021). Introducing unilateral divorce laws increased married and unmarried women's labor force participation by about two percentage points, suggesting that policy plays an important role in determining women's investment in outside options (Stevenson, 2008). I contribute to this literature by showing that the dependency deferments reinforced dependency norms even in an environment where war should reduce them.

Third, this paper contributes to the literature on the impact of war and draft policy on women's socioeconomic outcomes. World War I demand shocks increased agricultural prices, decreasing women's fertility, especially in agrarian regions. Doubling the agricultural price index reduced fertility by around 8 percent immediately and in subsequent years, due to increased women's opportunity costs (Kitchens and Rodgers, 2020). In France, the scarcity of men due to World War I led to increased female labor force participation. In départements with 20 percent military death rates compared to 10 percent, female labor force participation increased by 11 percent and persisted throughout the interwar period (Boehnke and Gay, 2020). One century after WWI, the legacy of the missing men remains vivid, with empirical evidence showing a persistent impact on women's working behaviors in départements with higher military death rates. This intergenerational transmission occurs through parental influence, marriage, and local social interactions, with mothers and mothers-in-law playing a key role (Gay, 2017). WWII increased labor force participation of married women with children by 4.6 percentage points, a shift that persists for more educated women

indicating a shock to labor supply (Goldin and Olivetti, 2013). Furthermore, the geography of female wartime work was mainly influenced by industrial mobilization rather than the withdrawal of drafted men. Post-war, returning veterans and cuts in war-related industries displaced many women, resulting in minimal long-term effects on female labor force participation and only slight increases in durables manufacturing employment by 1950 (Rose, 2018). During this period, the female labor demand curve had an elasticity of -1.0 to -1.5, with men and women being close but not perfect substitutes, and women being closer substitutes for high school graduate men rather than the lowest-education men (Acemoglu, Autor and Lyle, 2004). This body of research reveals that WWII induced a significant but complex shift in female labor supply, with persistent effects for more educated women and nuanced changes in labor demand and substitution patterns influenced by industrial mobilization and post-war dynamics. During the Vietnam war, paternity deferments were issued at more than twice the rate of education deferments incentivizing draft-eligible men to become fathers in order to avoid military service. (Bailey and Chyn, 2020). This resulted in a noticeable increase in fertility rates among women with partners subject to the draft. An increase of one man drafted in a state per 100 men aged 19-25 leads to a 1.6 percent decrease in the birth rate or approximately 0.3 fewer births per 1000 women (Bitler and Schmidt, 2012). I contribute to this literature by examining how draft policy can counteract upward pressure on women's labor force participation during war. I contribute to this literature by examining how draft policy can counteract upward pressure on women's labor force participation during war.

The remainder of this paper is organized as follows. Section 2 presents the historical background and conceptual framework. Section 3 provides data and descriptive statistics. Section 4 presents the empirical framework, and Section 5 presents results and discussion. Section 6 concludes.

2 Historical Background and Conceptual Framework

2.1 Historical Background

During the Progressive Era (1897-1920), women's employment patterns were distinctly shaped by marital status and race. While single women found increased opportunities, married women largely remained out of the paid labor force. Specifically, white married women experienced low labor force participation, while black women, both single and married, participated more actively due to higher rates of poverty and a legacy of slavery (Goldin, 1990, 2006; Boustan and Collins, 2014; Jones, 2009).

In the summer of 1915, the U.S. faced a severe labor shortage due to high industrial demand from European countries engaged in WWI and an abrupt end to the influx of European migrants. This shortage

became even more pronounced when the U.S. entered the war in April 1917 (Greenwald, 1990; Anderson and Chang, 2022). On the eve of the draft, there were 720,000 men in the Army (U.S. War Office, 1917). On June 5, 1917, all men between the ages of 18–30 residing in the U.S. were required to register for the draft. Local quotas were issued by the federal government based on population size, ensuring that the incidence of the draft was uniform across all counties (Crowder, 1919).[4] In total, only 28 percent of the 3.5 million soldiers were volunteers.[5] The remainder were drafted. (See appendix A.4 for details on the process of the draft.)

The Army implemented policies to discharge men with dependents, aiming to reduce widow pensions and limit financial claims through an appeal to Progressive Era social norms (Geva, 2013). These policies sought to minimize financial burdens on families and the federal government by offering deferments to men if their families relied on their labor for support. However, the criteria for these deferments varied widely across local draft boards. Some boards granted dependency deferments to all married men, while others assessed dependency based on whether a wife was employed or her skill level and employment prior to marriage (Geva, 2013; Henderson, 2010).

Black men rarely received dependency deferments, largely because their wages were generally lower than a soldier's pay, and because local boards in the South did not perceive Black families as dependent on men's wages (Shenk, 2005). Despite the ostensibly race-neutral draft policy, disparities were evident: 34.1 percent of Black men were drafted compared to 24.0 percent of white men. The variability in dependency deferments across states was significant, ranging from a high of 95.1 percent in Delaware to a low of 76.1 percent in Mississippi (Crowder, 1919).

For husbands who were drafted, the Army withheld a portion of their wages, supplementing it with government allotments that could reach up to $65 for wives and children. This financial support generally replaced or exceeded the civilian income of most men, particularly surpassing the income of sharecroppers in the South (Hickel, 2001; Shenk, 2005; Jones, 2009).

But, the rapid timeline of the draft meant that wives could not strategically drop out of the labor force so that their husbands could avoid military service. Men who were already married could claim dependents upon registration because the eligibility criteria for dependency deferments were not fully established until after men were required to register. Furthermore, the federal government issued a directive to local boards to scrutinize recent marriages for evidence of strategic moves to evade military service. For example, in one documented case, a man got married just days before his draft registration was not granted a dependency

[4]Consequently, any county-level variations in women's labor force participation are unlikely to be driven by differential mobilization rates, as they were during WWII and recorded by (Goldin and Olivetti, 2013).

[5]Women were barred by federal law from serving in the military, except for in auxiliary units as nurses and as clerical workers. A total of 34,000 women served in the Army and Navy Nurse Corps, Navy, Marine Corps, and the Coast Guard (Holm, 1992).

deferment (Newman, 2001; Crowder, 1919). This reduced the possibility that families could evade the draft by studying dependency deferment policy and reducing wives labor force participation.

As men left the civilian labor force for war and demand for war industries increased, single women increasingly filled vacant position (Kennedy, 2004). During the peak of U.S. participation in WWI, women entered various sectors in the civilian workforce. They produced armaments, steel and other metal products. Some were trained for railway and streetcar jobs. Women worked as telephone operators. Women also worked in agricultural roles, including single college women in the Women's Land Army. A smaller but notable group worked in utility maintenance and road repair (Greenwald, 1990; Anderson, 1920).

However, the end of WWI reversed many of the labor force gains made by women. Contraction of manufacturing, in particular, meant that women who found higher wages in this sector during the war lost them at the end of the war (Anderson and Chang, 2022). Women were also often dismissed from factories to make room for returning soldiers (Kennedy, 2004; Greenwald, 1990). Post-war employment policies increasingly featured marriage bars, which were used to fire single women upon marriage and not hire married women (Marchingiglio and Poyker, 2020). These bars served as significant structural barriers to women's employment and reinforced dependency norms for married women through the interwar period (Goldin, 1991). Despite marriage bars, there was a noticeable shift in the 1920s as young married women began to prolong their participation in the workforce (Goldin, 1991). After a century-long decline, female labor force participation in 1940 rebounded to its pre-industrial 1890 level, marking a significant turning point in women's labor trends (Olivetti, 2014).

