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The Great Depression and the rise of female employment: A new hypothesis ☆

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ABSTRACT

The life-cycle labor supply of women born at the turn of the 20th century diverged sharply from previous cohorts. Although they had similar participation rates in early adulthood, younger cohorts were significantly more likely to work at middle age. This paper documents a link between these changing patterns of female labor supply and the Great Depression. We find that the onset of the Great Depression led to an increase in young women's employment in 1930 via an added-worker effect. Cohorts induced into the workforce in the early 1930s had significantly higher employment rates through the 1940s and 1950s of up to 3 percentage points, suggesting a permanent impact of the Great Depression on women's lifecycle labor supply.

1. Introduction

1.1. Outline

The Great Depression was one of the most dramatic events in American economic history. It lasted nearly a decade, witnessed unemployment rates greater than 20% and a decline in GDP of over 25% (Margo, 1993). Economists and economic historians have extensively studied both the causes of the Great Depression and its impact on various socioeconomic outcomes, such as economic activity, fertility, mortality, and marriage.[1]

This paper provides the first evaluation of the long-run impacts of the Great Depression on female employment. A priori, this relationship is ambiguous. On the one hand, persistent unemployment of husbands, significant asset losses, and high levels of accumulated debt might have led married women to enter the labor market as secondary workers (an added worker effect). On the other hand, reduced labor demand and increased enforcement of marriage bars might have reduced their participation.[2]

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[1] Stuckler et al. (2012) examine the impact on mortality rates but find no significant effects. Hill (2015) finds a reduction in marriages and more long-lasting marriages. Fishback and Kachanovskaya (2015) study the impact of the New Deal on local economies, and Fishback at al. (2005, 2007) the impact of the New Deal on fertility and mortality rates in major US cities between 1929 and 1940. Fishback and Thomasson (2014) find that individuals born at the trough of the Great Depression in states with low per capita income suffered lower incomes and higher work disability rates when older. Margo (1993) reviews the literature on the impact of the Great Depression on employment and wages in the 1930s.

[2] According to Goldin (1991b) marriage bars were policies adopted by firms that required firing single women upon marriage and not hiring married women. These practices were common in teaching occupations.

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Our empirical analysis exploits variation in the severity of the economic downturn in the early 1930s across different states. We pool individual data on employment status as well as other characteristics from several Censuses between 1900 and 1960. Our primary measure of the severity of the Great Depression is the increase in the ratio of industrial and commercial failures to business concerns. Business failures increase in response to large and persistent shocks rather than to transitory shocks. They are also more akin to labor demand shifts that lead to layoffs than to labor supply shifts. Our main approach consists of comparing employment outcomes of women in different age brackets in states that were more *vs* less severely affected by the economic downturn during the Great Depression.

We document two main results. First, we show that women of working age in 1930 (16 to 64 years old in 1930) significantly increased their employment immediately after the Great Crash in states that were more severely impacted. Women who turned working age in the 1930s (aged 20 to 24 in 1940) also increased work in 1940 in response to the shock. The fact that married women increased their employment as well is suggestive of an added worker effect. Second, we find that these same cohorts had persistently higher employment rates throughout their lifecycle, decades after the Depression. Our estimates point to *cohort-specific* effects that are quantitatively important. We calculate that a 16 to 24-year-old woman in 1930 in a state that experienced a sharp increase in the business failure rate during the Great Depression will increase her work propensity by 16% when 25 to 34 years old in 1940 and by 22% when 45 to 54 years old in 1960. Calculations for a 25 to 34-year-old woman in 1930 suggest effects of similar magnitude. Among white women, the cohorts born between 1886 and 1920 – whom we refer to as the *D-cohort*– are the first to break the long-standing pattern of permanent labor market exit after marriage (Goldin, 1990; Costa, 2000).[3]

Our identifying assumption is that in the absence of Depression-related business failures, the employment of women would have trended similarly across states. We conduct a variety of checks to ensure the validity of this assumption. *First,* in addition to standard state, year, and division-year fixed effects, we control for a host of pre-Depression local covariates that could potentially confound the Depression-related effects (such as the size of manufacturing sector, migration, share of farms, etc.). *Second*, we show that our baseline measure of the Great Depression does not predict higher female labor force participation or employment in pre-Depression years. We further assess whether other unobservable state factors confound our estimates: significant economic downturns preceding the Great Depression, changes in contemporaneous economic conditions, WWII mobilization, the expansion of white-collar employment, or the expansion of the manufacturing and trade sectors (Goldin, 1990, 2000; Acemoglu et al., 2004). In the same spirit, we also employ county-level variation in per capita retail sales between 1929 and 1933 (Fishback et al., 2005) along with state-year fixed effects and verify that our main findings in the short-run go through. In sum, all exercises that we have conducted support the identifying assumption and strengthen our confidence that the link we document is likely causal.

Our findings suggest that the Great Depression could have induced an added worker effect in the short-term. What could explain, however, the persistence of the effects in the long-term? To answer this question, we first study the impact of the Great Depression on wages. We find that in states more severely affected by the shock, the *D-cohort* received lower wages in 1960, when 45 to 64 years old, relative to women of the same age in 1940. These effects persist after accounting for possible self-selection in the labor market. Habit formation and/or a labor supply shift due to declines in permanent income linked to the shock are plausible explanations of these findings. We obtain similar results for the wages of men in this age group, who could have been the likely spouses of the *D-cohort*. Employment gaps, absence of opportunities, and human capital depreciation may have led them to shift into lower paying occupations.

An alternative explanation for both the long-term increase in women's work and the decline in their wages is that the Great Depression had a long-term negative impact on the economies more severely affected. To address this possibility, we control for the states' differential growth of real per-capita GDP in the decades after 1930. Our results, however, remain unaffected. Finally, as an external validity check, we use an alternative source, a 1978 survey (Ridley, 2007) which asked a sample of 1,049 ever married women born between 1901 and 1910 questions relating to their experience surrounding the Great Depression. We find a strong positive link between the total number of years these women worked and the initial impact of the Great Depression on their family incomes.

Our findings complement previous explanations for the rise in women's participation including increased education, the expansion of the white-collar sector, the diffusion of labor-saving technologies, and WWII mobilization (Goldin, 1990, 1991a, 1998, 2000, 2006; Acemoglu et al., 2004; Greenwood et al., 2005; Lewis, 2018; Bailey and Collins, 2011). The paper also adds to the growing research aimed at understanding how households respond to negative shocks and in particular the role of spousal insurance in smoothing shocks due to husbands' job loss. Our analysis suggests that substantial income shocks, such as that induced by the Great Depression, which alter households' permanent income and entail long unemployment spells, can lead to persistent increases in women's labor supply.[4]

The paper proceeds as follows. A historical background is discussed in the rest of this introduction. Section 2 describes the data. Section 3 tests our hypothesis. Section 4 provides identification and robustness checks. Section 5 discusses various channels and examines the impact of the Great Depression on wages. Section 6 presents results from a survey on women born between 1901 and 1910. Section 7 concludes.

[3] The impact of the Great Depression is larger for the younger group in this cohort.

[4] Lundberg (1985), Finegan and Margo (1993, 1994), Stephens (2002), Blundell et al. (2016), Gong (2010), Cullen and Gruber (2000), and Bredtmann et al. (2018).

1.2. Historical background

The "Roaring Twenties" was a period of prosperity and economic growth, during which the construction and real estate sectors boomed and consumer debt to purchase durable goods, from home appliances to cars, sharply increased. Olney (1999) documents the dramatic expansion of installment payments in the 1920s and argues that "societal attitudes toward borrowers changed radically between 1900 and 1920; by the mid-1920s, buying on credit was considered normal, not sinful." She shows that this led to unmanageable household debt and to an increase in default rates in the 1930s. Bolin (1978) reports that middle-income households cut back on their expenditures but also tried to maintain installment purchases by "placing additional workers in the labor force". This meant that also wives of relatively more affluent husbands had to accept paid employment in order to maintain their living standards.[5]

In addition to the high consumer debt, the credit market expansion fueled a real estate bubble. After the stock market crash, falling prices combined with high unemployment and a sharp decline in incomes increased the real burden of nominal debt. Between 1926 and 1933, the foreclosure rate increased from 3.6 per 1000 home mortgages to 13.3. In 1933, on average 1000 homes were foreclosed daily (Wheelock, 2008). Bolin (1978) calculates that the number of married women in the labor force increased by approximately 50% between 1930 and 1940. Finegan and Margo (1994) report that among women whose husbands were unemployed in 1940 (but not on relief), 24% were in the workforce as opposed to 16% among women whose husbands were regularly employed. These calculations are suggestive of an added worker effect. Due to the hostility married women faced when entering the labor market during the Depression years, some acquired jobs by keeping their marital status secret (Vosko, 2000). Ware (1982) and Kennedy (1999) report that women took low-paid jobs in industries less hard hit such as in nursing, teaching, sewing or domestic services. Klein (2018) argues that after the 1929 crash, many African Americans were fired from positions that were taken over by white workers in need of employment.[6] These jobs, predominantly low-skill and low-pay, were also less likely to be restricted by marriage bars.

Fig. 1 corroborates the findings of Bolin (1978) and Finegan and Margo (1994) documenting increased participation of women in the 1930s, which is sharpest for younger and married women. Between 1940 and 1960 the increase in female employment is strikingly cohort-specific, with small increases for young cohorts and large increases for older cohorts, and particularly for those born between 1896 and 1915 (Goldin, 1990, 2000; Smith and Ward, 1985). The latter increased their participation dramatically and persistently relative to women born a decade earlier. Young married women may have been more affected than young single women as they may have bought their homes at peak real estate prices (Bellou and Cardia, 2016a) and/or have installment payments to make on newly purchased durable goods (Olney, 1999).

2. Data and identification

2.1. Data

Our main data source is the US Census obtained from IPUMS (Ruggles et al., 2020).[7] The baseline analysis relies on the full count files for 1910, 1930, 1940, the 1% sample for 1950 and the 5% sample for 1960. This data provides micro-level information on employment and other individual characteristics throughout this period as well as on wages from 1940 onwards. We primarily focus on white women born in the United States, not living in farm households and not in institutional group quarters.[8]

Our primary outcome of interest is employment status (variable *empstat*). Depending on the Census year, employment status is measured very close to the survey date, namely either the Census date or the previous regular work day or week.[9] This variable is available since 1910 but is not recorded in 1920, leaving us, unfortunately, with one pre-Depression reference point to account for pre-trends. We address this issue in Sections 2.3 and 4.1 by testing whether our measure of the Great Depression predicts (i) female labor force participation (available prior to 1910 but differently defined after 1930, see below) in pre-Depression decades 1900 through 1920, and (ii) employment in 1910, our only pre-Depression year for which this variable is recorded. This placebo test

[5] In a 1932 study, LaFollette surveyed women from the business and professional class who provided various reasons for working: economic necessity, children's education, mortgage payments or other debts, pay for sickness, raise standards of living, paying for the "extras" that would not have been possible if the husband was the only breadwinner (Bolin, 1978).

[6] Our calculations using the 1940 Census also suggest that the vast majority of non-farm ever married women who were employed in 1940 worked in personal services (in private households, hotels and lodging places, in laundering, cleaning and dyeing), hospitals, educational services, restaurants, food, apparel and general merchandise stores as well as in textiles. In terms of occupations, they were nurses, teachers, bookkeepers, stenographers/typists/secretaries, telephone operators, clerical workers, sales clerks, managers/officials/proprietors, dressmakers/seamstresses, operatives/kindred workers (about 20%), waitresses, housekeepers in private households, barbers/beauticians, laundry/dry cleaning operatives.

[7] All data and necessary files to replicate the results of this article are available in Bellou and Cardia (2020).

[8] Since we study changes in women's market work over time, we believe it is more sensible to focus on nonfarm households. Nevertheless, there was a major movement out of farming throughout the period of study starting even prior to the Great Depression. The Great Depression has been linked to agricultural distress in the 1920s and the New Deal farm-subsidy program and other work relief programs have induced movements out of farming (Fishback et al., 2006). To address potential selection issues related to this shift, we have examined whether exposure to the Great Depression influenced farming status. We find no evidence of this conditioning on all the variables described in (1). We also find that controlling for contemporaneous changes in the state's farming shares over time has no bearing on our baseline findings. These results are available upon request.

[9] The precise reference period for the *"empstat"* was the Census day in 1910 (April 15, 1910), the previous to the Census day (April 1, 1930) regular work day in 1930, the week of March 24–30 in 1940 (Census day was April 1, 1940) and the previous week to the Census date for later years (April 1st both in 1950 and in 1960).

