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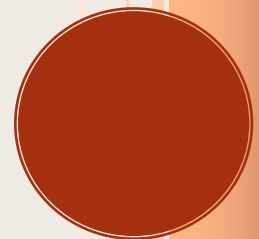
Canadian Labour Economics Forum

The Great Depression and the Rise of Female Employment: A New Hypothesis

Andriana Bellou (Univ. de Montréal, CIREQ & IZA)
Emanuela Cardia (Univ. de Montréal & CIREQ)

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Andriana Bellou (Université de Montréal, CIREQ & IZA) [1]

Emanuela Cardia (Université de Montréal & CIREQ)

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 a large increase in young women's labor force participation 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, suggesting a permanent impact of the Great Depression on women's lifecycle labor supply.

I.   Introduction

A. 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 by over 25% (Margo, 1933). 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.[2]

This paper provides the first evaluation of the short- and long-run impacts of the Great Depression on female employment. A priori, these relationships are 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 (added-worker effect). On the other hand, reduced labor demand and increased enforcement of marriage bars might have reduced women's participation (Goldin, 1991b).

Our empirical analysis exploits local variation in the severity of the economic downturn in 1929/30 across different states and counties. We pool individual data on employment status as well as other characteristics from several Censuses between 1910 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 who resided 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 between 1930 and 1940 women in prime working ages – 25 to 44 years old in 1940 – significantly increased their employment rates in states that were more severely impacted by the Great Depression. The effects are similar among married women, suggesting an added-worker effect. Second, we find that

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[2]Stuckler, Meissner, Fishback, Basu and McKee (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, Haines and Kantor (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.

these same cohorts of women had persistently higher participation rates throughout their lifecycle, decades after the Depression years. Our estimates point to cohort-specific effects of the shock. Among white women, this cohort -- which we refer to as the *D-cohort* -- is the first to break the long-standing pattern of permanent labor market exit after marriage (Goldin, 1990; Costa, 2000).

Our identifying assumption is that in the absence of Depression-related business failures, the labor supply of women would have trended similarly across states. We conduct a variety of checks to ensure the validity of this assumption. F*irst,* 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.). S*econd*, we construct two alternative measures of Depression severity using county data on retail sales (Fishback et al., 2007) and state per-capita real income (Fishback et al., 2005). *Third*, we assess whether alternative explanations of the increase in women's participation rates in first half of the 20th century could be driving the results, namely the increase in education, the expansion of the white-collar sector, or WWII mobilization (Goldin, 1990 and 2000; Acemoglu et al., 2004). We also control for changes in contemporaneous economic conditions. *Fourth*, we conduct two falsification exercises to check whether: 1) our baseline Depression measure can predict higher labor force participation rates for women in decades prior to 1930; 2) pre-Depression business failures predict female employment during the Depression. *Fifth,* throughout the paper we examine different cross-sections to follow our cohort and other cohorts over time. In all cases our results are *cohort-specific*, and the age brackets of women affected shift consistently across time. If we were capturing other factors, these would have to be cohort-specific to fit our findings inconsistent with all of the alternative explanations mentioned above. In sum, all these exercises support the identifying assumption and suggest that our main results are robust.

Our findings suggest that the Great Depression had a persistent impact on female labor supply, and that cohorts that entered the labor market in the 1930s continued working more through the 1960s. What could explain this long-term pattern? To answer this question, we first study the effects of the Depression on female wages. We find that in states more severely affected by the Great Depression, the *D-cohort* had significantly lower wages in 1960, when 45 to 64 years old, relative to women of the same age in 1940. These patterns are consistent with a permanent positive labor supply shift. Furthermore, the decline in relative wages cannot be explained by self-selection into lower-end occupations. Next, we explore the long-run effects of the Depression on *male* employment by cohort. We find that the likely spouses of the *D-cohort* tended to work *less* in 1940 in states that were more severely impacted by the Depression, but had higher participation rates and lower wages in subsequent decades. For these cohorts of men, self-selection into lower-end occupations explains a large part of the decline in wages. Employment gaps, absence of opportunities, and human capital depreciation may have contributed to this shift into lower paying occupations as well as reduced household permanent income.

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, Autor, and Lyle, 2004; Greenwood, Seshadri and Yorukoglu, 2005; Lewis, 2018; Bailey and Collins, 2011). The paper also adds to the growing research aiming 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.[3]

The paper proceeds as follows. A historical background is discussed in the rest of this introduction. Part II describes the data. Part III tests our hypothesis. Part IV provides identification and robustness checks. Part V discusses various channels and examines the impact of the Great Depression on wages. Part VI presents results from a survey on women born between 1901 and 1910. Part VII concludes.

B. 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

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[3] See Lundeberg, 1985; Finegan and Margo, 1993 and 1994; Stephens, 2002; Blundell, Pistaferri and Saporta-Eksten ,2016; Kawano and LaLumia, 2014; Morissette and Ostrovsky, 2008; Gong, 2010; Cullen and Gruber, 2000; Bredtmann, Otten and Rulff, 2018.
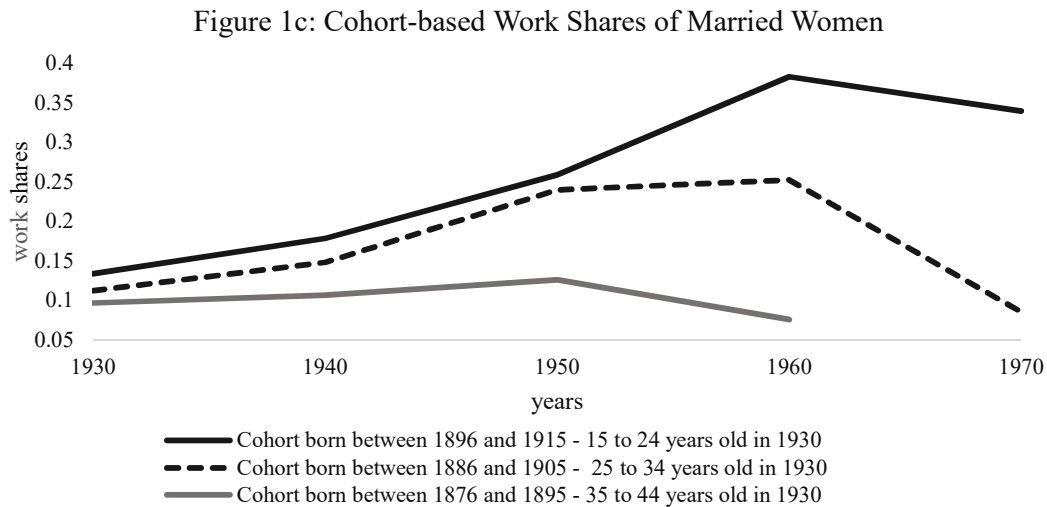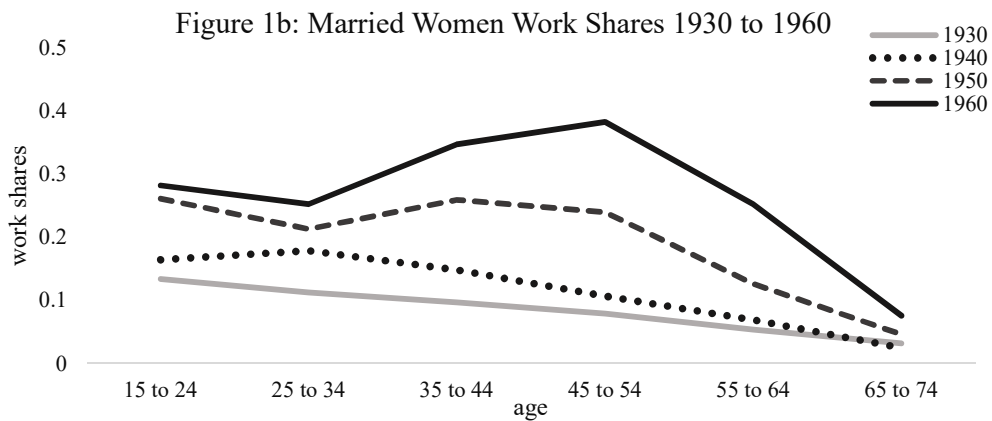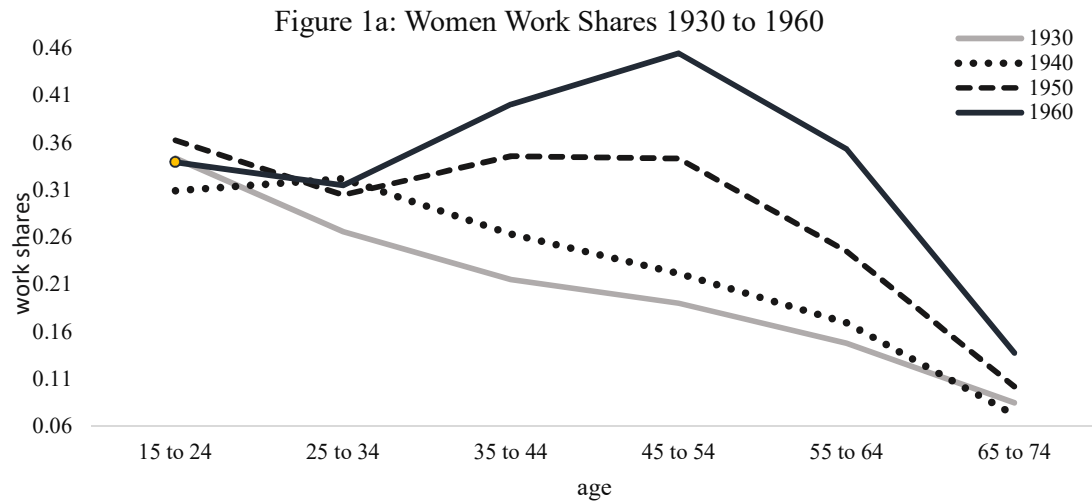
middle-income households cut back on their expenditures but also tried to maintain installment purchases by "placing additional workers in the labor force". This meant that also wives of relatively more affluent husbands had to accept paid employment in order to maintain their living standards.[4]

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 1,000 home mortgages to 13.3. In 1933, on average 1,000 home were foreclosed daily (Federal Home Loan Bank Board, 1937).

