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

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Preliminary Draft

Abstract

The cohorts of women born at the turn of the 20th century increased markedly their participation in the labor market when older. These are the first cohorts who worked after their childbearing years. In this paper, we document a link between their work behavior and the Great Depression. We show that the 1929 Crash attracted young married women 20 to 34 years old in 1930 (whom we name *D-cohort*) into the labor market, possibly via an added-worker effect. Using several years of Census micro data, we further document that the same cohort remained or re-entered the labor market in the 1940s and 1950s and that its entire life cycle labor supply is tightly linked to the conditions dating back to the Great Depression. We argue that these facts are consistent with the hypothesis of a labor supply shift for this cohort triggered by the 1929 Crash.

Keywords: Great Depression, added worker effect, female labor supply.

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I. Introduction

A. Outline

Female labor force participation increased slowly from 1880 to 1940, more sharply between 1940 and 1960 and at an accelerating pace thereafter (Smith and Ward, 1985). Till the 1920s, working women were generally young and unmarried; they also almost always exited the labor market upon marriage (see Goldin, 1990 and Costa, 2000). Among white women, the cohort born between 1896 and 1910 is the first to change the distinct pattern of permanently exiting the labor market after marriage. Figures 1a and 1b illustrate the work shares of this cohort between 1930 and 1970 as well as those of older cohorts (brown lines). We also report the same shares for each decade using 10-year age brackets to avoid overlap of cohorts across decades. As can be seen, in contrast to previous decades and cohorts, these women dramatically increased their labor supply over their lifecycle and kept working till their mid-60s. Moreover, this is the first cohort to remain or re-enter the labor market past its childbearing years.[1] To give an idea of their unprecedented entry: in 1960 they were 50 to 64 years old and 39% of them were still working, while in 1940 only 19% of women in that age bracket were working. Finally, another particular feature of this cohort is that, while it overall decreased its participation in the labor market between 1930 and 1940, married women increased it (see Figure 1b).

In this paper, we document a significant link between the entry and/or re-entry patterns of this cohort and the severity of the Great Depression.[2] Using several cross sections of IPUMS microdata and changes in state-level business failure rates as our baseline measure of economic conditions, we find that these women entered into the labor market during the 1930s and remained or re-entered in the 1940s and 1950s significantly more in states that were more negatively impacted by the Great Depression. We also find a persistent negative link between its severity and their wages in the 1950s, which suggests that their entry was the result of a labor supply shift. Our estimates suggest that improvements in the current state of the economy reinforced these long-term entry/re-entry patterns but did not

[1] The immediately older cohort (35 to 44 years old in 1930) also re-enters when older but to a much lesser degree.

[2] Goldin (1998) already documented the large shift in the participation of older women, including the fact that it was much more pronounced than for younger cohorts after 1940 (also see Smith and Ward, 1985). She attributes these changes to a shift in labor demand between 1940 and 1960. Lower fertility and the diffusion of new home technologies were additional contributing factors (Greenwood et al, 2005).

affect the impact of economic conditions dating back to the early 1930s. We refer to

Figure 1a: Female Employment by Age (all white women)

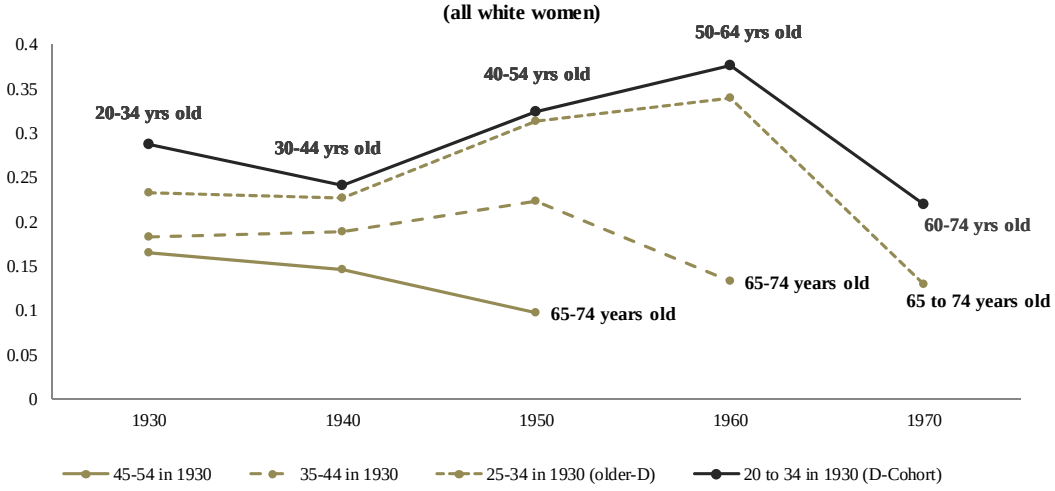
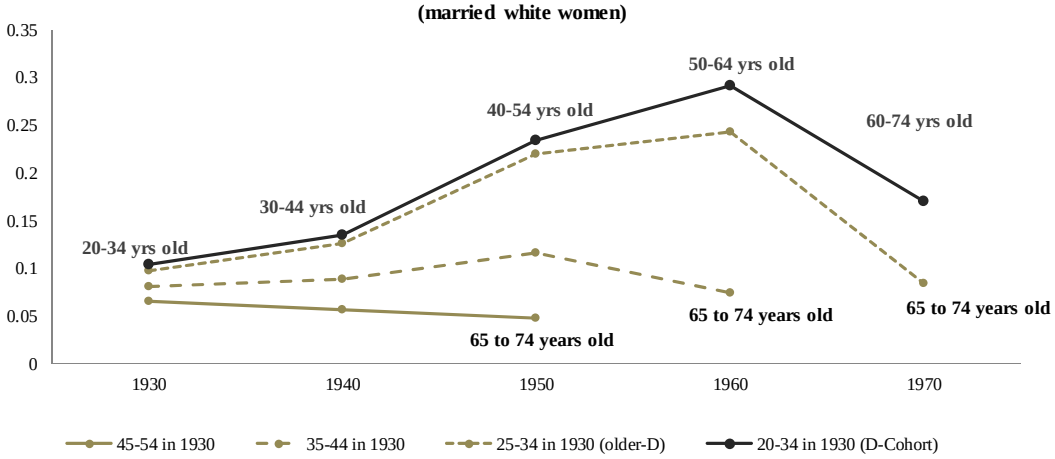


Figure 1b: Female Employment by Age (married white women)



women born between 1896 and 1910 as the *D-cohort* to emphasize the role of the Depression years on their work decisions.

The paper is organized in three parts. *In the first part*, we use several pooled samples of micro data from 1910 to 1960 to examine the work patterns of women in the *D-cohort* in response to economic conditions during the early Depression years. We show that in states where the Great Depression was most severe:

a) women in this cohort (and especially those married at the time of the Crash) increased their presence in the early phase, between 1930 and 1940;

b) the same birth cohort had significantly higher employment rates and worked more weeks in 1960, when 50 to 64 years old, relative to women of the same age in 1940.

Our estimates imply Depression-related long-term increases in their labor supply in the range of 15% to 25% relative to 1940 or even higher for the younger women in the *D-cohort*.

c) the same cohort of women had significantly lower wages in 1960, when 50 to 64 years old, relative to women of the same age in 1940.

In the second part of the paper, we perform a robustness analysis for the findings above. First, we use several alternative measures of the severity of the Great Depression: from state-level aggregate measures of the decline in the manufacturing sector during the early part of the 1930s to SEA-level data on bank deposit suspensions. Second, we use the 1940-1950 pooled samples to examine whether the patterns found hold when the *D-cohort* was a decade younger. Third, to assess the robustness of our results to the choice of 1940 as our base year and to the existence of pre-trends in female employment, we supplement the 1940-1960 pooled samples with the 1910, 1920 and 1930 cross-sections. Fourth, to further address identification concerns, we examine whether the expansion of the white-collar sector and of home technologies in the first part of the century (Goldin, 1990 and 1998a) could be driving the results. We additionally experiment with an instrumental variables strategy that uses the 1900 state-specific concentration of the durables and non-durables sectors weighted by their national growth between 1900 and 1930 as an instrument for the state business failure rate in the 1930s. In all cases, our findings remain intact and support the hypothesis that the Great Depression had long-lasting effects for this particular cohort. Finally, as an external validity check, we use an alternative source, a 1978 survey (Ridley, 1978) which asked ever married women born between 1901 and 1910 questions relating to the Great Depression. The sample is small, 1049 women, but worth examining given the kind of questions asked. We find a strong positive link between the number of years these women worked and the impact of the Great Depression on their family incomes.

In the third part of the paper, we examine one plausible channel via which the Great Depression may have affected the work behavior of this cohort. We investigate whether the persistent unemployment of the 1930s sidetracked their husbands into lower paying occupations. We use the IPUMS occupational income score variable, to examine whether in states with more severe downturns in the 1930s men married to women in our cohort had significantly lower occupational earnings in the post-Depression years. We, then, test

whether these declines significantly affected women's work decisions in subsequent decades. We find 1) that in states more severely hit by the Great Depression, the occupational scores of men married to women in the *D-cohort* were significantly lower in 1940 than the occupational scores of men in the same age group in 1920; 2) a similar decline when we compare the *same cohort of men* in 1960 versus men of the same age in 1920, and 3) that this decline is associated with an increased work propensity for their *"wives"* (the *D-cohort*) in the 1950s. Moreover, the wages of the men married to women in the *D-cohort* were significantly lower in 1960 relative to their counterparts in 1940 in states most adversely impacted by the Depression. These results suggest that the Great Depression may have produced a decline in men's permanent income that affected women's long-term work decisions.

The paper proceeds as follows. Related literature is discussed in the rest of this introduction. Part II describes the data. Part III tests our hypothesis and Part IV provides robustness checks. Part V presents suggestive evidence that declines in husbands' permanent income due to the Great Depression are associated with increased employment of the *D-cohort* in the 1950s. Part VI concludes.

B. Related Literature

Goldin (1990 and 1998a) attributes the increase in married women's labor market participation in the first part of the century to a labor supply shift and the increase that occurred between 1940 and 1960, to the expansion in the demand for office and other clerical work.[3] This, together with the raise in high-school enrollment/graduation rates between 1910 and 1940 (Goldin, 1998b) created opportunities for women in white-collar occupations where it was easier to reconcile work and marriage. Women in these occupations remained employed after marriage, leaving their job once their first child was born and re-entering when their children started school.[4] It is during this period (1940-1960) that we observe a sharp increase in the labor force participation of the *D-cohort*. Our results confirm that favorable contemporaneous economic conditions played an important role, which is consistent with the hypothesis of a labor demand shift (Goldin, 1990).