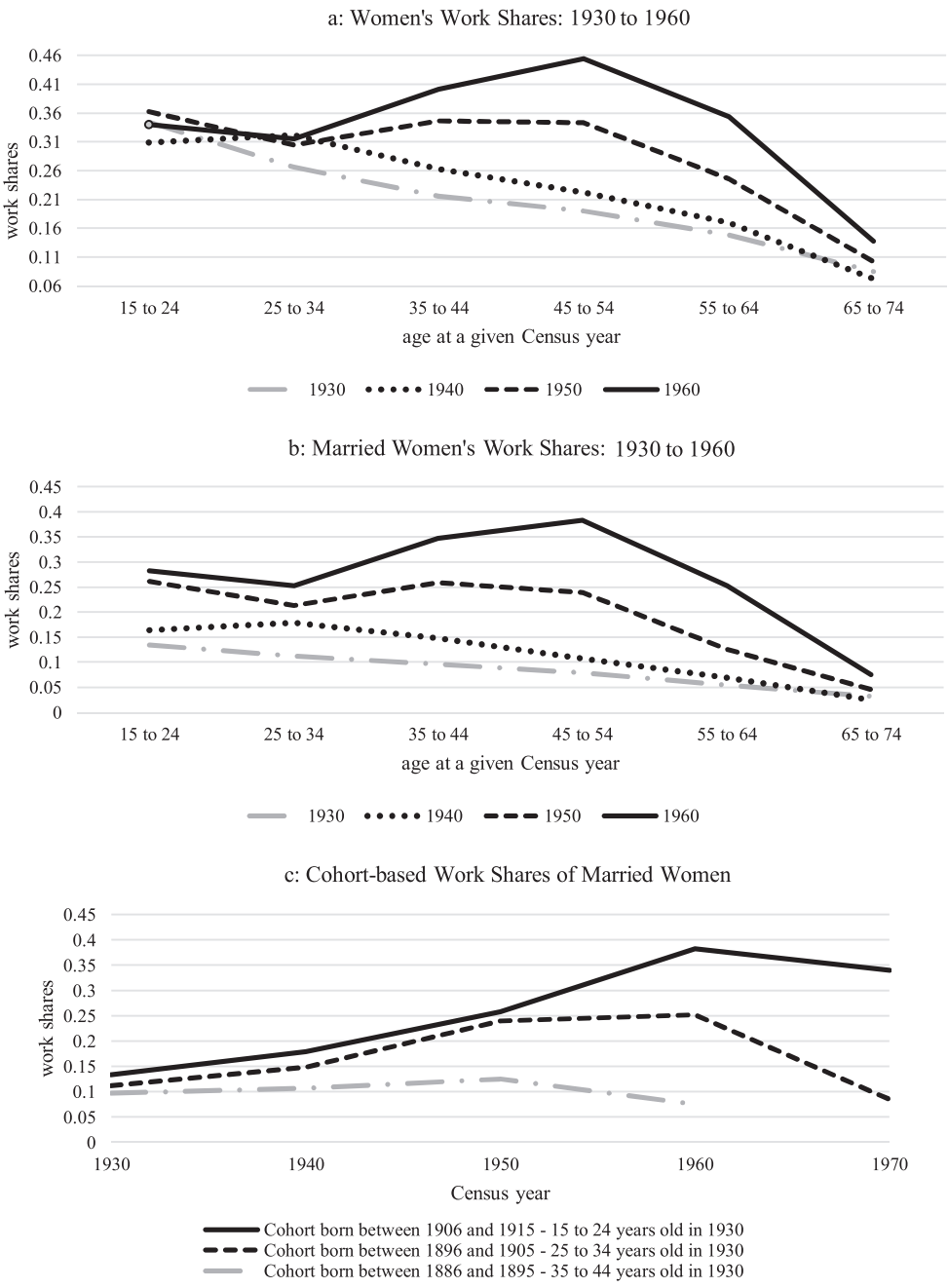

Fig. 1. a: Women's work shares: 1930 to 1960; b: Married women's work shares: 1930 to 1960; c: Cohort-based work shares of married women. Notes: Fig. 1a – mean female employment shares by age group and Census year. Fig. 1b – mean employment shares by age group and Census year for women who were married at the survey date. Fig. 1c – mean employment shares of married women by cohort (defined by their age in 1930) and over time. The sample includes white women born in the US, not in farm households and not in group quarters. Authors calculations using the 1930, 1940, 1950, 1960 and 1970 Census samples.

suggests that our measure has no predictive power in either of the two cases. Moreover, all our specifications include a number of pre-Depression state covariates (interacted with period fixed effects) that could confound our estimate of interest.

Labor force participation (variable *labforce*) is a preferable measure of female labor supply as it captures individual economic activity either through work or through active search for work. We focus, however, on employment (variable *empstat*), which can substantially differ from participation during periods of high unemployment, due to data limitations. Employment status is comparable across Census years for individuals aged 16 and above, while the labor force series presents serious comparability issues before 1940

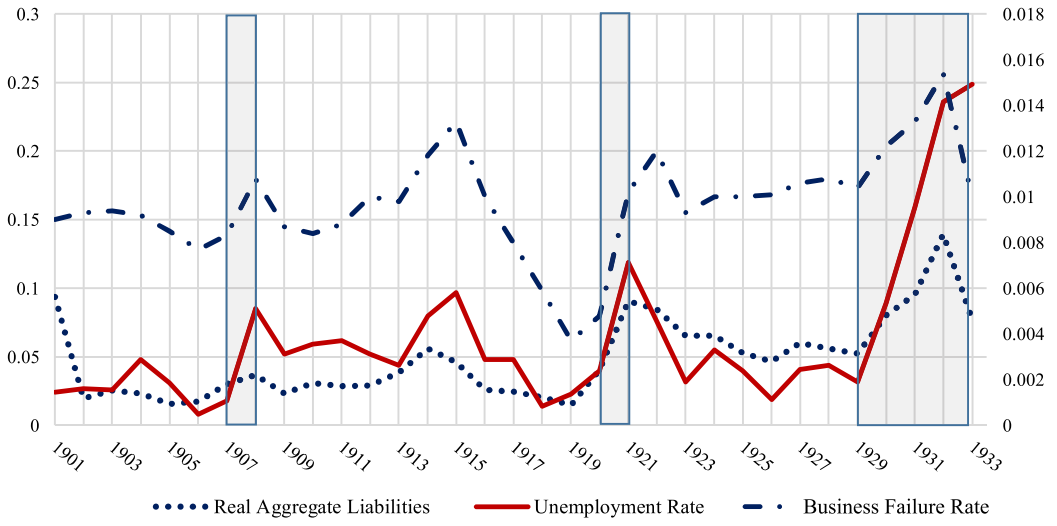

Fig. 2. Business failures, liabilities and unemployment rate.
Note: Historical statistics on national unemployment, business failure rate and total liabilities (scaled) of failing firms deflated by the CPI. Principal axis (left) measures the unemployment rate and aggregate liabilities. Secondary axis (right) measures the business failure rate. Grey shaded areas indicate NBER recessions: the Panic of 1907, the Depression of 1920–1921 and the Great Depression of 1929–1933. Data sources: BLS and Statistical Abstracts of the United States.

relative to after. Prior to 1940, *labforce* was based on reporting a "gainful occupation" during the previous year, while in the 1940 and later Censuses it is based on having paid employment or actively seeking one within a specific reference week. This discrepancy in the definition could be most problematic for the measurement of participation of married women over time. It has been argued that in the Censuses prior to 1940, there are significant issues regarding the ways women's market work was enumerated or perhaps not enumerated at all. If many married women considered their primary occupation to be "housewife" despite any other labor performed, then this could lead to undercounting of married female labor force participation and would make the subsequent increase in married women's work from 1940 onwards even more dramatic (Ruggles et al., 2020; Smuts, 1960).

Another central issue is how to consistently measure changes in economic conditions during the first half of the century. Our main measure of economic conditions is the ratio of industrial and commercial failures to business concerns (*U.S. Statistical Abstracts*) collected yearly by *Dun and Bradstreet Inc.*, NY (henceforth *business failures*). This is the only measure we are aware of that is at the state level and consistently available at an annual frequency since the late 19th century. Business failures include concerns involved in court proceedings or voluntary actions likely to end in losses to creditors. They cover manufacturers, wholesalers, retailers, building contractors, and certain types of commercial service, but do not include finance, insurance, and real estate companies, nor railroads, steamship lines or amusement enterprises. Business failures have been recognized as indicators of changes in economic activity; they decrease during expansions and increase during recessions (Moore, 1961; Richard and Gou, 2011).

Fig. 2 plots the nationwide rate of business failures against the unemployment rate since 1900. Major NBER recessions are highlighted with a shaded grey area (1907–1908, 1920–1921 and 1929–1933). We also report changes in total liabilities of failing businesses, collected yearly by *Dun and Bradstreet Inc.,* NY. They refer to the same universe of businesses as failures and give information about their size and economic significance.

As Fig. 2 shows, business failures capture the major recessions in the unemployment rate. Changes in failures rates and in total liabilities move in parallel with the business cycle, particularly in the neighborhood of significant business cycle changes such as the banking crisis of 1907–1908, the sharp recession of 1920–1921 and the Great Depression. In the recession of 1920–1921, business failures peak a year after the unemployment rate and total liabilities. While the business failure rate overall captures the peak and the trough of major business cycles, in some cases it may understate or overstate the amplitude of the cycle. In the pre-WWI period business failures increased remarkably. By comparison with the Great Depression these failures were fairly high. One limitation of business failures is that they are not informative about the size of failing businesses. Total liabilities show that failing businesses in the 1929–1933 recession carried relatively more significant liabilities than in the pre-WWI recession.[10]

We measure the severity of the Great Depression by the change in the average failure rate between 1929 and 1932 and the failure rate in 1910 (see Section 2.2). The recovery began in early 1933, and hence we are picking the years when the crisis was most severe. Henceforth, we refer to the Great Depression as the period between 1929 and 1932. Fig. 3 in the Appendix displays the cross-state variation in our measure.

[10] As part of our robustness exercises, we also use changes in business failures between 1911 and 1914 and 1910 and 1915 to see whether they have similar to the Great Depression effects on employment. We find that they did not have any statistically significant effect.

Table 1
Presentation of cohorts.

	Age in				
Birth cohort	*1910*	***1930***	*1940*	*1950*	*1960*
1866–1875	35–44	**55–64**			
1876–1885	25–34	**45–54**	55–64		
1886–1895	15–24	**35–44**	45–54	55–64	
1896–1905	0–14	**25–34**	35–44	45–54	55–64
1906–1915	0–4	**15–24**	25–34	35–44	45–54
1916–1925		**5–14**	15–24	25–34	35–44

In addition to the business failure rate measure, we confirm the robustness of our main findings using three alternative measures of economic conditions: per capita retail sales, state personal real income and state liabilities of failing firms. The first indicator is collected at the county level for a subset of years and allows us to use finer regional variation than state-level data. It is an indicator of consumers' purchasing power. Unlike business failures that cover a broader range of sectors, retail sales measure economic activity within one sector of the economy. We use the difference in per capita retail sales between 1929 and 1933 to capture the severity of the Great Depression.[11] This measure has a 0.27 correlation with our benchmark business failure measure.

Information on personal income by state is available since 1919 (Fishback and Thomasson, 2014), and is compiled from different sources (Martin, 1939; U.S Bureau of Economic Analysis, 2020). It includes various types of income (wages, proprietors' income, dividends, rents, interest, government transfers but not capital gains related to changes in stock prices) and is a measure of individuals' economic well-being (U.S Bureau of Economic Analysis, 2020). We measure a state's exposure to the Great Depression shock as the difference between the log-average real income between 1930 and 1932 and the log real income in 1928. There is a 0.33 correlation between this measure and our benchmark.

Finally, the third indicator is total liabilities of failing firms (L_s) and has already been discussed above. This measure of the Great Depression is constructed in an analogous way to the baseline measure: we take the average ratio of state-level liabilities over assets of failing firms between 1929 and 1932 relative to the same ratio for 1910.[12] Liabilities and assets are deflated using the CPI deflator. The correlation between this measure and our benchmark is 0.58. The results using the last two indicators are presented in the Appendix.