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) also argue in favor of an added worker effect in the 1930s. They 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. 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 hardly hit such as in nursing, teaching, sewing or domestic services. Klein (2018) states that after the 1929 Crash, many African Americans were fired from positions that were taken over by white workers in need of employment.[5] These jobs, predominantly low-skill and low-pay, were

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[4] 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).

[5] 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,

Figure 1a: Women Work Shares 1930 to 1960

Figure 1a: Women Work Shares 1930 to 1960

Figure 1b: Married Women Work Shares 1930 to 1960

Figure 1b: Married Women Work Shares 1930 to 1960

Figure 1c: Cohort-based Work Shares of Married Women

Figure 1c: Cohort-based Work Shares of Married Women

Cohort born between 1896 and 1915 - 15 to 24 years old in 1930
Cohort born between 1886 and 1905 - 25 to 34 years old in 1930
Cohort born between 1876 and 1895 - 35 to 44 years old in 1930

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managers/officials/proprietors, dressmakers/seamstresses, operatives/kindred workers (about 20%), waitresses, housekeepers in private households, barbers/beauticians, laundry/dry cleaning operatives.

also less likely to be restricted by marriage bars.

Figures 1a, 1b and 1c corroborate 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 the cohorts born between 1896 and 1915 (Goldin, 1990, 2000; Smith and Ward, 1985). The latter, increased their participation dramatically and persistently relatively to women born a decade earlier.[6] Young married women may have been more affected than young single women as they may have bought their homes at peak real estate prices (see Bellou and Cardia, 2016) and/or have installment payments to make on newly purchased durable goods (Olney, 1999).

II.   Data and Identification

A. Data

Our main data source is the 1% IPUMS files, between 1910 and 1960 (Ruggles et al., 2010). We use this data to obtain micro-level information on labor supply, wages and other characteristics. Our main analysis focuses almost exclusively on white women born in the United States, not in farm households and not in institutional group quarters. Finally, unless otherwise specified, we match all state variables by the woman's state of birth and use the appropriate sampling weights. We discuss, however, the robustness of our estimates to alternative state assignments and find that all results go through.

A central issue is how to consistently measure changes in economic conditions during

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[6] The immediately older cohort (35 to 44 years old in 1930) also re-enters when older but to a much lesser degree. We also find that slightly younger women 20 to 24 years old in 1940 and born between 1916 and 1920 also modified their labor supply in response to the shock of the Great Depression. These women turned working age in the early 1930s.

the first half of the century.[7] 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 referred to as *business failures*). This is the only measure we are aware of that is at state level and consistently available at 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 and steamship lines amusement enterprises. Figure 2 plots the nationwide rate of business failures against annual real GDP since the start of the century. Overall, the business failure rate captures the major recessions in the aggregate income series.[8] Figure 3 in the appendix

Figure 2: Business Failures and GDP
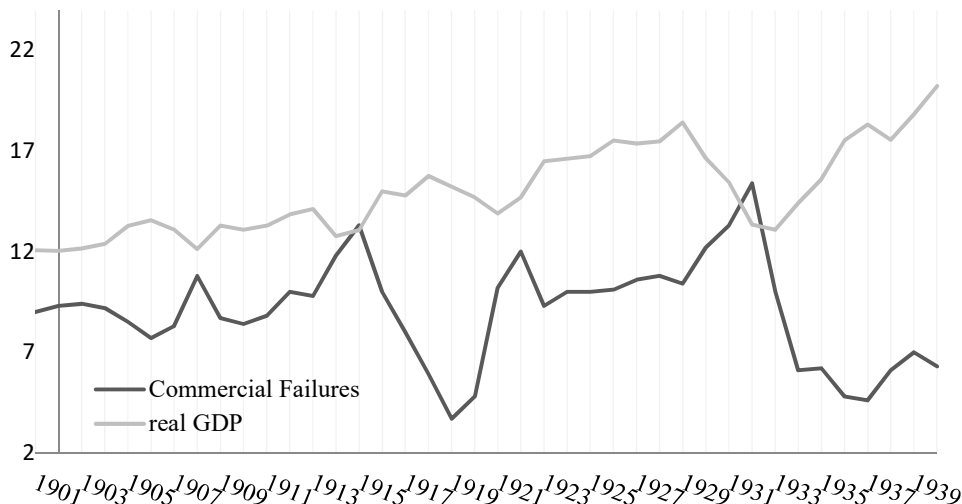
displays the cross-state variation in business failures. We measure the severity of the Great

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Depression by the change in the average failure rate between 1929 and 1932 and the average failure rate between 1909 and 1912 (see subsection II.C). The recovery began in early 1933, and we are picking the years when the crisis was most severe. Choosing different pre-depression years for the measure (such as the average failure rate between 1919 and 1922) does not change our results.

In addition to the business failure rate measure, we confirm the robustness of our main findings using two alternative measures of economic conditions: state personal real per capita income in 1967 dollars and county retail sales. The first measure is only available since 1919 (Fishback and Thomasson, 2014), the second is collected at the county level for a subset of years (Fishback, Haines and Kantor, 2007) and allows us to use finer regional variation than state-level data. Unfortunately, this series is only available until 1950 thus not allowing us to explore the long-term effects of the Great Depression.

B. 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.

In Table 1, we report several economic and demographic variables measured in 1910 (pre- Depression) separately for low and high changes in the average failure rates (as defined in the previous section). As cutting point between low and high changes, we use the average change, which is 0.28. As can be seen, high failure states have a larger average size of the manufacturing sector, higher share of white and foreign-born people, higher average

occupational scores and lower agricultural employment.[9] Reassuringly, pre-depression female labor force participation rates are uncorrelated with business failure rates during the Great Depression. The fact that states with a larger concentration in manufacturing experienced a higher failure rate increase in 1930 is not surprising given that manufacturing firms are a significant part of the concerns.[10]

Table 1: 1910 characteristics of states grouped by the increase in the business failure rate between 1930 and 1910

	(Avg failure rate btw 1929 and 1932) - (Avg failure rate btw 1909 and 1912)	
	Low failure rate increase	High failure rate increase
State characteristics	(<=0.28)	(>0.28)
employment share in agriculture	0.39	0.21
	(0.49)	(0.40)
employment share in manufacturing	0.23	0.30
	(0.42)	(0.46)
employment share in trade	0.15	0.17
	(0.36)	(0.38)
employment share in services	0.22	0.20
	(0.41)	(0.40)
employment share in finance	0.02	0.02
	(0.14)	(0.15)
share of farm households	0.38	0.20
	(0.48)	(0.40)
share foreign born	0.12	0.30
	(0.33)	(0.46)
share non-white	0.21	0.06
	(0.41)	(0.24)
share married	0.55	0.50
	(0.49)	(0.50)
participation rate of nonfarm women	0.28	0.29
	(0.45)	(0.45)
mean occupational score	19.03	22.03
	(11.04)	(10.11)

Note: State averages calculated from the 1910 IPUMS USA cross-section. State business failure rate is obtained from the Statistical Abstract of the United States.

To make sure that our results are not due to any of the above pre-Depression state characteristics, in all our specifications we control for the pre-Depression size of the manufacturing sector, the employment share in agriculture, the share of nonwhite people

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[9] The IPUMS provides no information on income prior to 1940. In absence of income information, occupational scores are used as a proxy. We found no association between employment shares in other sectors of the economy in 1910 and business failures in 1930. All statistics are calculated across the state population aged 20 to 64 using IPUMS USA data.

[10] 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% (from Richardson and Gou, 2011).

and the share of foreign born. Controlling for these characteristics could further account for the presence and intensity of marriage bars across states and their role in restricting female employment. States with higher share of non-natives, 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).[11] In addition, all our baseline specifications, include state (of residence and birth) and year fixed effects as well as division-year interactions. We further control for other potentially confounding mechanisms (such as education, the expansion of the white collar sector and WWII mobilization) and finally conduct falsification exercises examining pre-Depression labor market outcomes where our measure of the shock should not have any systematic effects. Our findings remain robust to all the above considerations.

C. Research Design

Our main strategy is to compare the work behavior of women in different age brackets in post-Depression years to that of women in the same age brackets in pre-Depression years. The work behavior will be captured by an indicator for whether a woman is currently employed at the time of the survey in year t (IPUMS variable *empstat*). Unlike labor force participation (IPUMS variable *labforce*) which is a variable not comparable before and after 1940, *empstat* is fairly comparable across Census years but does not exist in 1920. [12]

For the short-run analysis, we pool the 1910-1930-1940 cross-sections and compare the work responses to the Great Depression of women in different age groups in 1940 (post-

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[11] Both *hire bars* (prohibiting hiring married women) and *marriage* bars (dismissing women upon marriage) increased in the 1930s (Goldin, 1991b).

[12] According to IPUMS USA comparability note, the variable "empstat" is fairly comparable across years if analysis is limited to adults age 16+. When including 1910, the sample needs to be further restricted to employees who were not institutional inmates. This is in contrast to the "labforce" variable, which presents more serious comparability issues before and after 1940. As an additional check, we also defined "work" on the basis of whether the individual reports a gainful occupation (OCC1950 variable). The results were similar and are available upon request.