[3] Empirical studies examining the impact of WWII report no significant effects of the war on older women and that the effects of the war faded in the 1950s (Goldin 1991, and Acemoglu, Autor, and Lyle 2004).

[4] Women in this period also entered into professional and managerial occupations (teaching, accounting). On the supply side, time-freeing technological changes in home production also made it easier for women to remain or re-enter the labor market.

However, even after controlling for contemporaneous economic conditions, conditions *during the Great Depression* significantly increased the employment shares of these women in 1950 and 1960.

There are several hypotheses that could explain the increase in women's labor market participation in response to large negative income shocks in the short run but fewer that could imply a persistent and/or delayed response. The most well-known channel is the *Added Worker Effect* whereby a decrease in family income in presence of credit market constraints, implies an increase in wives' labor supply. Our cohort was 19 to 33 years old in 1929, at the time of the Great Crash. Many women in this cohort were married and starting a family. The loss of family income may have led them to enter the labor market to offset family income or asset losses.

Overall, the early empirical literature does not provide strong support for the added worker effect. Mincer (1962), using data from the 1950 BLS Survey of Consumer Expenditures and other Census sources, finds a negative link between wives' labor supply and transitory income changes that is stronger than the link to permanent income changes. He also finds that the response to transitory changes tends to fade over time. Heckman and MaCurdy (1980) find instead no significant effects of husbands' unemployment on their wives' labor supply. Lundeberg (1985) emphasizes the role of employment uncertainty and credit constraints in generating an added worker effect. Finegan and Margo (1994) provide evidence of an added worker effect in the late 1930s, which is not detectable if men on work relief are counted among the unemployed. They calculate that in 1940 the participation of women whose husbands were unemployed (and not on work relief) or out of the labor force, was higher than that of women whose husbands were employed in the private sector. These results are supportive of our findings.

More recent studies using micro-data provide evidence in favour of an added worker effect. Using several waves from the Panel Study of Income Dynamics (PSID), Stephens (2002) finds significant and persistent increases in women's labor supply in response to their husbands' job loss.[5] His estimates suggest that permanent income losses can have persistent effects. Kawano and LaLumia (2014) also detect an added worker effect using data on U.S tax returns. Morissette and Ostrovsky (2008) use a large Canadian longitudinal dataset based on tax records for family and individual annual earnings that

[5] There is a growing literature on the role of families to insure labor income shocks. Blundell, Pistaferri and Saporta-Eksten (2012) estimate a life cycle model with two earners and find strong evidence of smoothing to male's permanent shocks to wages.

covers the 1987-2001 period. They find evidence that, among families with no children, wives' earnings offset about one fifth of their husbands' income losses five years after the layoff. Gong (2010) uses several waves from the Australian HILDA Survey and finds a significant added worker effect both at the extensive and at the intensive margins. His data cover the years that followed the 2008 global financial crisis. Ayhan (2015) uses micro-data from Turkey to examine the impact of the post-2008 crisis on wives' employment. His findings suggest that in the short-term there is a 29% higher probability that wives enter the labor market in response to their husband's unemployment. Finally, Bredtmann, Otten et Rulff (2014) use longitudinal data from the European Union Statistics on Income and Living Conditions (EU-SILC) for 28 European countries covering the period 2004 to 2011 and also provide evidence of an added worker effect.

Recent evidence seems therefore more favorable to the added worker effect, though there are no studies on the long-term impact of large, negative and persistent shocks such as the Great Depression. The 2008 global financial crisis could be interesting because, although not as persistent and dramatic as the Great Depression, was probably the most severe financial crisis after the 1929 Crash. Many families were subjected to large financial losses, losing their homes or savings. Unfortunately, there are too few years following the recent crisis to examine its long-term effects. It could also be difficult to observe such important changes because most women are already working full-time making this margin of adjustment to shocks much less operative now than during the 1930s. Moreover, important changes in the unemployment insurance regime during and after the crisis could have significantly mitigated increases in wives' labor supply in response to husbands' unemployment spells (see Cullen and Gruber, 2000).

Filling-in this gap in the literature, in the last part of this paper, we propose a channel that could prolong the effects of large negative shocks as the one experienced during the Great Depression. More specifically, we examine whether men who were married to women in the *D-cohort* ended up working in less desirable occupations as a result of years of unemployment or underemployment, which may have led to lower *permanent* incomes. This could explain their wives' decision to keep working or re-enter the labor market several years after the initial shock. We find evidence consistent with this hypothesis.[6]

[6] The Great Depression also led these women to have smaller families and hence more time to work outside their homes. Other potential candidates (not explored here) are large financial losses, foreclosures or an increase in mortgage debt exposure to avoid foreclosure.

II. Data and Descriptive Statistics

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 analysis focuses exclusively on white, native American women, not residing in farms and not in group quarters. We consider women that were 20 to 64 years old in 1930, who most likely had completed their schooling and who were of working age at the time. Finally, unless otherwise specified, we match all state variables detailed below by the woman's state of birth and we use the appropriate sampling weights.

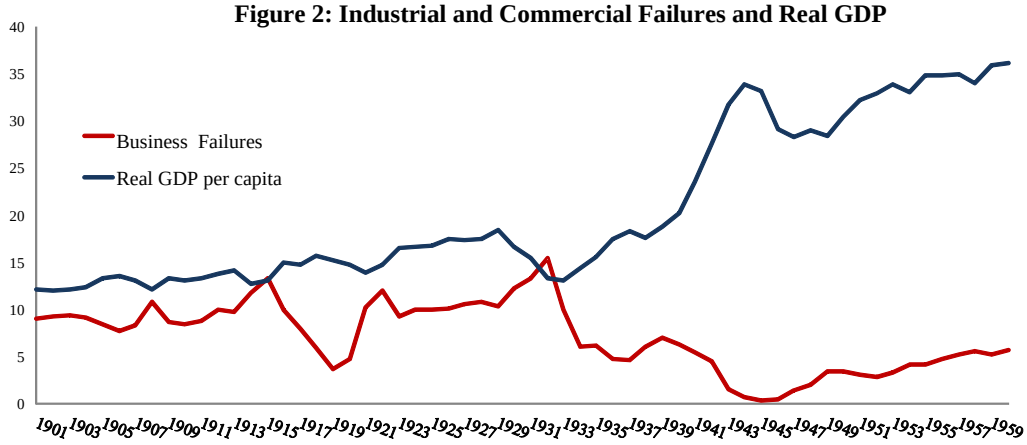
A central issue in our analysis is how to consistently measure changes in economic conditions during the first half of the century. Unemployment is not available annually before 1961, while information on income is not available prior to 1929.[7] The only measure we are aware of, that is both at state and annual level since the start of the century, 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*). The number of business failures includes 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. 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. Unemployment rate is instead affected by shifts in both labor demand and supply.

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. There are more failures in the early 1930s and very few during WWII, while the economic boom of the 1950s is also characterized by fairly low levels of business failures.

Table 1 reports average statistics for several demographic and economic variables in 1920 (pre-Depression), 1940 and 1960 for groups of states ranked in terms of how high

[7] State-level unemployment rate is reported every 10 years until 1960 by the census and can be calculated annually since 1962 from the Current Population Survey. Due to changes in the employment definition, however, unemployment rate estimates from the census before and after 1940 are not strictly comparable.

Figure 2: Industrial and Commercial Failures and Real GDP



failure rates were in 1930. We distinguish three groups: states with low, medium and high business failure rates.[8] The table shows that states with higher failure rates in 1930 had in 1920 a lower share of employment in agriculture and a larger one in manufacturing, a higher share of the white population and higher occupational scores for men. More importantly for identification purposes, the 1920 female labor supply is not systematically different across groups of states.[9]

In Table 2 we examine whether pre-Depression shares in the factors stated above led to significantly higher business failures in 1930. As can be seen, the size of the manufacturing sector and state income (approximated by occupational scores) are positively linked to business failures. Pre-depression female labor force participation rate is instead uncorrelated with the 1930 failure rates. The fact that states with a larger concentration in manufacturing experienced a higher failure rate in 1930 is not surprising given that the business failure rate is calculated over the universe of concerns that largely pertain to the manufacturing sector.

In the robustness section, we consider several other measures of the economic downturn as alternatives to the business failure rate. The *Census of Manufactures* (1935) reports various state-level statistics for the manufacturing sector at biennial frequency between 1927 and 1935. The 1914 and 1919 *Censuses of Manufactures* cover the years

[8] Low failure states have a failure rate in 1930 of less than 1%, medium failure states have rates between 1% and 1.3%, and high failure states have rates above 1.3%.

[9] The IPUMS provides no information on income prior to 1940. In absence of income information, occupational scores are used as a proxy. We calculated employment shares for all remaining sectors of the economy but found no systematic differences across states with low, medium and high failure rate. These statistics are not reported for brevity but are available upon request. All statistics are calculated across the state population aged 20 to 64.

Table 1: State characteristics in 1920 by the level of business failure rate in 1930 (low, medium, high)

	State Business Failure Rate in 1930								
	Low	Medium	High	Low	Medium	High	Low	Medium	High
State characteristics		1920 means			1940 means			1960 means	
employment share in agriculture	0.42	0.25	0.15	0.27	0.16	0.09	0.10	0.06	0.03
	(0.49)	(0.43)	(0.36)	(0.45)	(0.36)	(0.28)	(0.30)	(0.23)	(0.17)
employment share in manufacturing	0.12	0.25	0.31	0.13	0.26	0.27	0.19	0.33	0.31
	(0.32)	(0.43)	(0.46)	(0.34)	(0.44)	(0.45)	(0.39)	(0.47)	(0.46)
employment share in finance	0.18	0.18	0.21	0.24	0.24	0.28	0.34	0.31	0.35
	(0.38)	(0.38)	(0.41)	(0.42)	(0.42)	(0.45)	(0.47)	(0.46)	(0.48)
employment share in services	0.14	0.14	0.16	0.17	0.16	0.18	0.21	0.18	0.20
	(0.35)	(0.34)	(0.37)	(0.38)	(0.36)	(0.38)	(0.41)	(0.38)	(0.40)
share nonwhite	0.13	0.11	0.049	0.12	0.10	0.055	0.11	0.12	0.08
	(0.34)	(0.31)	(0.22)	(0.32)	(0.31)	(0.23)	(0.31)	(0.32)	(0.27)
market participation of non-farm women	0.24	0.24	0.26	0.31	0.32	0.33	0.40	0.42	0.42
	(0.42)	(0.43)	(0.44)	(0.46)	(0.46)	(0.47)	(0.49)	(0.49)	(0.49)
male occupational scores	21.2	23.82	25.59	22.42	24.49	26.14	26.70	27.71	28.82
	(11.11)	(10.62)	(10.54)	(10.75)	(10.17)	(10.26)	(10.55)	(9.86)	(10.11)
share literate	0.92	0.93	0.94						
	(0.27)	(0.25)	(0.24)						
share with high school education				0.27	0.27	0.31	0.45	0.45	0.50
				(0.44)	(0.44)	(0.46)	(0.49)	(0.49)	(0.49)

Notes: Reported numbers are state means calculated from the 1920 IPUMS Census. Low failure rate states have a failure rate in 1930 of less than 1%, medium failure rate states have rates between 1% and 1.3%, and high failure rate states have rates above 1.3%. State business failure rates are obtained from the Annual Statistical Abstracts of the United States.