2.2. Econometric specification and definition of main variables

For our baseline analysis, we pool together panels spanning five decades: 1910, 1930, 1940, 1950, 1960. We consider six age groups: 16 to 24, 25 to 34, 35 to 44, 45 to 54 and 55 to 64 years old. Our main strategy is to compare the work behavior of women in each of these age brackets in post-Depression years to that of women in the same age brackets in pre-Depression years. As a reference, Table 1 presents the cohorts included in the analysis, their age at different decades and provides a visualization of how they can be followed over time in order to track their short- and long-run employment responses to the shock.

We focus primarily on women who were of working age at the onset of the Great Depression (15 to 64 years old in 1930) and therefore whose labor market decisions could have been directly impacted by the shock (in bold, Table 1). Women 15 to 24 years old in 1940 turned working age in the 1930s so their work behavior could have been affected directly as well. Clearly, all age groups in 1910 were untreated. In 1930, given the timing employment status was recorded, all age groups are potentially treated and our estimates will capture their immediate reaction to the shock. In later decades, all age groups are potentially treated and our estimates will describe the impact in the short-, medium- and long-run.

We estimate versions of the following baseline specification:

$$y_{it} = \alpha_0 + \alpha_1 CC_{s',t} + \alpha_2 GD_s \cdot d_{1930} + \alpha_3 GD_s \cdot d_{1940} + \alpha_4 GD_s \cdot d_{1950} + \alpha_5 GD_s \cdot d_{1960} + \alpha_6 mobrate_s \cdot d_{1950} + \alpha_7 mobrate_s \cdot d_{1960} + \alpha_8 X_{it} + f_s + f_{s'} + g_t + z_{s,t} + h_{s,1910} \cdot d_t + \varepsilon_{it} \quad (1)$$

y_{it} is an indicator for whether woman i is currently employed in year t (y_{it} = 1 if *"empstat"*=1 and 0 otherwise). The variable $CC_{s',t}$captures the effect of current economic conditions at the individual's state of residence (s'). These are measured by the business failure rate in year $t-1$, where t = 1910, 1930, 1940, 1950, 1960. All state variables in (1), with the exception of current economic conditions, are matched by the individual's state of birth (s) unless otherwise specified. The variable that captures the economic environment during the Great Depression is measured by the change (increase) between the business failure rate during the core Depression years (1929 through 1932) and the failure rate in 1910. More specifically, the variable GD_s is defined as follows:

[11] Several authors have used the decline in retail sales as a measure of the severity of the Great Depression (Fishback and Kachanovskaya, 2015; Fishback et al., 2007; Hill, 2015). We obtained the county data from Fishback et al. (2005). Per-capita retail sales are available in 1929, 1933, 1935 and 1939.

[12] $L_{st} = \frac{Lst}{Ast} * \frac{Ast}{At} = \frac{Lst}{At}$ where L_{st} are total liabilities of failing businesses in state s in year t, A_{it} their total assets and A_t the country's total assets of failing businesses.

- The change between the average business failure rate F across the years 1929 through 1932 and 1910 for 1940 onwards: $GD_s=F_{s,1929\text{-}1932} - F_{s,1910}$, *if* $t \geq 1940$
- The change in business failures between 1929 and 1910 for the 1930 cross-section: $GD_s=F_{s,1929} - F_{s,1910}$, *if* $t=1930$[13]
- 0 for 1910, which is a pre-treatment year and not affected by the Great Depression shock: $GD_s= 0$, *if* $t=1910$

GD_s is interacted with a year dummy allowing the shock to have a differential effect on work in post-Depression years.[14] To capture the potentially confounding effect of WWII on employment, we follow Acemoglu et al. (2004) and control for the share of registered men 18 to 44 years old who were drafted or enlisted in the war in a given state ($mobrate_s$). Time-invariant state-specific characteristics that could lead to differences in work via alternative channels are captured by state fixed effects: f_s for the state of birth (s) and $f_{s'}$ for the state of residence (s') to account for migration. g_t are year fixed effects to control for shocks over time that affect uniformly all states. We include time-varying division dummies $(z_{s,t})$ to capture omitted time-varying regressors at the division-level that could confound the estimated impact of the Great Depression. $X_{it,A}$ is a vector of person-specific characteristics such as her age (dummies), marital status, and a dummy for whether her current state is different from the birth state. $h_{s,1910}$ is a vector of 1910 state characteristics (employment share in manufacturing and trade, share farmers, share nonwhite, share foreign-born, and average occupational score as a proxy for income) interacted with year dummies.[15] Standard errors are clustered by birth state. Estimates are weighted using the appropriate sampling weights.

Aside from the baseline specification, we also report results that use 1940 as a base year. In particular, we re-estimate (1) pooling the 1940–1950–1960 panels and using as the dependent variable various measures of labor supply at the extensive or intensive margins. The coefficients α_4 and α_5 will capture the effect of the Great Depression on the change in labor supply for a given age group in 1950 and in 1960 differentially relative to 1940. Even if the base year 1940 is a post-Depression year, this analysis is of interest for three main reasons. First, from 1940 onwards the definitions of employment and labor force status and the underlying population are more comparable than before. Second, from 1940 onwards, it is possible to also study the intensive work margin as IPUMS reports information on *weeks worked in the past year* and *hours worked in the previous week*. Third, from 1940 onwards, information on individual wages becomes available which allows us to study both labor market outcomes (wages and employment) in the same time frame.

2.3. Identification

Our analysis relies on the parallel trends assumption which states that in the absence of a large macroeconomic shock (Great Depression), the average change in the labor supply of women should not be systematically different in states with low versus high rates of business failures. Since business failures varied across states also due to regional differences in observable factors, an important concern is whether these factors could also systematically affect our outcome variables. We address this point in a number of ways.

Table 2 reports several economic and demographic variables measured in 1910 for low and high changes in our baseline measure (defined in Section 2.2). As the cutting point between low and high changes, we use the median change 0.366. As can be seen, high failure states have a larger average size (measured by employment shares) of the manufacturing and trade sectors, a higher share of white and foreign-born people, higher average occupational scores, and lower agricultural employment.[16] Reassuringly, pre-depression female labor force participation rates are uncorrelated with business failures during the Great Depression. The fact that states with a larger employment concentration in manufacturing and trade experienced higher failure rate increases in 1930 is not surprising given that failures largely refer to businesses in the manufacturing and trade sectors.[17,18]

To ensure that our results are not due to any of the above pre-Depression state characteristics, in all our specifications we control for the 1910 state employment shares in manufacturing and trade, for the state's occupational score, for the share of farmers, of nonwhite people and of foreign born.[19] Controlling for these elements could further account for the presence and intensity of marriage bars

[13] The 1930 Census day was on April 1st, just 6 months after the October 1929 Wall Street Crash. The business failure rate is instead measured in December of each year. For this reason, we can only allow the 1929 (instead of 1930 and 1932) failure rate to affect the 1930 employment. The 1931 business failure rate was not recorded.

[14] Note that our treatment variable (GD) differs from the standard definition of a treatment variable in the context of a difference-in-differences framework: it is set to 0 in the pre-treatment period, and it takes a different value in 1930 relative to subsequent decades. This is because 1930 is treated, but not to the extent of later decades. To check the robustness of this approach, we decompose our treatment variable in two terms: one that captures the effects of the initial shock on all decades, $(GD_{s,1929} = F_{s,1929} - F_{s,1910})$, and one that captures the effects of the changes in failures between 1930 and 1932 $(GD_{s,1930\text{-}32} = F_{s,1930\text{-}32} - F_{s,1910})$ in 1940 and later decades. These terms are multiplied with time dummies (years 1930 to 1960 for the first term, and 1940 to 1960 for the second). The estimates are reported in Appendix Table A5. As can be seen, the first term has a positive and significant effect only in 1930, while the second has a positive effect throughout reproducing the same patterns as our baseline measure.

[15] See Section 2.3 for a justification of the choice of variables included in this vector.

[16] The IPUMS provides no information on income prior to 1940. Therefore, occupational scores are used as a proxy. We found no association between employment shares in other smaller sectors of the economy in 1910 and our measure of business failures in the 1930s.

[17] However, they do not constitute the largest share of failures. For example, in March 1930 failures in *Manufacturing* constituted 26% of all failures, failures in *Trade* (wholesale and retail) 68%, and failures in *Brokers and Transporters*, 6% (Richardson and Gou, 2011).

[18] In Appendix Table A1, we compute analogous statistics for working women in 1910. The overall patterns presented in Table 2 are largely reproduced there, too: in high failure states, working women were more likely to be employed in manufacturing and trade industries, were less likely to live in urban areas, and were somewhat less likely to be married.

[19] In the robustness section, we show that controlling for the state distribution of the remaining smaller sectors of the economy in 1910 does not modify any of our findings.

Table 2
1910 characteristics of states grouped by the average increase in the business failure rate between 1929-1932 and 1910.

State characteristics	(Avg failure rate btw 1929 and 1932) – (Failure rate in 1910) Low failure rate increase (<=0.366)	High failure rate increase (>0.366)
Employment share in agriculture	0.408	0.284
	(0.037)*	(0.035)*
Employment share in manufacturing	0.132	0.205
	(0.018)*	(0.026)*
Employment share in trade	0.099	0.118
	(0.006)*	(0.007)*
Employment share in services	0.160	0.155
	(0.009)	(0.005)
Employment share in finance	0.014	0.016
	(0.001)	(0.001)
Employment share in utilities	0.074	0.086
	(0.004)	(0.005)
Share of farm households	0.425	0.298
	(0.038)*	(0.034)*
Share foreign born	0.096	0.178
	(0.017)*	(0.019)*
Share non-white	0.179	0.074
	(0.035)*	(0.028)*
Share married	0.696	0.679
	(0.009)	(0.009)
Participation rate of nonfarm women	0.274	0.277
	(0.013)	(0.015)
Mean occupational score	18.97*	21.11*
	(0.549)	(0.581)

Note: State averages calculated from the 1910 IPUMS USA cross-section. State business failure rate is obtained from the Statistical Abstract of the US. There are 24 states in the first group ("low" failure rate) and 25 in the second ("high" failure rate). * indicates that the means between the two categories for a given variable are statistically different at 5% significance levels.

across states and their role in restricting female employment. States with a higher share of non-natives and non-whites, lower incomes and higher manufacturing employment were potentially less likely to be affected by implicit or explicit prohibitions or restrictions in women's work (Goldin, 1991b).

We further check the validity of the parallel trends assumption by testing whether our measure of the severity of the Great Depression can predict (i) female labor force participation in pre-Depression decades 1900 through 1930 and (ii) employment in 1910. For the first placebo test we focus on labor force participation because employment status is not available in any pre-1930 samples except for 1910.

In addition, we address identification concerns related to the presence of confounding state factors as follows. First, we explicitly test within the context of our setup whether WWII mobilization, the expansion of white-collar employment or the expansion of other large sectors of the economy such as manufacturing and trade confound any of the short or long-run effects of the shock that we document. These time-varying controls are introduced in addition to state and year fixed effects as well as division-year interactions, which are by default included in all our estimations. We also check whether our measure is picking up the effect of the 1921 Depression, which was brief but sharp. Second, we evaluate the hypothesis that the Great Depression induced an increase in female employment using a conceptually different measure of economic conditions and a different source of variation: changes in per capita retail sales by *county* of residence between 1929 and 1933 along with state-year fixed effects. Since several counties are not identified in public-use microdata from 1950 onwards, this analysis is based on a subset of years (1910, 1930, 1940 pooled samples) and hence will be informative on the *short-run* impact of the shock.

3. Great Depression and female employment

3.1. Main results

The results from estimation of (1) are reported in Table 3. As can be seen, in states with worse economic conditions during the Great Depression, there is an immediate increase in women's work in 1930 across all age groups. Interestingly, these effects carry over in the short-, medium-, and long-run and have a clear *cohort-specific* pattern: more women, who were 16 to 34 years old in 1930, work when they are older in 1940, in 1950, and in 1960 (see solid black lines). Moreover, women younger than 16 at the onset of

Table 3
The impact of the Great Depression on employment of white women.