Depression, treated groups) to those of women in the same age-groups in 1930 (shortly after the Crash, possibly treated groups) and in 1910 (pre-Depression, untreated groups). We examine six age groups between 16 and 64 years old. We estimate versions of the following baseline specification:

$$y_{it,A} = \alpha_0 + \alpha_1 CC_{s',t} + \alpha_2 CC_{s',t} \cdot d_t + \alpha_3 GD_{s,t} \cdot d_{1940} + \alpha_4 GD_{s,t} \cdot d_{1930} + \alpha_5 X_{it,A} +$$

$$f_{s,s'} + g_t + z_{s,t} + h_{s,1910} \cdot d_t + \varepsilon_{it} \qquad (1)$$

$y_{it,A}$ is an indicator for whether woman i in age group A is currently employed in year t ($y_{it,A}$ = 1 if "empstat"=1 and 0 otherwise). The variable $CC_{s',t}$ captures the effect of current economic conditions measured at the individual's state of residence and is interacted with a year dummy.[13] All state variables in equation (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 (frate_GD, henceforth referred to as GD) is measured by the change (increase) between the business failure rate during the Depression years and the failure rate between 1910 and 1912 (pre-depression years). More specifically the variable GD is defined as follows:

- The change in the average business failure rate between the periods 1929-1932 and 1910-1912 for the 1940 cross-section: $GD_{s,t} = F_{s,1930s} - F_{s,1910s}$, *if t=1940*

- The change in business failures between 1929 and the average for the period 1910-1912 for the 1930 cross-section: $GD_{s,t} = F_{s,1929} - F_{s,1910s}$, *if t=1930* [14]

- 0 for 1910, which is a pre-treatment year and not affected by the change in business failures during the Great Depression: $GD_{s,t} = 0$, *if t=1910*

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[13] These are failures in year *t-1*: in 1909 for 1910, in 1929 for 1930, in 1939 for 1940. Hence: $CC_{s',t} = F_{s',t-1}$.
[14] 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 allow the 1929 (instead of 1930) failure rate to affect the 1930 labor supply.

The variable *GD* is interacted with a year dummy, allowing the shock to have a differential effect on work in 1940 and in 1930 (relative to 1910). Time-invariant state-specific characteristics that could lead to differences in work via alternative channels than the one we propose, are captured by state fixed effects which are included in all regressions. $f_{s,s'}$ are two separate sets of fixed effects; for the state of birth (s) and for 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 birth-state characteristics (employment share in manufacturing, share farmers, share nonwhite, share foreign-born and average occupational score as a proxy for income) interacted with year dummies. Standard errors are clustered by birth state. When state variables are matched by state of residence, division-year interactions and clustering are accordingly modified.

In the long-run analysis, we run two sets of regressions. First, we add the 1960 sample to the above pooled "short-run" sample and compare the work responses of women 45 to 64 years old in 1960 to that of women 45 to 64 years old in 1940, in 1930 and in 1910. The cohort of 45 to 64 year olds in 1960 was of working age in 1940, and we studied their work behavior in response to the Great Depression in the short-run analysis. This is essentially the pseudo-cohort (*D-cohort*) that we are following throughout our analysis. For the 1910 to 1960 pooled sample, we estimate regressions of the same general form as in (1):

$$y_{it,A} = \alpha_0 + \alpha_1 CC_{s',t} + \alpha_2 CC_{s',t} \cdot d_t + \alpha_3 GD \cdot d_{1960} + \alpha_4 GD_{s,t} \cdot d_{1940} + \alpha_5 GD_{s,t} \cdot$$

$$d_{1930} + \alpha_6 mobrate_s \cdot d_{1960} + \alpha_7 X_{it,A} + f_{s,s'} + g_t + z_{s,t} + h_{s,1910} \cdot d_t + \varepsilon_{it} \qquad (2)$$

The only difference between specifications (1) and (2) is that the latter accounts for the effect of WWII mobilization. Following Acemoglu et al. (2004), we measure the labor supply effects of WWII using the share of registered men 18 to 44 years old who were drafted or enlisted in the war in a given state (*mobrate*). Business failures during the Great Depression (*GD*) are defined as for the 1910-1930-1940 pooled sample, except that we also allow 1960 to be affected by the shock: $GD_{s,t} = F_{s,1930s} - F_{s,1910s}$, *if t=1960*. For contemporary failures (*CC*) we modify the measure to include the failure rate in 1959 if *t=1960*. $X_{it,A}, f_{s,s'}, g_t, z_{s,t}, h_{s,1910}$ include all the covariates and fixed effects we previously described. Standard errors are again clustered by birth state and state variables are assigned as discussed in the short-run analysis.

Subsequently, we report results that use the 1940 as a base year and pool the 1940-1960 cross-sections. Even if the base year is a post-depression year, this sample is of interest for three main reasons. First, from 1940 onwards the definition of work and the underlying population are more comparable than before 1940. Second, from 1940 onwards, it is possible to also study work decisions at the intensive 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. We estimate the following specification:

$$y_{it,A} = \alpha_0 + \alpha_1 CC_{s',t} + \alpha_2 CC_{s',t} \cdot d_t + \alpha_3 GD_s \cdot d_{1960} + \alpha_4 mobrate_s \cdot d_{1960} +$$

$$\alpha_5 X_{it,A} + f_{s,s'} + g_t + z_{s,t} + V_{s,t \le 1940} \cdot d_{1960} + \varepsilon_{it} \qquad (3)$$

The variables $y_{it,A}, CC_{s',t}, mobrate_s, f_{s,s'}, g_t, z_{s,t}, X_{it,A}$ are as previously defined. The vector $V_{s,t \le 194}$ includes state characteristics: the 1940 state share of men who were farmers, share of non-whites, average male education in 1940, age-specific female participation

shares in 1930 and in 1920 as well as the size of manufacturing employment in 1930.

To capture the impact of the Great Depression on labor supply, we use the difference in the average business failure rate between the periods 1929-1932 and 1909-1912 ($GD_s = F_{s,1930s} - F_{s,1910s}$, *if t=1940,1960*) interacted with a dummy for the year 1960. The coefficient α_3 should capture the *relative* effect of the Great Depression on the change in labor supply for a given age group between 1940 and 1960.

Our approach of following age groups over time implicitly amounts to following birth cohorts over time and to comparing their labor supply responses in 1940 or 1960 to that of older birth cohorts in 1910, prior to the Great Depression. These cohorts are therefore a pre-treatment reference point. An alternative approach to following age-groups (and indirectly cohorts) over time could be to directly follow the cohorts of working age in 1930 across Censuses and compare the within-cohort responses to the Great Depression over the life-cycle. This approach does not rely on other untreated groups as a comparison, and more importantly cannot use the information from the 1910 Census, which is a "clean" pre-treatment year. This is because many women of working age in 1930 were not born or were too young to enter the labor market in 1910. We can't therefore tell how the Great Depression may have tilted their labor supply (as measured by the *empstat* variable) because we have no pre-Crash observation point and the 1930 work behavior may have already been affected by the shock. For this reason, in our main analysis and subsequent exercises we adopt the first approach (of following age groups) but as a robustness and consistency check, in the appendix we also present estimates following the cohort approach.

III.   Great Depression and Labor Supply

A. Female Labor Supply and the Great Depression: Short-Term Effects

The results of the estimates of (1) are presented in Panel A of Table 3A. As can be

seen, in states with worse economic conditions during the Great Depression, women 20 to 44 years old work more in 1940 relative to previous decades. Older women and those 16 to 19 years old in 1940, who were children at the onset of the Crash, do not modify their labor supply. Moreover, there is overall no statistically significant effect on the labor supply of women in 1930 (perhaps apart from 20 to 24 years old women), which could be due to the timing the employment status was measured in the 1930 Census (April 1st). The increase in female labor supply is consistent with the hypothesis of an *added worker effect* as women in this age group (20 to 44 years old) are more likely to be married. To explore further this idea, in the last two columns of Table 3A we interact our variables of interest with an indicator for whether the woman is currently married. The estimates suggest that married, prime-age women in more affected states are significantly more likely to work relative to single women. To obtain an idea of the magnitude of these effects, evaluating the coefficient of 0.056 (Table 3A, Panel A: 0.084-0.028) for married females 16 to 44 years old at the average change in the business failure rate from peak to trough (about 0.79), the implied increase in the work share is 4.4 percentage points. This corresponds to an increase in employment by approximately 40% relative to the average age-specific employment rate of married women in 1930 (0.11).

In Panel B, we examine the robustness of our findings to the introduction of a broad unemployment insurance program in the 1930s. In the aftermath of the Great Depression, the sharp increase in unemployment led to the Social Security Act in 1935 and to the establishment of unemployment insurance programs (see Bordo, Goldin and White, 1998). The potential maximum duration of benefits however varied considerably across states, ranging from 12 to 28.8 weeks.[15] Unemployment benefits could reduce the incentive for

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[15] All state laws were in place by 1938, even though some states began payments the year after. The number of weeks allowed were in general a function of the amount of previous earnings or employment. Thus, claimants may have been eligible for less than the maximum number of weeks. See also, The Handbook of

married women to temporarily enter the labor market to offset their husbands' loss of income. Since unemployment benefits varied with the severity of the Great Depression, their exclusion could bias our estimates. To examine the role of unemployment insurance, we use data from Price (1985) on the maximum number of weeks that are covered by the insurance by state as of May 1st 1938.[16] The estimates show that our baseline results remain robust.[17]

In Panels C and D, we examine the relevance of selective migration for our main findings. 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. The extent to which such a bias could influence our results depends on its magnitude and on the relationship between out-migration and women's unobserved propensity to work. Both of these elements could also vary by age. Unfortunately, we have no way of knowing where the individuals resided at the time of the shock since the Census provides consistent information only for the birth and the current state of residence. Beginning 1940 there is also information about 5-year migration (variable *MIGPLAC5*). In order to address migration, we have taken two steps. First, all our specifications already include a dummy for whether the individual resides in a state different from that of birth as well as fixed effects for the state of birth and of residence. Therefore, our baseline estimates should already account for movements between birth state and current state. Second, in Panels C and D we experiment with alternative state assignments. In Panel C, state covariates are matched by the individual's

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Unemployment Insurance – 1938-1951, United States Labor Department, 1952.