2.2 Conceptual Framework

War-related market shocks might raise women's labor force participation during WWI through four effects. First, men might be drafted or enlist in the military, causing labor shortages among men workers which would positively shock demand for women workers in industries such as railroads and streetcar transportation (Greenwald, 1990).[6] Second, the war effort increased demand for wartime industry such as munition, steel, and metal production, necessitating more manufacturing workers. This male-biased demand shock would ordinarily increase demand for men workers only. But due to mobilization, fewer men would be available and employers would have to seek women. Third, wartime spillovers to female-dominated service industries such as telephone operators could also bolster demand for women workers. While these effects could enhance women's labor opportunities during the war, each could reverse at the war's end. Post-war, returning soldiers might displace women from male-dominated work. Furthermore, war-related manufacturing and spillover

[6] Unlike WWII, each county was required to furnish men in proportion to their population, so the incidence of labor shortages were not driven by differential rates of deployment of local men (Crowder, 1919).

service demand might dwindle, leading to layoffs of women employed during the war.[7] Fourth, war-triggered decreases in household income could potentially incentivize women to work (an income effect). But as I mentioned in Section 2.1, wives of drafted men received half of soldier's wages and an additional allotment of $15-$65. These payments were designed to defray the loss of men's civilian income. For black women in the south, these payments could be sufficient to fully replace men's civilian wages. For other women, the income effect might have provided some incentive to work but was limited by women's ability to replace husbands incomes with these payments. These four effects would all work in concert to increase women's labor force participation during wartime.

I test whether World War I dependency deferments played a crucial role in reinforcing traditional gender roles typical of the Progressive Era. These norms posited that a wife's employment reflected negatively on her husband's ability to provide (Goldin, 1995). Draft boards often reinforced this stigma by denying deferments to men whose wives refused to support their claims of dependency (Shenk, 2005). The application and impact of these dependency norms varied significantly across racial lines. For white families, the norms supported the traditional non-working wife ideal. Conversely, dependency norms generally did not apply to black families, where women's high labor force participation rates post-slavery were crucial for household income (Boustan and Collins, 2014). This racial discrepancy highlights the selective enforcement and acceptance of social norms influenced by economic needs and racial inequalities.

The end of the war and the subsequent reversal of demand shocks provided a context in which the long-term impacts of dependency deferments became evident. In counties that granted no dependency deferments, the increase in married women's wartime labor force participation altered both women's and employers' perceptions of women's roles, akin to the changes observed during World War II (Goldin and Olivetti, 2013). In these places, this shift suggested a potential normalization of women in the workforce. However, in counties with high rates of dependency deferments, these norms reinforced the male breadwinner model and penalized deviations from the male breadwinner family model. This created a perceived risk that employed wives could increase their husbands' likelihood of being drafted in future conflicts, discouraging labor force participation among newly married women even during peacetime.

Therefore, the presence of dependency deferments during World War I could diminish long-term labor force participation among dependent women by perpetuating dependency norms. These deferments not only reflected but also reinforced societal expectations regarding gender roles, with lasting effects on the labor market dynamics and cultural norms that extend beyond the war's end.

I provide three testable predictions based on this theory. First, higher rates of dependency deferments

[7](Goldin, 1991) suggests that one mechanism for displacement was through marriage bars, which enabled firms to fire married women workers.

should increase single women's labor force participation because single women are least least likely to live in a household with a man who claims them as a dependent. Second, higher rates of dependency deferments should decrease dependent women's labor force participation because married women are most likely to be dependent on men's labor (i.e. most likely to live in a household with a man who claims them as a dependent).[8]

3 Data

To identify local variation in dependency deferments, I draw on board-level administrative data from World War I. I have collected and coded the First and Second Reports of the Provost Marshal General (Crowder, 1918, 1919). This data is derived from a complete census of all men living in the United States between the ages of 21–30 in 1917–18.

The reports count classification of men within each local draft board, including the total number of soldiers who were registered, deferred for dependency, deferred for agricultural production, deferred for industrial production, or inducted into military service. Each local draft board was responsible for a small, individual county. However, in larger counties and cities, draft administration duties were divided among multiple boards. If multiple boards cover a single county, I combine them into one county-level observation to match the unit of observation in the study. Ideally, I would be able to calculate all variables from the decennial census at the local draft board level because this is the level at which deferment decisions are made in the draft. However, the decennial census does not identify which local draft board individuals reside in. The smallest geographic unit available is the county. Therefore, I am left with no alternative but to construct variables at the county level.[9]

Data on civilian workers comes from the full count U.S. decennial census data available for 1910 and 1920 (Ruggles et al., 2021). I focus on men between the ages of 21–30 because these are the men required to register for the draft. For these men, having dependents could earn deferment from the draft. Because it was common, but not universal, for women to leave the labor force upon marriage, women in this age range are on the margin of labor force participation (Goldin, 2021). Women on the margins of labor force participation during the war would have been children during the 1910 Census and potentially married women with children of their own by the 1920 census. The changes could meaningfully change women's

[8]Separated, divorced, and widowed women were likely to have a more complex relationship to extended family. Therefore, it is theoretically ambiguous how dependency deferments will affect these women.

[9]I exclude counties for which data is not available in 1910 for several reasons. I exclude 119 counties incorporated after the 1910 Census. I also exclude Flagler, FL; Okeechobee, FL; Humphreys, MS; De Baca, NM; and Lea, NM because they were established shortly before or during the draft period. I exclude Cochran, Crane, Hockley, and Loving in Texas, as these counties were "likely unorganized" at the time, and Bailey, TX, which was organized post-draft in 1919 (according to draft records). I omit five counties that were reorganized between 1910-1920 (Armstrong, SD; Schnasse, SD; Sterling, SD; and James,Tn.).