	1910-1930-1940-1950-1960 pooled samples				
Age in year *t*:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dependent variable:	*= 1, if currently employed*				
GD*d1930	0.022	0.016	0.019	0.018	0.014
	(0.010)**	(0.005)**	(0.006)**	(0.007)**	(0.007)**
GD*d1940	0.021	0.029	0.024	0.017	0.004
	(0.020)	(0.011)**	(0.007)***	(0.007)**	(0.007)
GD*d1950	0.001	0.024	0.022	0.024	0.003
	(0.014)	(0.010)***	(0.009)**	(0.013)*	(0.014)
GD*d1960	-0.006	0.009	0.027	0.028	0.018
	(0.011)	(0.009)	(0.010)**	(0.010)**	(0.010)*
CC	-0.019	-0.004	-0.008	-0.018	-0.019
	(0.006)***	(0.003)	(0.004)**	(0.005)***	(0.005)***
N	*17937326*	*17003488*	*13130954*	*9466752*	*6183620*

Notes: OLS coefficients from a regression of an indicator for whether the respondent is currently employed on a measure of the severity of the Great Depression (*GD*) interacted with year dummies, contemporaneous failures, dummies for age, marital status, whether state of residence differs from the birth state, state of birth, state of residence and year fixed effects, division-year interactions, 1910 state covariates (employment share in manufacturing and trade, share farmers, share nonwhite, share non-natives, average occupational score). See discussion of Eq. (1) in text for more details. *GD* is defined as the difference between the average business failure rate between 1929 and 1932 and the business failure rate in 1910 by state if *t*>=1940; it is the difference between 1929 and 1910 business failure rates if *t*=1930; it is 0 if *t*=1910. All state variables except current failures are assigned by birth state. The estimation uses the 1910, 1930, 1940 full count samples, the 1% 1950 and the 5% 1960 samples. The analysis is based on white, native women not in farm households and not in group quarters. Estimates are weighted using the available sampling weights. Standard errors are clustered by state of birth. The solid and dashed line rectangles indicate the cohorts we follow over time. For instance, women 16 to 44 years old in 1930 (rectangle with solid lines throughout) are "followed" when 25 to 54 in 1940, 35 to 64 in 1950 etc. Similarly for women 16 to 24 years old in 1940 (dashed line rectangles). ***, **, * indicate significance at 1%, 5% and 10% respectively.

the Great Depression, but who turned working age during the 1930s, also increase employment in 1950 and in 1960 in states more severely impacted by the shock (see dashed black lines).[20]

At the bottom of the table, we report the coefficients corresponding to the effect of contemporaneous economic conditions as measured by the current business failure rate (*CC*). In line with the hypothesis of a labor demand shift, these have a positive and significant effect on female labor supply (Goldin, 2006). Importantly, however, this is an effect independent from that of the Great Depression. Finally, note that these estimates are also independent of the effect of WWII mobilization for which we control using the state fraction of men who were drafted. Importantly, we find that the Great Depression increased female employment between 1930 and 1940, before WWII.

Our results do not only apply to a very broad group of cohorts but they are also quantitatively meaningful. To obtain an idea of the magnitude of these effects, we consider the cohorts of women who were 16 to 34 years old in 1930 and whose entire employment profile was linked to the Great Depression nearly until their retirement in the 1960s. Our estimates suggest that a 16 to 24-year-old woman in 1930 in a state severely affected by the Great Depression (such as Massachusetts or New Jersey experiencing an average increase in the business failure rate of 0.99) will increase her work propensity by 2.9 percentage points (0.029*0.99) when 25 to 34 years old in 1940 and by 2.8 percentage points (0.028*0.99) when 45 to 54 years old in 1960.[21] These effects imply an increase in the age-specific work shares by 16% and 22% respectively relative to their 1910 levels (see Table 5). Similar calculations for the 25 to 34 year-olds in 1930 suggest increases in their employment by 2.3 percentage points in 1940 and by 1.8 percentage points in 1960 when 55 to 64 years old. Relative to 1910, these amount to 15% and 20% higher work shares.[22]

[20] When we estimate (1) separately for the subgroup of 20 to 24 year-olds in 1940, we find a positive and significant estimate. Instead, there is no significant effect for women younger than 20 in 1940.

[21] The 0.99 is the average increase in the business failure rate (our measure) across Massachusetts, New Jersey, Rhode Island, Connecticut, Washington, Oregon, Wisconsin, Utah, Wyoming.

[22] The reader needs to interpret cautiously the estimates pertaining to the oldest age group (aged 55 to 64) due to selective mortality considerations.

Table 4
The impact of the Great Depression on employment of other demographic groups.

	1910-1930-1940-1950-1960 pooled samples				
Age in year *t*:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dependent variable:	*= 1, if currently employed*				
Panel A:	***White men***				
GD*d1930	0.005	0.003	-0.000	-0.011	-0.019
	(0.010)	(0.007)	(0.005)	(0.006)*	(0.006)**
GD*d1940	0.007	0.011	0.009	0.004	-0.008
	(0.019)	(0.011)	(0.009)	(0.008)	(0.008)
GD*d1950	-0.014	0.011	0.011	-0.017	0.006
	(0.014)	(0.007)	(0.005)**	(0.009)*	(0.013)
GD*d1960	0.015	0.013	0.010	0.001	0.004
	(0.016)	(0.010)	(0.009)	(0.009)	(0.011)
N	*16324122*	*15925241*	*12783769*	*9229553*	*5736885*
Panel B:	***African American women***				
GD*d1930	-0.029	-0.027	-0.031	-0.003	-0.008
	(0.020)	(0.013)**	(0.015)**	(0.019)	(0.017)
GD*d1940	-0.058	-0.061	-0.049	-0.035	-0.025
	(0.020)**	(0.013)***	(0.014)**	(0.015)**	(0.016)
GD*d1950	-0.036	-0.036	-0.060	-0.020	0.018
	(0.026)	(0.020)*	(0.031)*	(0.021)	(0.037)
GD*d1960	-0.081	-0.084	-0.051	-0.050	-0.015
	(0.022)***	(0.017)***	(0.015)**	(0.021)**	(0.019)
N	*2012150*	*2025590*	*1550152*	*964229*	*492364*

Notes: See notes to Table 3 for description of coefficients, variables and samples. The analysis is based on native men and women not in farm households and not in group quarters. Standard errors are clustered by birth state. ***, **, * indicate significance at 1%, 5% and 10% respectively.

In Table 4, we present results from estimation of (1) for white men and African–American women. Interestingly, we find no significant impact on men's work, neither in the short-run nor in the long-run. For African American women instead, we estimate negative and significant effects, which suggest that the Great Depression had an unfavorable impact on their employment that persisted over the long-run. In analogy to our calculations above, a 16 to 24-year-old African American woman in 1930 in a severely impacted state would experience a decline in her work propensity by 6 percentage points (−0.061*0.99) in 1940 and by 5 percentage points in 1960 (−0.050*0.99) when 45 to 54 years old. These translate to 12% and 9.4% declines in work shares relative to the 1910 age and race-specific levels (see Appendix Table A2). We return to this result in Section 4.1.

3.2. Who are these women?

The estimates presented is Table 3 suggest that the Great Depression played an important role in shaping the lifetime employment profile of women who were directly exposed to the shock. These cohorts were numerous and the effects documented permanent, and therefore the question of *who* these women are becomes relevant. To answer this question, in Table 5 we compute various statistics for a subgroup of women in the *D-cohort*, those that were 25 to 54 years old in 1940.

In Panel A we calculate aggregate work shares across age subgroups while in Panel B across industries. As reference, we provide the same statistics for 1910. Clearly, women in our cohort work more. While the work shares for married women in 1940 remain fairly low due to the presence of marriage bars and the social stigma attached to market work for wives, they are substantially higher than in 1910.

In terms of distribution across occupations and industries, women in the *D-cohort* are more likely to occupy white-collar jobs (professional, managerial and clerical occupations) and to be present in manufacturing and trade sectors as well as in services. While the service sector was a predominant work outlet for female workers in 1910, there has been an evident shift out of this sector and towards manufacturing, trade and other smaller industries.[23] Overall, women in the 1930s occupied cleaner, safer, of shorter duration and more "respectable" jobs relative to their counterparts in the 1910s and 1920s (Goldin, 2006).

[23] Our calculations suggest that while female employment shares in other sectors such as in utilities, finance and public administration increased between 1910 and 1940 they were still quite low at approximately 4%.

Table 5
Characteristics of women in the *D-cohort*.

Panel A:	***1940***		***1910***	
% 16 to 24 working	0.33		0.31	
	(0.47)		(0.46)	
% 25 to 34 working	0.32		0.18	
	(0.47)		(0.38)	
% 35 to 44 working	0.26		0.15	
	(0.44)		(0.35)	
% 45 to 54 working	0.22		0.13	
	(0.42)		(0.34)	
% 55 to 64 working	0.17		0.09	
	(0.37)		(0.29)	
% 25 to 54 working	0.28		0.16	
	(0.45)		(0.36)	
% 25 to 54 working (married)	0.15		0.04	
	(0.36)		(0.20)	
Mean weeks worked last year cond.	42.1			
On working (25 to 54 years old)	(14.1)			
Mean hours worked last week cond.	40.6			
On working (25 to 54 years old)	(12.1)			
Panel B: Share 25 to 54 years old females (in nonfarm hhds) employed in:	***1940***		***1910***	
	All	*Married*	*All*	Married
Manufacturing	0.25	0.29	0.14	0.12
	(0.43)	(0.45)	(0.34)	(0.33)
Trade	0.21	0.24	0.16	0.15
	(0.41)	(0.43)	(0.37)	(0.36)
Services	0.33	0.26	0.58	0.59
	(0.47)	(0.44)	(0.49)	(0.49)
White-collar occupations	0.50	0.43	0.32	0.19
	(0.49)	(0.49)	(0.47)	(0.39)
Panel C: Females 25 to 54 years old in:	***1940***		***1910***	
	Working	*All*	*Working*	*All*
Average years of education	12.56	11.85		
	(3.16)	(3.12)		
Average years of education (married)	12.19	11.73		
	(3.05)	(3.01)		
Share never married	0.39	0.14	0.58	0.18
	(0.49)	(0.35)	(0.49)	(0.38)
Average years of education (husband)	11.69	11.55		
	(3.38)	(3.51)		
Share with husband unemployed	0.069	0.052	0.053	0.043
	(0.25)	(0.22)	(0.22)	(0.20)
Average husband's wage	1014.5	1294.6		
	(972.7)	(1226.3)		
Share with husband having a white-collar occupation	0.33	0.33	0.28	0.32
	(0.47)	(0.47)	(0.45)	(0.47)
Number of children ever born	1.43	2.12	2.56	2.88
	(1.72)	(2.05)	(2.58)	(2.62)

Notes: Averages derived from the 1910 and 1940 full count Census samples. The sample includes white women, born in the US, not in farm households and not in group quarters. Information on wages and education is not available in 1910.

In terms of demographics, the working women of this group have on average 12.5 years of education and are less likely to have ever been married. Nevertheless, conditional on being married, they have on average more years of education than their husbands, and they are more likely to have a husband who in 1940 was unemployed and/or who received a lower wage (Panel C). Unfortunately, education in not recorded in the 1910 Census and therefore we have no precise point of comparison. Nevertheless, Goldin (2006) mentions that the average female worker up to the 1920s was poorly educated and usually coming from low-income households, and the average *married* woman worker was less educated than the population average.

In Appendix Table A3, we report estimates of (1) where the Great Depression-related variables ($GD_s{}^*d_t$) are further interacted either with an indicator for whether the woman has ever been married (Panel A) or with an indicator for whether the husband holds a blue-collar occupation (sales, craftsmen, operatives, services, laborers; Panel B). Our results suggest that in more severely affected states *all* women worked significantly more, including married women. However, ever married women 35 to 54 years old in 1960 were more likely to work in 1960 than the never married. In addition, estimates in Panel B suggest that the wives of men employed in blue-collar occupations were more likely to work both in the short-run as well as in the long-run. Note that while these sets of results

are intended to be informative of the qualitative aspects of these cohorts' presence in the labor market, they should be interpreted with caution as marital and occupational outcomes can be endogenous.

4. Robustness

4.1. Identification

As discussed in Section 2.3, our analysis relies on the parallel trends assumption. To understand whether the latter is likely to be satisfied, we check whether – conditional on all covariates specified in (1) – our measure of the severity of the Great Depression predicts female labor supply in years prior to the Great Depression. We pool together the 1900, 1910, 1920 and 1930 panels and use a labor force participation indicator as our dependent variable since employment status is not recorded in the 1900 and 1920 Censuses. Labor force participation in these decades is defined on the basis of whether the individual had a gainful occupation over the previous year. While we should expect no effect of the Great Depression measure on female participation in the years 1900 through 1920, the broader reference period for having a gainful occupation introduces ambiguity as to whether 1930 participation should be impacted. The results are presented in Table 6a and they are supportive of the underlying identification assumption.[24]

Table 6a
Robustness - Identification (1).