[16] Since unemployment insurance was officially introduced in the 1930s, the variable is set to zero in 1910 and in 1930.

[17] 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 - is likely correlated with the severity of the Depression. It could have indirectly affected female labor supply by decreasing women's work and increasing employment opportunities of the husbands of the *D-cohort*. Hence, we expect that accounting for it should only make our baseline results stronger. We have no state-level data on the relief program to directly control for it but division-year interactions may pick up some of the effect.

current state of residence. In Panel D, state covariates in the 1940 cross-section are matched by the individual's state of residence 5 years prior to the Census, which is in 1935, while state covariates in the 1930 and 1910 cross-sections are matched by the respondent's birth state. In all cases, the benchmark results remain intact. The revised estimates are in fact larger in magnitude for women aged 25 and above compared to the baseline estimates of Panel A (by birth state), which suggests that migration likely biases our estimates downwards.

Finally, in Table 3B Panel A, we present results from the baseline specification for men. The point estimates are negative but insignificant and suggest that women relative to men worked significantly more in 1940. This is consistent with the presence of an added worker effect. While we have suggested the added worker effect as the reason why more women joined the labour force, it remains to be understood how women could find jobs when the overall unemployment rate was high. Marriage bars grew in importance during the Great Depression and were more stringent for educated, native-born, middle-class, white married women.[18] Hill (2015) finds that they led women to postponing marrying, which may have helped them retain their jobs longer.

Here, we examine the possibility that some of the employment of white women was at the expense of other groups.[19] Sundstrom (2001) shows that African American women suffered from very high unemployment rates during the Great Depression which led many to leave the labor force (also see Margo, 1993). In Panels B and C of Table 3B we examine the impact of the increase in business failures on the employment prospects of African

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[18] 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 have marriage bars, and not retain married women upon marriage (Goldin, 1991b).
[19] 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.

Table 3A: The short-term impact of the Great Depression on female labor supply

	1910-1930-1940 pooled samples							
Age in year t:	16 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	*16 to 44*	*16 to 64*
Dependent variable:				= 1, if currently employed				
Panel A:				*Baseline*				
frate_GD*d1930	-0.011	0.021	0.008	-0.004	-0.002	0.012	0.035	0.033
	(0.022)	(0.011)*	(0.011)	(0.012)	(0.012)	(0.017)	(0.018)*	(0.015)**
frate_GD*d1940	-0.010	0.036	0.037	0.018	-0.012	0.016	-0.028	-0.017
	(0.038)	(0.017)*	(0.017)**	(0.008)**	(0.014)	(0.022)	(0.025)	(0.019)
frate_GD*d1930*married							-0.054	-0.049
							(0.026)**	(0.021)**
frate_GD*d1940*married							0.084	0.054
							(0.032)**	(0.025)**
Panel B:				*Baseline-Account for unemployment insurance*				
frate_GD*d1930	-0.014	0.015	0.003	-0.008	-0.002	0.004	0.031	0.029
	(0.022)	(0.011)	(0.011)	(0.012)	(0.012)	(0.015)	(0.018)*	(0.015)*
frate_GD*d1940	-0.011	0.034	0.036	0.016	-0.013	0.013	-0.029	-0.018
	(0.039)	(0.018)*	(0.017)**	(0.007)**	(0.014)	(0.020)	(0.025)	(0.019)
frate_GD*d1930*married							-0.054	-0.049
							(0.026)**	(0.021)**
frate_GD*d1940*married							0.084	0.054
							(0.032)**	(0.026)**
N	*79188*	*95641*	*162771*	*125468*	*89330*	*57605*	*463068*	*610003*
Panel C:				*Baseline-Assignment by state of residence*				
frate_GD*d1930	-0.003	0.038	0.023	-0.012	-0.010	0.011	0.046	0.045
	(0.033)	(0.014)***	(0.019)	(0.017)	(0.026)	(0.018)	(0.021)**	(0.018)**
frate_GD*d1940	-0.007	0.039	0.048	0.022	-0.009	0.028	-0.017	-0.005
	(0.052)	(0.020)*	(0.021)**	(0.013)*	(0.024)	(0.016)*	(0.027)	(0.022)
frate_GD*d1930*married							-0.060	-0.059
							(0.027)**	(0.022)***
frate_GD*d1940*married							0.075	0.044
							(0.033)**	(0.026)*
N	*79204*	*95672*	*162822*	*125496*	*89344*	*57611*	*463194*	*610149*
Panel D:				*Baseline-Assignment by birth state and state of residence in 1935*				
frate_GD*d1930	-0.009	0.026	0.009	-0.009	-0.012	0.007	0.033	0.027
	(0.023)	(0.012)**	(0.010)	(0.012)	(0.013)	(0.016)	(0.019)*	(0.016)*
frate_GD*d1940	-0.007	0.023	0.049	0.031	-0.011	0.029	-0.021	-0.012
	(0.047)	(0.019)	(0.017)***	(0.011)***	(0.014)	(0.021)	(0.027)	(0.020)
frate_GD*d1930*married							-0.054	-0.049
							(0.026)**	(0.021)**
frate_GD*d1940*married							0.080	0.049
							(0.033)**	(0.025)*
N	*78540*	*94999*	*161749*	*124543*	*88569*	*57016*	*459831*	*605416*

Notes: OLS coefficients from a regression of an indicator for whether the respondent is currently employed on the business failure rate increase during the Great Depression, contemporaneous failures, dummies for age, marital status and whether state of residence differs from the birth state, state of birth/residence and year fixed effects, division-year interactions, 1910 state covariates (employment share in manufacturing, share farmers, share nonwhite, share non-natives, average occupational score). See discussion of eq. (1) in text for more details. In Panel B, we control for the maximum number of weeks that are covered by the insurance by state as of May 1st 1938 (Prince, 1985). Married is an indicator for whether the individual is currently married. The baseline sample consists of 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. ***, **, * indicate significance at 1%, 5% and 10% respectively.

Table 3B: The short-term impact of the Great Depression on the labor supply of other groups

Age in year *t*:	16 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dependent variable:			*= 1, if currently employed*			
Panel A:			*Baseline - Men*			
frate_GD*d1930	0.011	-0.015	-0.010	-0.008	-0.000	-0.015
	(0.021)	(0.019)	(0.012)	(0.011)	(0.012)	(0.018)
frate_GD*d1940	0.027	-0.002	-0.002	-0.015	-0.008	-0.045
	(0.031)	(0.020)	(0.014)	(0.017)	(0.009)	(0.026)*
N	*73536*	*84933*	*151736*	*121133*	*87419*	*53503*
Panel B:		*Baseline - African American women (assignment by birth state)*				
frate_GD*d1930	-0.105	-0.021	0.009	-0.075	-0.009	0.093
	(0.041)**	(0.032)	(0.026)	(0.030)**	(0.037)	(0.071)
frate_GD*d1940	-0.097	-0.124	-0.059	-0.138	-0.058	0.037
	(0.053)*	(0.052)**	(0.030)*	(0.029)***	(0.046)	(0.042)
N	*15124*	*17931*	*28345*	*22031*	*14116*	*7381*
Panel C:		*Baseline - African American women (assignment by state of residence)*				
frate_GD*d1930	-0.216	-0.143	-0.078	-0.116	-0.138	-0.045
	(0.053)***	(0.048)***	(0.051)	(0.041)***	(0.053)***	(0.086)
frate_GD*d1940	-0.241	-0.202	-0.131	-0.147	-0.144	-0.102
	(0.048)***	(0.056)***	(0.051)***	(0.038)***	(0.052)***	(0.072)
N	*15124*	*17934*	*28345*	*22031*	*14116*	*7381*

Notes: OLS coefficients from a regression of an indicator for whether the respondent is currently employed on the business failure rate increase during the Great Depression, contemporaneous failures, dummies for age, marital status and whether state of residence differs from the birth state, state of birth/residence and year fixed effects, division-year interactions, 1910 state covariates (employment share in manufacturing, share farmers, share nonwhite, share non-natives, average occupational score). See discussion of eq. (1) in text for more details. Estimates are weighted using the available sampling weights. Standard errors are clustered by state. ***, **, * indicate significance at 1%, 5% and 10% respectively.

American women. As can be seen, the results suggest a strong negative effect across all age groups.[20] In other words, while not an exhaustive answer to why white non-farm women increased their participation in periods of high unemployment, white women may have crowded-out other groups of women, non-white women, and also possibly older and very young women.

B. Female Labor Supply and the Great Depression: Long-Term Effects

First, we present our baseline specification where we pool the 1910, 1930, 1940 and 1960 cross-sections. The cohort of women of working age in the 1930s is 45 to 65 years old in 1960 (*D-cohort*). We compare their work behavior in 1960 to the work behavior of

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[20] We have also looked at all non-white women. The effects go in the same direction but are most striking for African Americans.

women in the same age bracket in 1910, 1930 and 1940. Women in 1910 were not treated by the Great Depression. Moreover, the estimates in Table 3A show that white women aged 45 to 64 in 1930 or in 1940, were unaffected by the Great Depression. Hence, our approach is to compare the behavior of our focal (treated) cohort in 1960 to that of older (untreated) cohorts of the same age in years prior to 1960, including 1910 that is clearly a pre-treatment reference point.