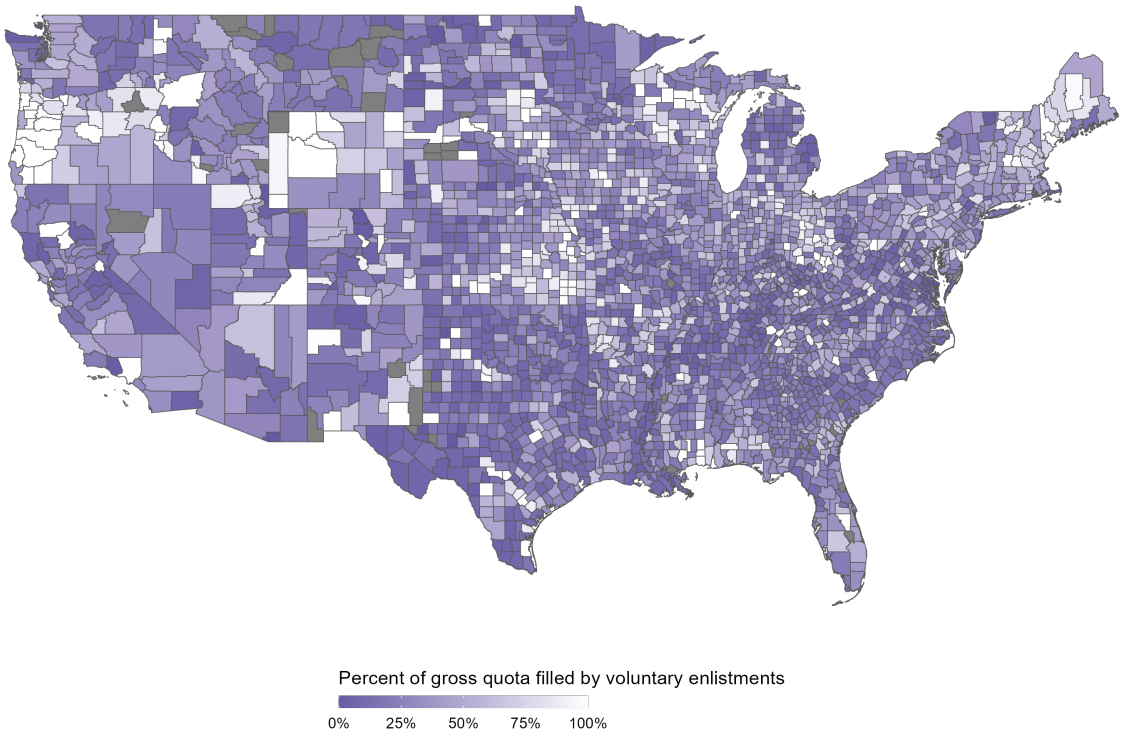


Figure 3: This map shows that the ratio of enlistments to draft quotas varied widely by county. Source: Second report of the provost marshal general to the secretary of war on the operations of the Selective Service System. December 20, 1918.

labor force participation. Therefore, I aggregate to the county level and calculate labor force participation rates for women aged 19-26 in 1910 and 1920.[10][11]

Table **??** and Figure 4 provides descriptive statistics for dependent variables capturing the change in labor force participation rates between 1910 and 1920. To provide a baseline comparison, the first outcome of interest is the change in men's labor force participation. The mean change in men's labor force participation rate is -0.028 with a standard deviation (SD) of 0.048, indicating a 2.8 percentage point decrease in men's

[10] In 1910 (1920), among married women, a quarter of women were married before age 19.1 (18.8), and a quarter were older than 26.5 (25.9) years old when they married (Rele, 1965).

[11] The 1910 decennial census recorded anomoly high levels of women's employment. This is due to a change of instruction to enumerators that " The occupation, if any, followed by a child, of any age, or by a woman is just as important, for census purposes, as the occupation followed by a man. Therefore if must never be taken for granted, without inquiry, that a woman, or child, has no occupation." By 1920, the Census had reverted to 1900 question without including this footnote and women's labor force participation once again dropped. I do not expect this change to impact the qualitative answer of my research. *How could/should I test this?*



Figure 4: This figure shows a negative correlation between rate of dependency deferment and the change in women's labor force participation. The spread of data is largest for divorced/widowed women and smallest for women who are currently married.
Source: Second report of the provost marshal general to the secretary of war on the operations of the Selective service system to December 20, 1918 and full count Decennial Census, 1910 and 1920 (IPUMS-USA).

labor force participation on average across counties. The mean change change in women's labor force participation rate is -0.039 with a SD of 0.091, indicating a 3.9 pp decrease on average across counties. Specifically, for single women, the mean change in labor force participation rate is -0.036 with an SD of 0.103, while married women experienced a slightly larger average decrease, with a mean change of -0.043 and an SD of 0.096. Divorced and widowed women saw more considerable variations in their labor force participation rates, with mean decreases of 0.072 and notably higher SDs of 0.238 indicating significant heterogeneity in labor force participation changes.

Table 1 provides descriptive statistics for independent variables in my sample. My key variable of interest is the share of draft registrants who received dependency deferments. The average share of dependency deferments was 0.170 with a standard deviation of 0.068. Figure 1 shows that there is not a strong regional pattern in dependency deferments, but rather meaningful variation within each region of the U.S..

My instrument is 1910 share of married men and fathers in each county, which serves as a proxy for the share of men eligible for dependency deferments. In 1910, the average share of married men or fathers across

counties was 0.48, with a standard deviation of 0.11. The range of this variable was quite broad, extending from a minimum of 0.17 to a maximum of 1.00, indicating substantial variation in family structures across counties.

I calculate the enlistment credit to quota ratio for each county, which controls for the fact that voluntary enlistments reduced a county's liability to the draft. The mean enlistment credit to quota ratio was 0.36 with a standard deviation of 0.26, indicating that most places drafted men but at drastically different rates. Figure 3 shows that the distribution of enlistment credit to quota by county was not uniform but also did not exhibit a strong regional pattern.

I also calculate control variables for known determinants of women's labor force participation.[12] High literacy rates enable women's participation in paid employment. The mean share of literate women in 1910 was 0.93 and a SD of 0.09, highlighting the relatively high and consistent literacy rates among women across counties. To control for the contemporaneous Great Migration of black Americans from the south to the north, I include the change in the share of black residents in a county with a mean change of -0.01 and a SD of 0.04. To control for the contemporaneous westward movement of immigrants, I include the change in the share of foreign born residents, with a mean change of -0.03 and a SD of 0.06, indicating large variation in movement of immigrants within the United States.

In my analysis, certain variables are constructed separately by race, marital status, and gender to capture detailed demographic effects. These variables include labor force participation rates (LFPR), shares of married men, shares of married or father men, and shares of literate individuals. Specifically, LFPR is calculated for different combinations of gender and marital status, while shares of married or father men and literacy rates are calculated for different racial groups. Conversely, some variables are aggregated across the entire county population, such as the mean number of children per household, overall shares of foreign-born residents, and the total share of Black residents. This distinction allows for a nuanced understanding of demographic influences while also providing a broader county-level perspective.

	1910-1920		1910-1930	
Married Men/Fathers	0.489	0.110	0.489	0.110
Dependency Deferments	0.171	0.068	0.171	0.068
Change in Share Black	-0.012	0.037	-0.02	0.048
Change in Share Foreign Born	-0.028	0.055	-0.05	0.082

[12] I use the same demographic group as the dependent variable to construct most controls. For example, in the regression where the dependent variable is the change in black married women's labor force participation, the share literate is also among black married women.

	1910-1920		1910-1930	
Change in Share Married Men	0.034	0.052	0.044	0.061
Enlistment to Quota Ratio	0.357	0.257	0.357	0.257
Share Black (1910)	0.144	0.217	0.144	0.217
Share Foreign Born (1910)	0.085	0.117	0.085	0.117
Share Literate (1910)	0.920	0.113	0.92	0.113

Table 1: Descriptive statistics for independent variables.