Age in year t:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dep. Variable:		*=1, if in the labor force*			
		1900-1910-1920-1930 pooled samples			
GD*d1910	-0.006	-0.002	-0.008	-0.000	0.002
	(0.007)	(0.004)	(0.005)	(0.011)	(0.009)
GD*d1920	-0.004	0.002	-0.007	-0.003	-0.003
	(0.010)	(0.005)	(0.007)	(0.006)	(0.009)
GD*d1930	0.007	0.008	0.001	0.005	-0.003
	(0.014)	(0.005)*	(0.005)	(0.008)	(0.009)
N	*15119999*	*13806010*	*10424097*	*7255372*	*4646384*

Notes: OLS coefficients from a regression of an indicator for whether the respondent is in the labor force on a measure of the severity of the Great Depression (*GD*) interacted with year dummies, current failures dummies for age, marital status and whether state of residence differs from the birth state, state of birth, state of residence and year fixed effects, division-year interactions, 1910 state covariates (employment share in manufacturing and trade, share farmers, share nonwhite, share non-natives, average occupational score). *GD* is defined as the difference between the average business failure rate between 1929 and 1932 and the business failure rate in 1910 by state. All state variables except current failures are assigned by birth state. The estimation uses the 1910, 1920, 1930 and 1940 full count samples, and the 5% 1900 sample. The analysis is based on white, native women, not in farm households and not in group quarters. Estimates are weighted using the available sampling weights. Standard errors are clustered by birth state. ***, **, * indicate significance at 1%, 5% and 10% respectively.

Moreover, our estimates will be biased if unobservable factors, not accounted for by the existing covariates, fixed effects, and division-year interactions, are correlated with the Great Depression and also determine employment. We address this concern in two ways. First, in Panels A and B of Table 6b we control for contemporaneous changes in employment in white-collar occupations and in other large sectors of the economy such as in manufacturing and trade.[25] Such expansions may be reflective of demand shocks. In Panel C, we control for the entire state distribution of industries in 1910 to ensure that states largely composed of industries that are not included in the business failures data aren't biasing the results. In Panel D, we control for the 1921 Depression to ensure that our baseline estimates do not pick up the effects of this preceding recession.[26] In all cases, our findings remain robust.

In Table 6c, we consider a different measure of the economic downturn – changes in per capita retail sales – and exploit its variation across counties between 1929 and 1933 to gauge potential short-run effects on female labor supply. For this exercise, we

[24] We do not extend this analysis to 1940 as the definition of labor force participation substantially changes after 1930. In a robustness analysis omitted here but available upon request, we have re-estimated (1) assigning the value of $F_{s,1929\text{-}1932} - F_{s,1910}$ in 1910 (in lieu of *0*) in our treatment variable *GD*, while maintaining the baseline definition for *t≥1930*. While *GD* reproduces the patterns discussed in Table 3 for *t≥1930*, reassuringly it has no predictive power on the employment of women aged 16 to 54 in 1910. For the oldest age group, 55 to 64 years old, the 1910 estimate is positive and significant. This result is driven by the older women in this group and may be due to selective mortality in the pre-treatment decade.

[25] In this case, the employment shares in white-collar occupations and in the various sectors of the economy are assigned on the basis of the state of residence as we believe that this local market is relevant in order to identify demand shocks.

[26] We introduce as covariate the difference in the average business failure rate between 1921/1922 and 1920.

Table 6b
Robustness - Identification (2).

	1910-1930-1940-1950-1960 pooled samples				
Age in year t:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dep. Variable:	*=1, if currently employed*				
Panel A:	***Baseline controlling for changes in employment across industries***				
GD*d1930	0.019	0.013	0.017	0.017	0.013
	(0.010)*	(0.005)**	(0.006)**	(0.007)**	(0.006)**
GD*d1940	0.016	0.025	0.020	0.013	-0.001
	(0.020)	(0.009)**	(0.006)**	(0.008)*	(0.009)
GD*d1950	-0.001	0.022	0.020	0.021	-0.001
	(0.015)	(0.009)**	(0.009)**	(0.013)	(0.014)
GD*d1960	-0.013	0.002	0.023	0.024	0.013
	(0.012)	(0.008)	(0.009)**	(0.010)**	(0.010)
Panel B:	***Baseline controlling for changes in white-collar employment***				
GD*d1930	0.019	0.013	0.017	0.017	0.014
	(0.010)*	(0.005)**	(0.006)**	(0.007)**	(0.007)**
GD*d1940	0.020	0.028	0.023	0.017	0.004
	(0.020)	(0.010)**	(0.007)**	(0.007)**	(0.007)
GD*d1950	0.002	0.024	0.022	0.024	0.003
	(0.014)	(0.010)**	(0.009)**	(0.013)*	(0.014)
GD*d1960	-0.006	0.009	0.027	0.028	0.018
	(0.012)	(0.010)	(0.010)**	(0.009)**	(0.010)*
Panel C:	***Baseline controlling for the entire distribution of industries in 1910***				
GD*d1930	0.026	0.021	0.021	0.019	0.018
	(0.009)**	(0.005)***	(0.005)***	(0.007)**	(0.006)**
GD*d1940	0.023	0.036	0.030	0.020	0.010
	(0.017)	(0.009)***	(0.007)***	(0.007)***	(0.007)
GD*d1950	0.009	0.022	0.024	0.021	0.013
	(0.012)	(0.010)**	(0.008)**	(0.016)	(0.010)
GD*d1960	-0.011	0.007	0.028	0.035	0.030
	(0.010)	(0.009)	(0.011)**	(0.010)***	(0.010)**
N	*17937326*	*17003488*	*13130954*	*9466752*	*6183620*
Panel D:	***Baseline controlling for the Depression of 1920-1921***				
GD*d1930	0.022	0.016	0.019	0.018	0.014
	(0.009)**	(0.005)**	(0.006)**	(0.008)**	(0.007)*
GD*d1940	0.022	0.029	0.024	0.017	0.005
	(0.019)	(0.010)**	(0.007)**	(0.008)**	(0.009)
GD*d1950	-0.000	0.024	0.023	0.023	0.002
	(0.014)	(0.010)**	(0.009)**	(0.013)*	(0.013)
GD*d1960	-0.004	0.011	0.029	0.029	0.019
	(0.009)	(0.009)	(0.009)**	(0.010)**	(0.010)*
N	*17937326*	*17003488*	*13130954*	*9466752*	*6183620*

Notes: See notes to Table 3 for a description of the baseline specification. In Panel A, we also control for contemporaneous changes in employment shares in manufacturing, trade, services, agriculture and the remaining sectors. In Panel B, we control for contemporaneous changes in employment in white-collar occupations (professional, managerial, clerical jobs). In Panel C, we further control for 1910 state employment shares in services, agriculture and in the remaining sectors of the economy. In Panel D, we control for the difference between the average business failure rate between 1921 and 1922 and the failure rate in 1920. Additional state covariates in Panels A and B are assigned by state of residence. The remaining covariates apart from current failures are assigned on the basis of the birth state. Standard errors are clustered by birth state. ***, **, * denote significance at 1%, 5% and 10% respectively.

Table 6c
Robustness - Identification (3).

Age in year *t*:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dependent variable:			*= 1, if currently employed*		
Panel A:			***1910-1940 samples (county)***		
(sales1929-sales1933)*d1940	0.028	0.034	0.045	0.030	0.017
	(0.013)**	(0.013)**	(0.010)***	(0.008)***	(0.007)**
N	*10154472*	*9684660*	*7271193*	*5316762*	*3413662*
Panel B:			***1910-1930-1940 samples (county)***		
(sales1929-sales1933)*d1930	0.050	0.059	0.042	0.022	0.004
	(0.015)***	(0.010)***	(0.009)***	(0.009)**	(0.008)
(sales1929-sales1933)*d1940	0.031	0.034	0.043	0.029	0.016
	(0.013)**	(0.012)***	(0.010)***	(0.009)***	(0.007)**
N	*15716830*	*14818905*	*11384719*	*8205268*	*5307329*

Notes: OLS coefficients from a regression of an indicator for whether the individual is currently employed, on the change in per capita retail sales by county between 1929 and 1933 interacted with year dummies, dummies for age marital status, whether birth and current state differ, fixed effects for current and birth state as well as the county of residence, year fixed effects, state-year interactions, contemporaneous county unemployment rate, 1910 county covariates (share farms, share foreign born, share nonwhite, employment share in manufacturing, trade, services and other sectors of the economy, average occupational score). Retail sales data are obtained from Fishback et al. (2005). Estimates are weighted using the available sampling weights. Standard errors are clustered by county. The sample includes white women, born in the US, not in farm households and not in group quarters. Full count samples are used. ***, **, * indicate significance at 1%, 5%, 10% respectively.

pool together the 1910, 1930 and 1940 panels and estimate a version of (1) in which we add state-year fixed effects.[27] This way we can control for time-varying confounding state unobservables. The estimates overwhelmingly support our baseline finding that working age women increased their labor supply in 1940 in counties experiencing larger drops in per capita retail sales at the onset of the Great Depression.[28]

4.2. Other considerations

In this section we discuss further robustness exercises. First, we restrict the analysis to the 1940, 1950, 1960 pooled samples and re-estimate (1). As dependent variables we consider work propensity and labor force participation at the extensive margin and weeks worked in the past year and hours work last week at the intensive work margin. Estimates from this reduced sample are reported in Table 7. They suggest that the Great Depression induced an increase in labor supply in 1960 (relative to 1940) at all margins for women 45 to 64 years old in line with our baseline results in Table 3.

Subsequently, we address the possibility of measuring the severity of the Great Depression with error due to the fact that we don't know where the individuals resided at the time of the shock. Our benchmark analysis relies on the assumption that the relevant state is that of birth and we have also included state of residence fixed effects as well as a dummy indicating whether the residence and birth states differ to partially account for migration. Clearly, however, this assumption may not be valid for older individuals who are more likely to have moved. In Appendix Table A4 we experiment with two alternative assignments: (i) one which uses the state of residence in 1935 as reference to assign the Great Depression measure to respondents in the 1940 sample and the state of birth as reference in the remaining sample years; (ii) one which uses the state of residence as reference to assign the Great Depression measure to respondents in all sample years. The revised estimates are if anything larger in magnitude and statistically significant especially for older women. This suggests that our baseline results provide conservative estimates of the impact of the shock on female employment.

[27] To facilitate the interpretation, the measure is defined as the difference $Retail\ Sales_{1929}$ - $Retail\ Sales_{1933}$, which is positive as are the reported coefficients. It is unclear whether the difference in per capita retail sales between 1929 and 1933 will correctly describe the severity of the Great Depression for respondents in the 1930 sample. Since we have no data on retail sales between 1929 and 1933, we consider two possibilities: one where the 1930 sample is excluded from the analysis (Table 6c, Panel A) and one where it is included allowing the same measure to differentially affect the 1930 and 1940 employment (Table 6c, Panel B).

[28] In an omitted analysis but available upon request, we examined the importance of the introduction of unemployment insurance through the Social Security Act of 1935 using data from Price (1985) on the maximum number of weeks covered by the insurance by state as of May 1st 1938 (see Bordo et al., 1998). Our main findings remain robust. The New Deal relief programs – instituted in the early 1930s (FERA, CWA, WPA and Social Security Programs) to provide work relief or direct relief to the poorer segments of the population could have also indirectly affected female labor supply by decreasing women's work and increasing employment opportunities of the husbands. Hence, we expect that accounting for it should only make our baseline results stronger. State-year fixed effects in the county analysis or division-year interactions in the baseline model may pick up some of the effect.

Table 7
Robustness – other considerations (1).