Table 2: 1920 state-level determinants of business failures in 1930

Dependent variable:	state business failure rate in 1930					
	(1)	(2)	(3)	(4)	(5)	(6)
employment share in manufacturing	1.49	1.53	1.52	1.69	1.03	1.47
	(0.49)***	(0.51)***	(0.52)***	(0.51)***	(0.55)*	(0.63)**
share nonwhite		0.12	0.11	0.66	1.05	0.75
		(0.36)	(0.48)	(0.78)	(0.85)	(0.76)
labor force participation of non-farm			0.028	-0.40	-1.20	-0.75
women			(0.80)	(1.03)	(1.27)	(1.13)
share literate				1.17	0.54	-0.072
				(1.41)	(1.28)	(1.222)
male occupational scores					0.066	0.22
					(0.028)**	(0.12)*
employment share in agriculture						2.77
						(2.05)
	49	49	49	49	49	49

Notes: OLS coefficients from regression of the state business failure rate in 1930 on the listed state covariates. State covariates reflect means calculated from the 1920 IPUMS Census. State business failure rates are obtained from the Annual Statistical Abstracts of the United States. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

1899, 1904, 1909, 1914 and 1919. We use 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.

In addition, we use information on the suspended bank deposits to construct a SEA-level (State Economic Area) measure of banking distress: the ratio of deposits suspended to total deposits. This is an alternative measure of the extent of the economic crisis that reflects the degree of fragility of the local banking system. SEAs are available for all samples from 1850 to 1950, and are defined identically in all years. This gives a lot more variation than state-level aggregate measures since there are about 500 State Economic

Areas. This data is available from the Board of Governors of the Federal Reserve System (the *Federal Reserve Bulletin*) which reports the number of banks between 1920 and 1936 closing temporarily or permanently on account of financial difficulties. A suspended bank closed its doors to depositors and ceased conducting normal banking business for at least one business day. Declining asset values and bank runs were the principal cause of bank suspensions. Between 1929 and 1933 most suspensions became permanent and indicate loss of assets (see Richardson, 2006).

Table 3 reports pre-Depression SEA and state-level determinants of the average SEA suspension rate of banks and of their deposits between 1929 and 1931. The latter are regressed on a set of variables *predating* the 1929 Crash, which reflect the underlying demographic and economic structure of the SEA. Several interesting results emerge. First, as for business failures, there is a significant, positive link to local occupational income but no link to female labor force participation. Areas with higher income before the Depression possibly experienced larger declines in economic activity during the Crash and banks suffered larger losses on their loans. Second, differently than for business failures, SEAs with larger agricultural sectors experienced higher suspension rates of banks and deposits during the Crash. A substantial number of banks that failed during the Crash were small rural banks, whose activity heavily depended on the prosperity of agriculture (Wheelock, 1995). Hence, states with larger agricultural sectors in 1920 likely experienced larger income declines in the 1920s contributing to increased banking distressed during the Great Depression.[10] Third, SEAs with higher literacy rates also had lower bank and deposit suspension rates. We hypothesize that these areas were less dependent on agriculture and more so on other sectors of the economy (such as the public sector) that were less severely hit by the Depression.

Fourth, in columns (3) to (5), we add three regressors that describe aspects of the pre-existing banking structure: the ratio of state to national FDIC banks in 1928 in the SEA, an indicator for the presence of state bank branching regulation in 1919 and for the presence of deposit insurance in the state in the 1920s.[11] Wheelock (1995) reports that state banks were smaller and less regulated, and had lower minimum capital requirements than national banks. Their failure rates during the Depression years were higher than those of national banks. There is a large empirical literature linking unit banking to bank

[10] See Alston, Grove and Wheelock (1994) and Temin (1976) among others.
[11] The data on bank branching and deposit insurance regulations come from Dehejia and Lleras-Muney (2007).

Table 3: Pre-Depression determinants of SEA average bank & deposit suspension rate between 1929-1931

Dependent variable: avg suspension rate (1929-1931) of	banks				deposits
	(1)	(2)	(3)	(4)	(5)
SEA empl. share in manufacturing (1920)	-0.012	0.014	-0.022	-0.024	-0.023
	(0.033)	(0.036	(0.037)	(0.037)	(0.038)
SEA empl. share in agriculture (1920)	0.061	0.223	0.154	0.155	0.141
	(0.021)***	(0.063)***	(0.062)***	(0.061)***	(0.067)**
SEA share nonwhite (1920)		0.059	0.032	0.031	-0.015
		(0.031)*	(0.033)	(0.032)	(0.033)
SEA labor force participation of non-farm women (1920)		-0.069	-0.015	-0.016	-0.025
		(0.052)	(0.051)	(0.051)	(0.049)
SEA share literate (1920)		-0.046	-0.089	-0.101	-0.193
		(0.063)	(0.065)	(0.062)*	(0.068)***
SEA male occupational scores (1920)		0.011	0.008	0.008	0.007
		(0.003)***	(0.003)**	(0.003)**	(0.004)*
SEA ratio of state to national FDIC banks (1928)			0.002	0.002	0.002
			(0.000)***	(0.000)***	(0.001)**
state had branching regulation (1919)			-0.028	-0.029	-0.023
			(0.006)***	(0.007)***	(0.007)***
state had deposit insurance regulation during the 1920s			-0.018	-0.017	-0.013
			(0.007)***	(0.007)***	(0.007)*
state business failure rate in 1928				0.005	0.009
				(0.009)	(0.010)
N	463	463	458	458	458

Notes: OLS coefficients from regressions of the average suspension rate of banks (Columns 1 to 4) and of their suspended deposits (Column 5) in a SEA between 1929 and 1931 on the listed covariates. SEA-level covariates are calculated from the 1920 IPUMS Census. Indicators for whether a state had a branching regulation in 1919 or a deposit insurance regulation during the 1920s are coded on the basis of information obtained from Dehejia and Lleras-Muney (2007, Table 1). Suspension rate of banks is defined as the number of banks suspended over the total number of banks in a given year and SEA. Deposits suspended is defined as the total value of deposits of banks suspended over the total value of deposits of all banks in a given year and SEA. Banking data are obtained from the FDIC Data on Banks in the United States, 1920-1936 accessed through ICPSR. State business failure rates are obtained from the Annual Statistical Abstracts of the United States. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

suspensions and failures (White, 1983 and Wheelock, 1995). This suggests a positive relationship between no-branch regulations and bank suspensions. The presence of deposit insurance systems induced more bank entry and higher risk-taking than economically viable and therefore should have increased the vulnerability of the local banking sector. On the other hand, as reported by Wheelock (1995), the decline of insurance systems earlier in the 1920s led to a relative increase in the number of national banks, which also had lower failure rates. If this effect dominates, then we could expect a negative association between insurance deposit regulations and bank suspensions in the Depression-era. Hence, the impact of insurance systems could differ depending on whether they ended before 1928 or lasted till 1930.[12]

Our estimates are consistent with the findings above: the higher the ratio of state-to-national banks, the higher the rate of suspension. States which allowed for bank branching had a significantly lower ratio of suspensions. States with deposit insurance laws

[12] Calomiris and Mason (2003b) examine whether bank panics and contagion may be the source of further panics in the banking system in the early 1930s and find that although they may have, these effects were not quantitatively important at an aggregate level.

experienced fewer suspensions, which suggests an effect driven by states where insurance systems ended prior to the Crash and hence had an unusually high relative number of lower-risk national banks.[13] Finally, conditional on the demographic, economic and banking-related covariates, the state business failure rate in 1928 has no further explanatory power. It is very likely that bank suspensions capture economic distress that is not directly linked to business failures, but yet could have affected households' finances and therefore their work behavior.

III. Great Depression, Work and Wages

In this section we examine the short and long-term impact of the Great Depression and of the subsequent economic recovery on female labor markets.

A. Female Labor Supply in the aftermath of the Great Crash

We use the 1930-1940 pooled samples to compare labor supply responses of women in various age groups in 1940 relative to those of women in the same age groups in 1930. We estimate versions of the following baseline specification:

$$y_{its} = \alpha_o + \alpha_1 CC_{s't} + \alpha_2 GD_{st-k} + \varphi_{ia} + f_{s,s'} + g_t + \varepsilon_{its} \quad (1),\ t=1930\text{-}1940$$

y_{its} is an indicator for whether woman i in state of birth s is employed in year t.[14] To capture the economic environment during the Great Depression, we include 10-year lagged failures (*GD*), allowing for the 1929/1930 average failure rate to affect the 1940 labor supply and symmetrically the 1919/1920 average failure rate to affect the 1930 labor supply. We also account for changes in the current state of the economy ($CC_{ts'}$).[15] Finally, all specifications include division-year interactions to account for omitted time-varying regressors that could confound the estimated impact of the Great Depression.[16]

The results are presented in Table 4. Panel I reports estimates using the 1930-1940

[13] In an omitted analysis but available upon request, we replace the dummy for deposit insurance regulation with two others: one dummy for states that ended their insurance systems before 1928 and another dummy for states that ended them after 1928. The dummy on the former was negative and significant, while on the latter insignificant. Wheelock (1995) also finds similar results.

[14] In the 1930-1940 samples, as well as in the 1940-1950-1960 analysis, the dependent variable is constructed using the IPUMS variable "empstat" (y_{its} = 1 if "empstat"=1 and 0 otherwise). This variable is fairly comparable across these years.