The results from the estimation of equation (2) are presented in Panel A of Table 4A. We report estimates for different age groups so that we can see the impact of the Great Depression on the work behavior of different cohorts. The results highlight the *cohort-specific* pattern of our findings. *First*, it is the same cohort of women that entered the market in the 1930s – the *D-cohort* – which also works more in 1960 in response to economic conditions during the Great Depression. More interestingly, as before, it is the ever-married women in this group that continue working more.[21] Indicatively, evaluated at the average increase in the business failure rate between peak and trough (about 0.79), the estimate of 0.028 for the 45 to 64 age bracket, suggests an increase in the labor supply of this group in 1960 by approximately 2.2 percentage points, which amounts to a roughly 13% increase from the work share of 45 to 64 year olds in 1930 (0.17) and to a 16% increase from the work share of this age group in 1910 (0.14). In Panel A we also report results linking all variables to the state of residence. The estimates are stronger in terms of significance and larger in magnitude (18% to 21% increase in the labor supply of the 45 to 64 year olds in 1960 relative to the same age work shares of women in 1930 and in 1910 respectively).

Second, in 1960 women younger than 45 are unaffected. These women were too young or even unborn in 1930 to be working and to have been directly impacted by the initial

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[21] The sum frate_GD*d1960 + frate_GD*d1960*evmarried in the last column of Table 4A is always significantly different from zero.

Table 4A: The longterm effect of the Great Depression on female labor supply

Age in year t:	16 to 34	35 to 44	45 to 59	45 to 64	40 to 64	40 to 64
Panel A:			*1910-1930-1940-1960 pooled samples*			
Dependent variable:			*= 1, if currently employed*			
			State covariates assigned by birth state			
mobrate*d1960	0.251	0.109	-0.073	-0.137	-0.077	-0.078
	(0.080)***	(0.125)	(0.153)	(0.151)	(0.142)	(0.142)
frate_GD*d1930	0.011	0.005	0.006	0.006	0.002	0.003
	(0.009)	(0.012)	(0.011)	(0.010)	(0.010)	(0.01)
frate_GD*d1940	0.025	0.023	-0.000	-0.003	-0.007	-0.007
	(0.019)	(0.009)**	(0.013)	(0.011)	(0.009)	(0.009)
frate_GD*d1960	-0.016	0.000	0.029	0.028	0.017	-0.027
	(0.012)	(0.012)	(0.015)*	(0.013)**	(0.011)	(0.017)
frate_GD*d1960*evmarried						0.047
						(0.014)***
N	*500240*	*217900*	*225340*	*275500*	*377295*	*377295*
			State covariates assigned by current state			
mobrate*d1960	0.260	0.036	-0.161	-0.297	-0.205	-0.199
	(0.116)**	(0.121)	(0.157)	(0.150)*	(0.133)	(0.134)
frate_GD*d1930	0.039	0.029	0.021	0.022	0.025	0.025
	(0.013)***	(0.015)*	(0.019)	(0.016)	(0.014)*	(0.014)*
frate_GD*d1940	0.049	0.051	0.017	0.022	0.028	0.028
	(0.018)***	(0.012)***	(0.016)	(0.013)*	(0.012)**	(0.012)**
frate_GD*d1960	0.006	0.024	0.036	0.038	0.035	-0.013
	(0.011)	(0.013)*	(0.020)*	(0.016)**	(0.014)**	(0.032)
frate_GD*d1960*evmarried						0.052
						(0.027)*
N	*555299*	*259843*	*283605*	*350061*	*472448*	*472448*
Panel B:			*1940-1960 pooled samples*			
Dependent variable:			*= 1, if currently employed*			
mobrate*d1960	0.271	0.244	-0.267	-0.351	-0.079	-0.074
	(0.097)***	(0.158)	(0.203)	(0.185)*	(0.164)	(0.166)
CC	-0.005	-0.028	-0.084	-0.075	-0.064	-0.064
	(0.010)	(0.017)*	(0.028)***	(0.022)***	(0.017)***	(0.017)***
CC*d1960	-0.022	-0.001	0.034	0.028	0.020	0.021
	(0.009)**	(0.012)	(0.016)**	(0.012)**	(0.009)**	(0.009)**
frate_GD*d1960	-0.016	-0.017	0.022	0.022	0.015	-0.039
	(0.010)	(0.009)*	(0.008)***	(0.008)***	(0.006)**	(0.017)**
frate_GD*d1960*evmarried						0.059
						(0.019)***
N	*308174*	*147837*	*160327*	*196965*	*267404*	*267404*
Dependent variable:			*weeks worked in the last year*			
mobrate*d1960	27.85	18.51	-8.30	-10.95	1.13	1.21
	(5.29)***	(7.34)***	(10.34)	(9.66)	(8.57)	(8.60)
frate_GD*d1960	-0.595	-0.605	1.067	0.995	0.744	-0.07
	(0.534)	(0.406)	(0.397)***	(0.402)**	(0.334)**	(0.71)
frate_GD*d1960*evmarried						0.88
						(0.74)
Dependent variable:			*hours worked last week*			
mobrate*d1960	14.33	10.46	-7.17	-9.19	-0.312	-0.14
	(3.88)***	(6.33)*	(7.42)	(6.47)	(6.17)	(6.22)
frate_GD*d1960	-0.764	-0.372	0.735	0.777	0.709	-0.94
	(0.450)*	(0.378)	(0.288)**	(0.260)***	(0.243)***	(0.58)
frate_GD*d1960*evmarried						1.78
						(0.62)***
N	*308174*	*147837*	*160327*	*196965*	*267404*	*267404*

Notes: OLS coefficients from regressions of the dep. variables above on the business failure rate increase during the *GD* (interacted with year dummies), current failures, dummies for age/marital status/whether birth and current state differ, state of birth/residence/year fixed effects, division-year interactions WWII mobilization, 1910 state covariates (Panel A: share foreign born, farmers, nonwhites, empl. share in manufacturing, average occup. score) or 1940 state covariates (Panel B: share farmers, nonwhites, average male education, age-specific female participation shares in 1930 and 1920, empl. share in manufacturing in 1930). Evmarried is an indicator for ever been married. State variables are assigned by birth state unless stated otherwise. Sample: white native women, not in farm households and not in group quarters. Estimates are weighted using the available sampling weights. Where assignment of state variables is by birth (current) state, standard errors are clustered accordingly. ***, **, * indicate significance at 1%, 5% and 10% respectively.

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shock, though some of them may have entered the labor market in the mid-to late 1930s. In Panel B of Table 4A, we present results for the 1940-1960 sample. We only report estimates that use the state of birth as reference state, but results are in all cases stronger when using the state of residence (available upon request). The coefficient α_3 should capture the *relative* effect of the Great Depression on the change in labor supply for a given age group between 1940 and 1960. Therefore, we do not assume that the Great Depression had no effects on women 45 years and older in 1940. However, even if there were effects on this group, these were likely small. Our estimates in Table 3A show that women 45 to 64 years old in 1940 did not enter the labor market in response to the Great Depression, probably because they were relatively old at the time.

The estimates from this "shorter" pooled sample confirm the results from the "longer" pooled samples (Panel A). The *D-cohort* (45 to 64 years old in 1960), and especially the ever-married subgroup, also worked significantly more when older (45 to 64 years old in 1960) in state more affected by the Great Depression, while women younger than 45 in 1960 were not significantly impacted. Findings are similar at the intensive margin, when using weeks and hours worked as outcome variables. In line with the hypothesis that the entry/re-entry of this cohort of women into the labor market is also driven by a labor demand shift; we find that work shares increase in response to improvements in current economic conditions. None of the estimates support the hypothesis that WWII mobilization led to higher labor market participation for our cohort in the long run.

In Table 4B we examine the long-term impact of the Great Depression on men and on African American women. We also find a positive link between the Great Depression and older men's long-term work propensity. For African American women, we find that

the Depression years had instead a persistent negative impact on their employment.[22] This could be consistent with the Great Depression inducing *persistent* crowding-out effects of this group from certain sectors or occupations, jobs that may have been taken over by white women.

Table 4B: The longterm effect of the Great Depression on the labor supply of other groups

Panel A:	*Men*					
Samples:	*1910-1930-1940-1960*			*1940-1960*		
Ages in year t:	35 to 44	45 to 59	45 to 64	35 to 44	45 to 59	45 to 64
Dependent variable:			*=1 if currently employed*			
			assignment by birth state			
frate_GD*d1930	-0.008	-0.001	-0.006			
	(0.011)	(0.011)	(0.009)			
frate_GD*d1940	-0.02	-0.010	-0.025			
	(0.017)	(0.009)	(0.012)**			
frate_GD*d1960	-0.008	0.010	0.004	0.012	0.020	0.025
	(0.013)	(0.011)	(0.010)	(0.007)	(0.005)***	(0.006)***
N	*208562*	*215422*	*260044*	*140485*	*151787*	*183895*
			assignment by current state			
frate_GD*d1930	0.004	0.021	0.021			
	(0.013)	(0.017)	(0.017)			
frate_GD*d1940	0.007	0.018	0.009			
	(0.016)	(0.012)	(0.012)			
frate_GD*d1960	0.007	0.034	0.033	0.005	0.018	0.026
	(0.015)	(0.012)***	(0.013)**	(0.006)	(0.008)**	(0.009)***
N	*254740*	*281074*	*342363*	*158560*	*187906*	*230447*
Panel B:	*African American women*					
Samples:	*1910-1930-1940-1960 (assignment by current state)*					
Age in year t:	16 to 34	35 to 44		45 to 59	45 to 64	40 to 64
Dependent variable:			*= 1, if currently employed*			
frate_GD*d1930	-0.072	-0.05		-0.097	-0.099	-0.066
	(0.027)***	(0.044)		(0.034)***	(0.037)**	(0.036)**
frate_GD*d1940	-0.100	-0.053		-0.107	-0.111	-0.062
	(0.034)***	(0.036)		(0.036)***	(0.038)***	(0.031)**
frate_GD*d1960	-0.132	-0.101		-0.147	-0.149	-0.119
	(0.032)***	(0.032)***		(0.032)***	(0.037)***	(0.032)***
N	*65423*	*26413*		*24022*	*28721*	*40446*

Notes: See notes to Table 4A. The baseline sample in Panel A consists of white, native men not in farm households and not in group quarters. The sample in Panel B includes all African American women not in group quarters. Estimates are weighted using the available sampling weights. Where assignment of state variables is by birth (current) state, standard errors are clustered by birth (current) state too. ***, **, * indicate significance at 1%, 5% and 10% respectively.