	Other measures of labor supply (1940-1950-1960 pooled samples)				
Age in year t:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dep. Variable:	*=1, if currently employed*				
GD*d1950	-0.020	-0.005	-0.000	0.007	-0.001
	(0.009)**	(0.005)	(0.005)	(0.010)	(0.008)
GD*d1960	-0.027	-0.020	0.005	0.011	0.015
	(0.011)**	(0.005)***	(0.005)	(0.005)**	(0.008)*
Dep. Variable:	*=1, if in the labor force*				
GD*d1950	-0.022	-0.004	0.001	0.010	0.001
	(0.008)**	(0.004)	(0.005)	(0.009)	(0.008)
GD*d1960	-0.028	-0.020	0.006	0.013	0.015
	(0.009)**	(0.005)***	(0.006)	(0.005)**	(0.008)*
N	*7668364*	*7822968*	*6095969*	*4601388*	*3076098*
Dep. Variable:	*weeks worked last year*				
GD*d1950	-0.252	0.069	0.119	0.795	0.395
	(0.709)	(0.312)	(0.515)	(0.543)	(0.525)
GD*d1960	-1.016	-0.888	0.235	0.814	0.641
	(0.523)*	(0.289)***	(0.272)	(0.328)**	(0.364)*
Dep. Variable:	*hours worked last week*				
GD*d1950	-0.150	0.238	0.250	0.455	0.668
	(0.581)	(0.349)	(0.305)	(0.497)	(0.459)
GD*d1960	-0.829	-0.505	0.363	0.683	0.494
	(0.483)*	(0.222)**	(0.213)*	(0.201)**	(0.261)*
N	*7602183*	*7742476*	*6029000*	*4564262*	*3054221*

Note: OLS coefficients from regressions of the dep. variables stated above on a measure of the severity of the *GD* interacted with year dummies and other covariates. See notes to Table 3 for the definition of the measure and for the list of included covariates. The sample includes white women, born in the US, not in farm households and not in group quarters taken from the full count 1940 Census, the 1% 1950 and the 5% 1960 Censuses. Sample-line individuals are used in 1950 when the dependent variables are the weeks and hours worked. Estimates are weighted using the appropriate sampling weights. Standard errors are clustered by birth state. ***, **, * indicate significance at 1%, 5% and 10% respectively.

Next, we check the robustness of our findings to excluding southern states, which on average experienced milder increases in their business failure rate relative to the rest of the country. We find that the estimates are robust and if anything, the size of the coefficients increases (Appendix Table A5, Panel B). Subsequently, we modify the pre-Depression year of reference and use failures in 1915 while still controlling for the 1910 covariates discussed in Section 2.2. The results are presented in Table A5, Panel C in the Appendix and are similar to the baseline. In an unreported analysis, we have also experimented with other base years in the 1910s or with using the 1932 peak business failure rate instead of the average across 1929 through 1932.

In Panels A and B of Appendix Table A6, we re-estimate (1) using two other state measures of the severity of the Great Depression: changes in real liabilities of failing firms and changes in real income (also see Section 2.1). For the first measure, we use the full 1910–1930–1940–1950–1960 pooled sample, while for the second we exclude the 1910 panel as income does not exist in 1910 and we cannot use it to control for current conditions. In this case unfortunately, we have no pre-Depression period to account for pre-trends.

Interestingly both measures confirm the short-run increase in employment of the affected cohorts and also overall suggest persistent effects.[29]

[29] When using changes in income as indicator of economic conditions, we find some effects for much younger cohorts. These could be due to indirect crowding-out/-in effects from the older cohorts or other indirect channels (see Bellou and Cardia, 2016b).

5. Discussion

5.1. Female employment over the short-run

Our findings suggest that the Great Depression was an important determinant of employment decisions for the cohorts born in the late 1800 and early 1900. All women increased work in response to the shock, including the married, a group with traditionally very low market participation. Moreover, female employment increased significantly more relative to male employment in states experiencing larger increases in their business failure rate. These results are consistent with an added worker effect, at least in the short-run.

The 1930s, however, was a period of exceptionally high unemployment and therefore it remains to be understood how these women could find jobs. Both *hiring* (prohibiting hiring married women) and *marriage* bars (dismissing women upon marriage) grew in importance during this period and were more stringent for educated, native-born, middle-class, white married women.[30] Hill (2015) finds that they led them to postpone marriage, which may have helped them retain their jobs longer. Another possibility is that some of the employment of white women was at the expense of other groups.[31] Sundstrom (1992) shows that unemployment rates for African American women were very high which led many of them to leave the labor force (Margo, 1993). In Table 4 we find that the shock had an unfavorable effect on the employment of this group, which persisted in the long-run. While not an exhaustive answer to why white non-farm women increased their participation during a period of job scarcity, these results suggest that they may have crowded-out other groups of women: non-white, and also possibly the older or the much younger.

5.2. Female employment over the long-run

The persistent effects of the Great Depression on women's employment could be due to a change in female labor supply or to a change in labor demand. To shed more light on the nature of the shift, we examine the impact of the Great Depression on wages. If the Great Depression led to a shift in the labor supply of the *D-cohort* in the 1950s relative to the labor supply of women of the same age in 1940, we should observe that the same shock also decreased their real relative wage. Second, we discuss the possibility that the extended presence of the *D-cohort* in the market is due to a structural change in the economy induced by the Great Depression. Third, we discuss whether some of the effects are driven from individuals who moved out of their birth state due to the shock and towards markets with relatively better employment opportunities.

Panel A in Table 8 reports results from estimation of (1) for the 1940 and 1960 pooled sample, where the dependent variable is the log of real weekly wage.[32] We consider women 35 to 64 years old whose labor supply in 1960 was found to be permanently affected by the Great Depression (Tables 3 and 7). Their wages are compared to those of women in the same age group in 1940. The estimates in Column 1 indicate a negative link between the Great Depression and female wages which remains robust when controlling for contemporaneous – possibly demand-related – changes in states' employment shares in various sectors (Column 2) or in white-collar occupations (Column 3).

To correct for possible self-selection bias, we use a Heckman two-step procedure. Selection would occur if, for instance, the Great Depression drew in the labor market women with "worse" unobservables, possibly employed in lower-skill, more physically demanding occupations. The negative effects on wages would then be due to a compositional change of the workforce. The exclusion restriction is family size (variable famsize). The identifying assumption is that, conditional on all covariates, this variable has a direct effect on the decision to work but no direct impact on the wage. The "corrected" estimates suggest that there has been selection, especially among the older cohorts, which is positive. They also suggest that the negative effect of past conditions on current wages is persistent and not entirely driven by selection.[33]

Panel B of Table 8 presents respective estimates for men. We find that the same cohorts also earn less in states more impacted by the crash several decades after it had ended. Young adult men in the 1930s, our cohort, may have been the least able to train for alternative career trajectories in face of persistent unemployment, which could explain their lower wage. Correcting for self-selection does not change this result but interestingly, relative to women, the selection for men seems to have been negative.

To summarize, while other demand-side explanations cannot be entirely excluded, our findings persist after accounting for selection and are suggestive of a Great Depression-induced labor supply shift *across* cohorts. One interpretation is that a significant

[30] They also varied geographically and by sector and size of firms. The sectors where marriage bars were more significant were public schools, insurance offices, publishing houses, bank and public utilities; in the private sector, large firms were more likely to adopt such policies (Goldin, 1991b).

[31] Women could have also more easily found jobs than men due to the fact that the Great Depression was less severe in industries where women were more likely to work (such as in services). Moreover, the New Deal along with the expanding role of the government created a demand for clerical type positions.

[32] We omit 1950 in the analysis of wages, as the latter are available only for a small subset of respondents (sample line). Note that in all wage regressions we also control for individual educational attainment.

[33] Family size predicts female labor market participation but may also be linked to wages via fertility decisions. While we control for education and therefore for the impact that fertility decisions may have had on acquired education, fertility decreases work experience and may be correlated with lower wages. This would bias the results. Family size in the IPUMS, refers to the number of own family members residing in the same household, including the person her/himself. Children are part of this universe if they are still residing at home, and a larger family size may be correlated with more children. The link is more tenuous as we consider older women for whom the number of children residing at home is not a measure of the total number of children they have had. To decrease the bias due to the presence of younger children, we control for the presence of children younger than 10 years old.

Table 8
Impact of the Great Depression on wages (1940 and 1960 pooled samples).

Ages in year *t*	35 to 44			45 to 64		
Dep. variable:	*Log of real weekly wage*					
Panel A:	***Female wages***					
	OLS					
	(1)	(2)	(3)	(1)	(2)	(3)
GD*d1960	−0.034	−0.036	−0.037	−0.063	−0.060	−0.069
	(0.022)	(0.022)	(0.023)	(0.037)*	(0.040)	(0.039)*
N		*739,518*			*665,748*	
	Heckman-corrected estimates					
GD*d1960	−0.027	−0.031	−0.029	−0.035	−0.036	−0.040
	(0.019)*	(0.019)*	(0.019)	(0.020)*	(0.020)*	(0.02)**
Inverse mills ratio	0.540	0.539	0.539	0.744	0.740	0.743
	(0.019)***	(0.019)***	(0.019)***	(0.018)***	(0.018)***	(0.018)***
N		*5,828,926*			*7,344,001*	
Panel B:	***Male wages***					
	OLS					
GD*d1960	−0.057	−0.058	−0.054	−0.059	−0.058	−0.058
	(0.014)***	(0.013)***	(0.013)***	(0.018)**	(0.018)**	(0.017)**
N		*3,071,036*			*3,124,986*	
	Heckman-corrected estimates					
GD*d1960	−0.056	−0.058	−0.055	−0.060	−0.061	−0.059
	(0.009)***	(0.009)***	(0.009)***	(0.010)***	(0.010)***	(0.010)***
Inverse mills ratio	−0.247	−0.246	−0.247	−0.332	−0.338	−0.337
	(0.021)***	(0.022)***	(0.022)***	(0.043)***	(0.043)***	(0.043)***
N		*5,243,286*			*6,360,339*	

Notes: OLS coefficients from estimation of (2) using log real weekly wages as dependent variable. See notes to Tables 3 and 7 for the list of covariates. State variables are assigned by birth state except current failures. In Column (2) we also control for changes in state contemporaneous employment shares across sectors of the economy. In Column (3) we control for state contemporaneous changes in white-collar employment. The additional covariates in Columns (2) and (3) are matched by state of residence. The Heckman correction procedure uses as exclusion restriction the number of own family members residing with each individual (famsize). These specifications also account for the presence in the household of a young child aged less than 10. The sample includes white men and women, born in the US, not in farm households and not in group quarters, who had worked at least 40 weeks in the previous year and more than 35 hours last week. Standard errors are clustered by birth state. Estimates are weighted using the available sampling weights. The analysis is based on the 1940 full count and the 5% 1960 samples. ***, **, * indicate significance at 1%, 5% and 10% respectively.

decline in household permanent income due to the shock led women to remain in the labor market for an extended period of time. It is also possible, however, that this cohort entered the market due to the shock and remained developing a "habit" for work (habit formation).[34]

A broader explanation consistent with a wage decline and increased employment, could be that the Great Depression led to a structural change in the economy whereby the states most severely affected never fully recovered. To test this hypothesis, we re-estimate (1) introducing contemporaneous real per-capita income as an additional covariate (see Section 2.1).[35] Changes in real income over time should summarize changes in local economic prosperity. Including this variable, however, does not change our main estimates (Table 9). Although we cannot rule out that the more severely affected economies had a slower recovery or underwent permanent changes, these results suggest that this channel does not seem to weaken our hypothesis of a direct effect on women's labor supply.

Finally, we have also examined the relevance of internal migration (also see Rosenbloom and Sundstrom, 2004). One plausible scenario is that the Great Depression induced migration out of an individual's birth state, if the latter witnessed sharp increases in its business failure rate, and towards lower-failure states with presumably more job opportunities. To address this possibility, we have studied the extent to which the shock at the state of birth affected the propensity to move out of an individual's state of birth both in the short-term as well as in the long-term. We have estimated versions of (1) using as the dependent variable an indicator for moving out of the birth state and as independent variables our measure of the shock, age and marital status,

[34] This cohort also accumulated experience as a result of its extended presence in the labor market, which could have made the Depression-induced wage decline less dramatic.

[35] Since state income is recorded from 1919 onwards, for this analysis we pool the 1930–1940–1950–1960 samples thus excluding 1910 for which no current income can be assigned. We match contemporaneous income on the basis of the birth state. Matching on the basis of the state of residence has no substantive effects on the reported estimates.

Table 9
Structural change hypothesis.