[15] These are averages over the previous two years: 1928 through 1930 for 1930, and 1938 through 1940 for the year 1940. Throughout the analysis contemporaneous economic conditions are measured at the respondent's current state of residence *s'*, while past failures pertaining to the Great Depression are measured at the respondent's state of birth *s*. In equation (1) all state variables are matched by the individual's state of birth *s*.

[16] Results (available on request) are qualitatively similar when division-year interactions are not included.

pooled samples. As can be seen, the only group that responds to the initial shock is women 35 to 44 years old in 1930 (older group of the *D-cohort*). The 1910-1920-1940 pooled sample analysis, which accounts for pre-existing trends in female participation, confirms this result. It also suggests that younger women, 30 to 34 years old in 1940, also worked more in 1940 in states more adversely affected by the Crash.[17] When we estimate (1) for a sample of married women that had already gotten married by 1929 – and therefore their timing of marriage cannot have been affected by the Depression – we find that the 35 to 44 year olds respond even more strongly to the shock by increasing their participation. This is consistent with the hypothesis of an *Added Worker Effect* whereby married women enter the labor market to make up for losses in family income and/or assets. Interestingly, in addition to the 35 to 44 year old group, much older women that were still married also increase their labor supply.

Subsequent results show that our baseline findings remain after controlling for failures prior to the Great Depression, which again indicates they are not driven by pre-Depression trends. They are also robust to using the increase in the SEA bank deposit suspension rate between 1930 and 1920 as an alternative measure of economic/financial distress.[18] This exercise shows that our findings hold even when using a finer-than-the-state level of observation. Finally, estimating equation (1) for men, we see that in contrast to women, the Depression did not have any significant impact on their participation shares, with the exception of younger men who, if anything, decreased their participation.

Quantitatively, the estimated effect for our cohort is measurable. Evaluating the coefficient of 0.024 (Panel I, Table 4) at the average business failure rate between 1929 and 1930 (about 1.1), it suggests an increase in the participation share of this group by 2.7 percentage points.[19] This corresponds to a 15% increase relative to the average employment rate of 35 to 44 years old women in 1930 (0.18).

[17] The labor force participation definition in the pre-1940 samples relative to the 1940 sample has differences. Hence, the reader should exercise some caution when interpreting the estimates from the extended 1910-1920-1940 pooled sample.

[18] More precisely, we assign the 1930 ratio of deposits suspended to total SEA deposits to individuals in the 1940 cross-section and symmetrically the 1920 ratio to individuals in the 1930 cross-section (i.e 10-year lagged deposit suspension rate). For this specification, banking data are matched by the individual's current state and SEA of residence as SEA at birth is not reported.

[19] The respective effect among the married women in that age group corresponds to an increase of by roughly 6 percentage points.

Table 4: The short-term impact of the Great Depression on female labor supply (1930-1940)

Dependent variable:	= 1, if currently employed			
Age in year *t*:	30-34 (all)	35-44 (all)	45-54 (all)	55-64 (all)
Panel I:	***1930-1940 pooled samples***			
failure rate_GD	-0.009	0.024	-0.024	-0.009
	(0.020)	(0.012)**	(0.012)*	(0.011)
N	*60367*	*100285*	*72223*	*47348*
	A. Sample of women married before 1929			
failure rate_GD	0.027	0.058	-0.015	0.030
	(0.022)	(0.019)***	(0.022)	(0.015)**
N	*13671*	*39286*	*29354*	*13160*
	B. Controlling for failures prior to the Great Depression			
failure rate_GD	-0.009	0.025	-0.024	-0.009
	(0.020)	(0.012)**	(0.013)*	(0.011)
N	*60367*	*100285*	*72223*	*47348*
	C. Short-term impact on work propensity of men			
failure rate_GD	-0.021	-0.002	0.012	-0.017
	(0.009)**	(0.007)	(0.009)	(0.015)
N	*57011*	*96359*	*70448*	*43918*
	D. Alternative measure: SEA deposit suspension rate			
deposit suspension rate_GD	0.031	0.034	-0.035	-0.031
	(0.025)	(0.017)**	(0.024)	(0.021)
N	*59937*	*99518*	*71669*	*46994*
Panel II:	***1910-1920-1940 pooled samples with a state-specific linear time trend***			
Dependent variable:	= 1, if in the labor force			
Age in year *t*:	30-34 (all)	35-44 (all)	45-54 (all)	55-64 (all)
failure rate_GD	0.022	0.024	0.003	-0.019
	(0.011)**	(0.011)**	(0.010)	(0.009)**
N	*69769*	*112402*	*80990*	*51651*

Notes: OLS coefficients from a regression of an indicator for whether the respondent is currently employed (Panel I) or in the labor force (Panel II) on contemporaneous state business failure rate, the business failure rate during the Great Depression, age dummies, fixed effects for calendar year, state of residence and state of birth (eq.1). These specifications also include division-year interactions. Specifications in Panel II additionally include a state-specific linear time trend. The failure rate during the Great Depression (*failure rate_GD*) is defined as a 10-year lag in the business failure rate: average failure rate between 1929 and 1930 if *t=1940* , between 1919 and 1920 if *t=1930*, and symmetrically if *t=1920, 1910*. It is matched on the basis of the individual's state of birth. The current business failure rate is the average state business failure rate between 1938 and 1940 if *t=1940* , between 1928 and 1930 if *t=1930* , and symmetrically in *t=1920 or 1910*. This variable is matched on the basis of the individual's state of residence. Failures prior to the Great Depression in Panel I.A are 20-year lagged failures: average of 1919 and 1920 failure rate if *t=1940* and of 1909 and 1910 if *t=1930*. Standard errors are clustered by state state of birth and year. In Panel I.D, *failure rate_GD* is replaced by the *deposit suspension rate_GD* variable. The latter is the ratio of the value of deposits suspended across all banks in 1930 (if *t= 1940* and in 1920 respectively if *t=193* 0) in a given SEA over the value of all deposits across all banks in that year and SEA. Specifications in Panel I.C also include age dummies and fixed effects for calendar year, SEA of residence, state of residence and state of birth. Standard errors are clustered by SEA and year. The sample includes white, non-farm women (or men in Panel I.C) born in the United States and not in group quarters. The *D-cohort* includes women 30 to 44 years old in 1940. All estimates are weighted using the available sampling weights. Banking data are obtained from the FDIC Data on Banks in the United States, 1920-1936 accessed through ICPSR. State business failure rates are obtained from the Annual Statistical Abstracts of the United States. ***, **, * indicate statistical significance at 1%, 5% and 10% respectively.

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

In this section we pool data from the 1940 and 1960 censuses to examine the long-term effects of the Great Depression on female labor supply both at the extensive and intensive margins. We estimate equations of the following general form:

$$y_{its} = \alpha_o + \alpha_1 Mobrate_s + \alpha_2 CC_{ts'} + \alpha_3 GD_{st-k} + \alpha_4 Z_{1940,s} + \varphi_{ia} + f_{s,s'} + g_t + \varepsilon_{its} \quad (2)$$

Equation (2) is a slightly modified version of (1) augmented with controls for WWII mobilization and 1940 state covariates. We estimate two variants of specification (3). In the first, y_{its} is an indicator for whether a woman *i* born in state *s* is employed at time *t (t= 1940, 1960)*; in the second y_{its} is the number of weeks worked in the previous year.[20] Following Acemoglu et al. (2004), we measure the labor supply effects of WWII using the share of registered men 18-44 years old who were drafted or enlisted in the war in a given state (*Mobrate*) and control for the 1940 state share of men who were farmers, non-white, and for the average male education in 1940 (vector Z_{1940}). Vector φ_{ia} includes individual age dummies. Time-invariant state-specific characteristics that could lead to differences across states in work via alternative channels than the one we propose are captured by state fixed effects which are included in all regressions. As before, we also include time-varying division dummies to capture time-varying unobserved division changes. $f_{s,s'}$ and g_t are state of residence (*s'*), state of birth (*s*) and year fixed effects. As before, all state covariates are matched by the individual's birth state except for contemporaneous failures. Standard errors are clustered by year and birth-state.

To control for changes in current economic conditions we include $CC_{ts'}$, while to capture the potentially lasting impact of the Great Depression we include as regressor *30*-year lagged failures (GD_{st-30}). Hence, we allow 1960 outcomes to be affected by the Great Depression 30 years back and 1940 outcomes to be symmetrically affected by events as far back as in 1910.[21] Our focal cohort, 20 to 34 years old in 1930, is 50 to 64 years old in 1960. We compare the effects of the GD_{st-30} variable on its labor supply to that of women in the same age bracket in 1940.

Table 5 presents our main results. On the left-hand side, we report the estimates at the

[20] The number of weeks worked in not available in the Censuses prior to 1940.

[21] As in the short-term analysis, for contemporary failures (*CC*) we use the average failure rate over the previous two years: 1938 through 1940 if *t=1940* and 1958 through 1960 for *t=1960*. For failures during the Great Depression (GD_{st-30}) we use average failures from 1909 to 1910 if *t=1940* and from 1929 to 1930 for *t=1960*.

extensive margin; on the right-hand side, at the intensive margin. Panel I reports the results for the baseline case (equation 3). Panel II reports estimates which control for failures prior to the Great Depression to assess whether results are due to pre-existing trends in the failure rate. Panel III uses business failures in 1932 instead of average business failures between 1929 and 1930 to assess the robustness of the results to the particular years we chose to characterize the Great Depression. Finally, Panel IV reports the same estimates as in Panel I but for men.

Let's first examine the results in Panel I. As can be seen, in states with more failures during the Great Depression ever married women in the *D-cohort* work significantly more in 1960 than women of the same age in 1940.[22] This is true regardless of the margin (extensive/intensive) considered. The effects are stronger for younger women, possibly more attached to the labor market than the relatively older, who may have also started retiring.[23] Quantitatively, evaluated at the average business failure rate in 1930 of 1.1, the estimates suggest an increase in the 1960 work shares between 2.1 (for women 50 to 64 years old) and 5.7 percentage points (for women 50 to 54 years old). This is a 14% to 33% increase, respectively, from the 1940 averages for these age groups.[24]

In line with the hypothesis that the entry/re-entry of this cohort into the labor market is also driven by a labor demand shift, we find that work shares and weeks worked increase in response to improvements in contemporaneous economic conditions. The estimates do not support the hypothesis that WWII mobilization led to higher labor market participation for this group of women (see also Goldin, 1991) in the long-run.

In Panel II we estimate the same regression as in Panel I but also control for failures

[22] Results are similar when considering all women regardless of marital status. The effects are, however, quantitatively stronger for the ever married. By 1960, the vast majority of women in this age group have been married at least once.