Note: I have also digitized ***non-representative*** *state-level employment data for wartime industry from the New Position of Women in American Industry report from the Women's Bureau of the U.S. Department of Labor (Anderson, 1920). The report documents by stae the number of male and female wage earners, the number of firms employing women, the number of women substituted for drafted men, and the number of women added without substitution after the first and second drafts in iron and steel, other metals, and lumber at the state level. Because the survey was not representative, and doesn't include all states, I have hesitated to use it in my main regressions. But still, I think it could provide value, particularly to disentangling short term impacts of men's mobilization and increased demand for war production from longer term changes in human capital of women and social norms. See Figure 5 for an example table that I have digitized.*

TABLE 22.—MEN AND WOMEN EMPLOYED AFTER THE FIRST AND SECOND DRAFTS AND WOMEN SUBSTITUTED ON MEN'S WORK OR ADDED WITHOUT SUBSTITUTION AFTER THE SECOND DRAFT IN PLANTS ENGAGED IN THE IRON AND STEEL INDUSTRY, BY STATES.

State.	Total firms reporting.	Labor force.								Total firms employing women after second draft.	Substitution of women on men's work after second draft.			Increase in force of women without substitution after second draft.		
		Total.		Men.		Women.										
		After first draft.	After second draft.	After first draft.	After second draft.	Actual number.		Number per 1,000 wage earners.			Firms substituting women.	Women employed.	Women substituted.	Firms adding women.	Women employed.	Women added.
						After first draft.	After second draft.	After first draft.	After second draft.							
Alabama	5	1,690	1,526	1,690	1,515	.....	11	.....	7	1	1	11	11	.....	.....	.....
Arizona	2	52	46	52	46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas	2	84	72	83	66	1	6	12	83	2	1	5	5	.....	.....	.....
California	69	2,756	2,747	2,702	2,676	54	71	20	26	28	4	23	13	6	23	6
Colorado	18	1,259	1,158	1,222	1,084	37	74	29	64	5	2	43	43	.....	.....	.....
Connecticut	175	66,776	76,842	55,884	61,435	10,892	15,407	163	201	129	52	13,125	3,103	25	905	497
	1	.....	10,718	.....	6,185	.....	4,533	.....	453	1	1	4,533	611	.....	.....	.....
Delaware	13	2,139	2,486	2,068	2,172	71	314	33	126	6	2	47	15	1	250	250
District of Columbia	2	2,520	2,021	2,519	2,020	1	1	(2)	(2)	1	.....	.....	.....	.....	.....	.....
Georgia	16	2,520	2,251	2,501	2,171	19	80	8	36	4	3	79	59	.....	.....	.....

Figure 5: This figure depicts data I have digitized at the state level that I could use to construct additional dependent variables. In particular, the last 3 columns could be useful to disambiguate increases in wartime demand and substitution of women for men who had been mobilized.
Source: New Position of Women in American Industry. Women's Bureau, US Department of Labor, 1920.

4 Empirical Framework

I used two model papers to rewrite this section.

- *Acemoglu, Daron, Amy Finkelstein, and Matthew J. Notowidigdo. 2013. "Income and Health Spending: Evidence from Oil Price Shocks." The Review of Economics and Statistics 95 (4): 1079–95.*
- *Miguel, Edward, Shanker Satyanath, and Ernest Sergenti. 2004. "Economic Shocks and Civil Conflict: An Instrumental Variables Approach." Journal of Political Economy 112 (4): 725–53. https://doi.org/10.1086/421174.*
- *Hornbeck, Richard. 2012. "The Enduring Impact of the American Dust Bowl: Short- and Long-Run Adjustments to Environmental Catastrophe." American Economic Review 102 (4): 1477–1507. https://doi.org/10.1257/aer.102.4.1477.*

The empirical analysis is based on estimating average changes in women's labor force participation in counties granting more dependency deferments relative to those granting fewer, with similar pre-war characteristics. I use a two-stage least squares (2SLS) regression to address the potential endogeneity of dependency deferments. This endogeneity arises because counties with higher rates of women dependent on men's labor have higher rates of men who qualify for dependency deferments. In the first stage, dependency deferments are regressed on the share of married men and fathers in 1910 and other control variables. In the second stage, the change in women's labor force participation is regressed on the predicted dependency deferments to estimate their impact on the change in women's labor force participation.

The simplest strategy would be to estimate β_1 in equation using ordinary least squares. However, OLS estimates of β_1 are likely be biased downward (i.e. larger negative effects) because dependency deferments are endogenous. This is because counties with higher rates of women dependent on men's labor have higher rates of men who qualify for dependency deferments

$$\begin{aligned} Y_{cst} - Y_{cs,1910} = \beta_0 \quad & + \beta_1 DependencyDeferments_{c,war} + \beta_2 EnlistmentCredits_c \\ & + \beta_3 (MMF_{ct} - MMF_{c,1910}) + \gamma (X_{cst} - X_{cs,1910}) \delta X_{c,war} + \theta X_{c,1910} \\ & + \mu_s + \epsilon_{cs} \end{aligned}$$

The outcome $Y_{cst} - Y_{cs,1910}$ in county c represents the difference in labor force participation from 1910 to year t. I regress this difference on $DependencyDeferments_{cs,war}$ and other controls likely to influence changes in women's labor force participation. The control variables include the rate of enlistment credits, which reduce

	1910-1920 change in women's labor force participation				
	All	Married	Divorced/ widowed	Single (with parents)	Single (not with parents)
Dependency Deferments	-0.096^{***}	-0.085^{***}	-0.145^{**}	-0.147^{***}	-0.040
	(0.021)	(0.031)	(0.058)	(0.032)	(0.030)
Mean dep. var.	-0.02	-0.027	-0.054	0.046	-0.002
All controls	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
R^2	0.510	0.540	0.240	0.501	0.217
Adj. R^2	0.501	0.531	0.225	0.492	0.202
Num. obs.	2923	2923	2865	2923	2919
N Clusters	49	49	49	49	49

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Note: Standard errors in parentheses are heteroskedasticity-consistent (HC2).

Table 2: OLS relationship between dependency deferments and change in weighted women's labor force participation

liability to the draft.[13] I include state fixed effects (μ_s) to control for state-level variation in policy, such as early women's suffrage.[14] I also control for baseline characteristics of women in 1910 that affect labor force participation, such as fertility and literacy ($X_{c,1910}$). Additionally, I account for demographic shifts, including internal migration of immigrants and the Great Migration of black Americans from the South to the North ($X_{cst} - X_{cs,1910}$).

I estimate equation 4 separately for all women, married women, divorced/widowed women, single women living with their parents, and single women living without their parents. I weight the observations by the number of women within each marital status category in a county. I cluster heteroskedasticity-consistent standard errors at the state level because governors distributed quotas to local draft boards.

The primary endogeneity concern in this setting is that social norms might simultaneously affect the generosity of dependency deferments and changes in women's labor force participation. To address potential endogeneity, I use the percentage of draft-age men who are married and/or fathers ($MMF_cs, 1910$) as an instrumental variable.[15] This instrument serves as a reasonable proxy for the share of draft-age men who are eligible for dependency deferments.[16]

In formal terms, the exclusion restriction requires that $MMF_{cs,1910}$ affects $Y_{cst} - Y_{cs,1910}$ only through $DependencyDeferments$, not through any other channels. Mathematically, this means $Cov(pre{-}warMMF, \epsilon_c) =$

[13]Men who voluntarily enlisted were not required to register for the draft.