	1930-1940-1950-1960 pooled samples				
Age in year *t*:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dep. variable:	*= 1, if currently employed*				
GD*d1930	0.005	0.027	0.037	0.033	0.041
	(0.013)	(0.013)**	(0.012)**	(0.016)**	(0.011)***
GD*d1940	0.008	0.046	0.046	0.035	0.035
	(0.017)	(0.014)**	(0.013)***	(0.017)**	(0.013)**
GD*d1950	-0.019	0.041	0.044	0.041	0.031
	(0.015)	(0.015)**	(0.014)**	(0.019)**	(0.016)*
GD*d1960	-0.023	0.023	0.047	0.045	0.044
	(0.016)	(0.015)	(0.014)**	(0.017)**	(0.015)**
N	*13867138*	*13511044*	*10612244*	*7768071*	*5171560*

Notes: OLS coefficients from a regression of an indicator for whether the respondent is currently employed on the list of covariates described in Table 3 and also log per capita real personal income. The estimation uses the 1930, 1940 full count samples, the 1% 1950 and the 5% 1960 samples. The analysis is based on white women born in the US not in farm households and not in group quarters. Estimates are weighted using the available sampling weights. Standard errors are clustered by birth state. ***, **, * indicate significance at 1%, 5% and 10% respectively.

the 1910 birth-state variables listed in (1), WWII mobilization rate, division-year interactions, birth-state and year fixed effects. The estimates can be found in Appendix Table A7. Overall, although the coefficients are positive, they are not statistically significant except for women 55 to 64 years in 1960. These results suggest that migration likely hasn't been a major determinant of our findings.

6. Results from a survey

A special survey on a subset of women in our cohort provides an additional external validity check on the hypothesis that the Great Depression had a long-term impact on the *D-cohort*.[36] This survey includes ever married women born between 1901 and 1910 who are part of our focal cohort. In 1978, these women were asked questions pertinent to the Great Depression, along with the number of years they worked after their first marriage. Their average age at first marriage was 21.8. Among women who worked after first marriage, the average age at retirement was 56.6 years and the median 61 years. This is consistent with data from the Census that show considerable persistence in their labor market presence throughout several decades.

We examine the effect of the Great Depression on the number of years worked after their first marriage by using the following two questions of the survey: i) "*Did the Depression influence you to find a job, either within or outside your home?*". To this question, 27.1% of the women answered affirmatively; ii) "*How much did you worry about your family's future during the Depression?*" To this question, 23.2% replied they were very worried, 18.6% moderately worried, 21.5% slightly worried, and 35.7% not worried at all. The dependent variable is the number of years a woman worked after her first marriage. Of the 1049 women in the sample, 788 worked after marriage. The main regressors are: Great Depression-*Find a Job*, which is an indicator variable with value of 1 if the Great Depression influenced them to find a job (question 1), 0 otherwise; Great Depression-*worry_a* is an indicator that takes value 1 if they were very worried about their family future (question 2), and 0 otherwise while Great Depression-*worry_b* takes value 1 if they were very or moderately worried about their family future, and 0 otherwise.

Table 10 reports the estimates using OLS and ordered probit models. All specifications include age and state of birth dummies. As can be seen, factors dating back to the Great Depression, such as having to find a job or strong concerns about its impact on their families, significantly increased the number of years these women remained in the labor market after first marriage. As the level of concern women had during the Great Depression decreases, the level and significance of the associated estimates decreases as well (see the results for Great Depression-*worry_b*).

These findings are reassuring because they are based on a totally different source and yet they are consistent with the hypothesis that women in the *D-cohort* stayed significantly longer in the labor market because of the hardships they likely experienced during the Great Depression.

[36] The "*Low-Fertility Cohorts Study, 1978: A Survey of White, Ever-Married Women Belonging to the 1901–1910 United States Birth Cohorts*" (Ridley, 2007).

Table 10
Results from the low-fertility cohort study, 1978.

Dependent variable:	*# years worked after first marriage*	
	OLS	*Ordered probit*
Did the Depression influence you to find a job, either within or outside your home? (GD-Find a Job)		
GD-Find a Job	3.61	0.271
	(1.156)***	(0.086)***
N	*786*	*786*
How much did you worry about your family's future during the Depression? (very worried)		
GD-Worry_a	3.747	0.283
a lot (23.2%)	(1.249)***	(0.093)***
N	*786*	*786*
How much did you worry about your family's future during the Depression? (very or moderately worried)		
GD-Worry_b	2.078	0.149
a lot or moderately (41.1%)	(1.075)*	(0.080)*
N	*786*	*786*

Note: Data come from the survey *"Low-Fertility Cohorts Study, 1978: A Survey of White, Ever-Married Women Belonging to the 1901–1910 United States Birth Cohorts"* (ICPSR 4698). Age and state dummies are included. ***, **, * indicate significance at 1%, 5% and 10% respectively.

7. Conclusion

We have documented a positive link between the severity of the Great Depression and the work behavior of cohorts that were of working age during the depression years. In states where economic conditions deteriorated the most, these women increased employment in the short-run likely to compensate for income or asset losses; many of them however continued working till their retirement. The entire lifetime labor supply profile of these cohorts is persistently linked to the economic conditions of the Great Depression. These results are found across several samples and are robust to a wide range of specification and identification exercises as well as different measures of the economic downturn. They are consistent with the hypothesis of a labor supply shift as the wages of these women were lower several decades after the crash in states most impacted by it relative to the wages of previous cohorts. Habit formation may have also played an important role in explaining their prolonged stay in the labor market. We also found that the wages of the men who were of age to be married to women in this cohort, were systematically lower many years after. This suggests the reduction in households' permanent income as a plausible channel for the increased participation of women in the *D-cohort* in the 1940s and the 1950s, decades after the depression years.

Appendix

Tables A1–A7, Figure 3.

Table A1
1910 characteristics of working women in states with low vs high increases in the business failure rate between 1930 and 1910.

	(Avg failure rate btw 1929 and 1932) - (Failure rate in 1910)	
State characteristics	Low failure rate increase (<=0.366)	High failure rate increase (>0.366)
Employment share in agriculture	0.217	0.122
	(0.044)	(0.039)
Employment share in manufacturing	0.091	0.170
	(0.017)*	(0.029)*
Employment share in trade	0.097	0.135
	(0.009)*	(0.012)*
Employment share in services	0.544	0.508
	(0.026)	(0.024)
Employment share in utilities	0.017	0.025
	(0.003)	(0.003)
Share urban	0.439	0.582
	(0.042)*	(0.041)*
share married	0.485	0.381
	(0.028)*	(0.024)*

Note: State averages calculated from the 1910 IPUMS USA. State business failure rate is obtained from the Statistical Abstract of the US. There are 24 states in the first group ("low" failure rate) and 25 in the second ("high" failure rate). * indicates that the means between the two categories for a given variable are statistically different at 5% significance levels.

Table A2
Work shares of African American women by age and year.

	Age group				
Year	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
1910	0.46	0.49	0.52	0.53	0.47
	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)
1930	0.39	0.47	0.49	0.49	0.42
	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)
1940	0.34	0.47	0.46	0.41	0.32
	(0.47)	(0.49)	(0.49)	(0.49)	(0.46)
1950	0.38	0.32	0.36	0.35	0.25
	(0.49)	(0.47)	(0.48)	(0.49)	(0.43)
1960	0.36	0.33	0.42	0.46	0.35
	(0.48)	(0.47)	(0.49)	(0.49)	(0.48)

Note: Average employment shares, standard deviation in parenthesis. The sample includes African American women born in the US, not in farm households and not in group quarters.

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Table A3
The impact of the Great Depression on employment (heterogeneity analysis).

	1910-1930-1940-1950-1960 pooled samples				
Age in year *t*:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dependent variable:	*= 1, if currently employed*				
Panel A:	***Baseline: by marital status***				
GD*d1930	0.046	0.095	0.111	0.080	0.023
	(0.018)**	(0.020)***	(0.024)***	(0.022)***	(0.018)
GD*d1940	0.001	0.054	0.125	0.122	0.024
	(0.025)	(0.012)***	(0.016)***	(0.019)***	(0.018)
GD*d1950	-0.019	0.075	0.067	0.122	0.097
	(0.019)	(0.012)***	(0.014)***	(0.029)***	(0.026)***
GD*d1960	-0.027	0.034	-0.005	-0.012	0.080
	(0.018)	(0.017)**	(0.019)	(0.016)	(0.017)***
GD*d1930*ever married	-0.066	-0.097	-0.105	-0.070	-0.011
	(0.037)*	(0.023)***	(0.025)***	(0.021)**	(0.016)
GD*d1940*ever married	0.067	-0.031	-0.115	-0.118	-0.023
	(0.030)**	(0.015)**	(0.017)***	(0.017)***	(0.015)
GD*d1950*ever married	0.043	-0.058	-0.049	-0.107	-0.104
	(0.025)*	(0.015)***	(0.014)***	(0.025)***	(0.021)***
GD*d1960*ever married	0.046	-0.028	0.034	0.042	-0.068
	(0.029)	(0.015)*	(0.015)**	(0.015)**	(0.013)***
N	*17937326*	*17003488*	*13130954*	*9466752*	*6183620*
Panel B:	***Baseline: by husband's occupational status***				
GD*d1930	0.009	0.006	0.010	0.003	0.003
	(0.011)	(0.007)	(0.006)	(0.007)	(0.007)
GD*d1940	0.017	0.018	0.012	-0.001	-0.004
	(0.015)	(0.012)	(0.008)	(0.007)	(0.005)
GD*d1950	0.02	0.007	-0.007	-0.009	-0.009
	(0.015)	(0.011)	(0.012)	(0.013)	(0.012)
GD*d1960	0.023	-0.019	-0.009	0.007	0.012
	(0.012)*	(0.010)*	(0.012)	(0.011)	(0.009)
GD*d1930*blue-collar	0.027	0.015	0.018	0.029	0.023
	(0.013)**	(0.010)	(0.009)**	(0.010)**	(0.009)**
GD*d1940*blue-collar	0.029	0.017	0.013	0.023	0.013
	(0.011)***	(0.012)	(0.011)	(0.010)**	(0.007)*
GD*d1950*blue-collar	0.015	0.032	0.060	0.036	0.005
	(0.021)	(0.011)***	(0.011)***	(0.016)**	(0.011)
GD*d1960*blue-collar	-0.024	0.046	0.066	0.040	0.012
	(0.011)**	(0.009)***	(0.010)***	(0.014)***	(0.011)
N	*4950191*	*10965509*	*8723166*	*5574470*	*2565963*

Notes: *Panel A* – See notes to Table 3 for specification, variables included and samples. *GD* is additionally multiplied with an indicator for whether the respondent has ever been married. The sample includes white women, born in the US, not from farm households and not in group quarters. *Panel B* – See notes to Table 3 for specification, variables included and samples. *GD* is additionally multiplied with an indicator for whether the husband has been employed in a blue-collar job (OCC1950 codes: 400 through 970). The sample includes white married women, born in the US, not from farm households and not in group quarters. *Panels A and B* – For coefficients included in *squares/rectangles*, within each age group and year, the sum of $GD^{*}dt^{*}X+GD^{*}dt$ for $t>=1930$ is statistically different from 0 at 5% significance level, where *X= ever married* (Panel A) or blue-collar (Panel B) indicators. Standard errors are clustered by birth state. ***, **, * indicate significance at 1%, 5% and 10% respectively.

Table A4
Robustness – identification (4).

	1910-1930-1940-1950-1960 pooled samples				
Age in year *t*:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dep. variable:	*= 1, if currently employed*				
Panel A:	***residence state in 1935 for t=1940 ; birth state otherwise***				
GD*d1930	0.024	0.018	0.018	0.015	0.012
	(0.010)**	(0.005)**	(0.006)**	(0.008)**	(0.007)
GD*d1940	0.023	0.037	0.023	0.010	-0.002
	(0.021)	(0.010)***	(0.008)***	(0.008)	(0.010)
GD*d1950	0.002	0.026	0.023	0.023	0.003
	(0.014)	(0.010)**	(0.009)**	(0.013)*	(0.014)
GD*d1960	-0.005	0.010	0.028	0.028	0.018
	(0.011)	(0.009)	(0.010)**	(0.010)**	(0.010)*
N	*17688673*	*16764426*	*12962003*	*9349477*	*6108322*
Panel B:	***current state of residence***				
GD*d1930	0.036	0.026	0.036	0.037	0.033
	(0.014)**	(0.010)**	(0.011)***	(0.012)***	(0.010)**
GD*d1940	0.029	0.039	0.037	0.030	0.018
	(0.024)	(0.011)***	(0.010)***	(0.010)***	(0.009)*
GD*d1950	0.004	0.026	0.037	0.046	0.045
	(0.018)	(0.012)**	(0.010)***	(0.014)***	(0.014)**
GD*d1960	-0.003	0.007	0.035	0.049	0.040
	(0.014)	(0.010)	(0.012)**	(0.012)***	(0.011)***
N	*17943462*	*17009555*	*13134560*	*9467913*	*6183576*

Notes: See notes to Table 3 for description of coefficients, variables and samples. All state covariates in Panel A except current failures are assigned by state of residence in 1935 for *t=1940* and by birth state in the remaining years. In Panel B all state covariates are assigned on the basis of the current state of residence. Standard errors are clustered accordingly. The sample includes white women, born in the US, not in farm households and not in group quarters. ***, **, * indicate significance at 1%, 5% and 10% respectively.