IV. Long-Term Effects: Robustness

First, we examine whether alternative explanations of the increase in female

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[22] These results hold whether we use state of birth or state of residence (reported), but the latter are stronger.

participation in the first half of the 20th century could be confounding the link to the Great Depression. The alternative hypotheses we examine are: 1) the increased education of women in the early part of the century (Goldin, 1990), 2) the expansion of the white-collar sector in the early 20th century (Goldin, 2000), and 3) WWII.

In Table 5 we explicitly account for the first two factors by controlling for individual education (Panel A) and for changes in the state employment share in white-collar occupations in 1910, 1930, 1940 and 1960 (Panel B). In all cases, the baseline effects remain intact. Regarding WWII, first it is important to notice that we find that the Great Depression increased female work between 1930 and 1940, before WWII. Second, in all our other regressions, we control for the fraction of men who were drafted which varied across states. We find that WWII mobilization rates increased the work of 25 to 35 years old women in 1950 but find no effects for women older than 35 in 1960 (Table 4A). Consistent with our findings, the existing evidence suggests that the war only affected younger cohorts and that these effects faded by the end of the decade (Goldin, 1991a and Acemoglu et al., 2004).

In Table 6, we perform two falsification exercises. In the first, instead of the Great Depression measure, we use the change in average failures between 1916 and 1919 (instead of 1929 and 1932) and average failures between 1906 and 1909 (instead of 1909 and 1912) in the 1910-1930-1940-1960 pooled sample. In the second exercise, we check whether our baseline measure of the Great Depression can predict labor force participation of women in *pre-Depression* decades using the 1860-1870-1880 pooled samples. This is essentially a test in the spirit of the parallel trends assumption. We find that none of these exercises produces systematic effects for our cohorts.[23]

In Appendix Table A1 (part I) we present estimates of equation (2) by birth cohort (see

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[23] Similar results are obtained if state variables are assigned on the basis of the residence state.

Section II.C for a discussion of this approach and its limitations in this case). In line with the findings of Table 4A, we see that cohorts of women that were 20 to 34 years old in 1930 increased their labor supply over their life cycle in response to the shock. Younger cohorts, 15 to 19 in 1930, and older cohorts, 35 to 54 years old in 1930, displayed instead no such behavior. As a falsification exercise, we also test whether the Great Depression implied labor supply changes over the life-cycle for cohorts who were of working age in 1860 and should have not been affected by the Great Depression (Appendix Table A1, part II). These

Table 5: Robustness

Ages in year *t*:	35 to 44	45 to 59	45 to 64
Dependent variable:		*= 1, if currently employed*	
Panel A:		***1940-1960 pooled samples***	
		Controlling for individual educational attainment	
frate_GD*d1960	-0.019	0.020	0.022
	(0.009)***	(0.009)**	(0.008)**
N	*147837*	*160327*	*196965*
Panel B:		***1910-1930-1940-1960 pooled samples***	
		Controlling for changes in white-collar employment	
frate_GD*d1930	0.006	0.004	0.005
	(0.013)	(0.011)	(0.009)
frate_GD*d1940	0.021	-0.002	-0.003
	(0.011)*	(0.014)	(0.011)
frate_GD*d1960	-0.002	0.03	0.03
	(0.013)	(0.014)**	(0.012)**
N	*217900*	*225339*	*275499*

Notes: See notes to Table 4A. Specification in Panel A also includes dummies for educational attainment. Specification in Panel B additionally includes current employment shares in white-collar occupations. Estimates are weighted using the available sampling weights. Standard errors are clustered by birth state. The sample includes white, native women not in farm households and not in group quarters. ***, **, * indicate significance at 10%, 5% and 1% respectively.

results further confirm that the *D-cohort* was uniquely impacted by the Great Depression.

In Appendix Table A2, we report results from estimation of eq. (2) and (3) for the 1910-1930-1940-1950 and 1940-1950 pooled samples. We find a significant increase in work propensity for the same cohort when 10 years younger. Note, however, that we consider this robustness exercise as less "clean" than comparing the behavior of this cohort of women in 1960 when 45 to 64 years old (treated) to that of 45 to 64 year olds in 1940 (unaffected

based on results from Table 3A). In 1950, the *D-cohort* is 35 to 54 years old and in 1940 the (comparison) sub-group who was 35 to 44 years old responded to the Great Depression by working more (see Table 3A).

Table 6: Falsification tests

Age in year *t*	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Dependent variable:			*=1, if in the labor force*		
Panel A:			**1910-1930-1940-1960 pooled samples**		
false_GD*d1930	-0.008	-0.009	-0.003	0.018	-0.004
	(0.008)	(0.008)	(0.012)	(0.015)	(0.015)
false_GD*d1940	-0.004	0.014	0.009	-0.001	0.001
	(0.017)	(0.014)	(0.015)	(0.017)	(0.017)
false_GD*d1960	-0.043	-0.013	-0.013	0.017	0.008
	(0.011)***	(0.011)	(0.011)	(0.014)	(0.016)
N	*250964*	*249276*	*217900*	*164068*	*111432*
Panel B:			**1860-1880-1890 pooled samples**		
frate_GD*d1930	0.031	-0.011	-0.009	0.009	0.015
	(0.049)	(0.011)	(0.016)	(0.029)	(0.025)
frate_GD*d1940	0.08	-0.053	-0.007	-0.012	-0.011
	(0.041)*	(0.024)**	(0.016)	(0.021)	(0.022)
N	*19002*	*29987*	*19477*	*12420*	*7636*

Notes: OLS coefficients from regressions of an indicator for whether a woman is in the labor force on the variables described in Tables 3 and 4. All state variables are matched by state of birth. Estimates are weighted using the available sampling weights. The sample include white, native 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.

Finally, in Appendix Table A3, we consider two additional alternative measures of the Great Depression: (i) changes in retail sales by county (short-run analysis using 1910-1940 pooled samples) or by SEA (long-run analysis using the 1910-1940-1950 pooled samples) between 1929 and 1933, and (ii) changes between 1929 and 1935 in state per-capita real personal income (see subsection II.A). These measures (in contrast to the business failures measure) capture the drop in consumer's purchasing power induced by the Great Depression across different sectors. The effects are qualitatively similar to the baseline and highlight again the cohort-specific nature of our findings. The results using retail sales are important as they show robustness of the main findings to a finer level of disaggregation than at state

level. [24]

We conclude that, while we cannot completely rule out the potential presence of omitted factors, the fact that our results are cohort-specific and robust 1) across samples over time, 2) to the use of different measures of the Great Depression, 3) to the inclusion of a broad range pre-Depression characteristics, 4) alternative existing explanations and 5) falsification exercises, is suggestive of a causal link between the Great Depression and the work of women in the *D-cohort*.

V.   Discussion

In this section, we discuss channels via which the Great Depression could have affected women's labor supply. First, we examine its impact on women's wages. If, as we argue, the Great Depression led to a labor supply shift after 1940, we should observe that the same shock decreases real wages over the same period. In the same spirit, we examine how the Great Depression affected men's wages. If there is a supply shift or a downgrade in their occupations, we also expect a decline in their wages. 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.

Panel A in Table 7 reports results from estimation of specification (3) for the 1940-1960 pooled sample, where the dependent variable is the log of real weekly wages.[25] As before, we consider all women that were or turned working age in the 1930s and who can

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[24] Several authors have used the decline in retail sales as a measure of the severity of the Great Depression (Fishback and Kachanovskaya, 2005; Fishback et al., 2007; Hill, 2012). Per-capita retail sales are available for 1929, 1933, 1935 and 1939. In an unreported analysis, we have also used data from the *Census of Manufactures* (1935) on the number of establishments, the number of wage earners and wages to construct measures of the dramatic decline of the manufacturing sector in the early 1930s. The effects are similar to the ones using the baseline measures.

[25] For the wage regressions, we match all state variables by the current state of residence as we think this is the most relevant labor market for wage determination. In all wage regressions we also control for individual educational attainment.

still work in 1960. They are 35 to 64 years old in 1960 and their wages are compared to those of women in the same age group in 1940. In all cases, we find a strong negative link between the Great Depression and female real wages, which is consistent with an outward shift in the labor supply of women in the *D-cohort*.

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" unobservable characteristics, possibly employed in lower-skill, more brawn-type occupations. In response, women with "better" unobservable characteristics would drop out of the workforce. In this case, the negative effects on wages could be due to a compositional change of the workforce. The exclusion restriction is the number of own family members residing with each individual, including the person her/himself (IPUMS variable *famsize*). The assumption is that, while family size has a direct effect on the decision to work, it should have no direct impact on the wage other than through the labor supply.

The "corrected" estimates confirm that the negative effect of past conditions on current wages is not due to selection. Although there has been negative selection in the workforce across *all* women in the *D-cohort*, this selection *neither* significantly alters our previous findings of a persistent wage decline linked to the Great Depression, nor contradicts our interpretation of a labor supply shift. In fact, the adjusted estimates suggest an even stronger effect of the Great Depression in lowering contemporaneous wages. It is to be noticed that also younger women, 35 to 44 years old in 1960 have lower wages. Possibly, the shift in the labor supply of older women lowered the wages for all women and restricted the types of jobs available to the younger.