[14]A handful of states granted women the right to vote before the passage of the 19th Amendment.

[15]Ideally, I would measure the share of married men and fathers in 1917, just before the draft rules were announced. Because no such data exists, instead I opt to use data from 1910 to estimate the share of men who would have been required to register if a draft were enacted in that year as the best available proxy.

[16]Ideally, I would exclude men earning less than $30 per month from the numerator of this instrument because men earning less than $30 per month were not eligible for dependency deferments. However, the decennial census does not enumerate wages during my period of study, so I cannot apply this criterion. It is worth noting that most agricultural wages in the South were below this threshold, but not in the West, making a simple earnings restriction for all agricultural workers ineffective for developing a better instrument (Bureau of Labor Statistics, **?**).

0, where ϵ_c represents the error term in the second stage regression, capturing all other unobserved factors affecting $Y_{cst} - Y_{cs,1910}$. The exclusion restriction asserts that the instrumental variable—the 1910 share of married men and fathers—should influence the change in women's labor force participation solely through dependency deferments. The exclusion restriction asserts that the instrumental variable—the 1910 share of married men and fathers—should influence the change in women's labor force participation solely through dependency deferments. The key to understanding the validity of the exclusion restriction in this context lies in distinguishing between levels and changes. The pre-war level of married men and fathers in 1910 is static within a county. While it can predict who received deferments, there is no obvious pathway by which this level could influence the dynamic changes in women's labor force participation.

Moreover, the exclusion restriction could be violated if dependency deferments were more common in regions with high wartime industrial production. However, local quotas required boards to draft men proportional to the population, preventing them from retaining more men for local production based on nearby manufacturing. Only after a decision was made on dependency was the process for granting deferments to men engaged in war industry initiated. The temporal separation of these decisions supports the claim that dependency deferments were not made based on industrial claims. This indicates that regional variations in dependency deferments reflected differing interpretations by local boards, rather than economic conditions, supporting the exclusion restriction.

Endogeneity could also occur if couples acted strategically to avoid the draft. Women could have stopped working to win dependency deferments for husbands. Men already married could claim dependents upon registration. However, as mentioned in Section 2.1, the eligibility criteria for dependency deferments were not fully established until after men were required to register, so it was impossible for wives to strategically stop working before determinations on his eligibility for dependency. For all these reasons, families were very unlikely to game the draft, which reduces the possibility of reverse causality.

The first stage estimates model 1.

$$DependencyDeferments_{cs,war} = \pi_0 \quad + \pi_1 MMF_c + \gamma(X_{cst} - X_{cs,1910}) + \theta X_{c,1910} + \rho X_{c,war} + \nu_s + \epsilon_c \tag{1}$$

The relevance of the instrument is confirmed by the significant correlation between the share of married men and fathers in 1910 and the share of dependency deferments among draft registrants. The first-stage results, presented in Table XX, yield a coefficient of 0.26 with a p-value less than 0.01, indicating a strong and statistically significant relationship between the share of married men and fathers in 1910 and my endogenous rate of dependency deferments in 1917-18, satisfying the relevance criterion for a valid instrument.

	Share of draft registrants who received dependency deferments				
	All	Married	Divorced/ widowed	Single (with parents)	Single (not with parents)
Married Men/Fathers	0.331***	0.323***	0.321***	0.334***	0.354***
	(0.062)	(0.056)	(0.069)	(0.067)	(0.074)
All controls	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
R^2	0.423	0.396	0.367	0.433	0.497
Adj. R^2	0.412	0.384	0.355	0.422	0.487
Num. obs.	2923	2923	2865	2923	2919
F statistic					
N Clusters	49	49	49	49	49

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Note: Standard errors in parentheses are heteroskedasticity-consistent (HC2).

Table 3: First stage relationship between share married men and fathers (instrument) and dependency deferments

The first-stage results, presented in Table XX, yield a coefficient of 0.26 with a p-value less than 0.01, indicating a strong and statistically significant relationship between the share of married men and fathers in 1910 and my endogenous rate of dependency deferments in 1917-18, satisfying the relevance criterion for a valid instrument.

$$\begin{aligned} Y_{cst} - Y_{cs,1910} = \beta_0 \quad & + \beta_1 Dependency\widehat{Deferments}_{cs,war} + \beta_2 EnlistmentCredits_{cs,war} \\ & + \beta_3 (MMF_{ct} - MMF_{c,1910}) + \gamma (X_{cst} - X_{cs,1910}) + \theta X_{c,1910} \\ & + \rho_s + \epsilon_{cs} \end{aligned}$$

Serial correlation in the errors can occur if there are omitted variables that vary over time in a systematic way, or if the effect of an independent variable persists over time. If the differenced errors are serially correlated, standard errors may be underestimated. To strengthen the claim against serial correlation, I control for migration that shifts the underlying demographics of a county. These controls include changes in literacy rates, the average number of children, racial composition, and nativity status. Including these controls aims to mitigate potential bias stemming from omitted variables that could also be influencing the labor force participation of women.

To test for the presence of serial correlation, I plot the residuals (i.e., the difference between actual and predicted $Y_{cst} - Y_{cs,1910}$). The residual plot is examined for any systematic patterns. Figure 6 shows that there is no systematic correlation between $DependencyDeferments$ and the residuals, providing some confidence that there is no serial autocorrelation. The lack of systematic bias in the residual plot suggests

that the model adequately accounts for the potential omitted variable bias. This further supports the validity of the causal inference drawn from the second stage regression.