Table A5
Robustness – other considerations (2).

	1910-1930-1940-1950-1960 pooled samples				
Age in year t:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dep. Variable:	*=1, if currently employed*				
Panel A:	***Baseline - Decomposition of the GD measure***				
GD_{1929}*d1930	0.021	0.009	0.013	0.013	0.006
	(0.012)*	(0.007)	(0.005)**	(0.005)**	(0.005)
GD_{1929}*d1940	-0.016	-0.020	-0.020	-0.015	-0.005
	(0.020)	(0.015)	(0.010)**	(0.008)*	(0.006)
GD_{1929}*d1950	0.009	-0.010	-0.011	0.002	-0.047
	(0.017)	(0.014)	(0.012)	(0.015)	(0.016)**
GD_{1929}*d1960	-0.000	-0.022	-0.007	-0.011	-0.011
	(0.013)	(0.013)*	(0.014)	(0.014)	(0.014)
$GD_{1930\text{-}32}$*d1940	0.041	0.049	0.044	0.032	0.005
	(0.014)**	(0.015)**	(0.010)***	(0.009)***	(0.007)
$GD_{1930\text{-}32}$*d1950	-0.010	0.032	0.032	0.019	0.053
	(0.015)	(0.015)**	(0.013)**	(0.019)	(0.017)**
$GD_{1930\text{-}32}$*d1960	-0.007	0.029	0.033	0.039	0.027
	(0.012)	(0.013)**	(0.015)**	(0.016)**	(0.016)*
N	*17936730*	*17003220*	*13130859*	*9466685*	*6183590*
Panel B:	***Baseline - exclude south***				
GD*d1930	0.022	0.015	0.014	0.010	0.015
	(0.009)**	(0.005)**	(0.006)**	(0.006)	(0.007)**
GD*d1940	0.043	0.032	0.021	0.014	0.004
	(0.017)**	(0.008)***	(0.006)**	(0.006)**	(0.006)
GD*d1950	0.009	0.025	0.013	0.010	0.015
	(0.015)	(0.007)**	(0.007)*	(0.013)	(0.016)
GD*d1960	0.009	0.013	0.036	0.037	0.028
	(0.007)	(0.007)*	(0.009)***	(0.010)***	(0.010)**
N	*13612231*	*12756978*	*10036644*	*7322586*	*4800907*
Panel C:	***1915 as reference year for the measure of the GD instead of 1910***				
GD*d1930	0.017	0.014	0.011	0.014	0.012
	(0.010)*	(0.004)**	(0.005)**	(0.008)*	(0.007)*
GD*d1940	0.017	0.023	0.018	0.012	0.005
	(0.017)	(0.009)**	(0.006)**	(0.006)*	(0.007)
GD*d1950	0.011	0.013	0.019	0.023	-0.007
	(0.010)	(0.008)	(0.008)**	(0.011)**	(0.011)
GD*d1960	0.008	0.012	0.020	0.021	0.019
	(0.010)	(0.007)*	(0.008)**	(0.006)**	(0.007)**
N	*17937326*	*17003488*	*13130954*	*9466752*	*6183620*

Notes: OLS coefficients from a regression of the dependent variable stated above on a measure of the *GD* and the covariates listed in Table 3 and in Section 2.2 in the text. In Panel A, the measure consists of two terms: the term $GD_{1929} = Failures_{1929} - Failures_{1910}$, and the term $GD_{1930-32} = Average\ Failures_{1930\ to\ 1932} - Failures_{1910}$. The first term is multiplied with time dummies for the years 1930 to 1960, and the second for the years 1940 to 1960. In Panel B, the measure of the GD is as defined in Table 3 and in Section 2.2. Southern region is excluded from the sample. In Panel B, the measure of the GD is the difference between the average business failure rate during the core years of the GD (1929 through 1932) and the business failure rate in 1915 if *t>=1940*, the difference between the 1929 and the 1915 business failure rates, if *t=1930* and 0, if *t=1910*. All state covariates except current failures are assigned on the basis of the residence state. The sample includes white women, born in the US, not living in farm households and not in group quarters. Standard errors are clustered by birth state. ***, **, * indicate significance at 1%, 5% and 10% respectively.

Table A6
Robustness – other considerations (3).

Age in year t:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dep. Variable:			*=1, if currently employed*		
Panel A:			***change in liabilities of failing firms as a measure of the GD***		
			(1910-1930-1940-1950-1960 pooled samples)		
dliab_GD*d1930	0.003	0.001	0.002	0.002	-0.000
	(0.001)**	(0.001)	(0.001)*	(0.000)**	(0.001)
dliab_GD*d1940	0.007	0.005	0.003	0.003	-0.002
	(0.003)***	(0.0010)***	(0.001)***	(0.001)**	(0.001)
dliab_GD*d1950	-0.001	0.003	0.001	0.003	0.000
	(0.002)	(0.001)*	(0.001)	(0.002)	(0.003)
dliab_GD*d1960	0.000	0.000	0.003	0.004	0.001
	(0.003)	(0.001)	(0.002)*	(0.002)**	(0.002)
N	*17936730*	*17003220*	*13130859*	*9466685*	*6183590*
Panel B:			***change in log real personal income as a measure of the GD***		
			(1930-1940-1950-1960 pooled samples)		
dlninc_GD*d1930	0.141	0.153	0.185	0.166	0.054
	(0.076)*	(0.079)*	(0.075)**	(0.070)**	(0.070)
dlninc_GD*d1940	0.166	0.126	0.133	0.161	0.051
	(0.066)**	(0.073)*	(0.072)*	(0.067)**	(0.077)
dlninc_GD*d1950	0.116	0.116	0.113	0.151	0.007
	(0.073)	(0.071)*	(0.072)	(0.065)**	(0.092)
dlninc_GD*d1960	0.180	0.137	0.165	0.100	0.031
	(0.062)***	(0.077)*	(0.075)**	(0.067)	(0.088)
N	*13830143*	*13479078*	*10587389*	*7749035*	*5158263*

Notes: OLS coefficients from a regression of the dependent variable stated above on a measure of the *GD* and the covariates listed in Table 3 and in Section 2.2 in the text. In Panel A, the measure of the *GD* is defined in terms of the ratio of state liabilities of failing firms (deflated by the CPI) in a given year over the country-wide assets of failing firms in that year. We assign the average of this ratio across the core Depression years (1929 through 1932) divided by the respective ratio in 1910 if t>=1940; the ratio of state liabilities in 1929 weighted by the total nationwide assets in 1929 divided by the same ratio in 1910, if t=*1930*; 1 if t=1910.The measure is interacted with year dummies. We additionally control for state-level liabilities and state-level assets of failing firms in 1910 interacted with year dummies. In Panel B, the measure of the *GD* is the difference between the log of average real income during the core Depression years (1930 through 1932) and the log of real income in 1928, if t>=1940; the difference between the log of real per capita income in 1930 and in 1928, if t=1930. We control for current real per capita income at the state of residence in lieu of contemporaneous failures. Additionally, we control for the 1910 state-specific female employment shares interacted with year dummies. Income information is not available prior to 1919 and hence we use the 1930–1940–1950–1960 pooled sample in this case. The *GD* measure and the remaining state covariates (except for measures of current economic conditions) are assigned on the basis of the birth state. Standard errors are clustered by birth state. The sample includes white women, born in the US, not in farm households and not in group quarters. ***, **, * indicate significance at 1%, 5% and 10% respectively.

Table A7
Great Depression and the propensity to move out of the birth state.

	1910-1930-1940-1950-1960 pooled samples				
Age in year t:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dep. variable:	= 1, if the individual has move out of the birth state				
GD*d1930	-0.012	-0.012	-0.014	-0.014	-0.000
	(0.011)	(0.014)	(0.012)	(0.011)	(0.018)
GD*d1940	0.008	0.011	0.002	0.003	0.009
	(0.014)	(0.021)	(0.020)	(0.015)	(0.020)
GD*d1950	0.006	0.010	0.009	0.010	0.029
	(0.018)	(0.026)	(0.027)	(0.019)	(0.022)
GD*d1960	0.005	0.010	0.011	0.022	0.039
	(0.019)	(0.028)	(0.027)	(0.020)	(0.018)**
N	*17942107*	*17007263*	*13133503*	*9468043*	*6184277*

Notes: OLS coefficients from a regression of an indicator for whether the individual has move out of the birth state on our measure of the GD interacted with year dummies (see notes to Table 3), age and marital status dummies, 1910 birth state covariates (see notes to Table 3), WWII mobilization rate, state of birth fixed effects, year fixed effects, division (defined by birth state)-year fixed effects. The sample includes white women, born in the US, not in farm households and not in group quarters. Standard errors are clustered by thethe state of birth. ***, **, * indicate significance at 1%, 5% and 10% respectively.

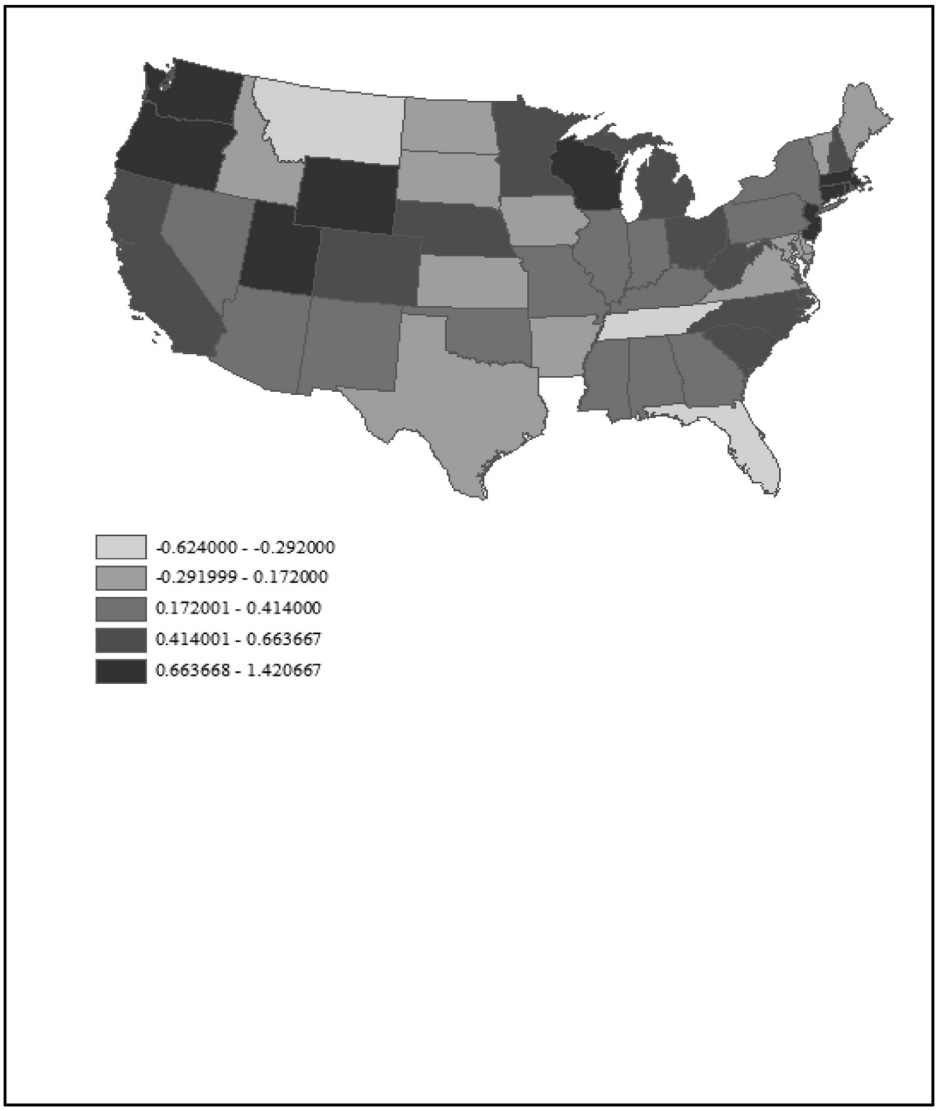

Fig. 3. Business failures by state (change between average business failure rate from 1929 to 1932 and business failure rate in 1910).

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