Panel B of Table 7 presents respective estimates for men. We find that the same cohort of men – 45 to 64 years old in 1960 – earns less in states more impacted by the Crash several

decades after it had ended. The same group also works more in 1960 (Table 4B). Relative to women, correcting for self-selection almost entirely wipes out the significance of the Great Depression coefficient. This suggests that the negative self-selection channel is more powerful than the labor supply shift for men. 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, thus explaining both lower wage and intensive work effects.

These results are suggestive of a Great Depression-induced labor supply shift for

Table 7: Impact of the Great Depression on wages (1940-1960 samples)

Dependent variable:	log weekly wage		
Ages in year *t*	35 to 44	45 to 59	45 to 64
Panel A:		*Women*	
		OLS	
frate_GD*d1960	-0.122	-0.155	-0.151
	(0.029)***	(0.039)***	(0.037)***
N	*28936*	*24524*	*37976*
	Heckman-corrected estimates		
frate_GD*d1960	-0.056	-0.191	-0.200
	(0.029)*	(0.036)***	(0.039)***
Inverse mills ratio	-0.814	-0.864	-0.891
	(0.018)***	(0.023)***	(0.023)***
N	*144191*	*154764*	*190276*
Panel B:		*Men*	
		OLS	
frate_GD*d1960	0.004	-0.028	-0.022
	(0.011)	(0.012)**	(0.011)*
N	*93201*	*89332*	*104404*
	Heckman-corrected estimates		
frate_GD*d1960	0.003	-0.022	-0.026
	(0.014)	(0.014)	(0.014)*
Inverse mills ratio	-0.465	-0.550	-0.565
	(0.011)***	(0.017)***	(0.017)***
N	*126313*	*133165*	*161661*

Notes: OLS estimates from estimation of eq. (3) using log real weekly wages as dependent variable. See notes to Table 4A for the list of covariates. State variables are assigned on the basis of the state of residence. The Heckman correction procedure uses as exclusion restriction the number of own family members residing with each individual (*famsize)*. 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 calendar year. Standard errors are clustered by state of residence. Estimates are weighted using the available sampling weights. ***, **, * indicate significance at 1%, 5% and 10% respectively

women and a negative self-selection effect for both women and men. The negative self-selection for men is consistent with the hypothesis that a decline in household permanent income led women to enter the labor market and work for an extended period. In the appendix we show that despite the decrease in women's relative wages, their wages increased due to their accumulated experience. Thus, their overall Depression-induced wage decline was less dramatic due to the acquired experience.

A broader explanation of increased work for this cohort that is also consistent with a wage decline, could be that the Great Depression led to a structural change in the economy whereby the states most severely affected never fully recovered. We test this hypothesis in Table 8, Panel B. We include changes in contemporaneous real per-capita income in the

Table 8: Structural change hypothesis

Ages in year *t:*	35 to 44	45 to 59	45 to 64
Dependent variable:		*= 1, if currently employed*	
Panel A:		***1930-1940-1960 pooled samples***	
		Baseline	
frate_GD*d1930	0.025	0.026	0.034
	(0.027)	(0.021)	(0.021)
frate_GD*d1940	0.038	0.030	0.042
	(0.036)	(0.026)	(0.025)
frate_GD*d1960	0.046	0.063	0.064
	(0.034)	(0.030)**	(0.028)**
Panel B:		***Baseline controlling for contemporaneous income***	
		in the current state of residence	
frate_GD*d1930	0.021	0.015	0.023
	(0.025)	(0.200)	(0.019)
frate_GD*d1940	0.036	0.026	0.037
	(0.035)	(0.026)	(0.024)
frate_GD*d1960	0.044	0.061	0.061
	(0.033)	(0.029)**	(0.026)**
N	*192717*	*202519*	*248136*

Notes: OLS coefficients from estimation of specification (2) using the 1930-1940-1960 pooled samples. The measure of the Great Depression is redefined using as base the year 1920. It is the difference between the average failure rate across years 1929 through 1932 and the average failure rate across years 1919 through 1922 if t>=1940. It is the difference between the business failure rate in 1929 and the average failure rate across years 1919 through 1922 if t=1930. State covariates are those described in eq. (2) but for 1920. Specification in Panel B also includes state per capital real income at *t-1* assigned on the basis of the state of residence. Estimates are weighted using the available sampling weights. Standard errors are clustered by birth state. The sample includes white, native women not in farm households and not in group quarters. ***, **, * indicate significance at 10%, 5% and 1% respectively.

state of residence using the 1930-1940-1960 pooled cross-sections.[26] Changes in per capita real income over time should summarise changes in local economic prosperity. Including this variable, however, does not change our main estimates. Overall, these results indicate that although we cannot rule out that the economies of the states more severely affected had a slower recovery or underwent permanent changes, this channel does not seem to weaken our hypothesis of a direct effect on women's labor supply.

VI.   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*.[27] This survey covers 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 two questions of the survey: 1) '*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; 2) '*How much did you worry about your family's future during the*

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[26] In this case we redefine our baseline measure of the Great Depression using as base the year 1920. In particular, it is the difference between the average failure rate across years 1929 through 1932 and the average failure rate across years 1919 through 1922, if *t>=1940*. It is the difference between the business failure rate in 1929 and the average failure rate across years 1919 through 1922, if *t=1930.* We re-estimate eq. (2) using the 1930-1940-1960 pooled cross-sections and the same covariates as in eq. (2). Instead of 1910 state covariates, we use the respective state averages for 1920.

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

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: *GD-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; *GD-worry_a* is an indicator that takes value 1 if they were very worried about their family future (question 2), and 0 otherwise while *GD-worry_b* takes value 1 if they were very or moderately worried about their family future, and 0 otherwise.

Table 9: 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	(1.075)*	(0.080)*
(41.1%)		
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. GD-Find a job, variable Vl250=1, 0 otherwise. GD-Worry_a, variable Vl252=2 (very worried). GD-Worry_b, variable Vl252=2 or Vl252==3 (very or moderately worried). ***, **, * indicate significance at 1%, 5% and 10% respectively.

Table 9 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 *GD-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.

VII.   Conclusion

We have documented a positive link between the severity of the Great Depression and the work behavior of the cohort that was of working age during the depression years and in later decades. In states were economic conditions deteriorated the most, women of working age in 1930 or who turned working age in the early 1930s, entered the market in the short-run likely to compensate for income or asset losses; many of them worked till their retirement years. The entire lifetime labor supply profile of this cohort 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. Moreover, 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. 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.[28]

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[28] The Great Depression also led these women to have smaller families and hence more time to work outside their homes.

Our checks suggest that this link is robust and not explained by historical trends or changes in the industrial structure of the economy. Moreover, it is cohort-specific. For younger cohorts we systematically find no impact or the opposite impact which may be due to some indirect crowding-out effects from the older cohorts or other indirect channels. Additional supportive evidence comes from the fact that these results are specific to white women while for non-white women we find the opposite effects. The cohort- and group-specificity of these results support the idea that our measures do not capture pre-trends or other contemporaneous shocks as these would have more likely affected women of all ages and races.

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APPENDIX

I. Section IV: Long term effects – Robustness

See text for a discussion of the tables below.

Table A1: The impact of the Great Depression on female labor supply by cohort

I. Samples: 1910-1930-1940-1950-1960 (assignment by current state of residence)								
Age in 1930:	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54
Dependent variable:				*=1 if currently employed*				
frate_GD*d1960	-0.127	0.060	0.083	0.059				
	(0.045)***	(0.032)*	(0.029)***	(0.031)*				
frate_GD*d1950	-0.100	0.055	0.087	0.078	0.005	-0.003		
	(0.044)***	(0.028)*	(0.029)***	(0.030)**	(0.024)	(0.016)		
frate_GD*d1940	-0.076	0.081	0.103	0.086	-0.011	-0.050	0.015	0.011
	(0.044)*	(0.026)***	(0.031)***	(0.029)***	(0.026)	(0.014)***	(0.015)	(0.011)
frate_GD*d1930	-0.079	0.058	0.072	0.069	0.015	-0.014	0.022	0.035
	(0.037)**	(0.026)**	(0.027)***	(0.027)**	(0.019)	(0.017)	(0.018)	(0.017)**
N	174702	159767	140109	124502	111392	98791	67704	56772
II. Falsification: 1860-1870-1880-1900 (assignment by current state of residence)								
Age in 1860:	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54
Dependent variable:				*=1 if in the labor force*				
frate_GD*d1900	0.070	0.108						
	(0.062)	(0.067)						
frate_GD*d1880	0.051	0.089	-0.145	-0.008	-0.011	-0.115		
	(0.063)	(0.069)	(0.069)***	(0.063)	(0.063)	(0.046)**		
frate_GD*d1870	0.061	0.103	-0.137	-0.016	-0.029	-0.102	-0.065	0.013
	(0.064)	(0.070)	(0.067)**	(0.066)	(0.063)	(0.048)**	(0.101)	(0.059)
frate_GD*d1860	0.040	0.053	-0.112	-0.022	-0.002	-0.072	-0.084	0.015
	(0.045)	(0.056)	(0.052)**	(0.043)	(0.049)	(0.032)**	(0.079)	(0.051)
N	46263	41662	28596	24064	18574	15689	7964	7034

Notes: See notes to Table 4 for part I. For part I, birth cohorts are defined on the basis of age in 1930. For instance, in col. 1 we follow women 15 to 19 years old in 1930, when they are 25 to 29 in 1940, 35 to 39 in 1950 and 45 to 49 in 1960. Part II repeats the analysis of part I in the pooled sample 1860-1870-1880-1900. Birth cohorts are defined on the basis of age in 1860 in this case. The year 1860 is the analoguous of year 1930 in part I. ***, **, * indicate significance at 1%, 5% and 10% levels respectively.