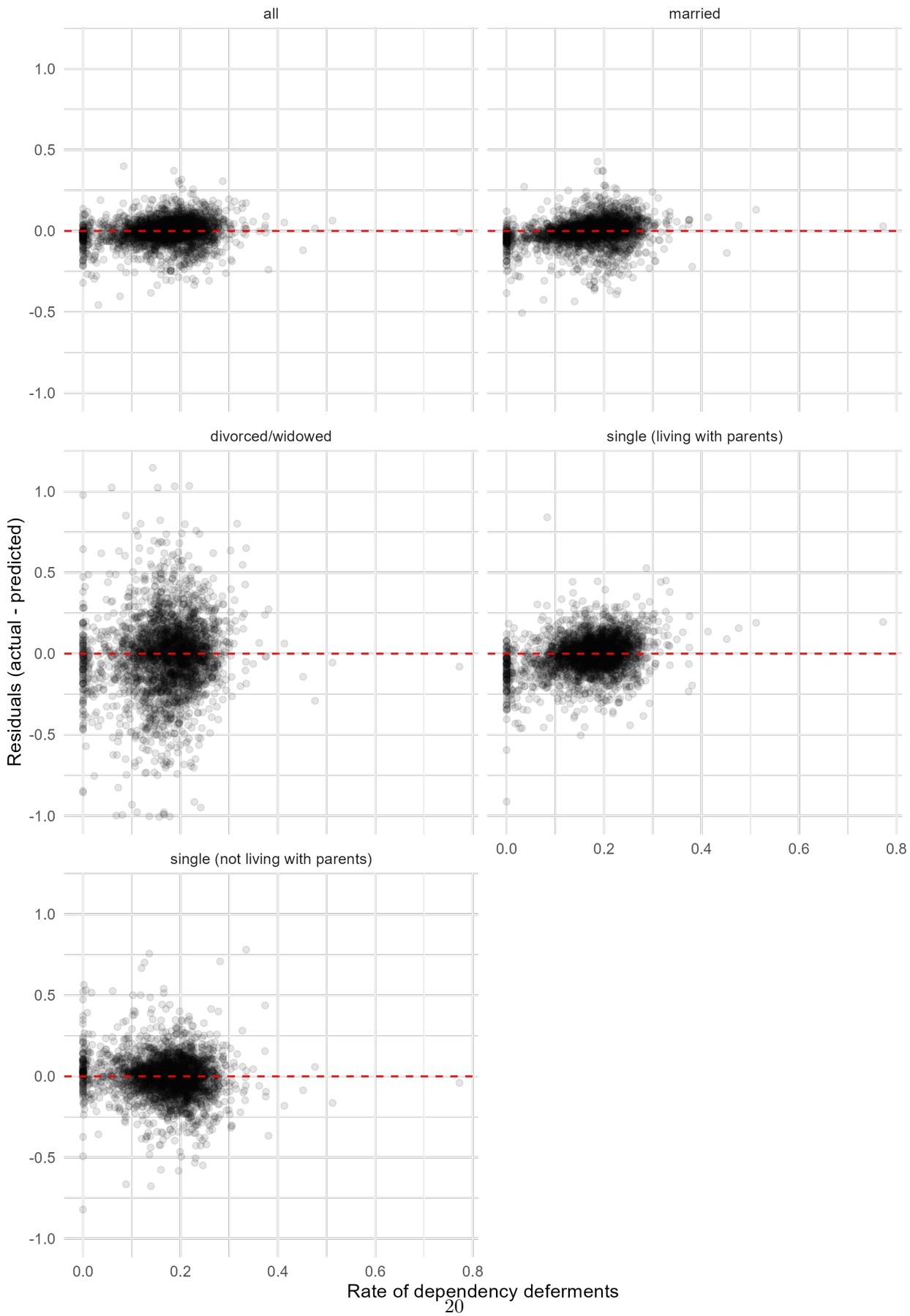


Figure 6: This figure plots the residuals between actual and predicted $\mathrm{Y}_{cst} - Y_{cs,1910} using model$**??**.

5 Results and Discussion

The principal findings regarding women's labor market outcomes are presented in Table **??**. To establish a baseline, I evaluate the impact of dependency deferments on the change in men's labor force participation. The first column shows that dependency deferments do not significantly influence men's labor force participation. Unsurprisingly, men's labor force participation is not impacted by draft policy.

The relationship between dependency deferments and women's labor force participation, however, is mediated by women's actual degree of dependence on draft age men. The second column shows that a one percentage point increase in dependency deferments leads to a 0.27 percentage point decrease in women's labor force participation, significant at the one percent level. The effect is more pronounced for married women, as indicated in the third column, where a one percentage point rise in dependency deferments results in a 0.44 percentage point decline in labor force participation for married women, reinforcing the hypothesis that dependency deferments negatively impact this subgroup. The fourth and fifth columns show no significant effect on divorced and widowed women. This is perhaps unsurprising considering the fact that these women may share caregiving and household responsibilities in common with married women, but are a group that is more likely to have been in the labor force prior to the war because of a lack of husband's income.

The last column demonstrates that single women's labor force participation increased by 0.86 percentage points with a one percentage point increase in dependency deferments.

	Women's labor force participation				
	All	Married	Divorced/ widowed	Single (with parents)	Single (not with parents)
Dependency Deferments	−0.286	−0.364**	−0.494**	−0.779***	0.170
	(0.174)	(0.147)	(0.211)	(0.244)	(0.233)
Mean dep. var.	-0.02	-0.027	-0.054	0.046	-0.002
All controls	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
R^2	0.492	0.508	0.218	0.380	0.200
Adj. R^2	0.482	0.498	0.202	0.368	0.184
Num. obs.	2923	2923	2865	2923	2919
N Clusters	49	49	49	49	49

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Note: Standard errors in parentheses are heteroskedasticity-consistent (HC2).

Table 4: Second stage relationship between predicted dependency deferments and change in women's labor force participation

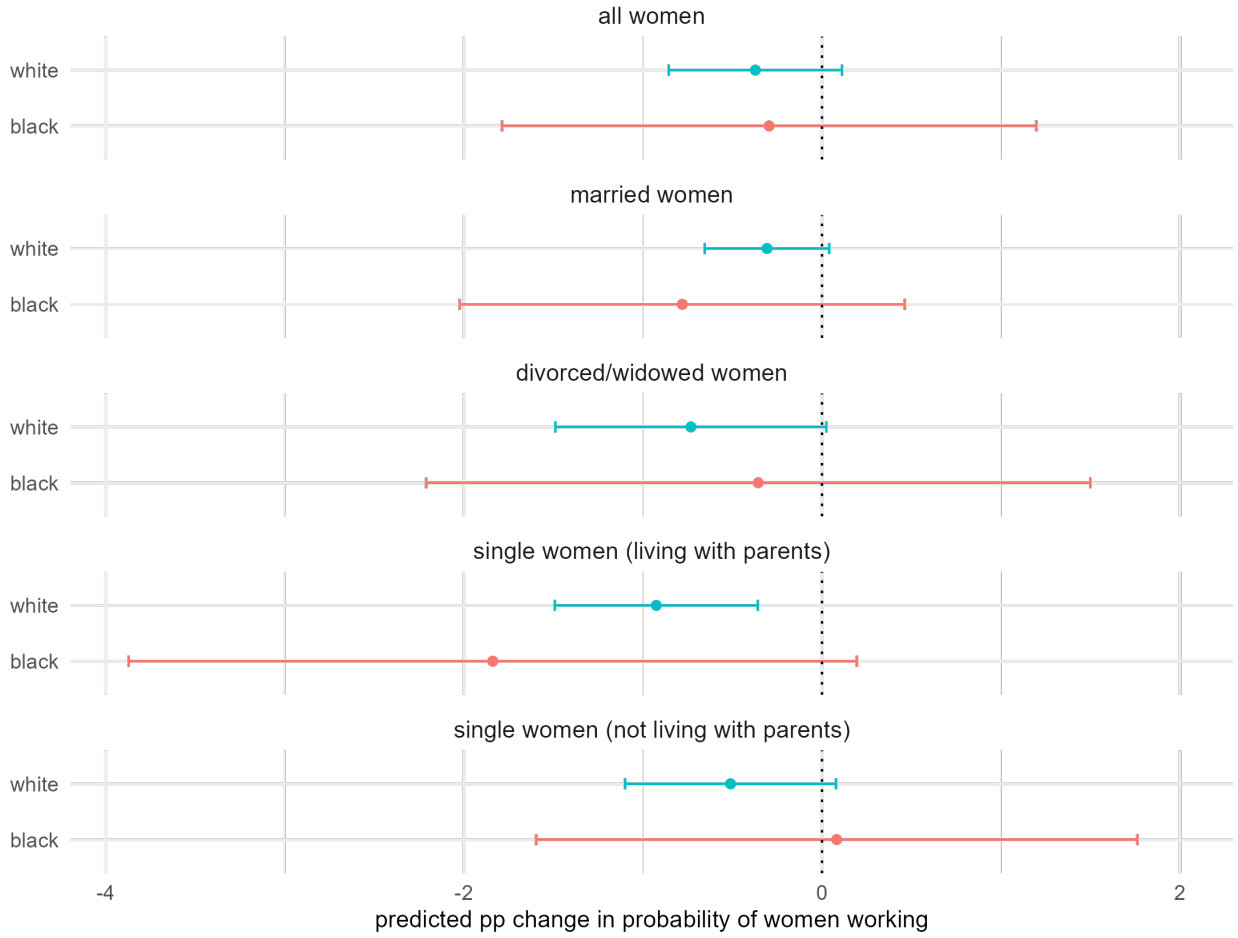


Figure 7: This figure plots β_1 values for model **??** by marital status and race.