[23] In an unreported analysis but available upon request, we studied what the patterns documented in Table 5 imply in terms of occupations. Simple summary statistics suggest that the *D-cohort* occupied both blue-collar and white-collar jobs at all times and at proportions that remain remarkably stable over time: roughly 30% in blue-collar (operatives & services) and 50% in white-collar (professional/managerial & clerical) jobs. 40% of women in white-collar jobs were in clerical occupations. Using a multinomial logit to model the presence of women across occupations, and where "out of the labor force" is our excluded category, we find that, as a result of the Great Depression, women in this cohort were more likely to be present both in white collar and in blue collar occupations than being out of the labor force.

[24] Similarly, using weeks worked as the dependent variable, the estimates - evaluated at the average business failure rate in 1930 of 1.1 - suggest an increase in the average number of weeks worked in 1960 between 1.04 (women aged 50 to 64) and 3.59 (women aged 50 to 54). These numbers imply a 15% to 46% increase respectively from the 1940 weeks worked averages for the respective age groups.

preceding the Great Depression.[25] If results are driven by pre-existing trends in business failures our estimates could be lower and/or non-significant. Instead, in all cases they are similar to the ones reported in Panel I, if not larger, and significant. Panel III shows that, using business failures in 1932 instead of the average between 1929 and 1930, produces similar findings.[26] Hence, results do not depend on the particular year we choose to characterize the changes in the economic environment during the Crash. Finally, the estimates reported in Panel IV indicate that men in 1960 did not work significantly more than men of the same age in 1940, neither at the extensive nor at the intensive margin. Later though we show that their incomes (proxied by occupational income scores) were significantly lower than for previous cohorts due to the Depression.

Next, we explore the link between past conditions and contemporaneous 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. Panel I in Table 6 reports results from the estimation of specification (2) for the 1940-1960 sample, where the dependent variable is the log of real weekly wages.[27] The negative and significant estimate associated with business failures in 1930 is consistent with the hypothesis that the Great Depression led to an outward shift in the labor supply of women in the *D-cohort*. Improvements in current economic conditions instead do not significantly affect wages.

To correct for possible self-selection bias, we re-estimate specification (3), with real wages as a dependent variable, using 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 work-force. The Heckman-corrected estimates are presented in Panel II of Table 6. The exclusion restriction is the number of own family members residing with each individual, including the person her/himself (IPUMS variable *famsize*). These "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

[25] In particular, we include the average of 1919/1920 failure rate when t=1960, and symmetrically the average of 1899/1900 when t=1940.
[26] We use 1932 business failures for 1960 and symmetrically 1912 for 1940.
[27] The censuses prior to 1940 do not report wages and therefore a similar analysis for these years is not feasible. We restrict attention to respondents who worked more than 47 weeks in the previous year in order to obtain a sample of individuals that are strongly attached to the labor market.

Table 5: The long-term impact of the Great Depression of female labor supply (1940-1960)

Ages in 1940 and 1960	50 to 54	50 to 59	50 to 64	50 to 54	50 to 59	50 to 64
Dependent variable:	= 1, if currently employed			weeks worked in the past year		
Panel I:	***Baseline***					
WWII mobilization*d1960	-0.491	-0.473	-0.455	-28.881	-28.945	-25.194
	(0.203)**	(0.150)***	(0.125)***	(9.370)***	(7.441)***	(6.211)***
current failure rate	-0.040	-0.65	-0.057	-0.657	-2.064	-1.695
	(0.020)*	(0.018)***	(0.013)***	(0.981)	(0.830)**	(0.579)***
failure rate_GD	0.052	0.024	0.019	3.168	1.301	0.945
	(0.011)***	(0.007)***	(0.006)***	(0.565)***	(0.369)***	(0.343)***
Panel II:	***Baseline - controlling for failures in early 1920s (prior to the Great Depression)***					
failure rate_GD	0.055	0.027	0.022	3.370	1.539	1.139
	(0.011)***	(0.007)***	(0.007)***	(0.548)***	(0.352)***	(0.323)***
Panel III:	***Baseline - using failure rate in 1932 (instead of 1929 & 1930 average) as baseline measure***					
failure rate_GD	0.022	0.018	0.015	1.741	1.432	1.146
	(0.010)**	(0.006)***	(0.005)***	(0.548)***	(0.305)***	(0.287)***
N	49019	89450	122808	49019	89450	122808
Panel IV:	***Baseline - Men***					
failure rate_GD	0.015	0.009	0.011	0.684	0.247	0.049
	(0.008)*	(0.006)	(0.007)	(0.457)	(0.362)	(0.294)
N	47570	85387	115296	41930	74842	101037

Notes: OLS coefficients from a regression of an indicator for whether the respondent is currently employed (Columns 1-3) or of the number of weeks worked in the past year (Columns 4-6) on the failure rate during the Great Depression, contemporaneous state business failure rate, WWII mobilization rate, 1940 state share of men who were farmers, 1940 state share of non-whites, average male education in 1940, age dummies, fixed effects for calendar year, state of residence, state of birth and division-year interactions (eq. 3). In Panels I, II, IV *failure rate_GD* is the 30-year lagged business failure rate: average business failure rate between 1929 and 1930 if *t=1960* and between 1909 and 1910 if *t=1940*. In Panel III is the state business failure rate in 1932 if t=1960 and in 1912 respectively if *t=1940*. Current failures is the average business failure rate over the previous two years: 1938 through 1940 if *t=1940*, 1958 through 1960 if *t=1960*. All state covariates except contemporary failures are matched on the basis of the respondent's state of birth. Contemporary failures are matched at the individual's current state of residence. 1940 covariates are interacted with a year dummy. Failures prior to the Great Depression (Panel II) is defined as a 40-year lag in the business failure rate: average between 1919 and 1920 if *t=1960*, and between 1899 and 1900 if *t=1940*. The sample includes white, non-farm, ever married women (or men, Panel IV) born in the United States and not in group quarters. The *D-cohort* of women is 50 to 64 years old in 1960. All specifications are estimated using the appropriate sampling weights. Standard errors are clustered by state of birth and year. ***, **, * indicate significance at 1%, 5% and 10% respectively. WWII state mobilization rates are obtained from Acemoglu et al. (2004).

Table 6: The long-term impact of the Great Depression on female wages (1940-1960)

Ages in 1940 and 1960:	50 to 54	50 to 59	50 to 64
Dependent variable:		log-real weekly wage	
Panel I:		***OLS estimates***	
current failure rate	0.051	0.004	-0.011
	(0.082)	(0.069)	(0.067)
failure rate_GD	-0.144	-0.096	-0.114
	(0.045)***	(0.034)***	(0.032)***
N	11233	19619	24748
Panel II:		***Heckman corrected estimates***	
current failure rate	0.075	0.089	0.074
	(0.096)	(0.089)	(0.080)
failure rate_GD	-0.188	-0.090	-0.122
	(0.041)***	(0.030)***	(0.030)***
Inverse mills ratio	-0.889	-0.921	-0.959
	(0.027)***	(0.026)***	(0.023)***
N	51550	94380	129949

Notes: *Panel I* - OLS coefficients from a regression of the log-real weekly wage on the failure rate during the Great Depression, contemporaneous state business failure rate, WWII mobilization rate, 1940 state share of men who were farmers, 1940 state share of non-whites, average male education in 1940, age dummies, fixed effects for calendar year, state of residence, state of birth and division-year interactions. *Panel II* - Heckman corrected version of specification in Panel I using as exclusion restriction the number of own family members residing with each individual, including the person her/himself (IPUMS variable *famsize*). *Failure rate_GD* is the 30-year lagged business failure rate: average rate between 1929 and 193(if *t=1960* and between 1909 and 1910 if *t=1940*.*Current failures* is the average business failure rate over the previous two years: 1938 through 1940 if *t=1940*, 1958 through 1960 if *t=1960*. All state covariates except contemporary failures are matched on the basis of the respondent's state of birth. Current failures a matched at the individual's current state of residence. The sample includes white, non-farm, ever married women born in the United States and not in group quarters who worked more than 47 weeks in the previo year. All specifications are estimated using the appropriate sampling weights. Standard errors are cluster by state of birth and year. ***, **, * indicate significance at 1%, 5% and 10% respectively.

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 Depression in lowering contemporaneous wages.

IV. Robustness and Identification of Long-term Effects

Our analysis of the long-term impact of the Great Depression on female employment presented in Section II suggests that these effects are quantitatively important. In this section, we perform several robustness exercises pertaining to the identification and measurement of these effects.

With respect to identification, one potential concern is that concurrent changes in factors other than the Great Depression, that are not accounted for by state and year fixed effects, could invalidate our hypothesis. Moreover, pre-existing trends in employment could be correlated with changes in past failures and hence our results could be driven by secular trends rather than by the exceptional economic conditions of the early 1930s, as we conjecture. We address identification concerns as follows. First, we explicitly examine the potential role of alternative hypotheses that have been brought as explanations of the dramatic increase in the labor force participation of older women in the 1950s: 1) the expansion of the white collar sector in the early 20th century (Goldin, 1998a) ; 2) the diffusion of home technology in the early 1900th (Greenwood et al., 2005); 3) the increased education of women in the early part of the century (Goldin, 1990, see Section II on the related literature). These changes could have been more important in states where the Great Depression was more severe and be the true driving force behind our results. Second, we consider an instrumental variables strategy that uses the 1900 state-specific size of the durables and non-durables sectors weighted by their national growth between 1900 and 1930 as an instrument for the state business failure rate in the 1930s. Finally, to address the issue of pre-existing employment trends, we augment the baseline 1940-1960 pooled samples with the 1910, 1920 and 1930 cross-sections while including division-year interactions as well as birth-state specific linear time trends. We find that none of these exercises changes our baseline results.

We also experiment with several alternative measures of economic distress during the Great Depression at the state as well as at the SEA-level. All of them consistently lead to the same conclusions. Further support to our work hypothesis is provided by the study of the 1940-1950 pooled samples where we examine the work behavior of the same cohort when the latter is a decade younger. We consistently find the exact same patterns, while for older women the effects are insignificant. This strengthens the argument that the documented patterns are cohort-specific. Finally, we provide external validity to our findings, by using a 1978 survey of women in the *D-cohort.*

A detailed analysis of the exercises performed, starting with measurement and subsequently identification, is presented in the following subsections. We conclude that, while we cannot completely rule out the potential presence of omitted factors, the facts that our results are robust 1) across samples over time, 2) to the use of different measures of the Great Depression, 3) to the potential presence of pre-existing trends and to alternative existing explanations, are jointly suggestive of a causal link between the Great Depression and the work of women in the *D-cohort*.