Table A2: The impact of the Great Depression on female labor supply
Samples: 1910-1930-1940-1950 and 1940-1950

Age in year t:	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64
Panel A:		*1910-1930-1940-1950 pooled samples* - assignment by birth state			
Dependent variable:		*= 1, if currently employed*			
mobrate*d1950	0.564	0.315	-0.118	0.266	-0.059
	(0.139)***	(0.109)***	(0.156)	(0.163)	(0.138)
frate_GD*d1930	0.003	0.009	-0.001	0.004	0.021
	(0.011)	(0.010)	(0.012)	(0.012)	(0.019)
frate_GD*d1940	0.010	0.037	0.021	-0.012	0.021
	(0.025)	(0.017)**	(0.009)**	(0.014)	(0.024)
frate_GD*d1950	-0.017	0.021	0.010	0.022	0.023
	(0.018)	(0.015)	(0.011)	(0.017)	(0.025)
N	*262667*	*270926*	*215348*	*143439*	*91792*
Panel B:		*1910-1930-1940-1950 pooled samples* - assignment by current state			
Dependent variable:		*= 1, if currently employed*			
mobrate*d1950	0.422	-0.013	0.019	0.040	-0.074
	(0.164)***	(0.158)	(0.013)	(0.199)	(0.171)
frate_GD*d1930	0.026	0.029	0.009	0.037	0.046
	(0.013)*	(0.016)*	(0.016)	(0.021)*	(0.012)***
frate_GD*d1940	0.028	0.053	0.042	0.020	0.057
	(0.029)	(0.019)***	(0.011)***	(0.021)	(0.011)***
frate_GD*d1950	-0.005	0.030	0.022	0.056	0.071
	(0.019)	(0.018)*	(0.013)*	(0.023)**	(0.014)***
N	*280150*	*303578*	*258234*	*186652*	*124901*
		1940-1950 pooled samples			
Panel A:					
Dependent variable:		*= 1, if currently employed*			
mobrate*d1950	0.565	0.284	-0.019	0.109	-0.086
	(0.195)***	(0.146)*	(0.165)	(0.213)	(0.169)
frate_GD*d1950	-0.014	-0.004	-0.009	0.023	-0.009
	(0.013)	(0.008)	(0.009)	(0.011)**	(0.011)
N	*161134*	*180392*	*145285*	*95416*	*61280*
Panel B:					
Dependent variable:		*weeks worked last year*			
mobrate*d1950	31.63	11.49	27.92	4.40	5.19
	(11.69)***	(8.27)	(8.41)***	(12.07)	(9.78)
frate_GD*d1950	0.344	0.196	0.078	1.223	1.155
	(1.182)	(0.442)	(0.599)	(0.593)**	(0.687)*
N	*94953*	*99900*	*78316*	*58290*	*39403*
Panel C:					
Dependent variable:		*hours worked last year*			
mobrate*d1950	26.93	7.86	4.79	5.72	-1.60
	(7.79)***	(5.68)	(5.41)	(7.84)	(8.04)
frate_GD*d1950	-0.679	0.011	0.317	1.321	-0.388
	(0.562)	(0.339)	(0.319)	(0.433)***	(0.644)
N	*161134*	*180392*	*145285*	*95416*	*61280*

Notes: See notes to Table 4.

Table A3: The impact of the Great Depression of female labor supply - Alternative measures of the Great Depression

I. Retail sales data

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:			*1910-1940-1950 pooled samples (SEA)*		
(sales1933-sales1929)*d1940	0.164	-0.055	-0.066	-0.127	-0.115
	(0.057)***	(0.037)	(0.036)*	(0.039)***	(0.045)**
(sales1933-sales1929)*d1950	0.081	-0.095	-0.023	-0.102	-0.126
	(0.051)	(0.035)***	(0.037)	(0.054)*	(0.050)**
N	*212829*	*235860*	*198780*	*143604*	*96446*
Panel B:			*1910-1940 samples (county)*		
(sales1933-sales1929)*d1940	-0.042	-0.044	-0.059	-0.015	-0.042
	(0.027)***	(0.020)**	(0.023)***	(0.021)	(0.028)
N	*115452*	*114728*	*92976*	*72180*	*47850*

Notes: OLS coefficients from estimation of equations (2) for Panel A and (1) for Panel B. Both specifications control for age, marital status, whether birth and current state differ, fixed effects for current/birth state as well as SEA (Panel A) or county (Panel B) of residence, year fixed effects, contemporaneous failures, 1910 SEA or county covariates (share farms, share foreign born, share nonwhite, employment share in manufacturing, 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 SEA (Panel I) or county (Panel II). The sample includes white, native women not in farm households and not in group quarters. ***, **, * indicate significance at 1%, 5%, 10% respectively.

II. Real state per capita income

Ages in year *t*:	35 to 44	45 to 59	40 to 64	45 to 64
Dependent variable:		*=1, if currently employed*		
		1930-1940-1960 pooled samples		
mobrate*d1960	0.219	-0.124	-0.152	-0.236
	(0.133)*	(0.148)	(0.148)	(0.138)*
[Change in log(real per cap.	-0.064	-0.170	-0.133	-0.151
income): 1935-1929 (*decline)*]	(0.071)	(0.073)**	(0.050)***	(0.061)**
N	*192727*	*202522*	*338808*	*248139*

Notes: OLS coefficients from a regression of an indicator for whether the respondent is currently employed on the measure listed above, dummies for age, marital status, whether state of residence and state of birth differ, fixed effects for state of residence, state of birth and year, division-year interactions, contemporaneous log real per capita income, WWII mobilization rate, and 1920 state covariates: share farmers, share non-white, share foreign born, employment share in manufacturing, age-specific female participation share, average occupational score. The measure is set to zero if *t=1930* and to the change in log per capita real income between 1935 and 1929 if *t>=1940* . Estimates are weighted using the available sampling weights. All state covariates except contemporaneous income are assigned on the basis of the state of birth. Standard errors are clustered by birth state. The samples includes white, native women, not in farm households and not in group quarters ***, **, * indicate significance at 1%, 5% and 10% respectively.

II.   Section V: Discussion – Role of acquired experience

It may seem strange that women worked more and longer while their wages decreased relative to women of the same age in previous decades. If they remained longer in the work force, one would expect an increase in their wages due to experience and this could have contributed to their staying in the labor market. It is possible that their wages decreased but that the decrease was less dramatic due to the fact that they acquired experience.

We test a version of this hypothesis first by estimating a wage regression as above that includes women 20 to 64 years old and a dummy interacted with the *GD* regressor that takes the value of 1 if the age of women is between 45 and 64 (*GD*old*). We can then test whether in states more severely impacted by the Crash older (*vs* younger) women in 1960 earned more than older (*vs* younger) women in 1940, controlling for age and for the overall effect of the Great Depression on all women. As can be seen in Panel C of Table 7 (first column), the coefficient on the interaction term *GD*old* is positive and significant suggesting that, relative to 1940, the "wage-experience" gap among females increased (favoring older women) more so in states severely impacted by the Great Depression.

Another way to proceed is to test whether the above "wage-experience" gap for older *vs* younger women mirrored that of men over the same period. This exercise essentially addresses whether gains from experience have changed over time (1960 *vs* 1940) differentially for men *vs* women and differentially across states. In this case, we pool men and women 20 to 64 years old and create four sets of dummies: the first is a dummy that takes the value of 1 if the individual is a female and 0 otherwise (*female*); the second is the dummy *female* multiplied by the Great Depression measure (*GD*female*); the third is *GD* multiplied by a dummy that takes the value of 1 if the age of the individual (male or female) is between 45 and 64 (*GD*old*); the fourth is the previous interaction multiplied by the dummy *female* (*GD*female*old*) and is our object of interest.[29] The results are reported in the second column of Table 7 (Panel C) and give a similar answer to before. The triple interaction is positive and significant and suggests that the Great Depression "wage-experience" gap for women has increased relative to 1940 and relative to that for men. Conclusively, one cannot rule out that the persistence of our cohort's stay in the labor market

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[29] We also control for the interaction *female*old*.

could be due to acquired experience, even if their overall wages declined in real terms.

Table A4: Impact of the Great Depression on wages and experience

Dependent variable:	log weekly wage	
	1940 - 1960 pooled samples	
Ages in year *t*	20 to 64	
	women	*men & women*
frate_GD	-0.046**	0.014
	(0.026)	(0.016)
frate_GD*old	0.071	-0.019
	(0.014)***	(0.018)
frate_GD*female	-	-0.059
		(0.0024)**
frate_GD*female*old	-	0.112
		(0.029)***
N	129306	498398

Notes: OLS estimates from estimation of eq. (3) using log real weekly wages as dependent variable. See notes to Table 4A for the list of covariates. State variables are assigned on the basis of the state of residence. The variable *old* takes the value of 1 if the age is between 45 and 64 years old and 0 if between 20 and 44 years old. The variable *female* takes the value of 1 is the respondent is a woman. 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 calendar year. Standard errors are clustered by state of residence. Estimates are weighted using the available sampling weights. ***, **, * indicate significance at 1%, 5% and 10% respectively.

Figure A1: Business Failures by State

Figure 3: Business Failures by State (change between average 1929 to 1932 and average between 1909 and 1912

Business failures

- -0.760667 - -0.094667
- -0.094666 - 0.146000
- 0.146001 - 0.360667
- 0.360668 - 0.670333
- 0.670334 - 1.260667