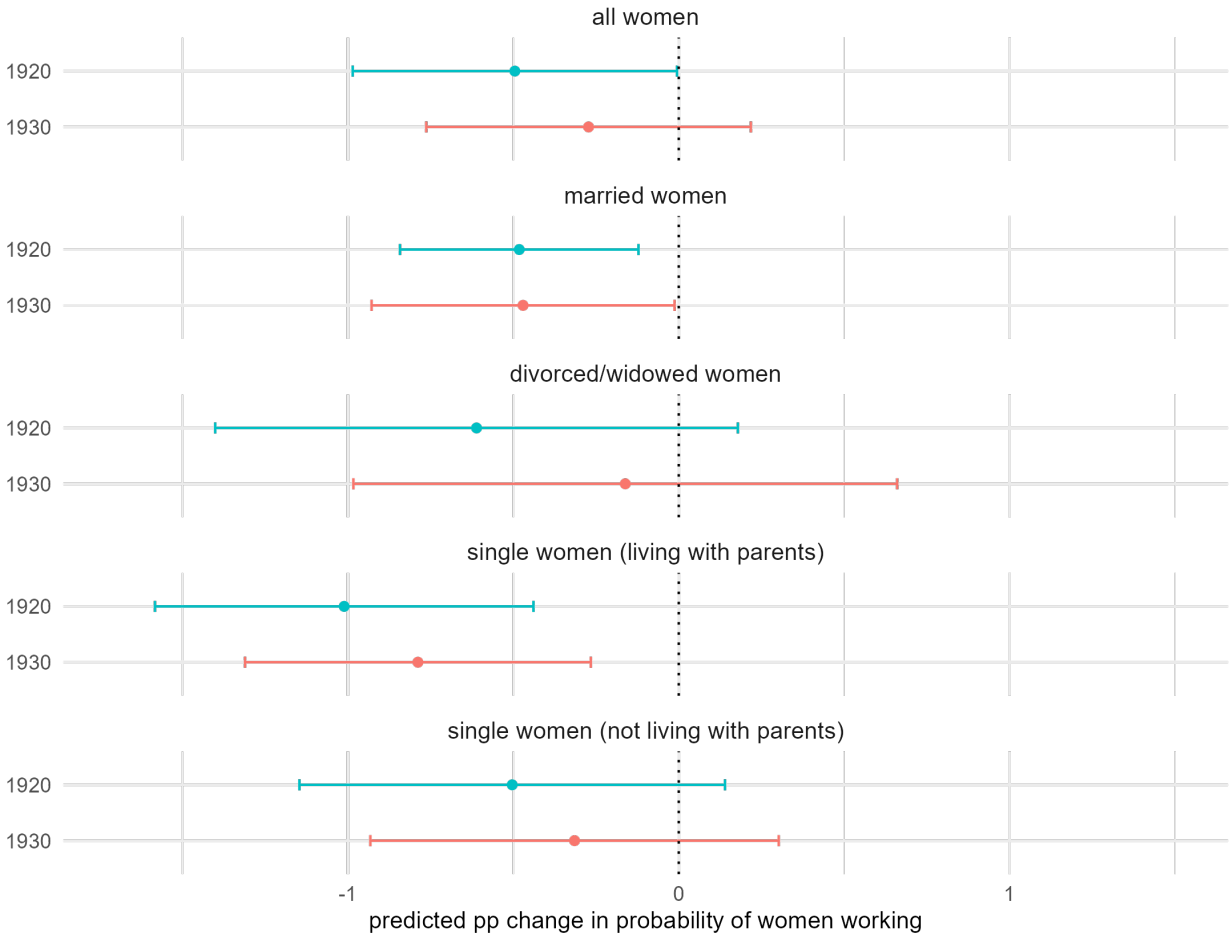


Figure 8: This figure plots β_1 values for model **??** by marital status over time.

6 Conclusion and next steps

During World War I, the U.S. government implemented a draft system that included dependency deferments, allowing men who financially supported family to delay or avoid conscription. This paper investigates the impact of dependency deferments on the labor force participation. The core hypotheses is that war increases women's labor force participation but that breadwinner deferments counteract this effect for women who are dependent on draft eligible men. Results confirm this hypothesis. Notably, a one-percentage-point increase in dependency deferments corresponds to an 0.44 percentage-point decrease in the labor force participation rate for married women but a 0.86 percentage point increase in the labor force participation of single women. This result validates the core hypothesis that dependency deferments suppressed the labor force participation of women who were dependent on draft eligible men. I show that policy ostensibly aimed at stabilizing families during wartime changed which women participated in paid work during a period of increased demand for women workers. Specifically, the analysis reveals that while single women experienced an increase in employment opportunities due to labor shortages and increased demand in several sectors, married women were subjected to societal pressures that curtailed their participation in the workforce. This differential impact underscores that seemingly neutral policies can actively reinforce norms around women's dependency.

This paper also suggests that government policies which shape how war shocks are distributed influence labor force outcomes for men and women. Unlike later wars where policy enabled large numbers of married young men to be drafted out of the civilian labor force, WWI dependency deferments enabled men to stay home. This reinforced dependency norms even in an environment of first wave feminist agitation. This paper clarifies the causal relationship between war policy and social norms around women's labor force participation. While mobilization and expanded wartime production increase demand for women workers, policy plays a mediating role. If women's dependency on men is not codified into policy, as it was during WWII, then war can shock erode dependency norm and increase women's labor supply. However, if women's dependency on men is codified, then war can reinforce dependency norms and decrease women's labor supply.

I want for this paper to inform a latent policy discussion about women's registration for the draft. APPAM discussants who know more about the military than I do argue that a draft is unlikely today so this

paper should not attempt policy recommendations to that end. I disagree because I have carefully examined the 2020 Final Report of the National Commission on Military, National, and Public Service and I can see that religious conservatives care deeply about maintaining a male-only draft registration. The impending maelstrom is apparent if the U.S. started to require that young women register for the draft. It is precisely that debate that I had in mind when developing this research question. But for now, I have removed those policy implications from my conclusion. As it stands, I feel that the conclusion is a bit anemic and that my paper fits into an obscure historical footnote of gender in the American economy. Is this a function of me not explaining my ideas well, or of the fact that this paper really isn't that important. Have I missed some other angle for my conclusion?