A. Alternative state measures of the Great Depression

We employ data from the *Census of Manufactures* in order to construct alternative state measures of economic distress and of the decline in employment opportunities during the Great Depression. These are used in our baseline specification (equation 2) - in lieu of the business failure rate - to predict female work patterns in the 1940-1960 pooled samples. The following variables are used: number of wage earners, log real wage, and the number of establishments in the manufacturing sector. While our baseline measure summarizes the decline in activity of a broader spectrum of sectors, these measures are more focused. Nonetheless, the manufacturing sector represents a large part of the economy and its sharp decline is correlated with income losses. In addition, while the business failure rate provides information on the state of the economy, it contains little information about the quantitative relevance of the businesses that are failing. How many people did they employ? Were they large or small companies? The industrial structure of the economy may vary considerably across states, and examining state-level variations in the employment rate and wages can shed some light on whether the results hold when the decline in activity is quantified in terms of employment and income losses.

The three measures are calculated as follows. To capture the deteriorating economic environment during the core Depression years, we use the change in these variables between 1933 and 1929 and also between 1909 and 1904. More specifically, we consider level differences in the number of wage earners, percentage changes in real wages and the rate of change in the number of establishments over the time intervals specified above. The 1933-1929 differences are linked to the 1960 individual labor supply responses by the woman's state of birth. The 1909-1904 differences are similarly linked to the 1940 individual labor supply. The number of wage earners in 1933 and 1929 is scaled by the total state population of 20 to 64 year olds in 1930, while the number of wage earners in

1909 and 1904 is similarly scaled by the state population in 1900. Wages are deflated by the same year CPI index. Finally, the rate of change in the number of establishments is the measure that most closely resembles the business failure measure, though it is more general. It summarizes a decline that can be due to failures or to the closing down of a business before it fails or simply a decrease in the creation of new businesses.

The results are reported in Table 7. As can be seen, the different measures are associated with a relative employment increase in 1960 for the cohort of interest. In the lower part of the table we report estimates when also controlling for changes in the same measures that pre-date the Depression. The results are again very similar to the ones obtained without controlling for prior conditions. Furthermore, measuring the extent of the Great Depression in terms of employment or income losses produces effects that are also quantitatively significant. Considering the wage measure, the latter changed from an average of 0.20 between 1904 and 1909 to -0.51 between 1929 and 1933 (change of -0.71). Given the estimates of -0.04 (work propensity) and -2.887 (weeks worked), this

Table 7: The impact of the Great Depression of female labor supply
Robustness: Alternative Measures of the Great Depression (1940-1960)

Ages in 1940 and 1960	50 to 64 years old	
Dependent variable:	= 1, if currently employed	weeks worked in the past year
Panel I:	***Baseline***	
(1): Change in log-avg manuf. wage:	-0.040	-2.887
1933 vs 1929	(0.008)***	(0.431)***
(2): Change in avg share of wage	-0.409	-26.311
earners in manuf.: 1933 vs 1929	(0.151)***	(8.166)***
(3): Rate of change in avg number of	-0.007	-0.262
establishments in manuf:1933 vs 1929	(0.0007)***	(0.060)***
Panel II:	***Robustness: Controlling for changes in the measures prior to the GD (1919 vs 1914)***	
(1): Change in log-avg manuf. wage:	-0.042	-2.973
1933 vs 1929	(0.009)***	(0.463)***
(2): Change in avg share of wage	-0.566	-33.506
earners in manuf.: 1933 vs 1929	(0.145)***	(8.807)***
(3): Rate of change in avg number of	-0.007	-0.274
establishments in manuf:1933 vs 1929	(0.0008)***	(0.062)***
N	122808	

Notes: OLS coefficients from regressions of an indicator for whether the respondent is currently employed or of the number of weeks worked in the past year on an alternative measure of economic distress during the Great Depression (see *Dependent variable* Column), contemporaneous state business failure rate, WWII mobilization rate, 1940 state share of men who were farmers, 1940 state share of non-whites, average male education in 1940, age dummies, fixed effects for calendar year, state of residence, state of birth and division-year interactions. The three measures are defined as follows: *(1)* - change in log-real manufacturing wages between 1933 and 1929 if *t=1960,* and between 1909 and 1904 if *t=1940, (2)* - change in the number of wage earners in manufacturing between 1933 and 1929 if *t=1960* (scaled by total state population of 20 to 64 year olds in 1930) and between 1909 and 1904 if *t=1940* (scaled by total state population of 20 to 64 year olds in 1900), *(3)* - rate of change in the number of manufacturing establishments between 1933 and 1929 if *t=1960* and between 1909 and 1904 if *t=1940*. Current failures is the average business failure rate over the previous two years: 1938 through 1940 if *t=1940* , 1958 through 1960 if t=1960.All state covariates except contemporary failures are matched on the basis of the respondent's state of birth. Contemporary failures are matched at the individual's current state of residence. Specifications in Panel II include all covariates of specifications in Panel I and also changes in the three measures between 1919 and 1914 if *t=1960* and between 1904 and 1899 if *t=1940*. 1940 covariates are interacted with a year dummy. The sample includes white, non-farm, ever married women born in the United States and not in group quarters. The *D-cohort* of women is 50 to 64 years old in 1960. All specifications are estimated using the appropriate sampling weights. Standard errors are clustered by birth state and year. Data from the *Census of Manufactures* are used to construct the three measures. WWII state mobilization rates are obtained from Acemoglu et al. (2004).***, **, * indicate significance at 1%, 5% and 10% respectively.

change suggests an increase in employment shares and weeks worked by 0.028 and 2.049 respectively or by 19% and 29% respectively relative to the 1940 average employment shares (0.15) and weeks worked (6.9) for ever married women in that age group. Similarly, using the employment measure, the latter changed from 0.026 between 1904 and 1909 to -0.032 between 1929 and 1933 (change of -0.058). Following the same rational as above, the estimated coefficients of -0.409 and -26.31 imply increases from the 1940 age-specific average employment share and weeks worked by 16% and 22% respectively.

B. 1940-1950 pooled sample

We employ the 1940-1950 pooled samples to perform two robustness exercises. First, we test whether our main results on the long-term impact of the Great Depression on the labor supply of the *D-cohort* still go through. These women are 40 to 54 years old in 1950, and their employment response to the Crash is compared to that of women 40 to 54 years old in 1940. For this, we re-estimate specification (2), using the same controls as in the 1940-1960 analysis. To capture the impact of the Great Depression we include 20-year instead of 30-year lagged failures ($GD_{st\text{-}20}$).[28]

Second, we use the *Federal Deposit Insurance Corporation Data on Banks in the United States, 1920-1936,* to construct an indicator of financial distress: the ratio of suspended deposits in the aftermath of the Great Crash. We allow for the 1950 labor supply to be affected by the share of suspended deposits in 1931 and symmetrically the 1940 labor supply to be affected by the 1921 share. Information at the SEA-level of residence is available in the censuses prior to 1960. Hence we can test the robustness of our findings to a different measure of the economic downturn and to a different level of regional aggregation, much finer than the state. Notice though that for this exercise, the constructed measure is matched to the IPUMS data files by the respondent's state and SEA of current residence as residence at birth is not reported at the SEA-level.

The results of both exercises are presented in Table 8. The top panel reports estimates that use average business failures between 1929 and 1930 to capture the impact of the Great Depression on women's work; the second panel uses instead the measure of bank

[28] For contemporary failures (*CC*) we use the average failure rate over the previous two years: 1938 through 1940 if *t=1940*, 1948 through 1950 for *t=1950*. For failures during the Great Depression ($GD_{st\text{-}20}$) we use average failures from 1919 to 1920 if *t=1940* and from 1929 to 1930 if *t=1950*.

Table 8: The impact of the Great Depression of female labor supply
Robustness: Alternative Samples & Measures of the Great Depression (1940-1950)

Ages in 1940 and 1950	40 to 44	45 to 54	55 to 64	40 to 44	45 to 54	55 to 64
Dependent variable:	= 1, if currently employed			weeks worked in the past year		
Panel I:						
WWII mobilization*d1950	0.051	0.259	-0.020	21.076	11.638	-4.014
	(0.137)	(0.148)*	(0.132)	(8.699)**	(6.541)*	(9.371)
current failure rate	-0.021	-0.033	-0.066	-0.883	-1.682	-2.295
	(0.019)	(0.016)**	(0.015)***	(1.166)	(0.886)*	(1.177)*
failure rate_GD	0.041	0.043	-0.044	1.961	1.976	-0.163
	(0.011)***	(0.012)***	(0.009)***	(0.677)***	(0.726)***	(0.572)
N	61036	87393	55579	33345	52873	35443
Panel II:						
Change in deposit suspension	0.133	0.129	-0.027	8.503	6.553	-0.440
rate_GD	(0.039)***	(0.033)***	(0.041)	(2.020)***	(1.895)***	(2.163)
N	60865	87028	55374	33155	52552	35272
Panel III:						
failure rate_GD	0.041	0.031	-0.038	1.198	2.173	0.341
	(0.011)***	(0.010)***	(0.009)***	(0.611)*	(0.701)***	(0.547)
electrification index	0.001	0.002	0.000	0.146	0.088	-0.052
	(0.000)	(0.000)***	(0.000)	(0.044)***	(0.025)***	(0.028)*
	58314	83522	52967	31850	50593	33862

Notes: OLS coefficients from a regression of an indicator for whether the respondent is currently employed (Columns 1-3) or of the number of weeks worked in the past year (Columns 4-6) on the failure rate during the Great Depression, contemporaneous state business failure rate, WWII mobilization rate, 1940 state share of men who were farmers, 1940 state share of non-whites, average male education in 1940, age dummies, fixed effects for calendar year, state of residence, state of birth and division-year interactions. In Panels I and III, *failure rate_GD* is the 20-year lagged business failure rate: average business failure rate between 1929 and 1930 if *t=1950* and between 1919 and 1920 if *t=1940* . Standard errors are clustered by state state of birth and year. In Panel II, *failure rate _GD* is replaced by the *deposit suspension rate_GD* variable. The latter is the ratio of the value of deposits suspended across all all banks in 1930 (if *t=1950 a* nd in 1920 respectively if *t=1940)* in a given SEA over the value of all deposits across all banks in that year and SEA. Other covariates in Panel II: current unemployment rate in the SEA, WWII state mobilization rate, 1940 share of men who were farmers, 1940 share of non-whites, average male education in 1940, age dummies, fixed effects for calendar year, state of residence, state of birth, SEA of residence. Standard errors are clustered by SEA and year. All 1940 covariates are interacted with a year dummy. *Electification index* is defined as the state's electrical service exposure index in 1935 if *t=1950* and in 1925 if *t=1940*. Data is obtained from Bailey and Collins (2011). Banking data are obtained from the FDIC Data on Banks in the United States, 1920-1936. WWII state mobilization rates are obtained from Acemoglu et al. (2004). The sample includes white, non-farm, ever married women born in the United States and not in group quarters. The D-cohort of women is 40 to 54 years old in 1950. All specifications are estimated using the appropriate sampling weights. ***, **, * indicate significance at 1%, 5% and 10% respectively.

suspensions previously described. The last Panel will be discussed in the next section. As can be seen from Panel I, the findings from the 1940-1960 analysis are corroborated in the

1940-1950 sample: women in the *D-cohort* (40 to 54 years old in 1950) work significantly more in 1950 at the extensive and intensive margin in states most severely impacted by the Great Depression. Moreover, this effect is independent from that of WWII mobilization, the latter already documented by Acemoglu et al. (2004). Current economic conditions reinforce the impact of past conditions, in line again with the findings in the 1940-1960 samples. The effects are *cohort-specific* as for older women, 55 to 64 years old in 1950, the estimates either have the opposite sign or are insignificant. Qualitatively similar results are obtained when using the change in the SEA bank suspension rate as an alternative measure in the lower panel of Table 8 (Panel II).[29]

C. Identification: existing explanations, confounding factors and the role of pre-existing trends in female employment

As previously discussed, the long-term impact of economic conditions surrounding the Great Depression could be confounded by three factors that also changed in the early 20th century, and which have been linked to the increased employment of older women (see Section II): the expansion of the white collar sector, the diffusion of home technology, and the increase in female educational attainment. In Table 9 we explicitly account for changes in these factors by controlling for individual education (Panel I) and for changes in the share of women employed in white-collar occupations in a given state between 1930 and 1910 (Panel II). To address the importance of the diffusion of home technology, we use the state electrical service exposure index constructed by Bailey and Collins (2011) from the Edison Electrical Institute's *Statistical Bulletin*. This is an annual index first computed in 1925. Given the lack of data prior to 1925, for symmetry, we use the 1940-1950 pooled samples as in Panel I of Table 8 and control for changes in exposure to electrification between 1925 and 1935.[30] These results are presented in Panel III of Table 8. As can be seen, in all cases, the baseline effects remain intact.

To address further identification concerns, we construct a Bartik (1991)-type instrument for changes in past failures that uses changes in the national growth rate of manufacturing, along with the state share of this industry in 1900, a point in time that

[29] Similar results are also obtained when using the banking measure in the 1940-1960 samples and aggregate suspensions at state-level (results available on request).
[30] We assign the 1935 index to individuals in the 1950 cross-section and the symmetrically the 1925 index to respondents in the 1940 cross-section. The assignment is done on the basis of the respondent's state of birth.

precedes the time frame of our analysis.[31] The main idea is that shocks in the national growth rate in manufacturing, usually driven by demand, should differentially affect local business activity depending on the initial concentration in manufacturing. In states where the manufacturing sector was larger, negative nationwide shocks such as that experienced during the Great Crash, should entail bigger increases in business failure rates, especially since the latter heavily reflect business activity in manufacturing (see Section II on Data and Descriptive Statistics). As also shown in Table 2, states with higher concentration in manufacturing in 1920 experienced higher failure rates in 1930, while the size of the agricultural sector had no significant effect. To increase the variability of the instrument, we decompose the manufacturing sector into durables and non-durables. In particular, the instrument is computed as follows:

$$I_{st} = g_{d,t} * Emp.share^{d}_{1900,s} + g_{nd,t} * Emp.share^{nd}_{1900,s}$$

$g_{i,t}$ ($i=d, nd$) is the national employment growth rate in the durables and non-durables sectors respectively weighted by the size of these sectors in 1900, as measured by their state employment shares. To instrument the 30-year lagged business failure rate used in equation (3), we compute the national growth rate in the durables and non-durables sectors between 1930 and 1900 to predict the average failure rate in 1930 (assigned in the 1960 sample) and between 1910 and 1900 to predict the average failure rate in 1910 (assigned in the 1940 sample). Finally, in the IV specification we further control for state-level actual changes between 1930 and 1910 in the size of employment in various industries.[32] The identification assumption is that, conditional on all covariates, the instrument is valid if the national growth rate in durables and nondurables is uncorrelated with state-level labor demand shocks.

The second stage estimates are presented in Panel III of Table 9 along with the associated F-statistic.[33] For reference, we also provide the OLS estimates of equation (3) when accounting for state-level changes between 1930 and 1910 in the size of employment in various industries. The F-statistics do not indicate the presence of a weak instrument, while the second stage coefficients suggest effects that align with the OLS estimates although they are slightly larger in magnitude. Evaluated at the average business failure rate in 1930 (1.1), the IV estimates for the 50 to 64 years old women in 1960 imply

[31] Also see Schaller (2016) for a similar application.
[32] These are manufacturing, agriculture, mining, construction, trade, services, finance, telecommunications, transportation, utilities and public administration.
[33] As anticipated, the first stage estimate is always positive.

increases in their work shares and weeks worked by approximately 24% and 20% respectively from their 1940 respective averages.

Finally, we address the role of pre-trends in female employment. To do so, we supplement the 1940-1950 and 1940-1960 pooled samples with the 1930, 1920 and 1910 cross-sections. We use an indicator for labor force participation as the dependent variable

Table 9: The long-term impact of the Great Depression of female labor supply
Robustness: existing explanations and confounding factors (1940-1960)

Ages in 1940 and 1960	50 to 54	50 to 59	50 to 64	50 to 54	50 to 59	50 to 64
Dependent variable:	= 1, if currently employed			weeks worked in the past year		
Panel I:	***Controlling for individual educational attainment***					
failure rate_GD	0.049	0.023	0.019	3.028	1.223	0.916
	(0.012)***	(0.008)***	(0.007)***	(0.589)***	(0.395)***	(0.366)
Panel II:	***Controlling for changes in white-collar female employment between 1910 and 1930***					
failure rate_GD	0.051	0.022	0.018	3.114	1.231	0.879
	(0.011)***	(0.007)***	(0.007)***	(0.587)***	(0.385)***	(0.350)***
Panel III:	***A. Instrumental variables - controlling for changes in industrial concentration between 1910 and 1930***					
	Second stage estimates					
failure rate_GD	0.096	0.059	0.033	4.824	2.301	1.228
	(0.016)***	(0.013)***	(0.010)***	(0.883)***	(0.715)***	(0.584)***
F-stat	*29.97*	*31.90*	*32.34*	*29.97*	*31.90*	*32.34*
	B. OLS Benchmark for IV - controlling for changes in industrial concentration between 1910 and 1930					
failure rate_GD	0.074	0.040	0.025	3.648	1.855	1.122
	(0.011)***	(0.007)***	(0.006)***	(0.621)***	(0.481)***	(0.379)***
N	49019	89450	122808	49019	89450	122808

Notes: *Panels I, II*, and *III.B* - OLS coefficients from a regression of an indicator for whether the respondent is currently employed (Columns 1-3) or of the number of weeks worked in the past year (Columns 4-6) on the failure rate during the Great Depression, contemporaneous state business failure rate, WWII mobilization rate, 1940 state share of men who were farmers, 1940 state share of non-whites, average male education in 1940, age dummies, fixed effects for calendar year, state of residence, state of birth and division-year interactions (eq. 3). *Failure rate_GD* is the 30-year lagged business failure rate and *current failures* is the average business failure rate over the previous two years (also see notes to Table 5). All state covariates except contemporary failures are matched on the basis of the respondent's state of birth. Contemporary failures are matched at the individual's current state of residence. 1940 covariates are interacted with a year dummy. Specifications in Panel I also include dummies for the respondent's educational attainment. Specifications in Panel II also include the state's share of women employed in white-collar occupations in 1930 if $t=1960$ and in 1910 if $t=1940$. These state shares were computed from the 1930 and 1910 IPUMS Censuses for women that were currently employed in 1930 and 1910 respectively. Specifications in Panel III also include state employment shares in 1930 (if $t=1960$) and in 1910 (if $t=1940$) respectively in the following industries: manufacturing, agriculture, mining, construction, trade services, finance, telecommunications, transportation, utilities and public administration. See Section IV.C for details on the construction of the instrument. The sample includes white, non-farm, ever married women born in the United States and not in group quarters. The *D-cohort* of women is 50 to 64 years old in 1960. All specifications are estimated using the appropriate sampling weights. Standard errors are clustered by state of birth and year. ***, **, * indicate significance at 1%, 5% and 10% respectively. WWII state mobilization rates are obtained from Acemoglu et al. (2004).

in equation (3), as employment status is not reported in 1920.[34] As before, we control for the contemporaneous state of the economy using the current failure rate, for WWII mobilization, age, year, birth and current state fixed effects as well as division-year

[34] The definition of labor force status is different for the 1940 and onwards censuses relative to before. Given this, the reader should exercise some caution when interpreting the estimates in Table 10.

interactions. We also include a birth-state-specific linear time trend. To capture the impact of the Great Depression, we interact the state average failure rate in 1930 (*failure rate_GD*) with dummies for years 1940, 1950 and 1960 (*failure rate_GD*d1940, failure rate_GD*d1950, failure rate_GD*d1960*). Moreover, we interact the current failure rate with a dummy for the year 1930 (*current failures*d1930*). These dummies allow for conditions at the onset of the Depression to have differential effects in the actual year of

Table 10: The impact of the Great Depression of female labor supply
Robustness I: Sample extension - accounting for pre-trends in female employment