Note: Jeff Wheble has suggested another policy angle in which this paper could inform how LFP would change if men were no longer required to register for the draft. In my read of the policy and political environment, the chances of this happening are close to 0 so I find myself not wanting to bring my speculations there. But maybe there is value in defining that scenario as a contrapositive?

6.1 Next steps

I have intentionally left my empirical analysis limited in this draft because the directions I can take this paper differ quite a lot and I want feedback from my committee before I proceed. Ideas I have received so far:

1. **Use novel data during the war to inform short run outcomes.** *[My own idea:]* As I mentioned in Section 3, I have digitized the New Position of Women in American Industry which provides non-representative data on the degree to which employment of women grew during WWI, including the degree to which women replaced men in steel, other metal, and lumber production. The major benefit to this data is that it could enable me to say something about whether increased demand for war industry or the mobilization of men mattered more in the expansion of women's employment during the war. Unfortunately, the data are not disaggregated by marital status (nor do most of the qualitative descriptions offer much insight into the marital status of women workers during WWI). I *suspect* that most of the women workers during the war were single, but I likely need to do more theorizing or at least make that assumption to proceed. Additionally, women enumerated in the 1920 Census as not in the labor force may have indeed been working during the war but dropped out or were displaced when men returned home (Greenwald, 1990).

    - To do this, I need help thinking through how I can use nonrepresentative data, what I can say with it, and what I cannot.

2. **Disentangle mobilization from increased war manufacturing as demand shifters.** If I could find a reasonable source of information on where wartime manufacturing was located, I could use this to disentange mobilization from increased war manufacturing. Use proximity to war manufacturing to disentangle mobilization from increased demand.

    - The major problem here is that there is no single data source on wartime production for WWI as there is for later wars. Here is the NARA record group on the Office of the Quartermaster General which might provide something if I find the right folks. If you think it's worth a fishing trip, let me know. My inclination is to wait and discuss this at Clio.

3. **Consider the role of allotments for soldier's wives by race and marital status**. *[Suggested by: Kelly Jones and seminar participants at VMI/Washington and Lee]* The historical record shows that black men were less likely to receive dependency deferments for two reasons. First, sharecroppers in the south were unlikely to meet the $30/month salary requirement to earn dependency deferments (Crowder, 1918). Second, historically high persistence of black women's labor force participation (as a legacy of slavery) made black families less materially dependent on men (Shenk, 2005). This led to higher rates of drafted black men, whose wives earned race neutral allotments from the Army for financial support. These payments were sufficient in many cases to fully replace her wages from domestic or agricultural work (Hickel, 2001). I think this is super interesting and carefully constructed analysis could make a neat contribution to historical political economy of race and gender, but I would need to get feedback from economic historians who have more experience with racial analysis than I do to get it right. See footnote **??** for a historical data issue I would need to sort out.

    - To do this, I need to construct my dependent variable differently. I also need to get feedback from scholars who write about race in U.S. economic history.

4. **Disaggregate results by Civil War affiliation.** *[My own idea:]* During the Civil War, meaningful differences in draft policy drove differences in the relationships between civilians and the state with respect to corruption, concepts of fairness, and military/civilian relations. My read is that WWI draft policy more closely resembles Union Army draft policy (at least with respect to dependency). (Dorit Geva's Geva (2013) work has largely left me with this impression though I would need to shore it up if pursing this angle.) I hypothesize that because the draft rules were not finalized until weeks before draft registration, young men who were anxious about the possibility of a draft would look to social norms established from how the draft operated in their region during the Civil War. These norms could also influence how local boards interpreted and enforced the *de jure* draft classification rules during

the WWI draft. There's more thinking and reading to do here, but before I go down that rabbit hole, I want feedback.

- To do this, I need to run regressions on samples that are split by Civil War affiliation (e.g. state fought in Union Army, Confederate Army, was neutral, or was not yet a state). I would also have to read more about the legacy of the Civil War draft.

5. **Look at longer term outcomes.** *[Suggested by: Prof Hansen and Carl Wojtaszek]* Extend the first difference to 1930 and 1940 to evaluate how dependency deferments shaped longer term changes in women's labor force participation. Use Hornbeck (2012) as a model.

   - To do this, I need to clean data for the 1930 and 1940 decennial census. I also need to do additional lit review about the effect of the Great Depression on women's labor force participation and possibly modify my model to consider how geographic variation in the impact of the Great Depression affected women's labor force participation.
   - I do not think I should extend the analysis to 1950 because the concepts of labor force participation changed drastically in that year that "creates a disjuncture in the measurement of married women's labor" (details here). Also, WWII happened before the 1950 Census which changed norms around women's labor supply (Fernández, Fogli and Olivetti, 2004).

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A The draft registration and selection process

A.1 Centralization and Quota System

One of the striking features of the World War I draft system in the United States was its transition from local to national centralized drafting. In this system, local boards played a significant role and were generally composed of the county sheriff, county clerk, and a physician. Remarkably, these boards were civilian in nature, as military personnel were not allowed to serve on them, which was a policy decision aimed at avoiding undue military influence on the draft process. These boards were appointed by the governor of each state.

To ensure fairness and proportionality in the draft, net quotas for each local board were established based on the area's population size. The system operated under the equation $NetQuota_s = GrossQuota_s - EnlistmentCredits_s$, meaning that the quotas were adjusted to account for the number of men already enlisted in each state's Army or National Guard (Crowder, 1918).

A.2 Registration and Evaluation Process

Men who fell within the age bracket of 21 to 30 were required to register for the draft with their respective local boards. After registration, each registrant was assigned a serial number. The federal government then conducted a lottery in Washington, D.C., which determined the order in which these men would be assessed for potential deferments and undergo physical examinations.

The system allowed for a degree of flexibility and local discretion in the evaluation process. Applications for deferment could be submitted either by the registrants themselves or by their families. Financial guidelines were also in place; for instance, the draftee's monthly allotment was set at $30, and different family allowances served as a baseline for deferment decisions (Crowder, 1918; Hickel, 2001).

A.3 Deferments and Exemptions

As mentioned in Section 2.1, another key feature of the draft system was the concept of dependency deferments. The local boards had complete discretion in granting these deferments, leading to significant variations across different jurisdictions. Nationwide, a high proportion of married men—approximately 89.1%—received dependency deferments. However, these rates differed from state to state, indicating a lack of uniformity in the application of the deferment rules. Official guidance aiming to standardize the interpretation of "dependency" was eventually issued on August 18, 1917 (Geva, 2013; Crowder, 1919).

Among those not receiving dependency deferments, men skilled in critical jobs for wartime production, clerics, and foreign enemies (born in Austria or Germany) were granted exemptions by district boards. Nationwide, there were 4,557 local boards and 156 district boards. Men who did not receive a deferment or exemption were inducted into the Army in the order determined by the lottery (Crowder, 1919).

A.4 Multiple Registration Rounds

The draft was not a one-time event but was conducted in multiple rounds. The first round took place in June 1917, targeting men aged 21–30. A second round followed in June 1918 for men who had turned 21 in the past year. A third and final round in September 1918 expanded the age range to include men between 18 and 45. Yet, the armistice was signed before any men from this final round could be drafted (Crowder, 1920).