Pooled cross-sections:	1910-1920-1930-1940-1950			1910-1920-1930-1940-1960		
Ages in census year *t*	40 to 44	45 to 54	55 to 64	50 to 54	50 to 59	55-64
Dependent variable:	= 1, if in the labor force					
current failures	0.007	-0.011	-0.025	-0.007	-0.014	-0.022
	(0.009)	(0.007)	(0.009)***	(0.012)	(0.010)	(0.009)***
current failures*d1930	0.023	0.023	0.001	0.019	0.023	0.026
	(0.009)**	(0.010)**	(0.011)	(0.016)	(0.012)*	(0.011)**
failure rate_GD*d1940	0.003	0.017	-0.001	-0.002	0.014	0.026
	(0.015)	(0.014)	(0.014)	(0.022)	(0.014)	(0.018)
failure rate_GD*d1950	0.061	0.051	-0.002			
	(0.019)***	(0.019)***	(0.019)			
failure rate_GD*d1960				0.073	0.063	0.040
				(0.028)***	(0.018)***	(0.024)*
age, year fixed effects	yes	yes	yes	yes	yes	yes
birth & current state fixed effects	yes	yes	yes	yes	yes	yes
birth division-year interactions	yes	yes	yes	yes	yes	yes
birth state-specific linear time trend	yes	yes	yes	yes	yes	yes
N	132556	201069	127747	78151	141078	114696

Notes: OLS coefficients from a regression of an indicator for whether the respondent is in the labor force on the failure rate during the Great Depression, contemporaneous state business failure rate, WWII mobilization rate, age dummies, fixed effects for calendar year, state of residence, state of birth and division-year interactions. *Failure rate_GD* is the average state business rate between 1929 and 1930. The latter is interacted with year dummies for the 1940, 1950 and 1960 Censuses (*d1940, d1950, d1960 respectively).Current failures* is the average business failure rate over the previous two years (see notes to Table 5). It is also interacted with a dummy for the year 1930 (*d1930*). All state covariates except contemporary failures are matched on the basis of the respondent's state of birth. Contemporary failures are matched at the individual's current state of residence. The sample includes white, non-farm, ever married women born in the United States and not in group quarters. The *D-cohort* of women is 40 to 54 years old in 1950 and 50 to 64 years old in 1960. All specifications are estimated using theappropriate sampling weights. Standard errors are clustered by state of birth and year. ***, **, * indicat significance at 1%, 5% and 10% respectively. WWII state mobilization rates are obtained from Acemoglu et al. (2004).

the Crash as well as in subsequent years.[35]

The results are presented in Table 10. The *D-cohort* is 40 to 54 years old in 1950 and 50 to 64 years old in 1960. As can be seen, the long-term effects of the Crash on female

[35] Instead of interacting *failure rate_GD* with a year dummy for 1940, 1950 and 1960, which essentially gives a value of 0 in 1930, 1920 and in 1910, we have also experimented with the following assignment: allowing failures rate in 1930 (*failure rate_GD*) to have different coefficients in 1940 through 1960, while assigning 10-year lagged failures in 1930, 1920 and 1910 (instead of a value of 0). This assignment produced very similar results (available upon request).

employment remain significant after extending the sample. The estimates are even higher than the baseline presented in Tables 5 (1940-1960) and 8 (1940-1950). Moreover, the conjecture that the effects are cohort-specific is further confirmed, as again women older than the *D-cohort* - 55 to 64 years old in 1950 - experience no long-term changes in their labor supply linked to the Crash.

Overall, while the possibility of endogeneity cannot be completely eliminated, the IV results along with the remaining analysis in Tables 7, 8, 9 and 10 strongly support the causal interpretation of the long-term estimates of the Great Depression.

D. Results from a Survey

A special survey on a subset of women in our cohort (see Ridley, 1978) provides an additional external validity check on the hypothesis that the Great Depression had a long-term impact on the *D-cohort*.[36] This survey 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 participation in the labor market 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 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 in our regression 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

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

otherwise while *GD-worry_b* takes value 1 if they were very or moderately worried about their family future, and 0 otherwise.

Table 11 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 worry 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.

Table 11: 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 worried 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 included. GD-F, variable V1250==1 , 0 otherwise. GD-Worry_a, variable V1252==2 (very worried). GD-Worry_b variable V1252==2 or V1252==3 (very worried or moderately worried).

VI. Possible Channels

The results from the previous section suggest that existing explanations for the increased participation of older women - such as changes in education, the expansion of white collar employment as well as the diffusion of home technology - do not confound

the effects of the Great Depression. In this section, we examine one plausible mechanism through which the latter could have impacted female employment decades later: its effect on the earnings of the husbands. To proxy for income, we use the IPUMS occupational income score (*occscore*), which assigns to each occupation the value of the median annual income (in hundreds of 1950 dollars) earned in that occupation in 1950. This variable is available across censuses prior to 1940, while there is no data on individual wages before 1940. Although occupational scores are derived from individual data, they are not the same as actual personal income. Higher values of the score indicate occupational upgrading in the sense of upward movements in the occupational ladder towards occupations offering higher income. While its values differ across occupations, they do not vary within occupations.

We examine how the Great Depression affected the occupation-based earnings of men married to women in our cohort in 1940 relative to the earnings of men married to women of the same age as the *D*- but in 1920 (comparison, pre-Depression year); we also use the 1920-1960 pooled samples to see whether the effects found for 1940 persist to later decades. We perform the same analysis focusing on husbands' wages in the 1940-1960 pooled samples, since individual wages are reported from 1940 onwards.

We estimate regressions of the following general form:

$$y_{its} = \alpha_o + \alpha_1 CC_{s't} + \alpha_2 GD_{st-k} + \varphi_{ia} + f_{s,s'} + g_t + \varepsilon_{its} \quad (3)$$

where the dependent variable y_{its} is the occupational score of the husband, $CC_{s't}$ as before measures contemporaneous economic conditions, and GD_{st-k} captures the effects of the Great Depression measured by changes in the business failure rate as in the baseline definition. Index *k* equals 10 (10-year lag) in the 1920-1940 pooled sample and 30 (30-year lag) in the 1920-1960 pooled sample.[37] Vector φ_{ia} includes dummies for the ages of the wife and of the husband. We additionally include state of residence, state of birth and year fixed effects as well as division-year interactions. In the 1940-1960 pooled sample analysis, y_{its} is the real weekly log-wage of the husband and index *k* equals 30 (30-year lag) as in equation (2). In this case, we also control for the educational attainment of the wife and of the husband available in the 1940 and subsequent cross sections.

The results are reported in Table 12. There are several interesting observations. First,

[37] In practice, in the 1960-1920 analysis, we assign the 1929/1930 average business failure rate in 1960 and the 1899/1900 average failure rate in 1920 as we have no failure data for the 1800.

simple averages suggest that men married to women 30 to 44 years old in 1940 (*D-cohort*) hold lower-paid occupations relative to men in the comparison group in 1920, as well as relative to men married to older women in 1940. Increased failures due to the Crash can significantly explain these results, while they have no significant effects for men married to older women. Following the pseudo-cohorts of men and women from 1940 to 1960, we see that these effects are not transitory but persist to later decades: men married to women in the *D-cohort* in 1960 rank lower in the occupational ladder and receive lower wages in states most affected by the Depression relative to men in the comparison year. We interpret the decline in wages and occupational income scores as suggestive that the Depression years reduced the permanent income of the families of women in the *D-cohort*.

Next, we examine whether declines in the occupational scores of men between 1920 and 1940 predict higher employment shares for women in 1960 (relative to 1940, the comparison year in our baseline analysis). To do so, first we compute state-level average occupational scores of men married to women 30 to 34, 30 to 39 and 30 to 44 years old in

Table 12: The impact of the Great Depression on male occupational scores and wages

Panel I:	***1920-1940 pooled samples***					
Dependent variable:	husband's occupational score					
Wife's age in 1920 and in 1940:	30-34	35-44	30-44	45-54	55-64	
failure rate_GD	-0.493	-0.350	-0.401	-0.629	0.051	
	(0.354)	(0.162)**	(0.197)**	(0.451)	(0.504)	
Avg husband's score in 1940	28.63	29.04	28.87	28.39	26.23	
Avg husband's score in 1920	30.07	30.07	30.06	28.70	26.01	
Change	*-1.44*	*-1.03*	*-1.19*	*-0.31*	*0.22*	
N	41292	66580	107872	43161	15925	
Panel II:	***1920-1960 pooled samples***			***1940-1960 pooled samples***		
Dependent variable:	husband's occupational score			husband's real log-wage		
Wife's age in year t:	50-54	50-59	50-64	50-54	50-59	50-64
failure rate_GD	-1.327	-0.862	-0.623	-0.054	-0.034	-0.029
	(0.389)***	(0.379)**	(0.370)*	(0.021)***	(0.016)**	(0.014)**
N	30395	50201	59155	21589	34827	40283

Notes: OLS coefficients from a regression of husbands' occupational scores (Panels I and II) or log-real weekly wages (Panel II) on the business failure rate during the Great Depression, the contemporaneous failure rate, own age and husband's age dummies, fixe effects for calendar year, state of residence, state of birth and division-year interactions. *Failure rate_GD* is the 10-year lagged business failure rate in the 1920-1940 pooled samples and the 30-year lagged business failure rate in the 1920-1960 and 1940-1960 pooled samples. It is assigned on the basis of the respondent's state of birth. Current failures is the average business failure rate over the previous two years (see notes to Table 5) and is matched by the individual's current state of residence. The sample includes white, non-farm women, born in the United States and not in group quarters who were married at the time of the interview and whose husbands were of working age. The *D-cohort* includes women who were 30 to 44 years old in 1940. The log-wage regression further controls for own and husband's educational attainment, WWII mobilization rate and the 1940 state covariates described in Table 5 and restricts attention to women whose husbands had worked more than 47 weeks in the previous year. All specifications are estimated using the appropriate sampling weights. Standard errors are clustered by state of birth and year. ***, **, * indicate significance at 1%, 5% and 10% respectively. WWII state mobilization rates are obtained from Acemoglu et al. (2004).

Table 13: Male occupational scores and female employment (1940-1960)

Dependent variable:	= 1, if currently employed			weeks worked in the past year		
Woman's age in 1940 and in 1960:	50-54	50-59	50-64	50-54	50-59	50-64
Avg. change in husband's score btw	-0.009	-0.005	-0.005	-0.513	-0.403	-0.224
1920-1940 in woman's age bracket	(0.003)**	(0.002)**	(0.003)*	(0.179)***	(0.157)**	(0.175)
N	49019	89450	122808	49019	89450	122808

Notes: OLS coefficients from a regression of an indicator for whether the respondent is currently employed (Columns 1-3) or of weeks worked in the previous year (Columns 4-6) on the current business failure rate, the 1940 state covariates described in Table 5, division-year interactions, age dummies, fixed effects for calendar year, state of residence, state of birth and the average occupational score of married men whose age dummies, fixed effects for calendar year, state of residence, state of birth and the average occupational score of married men whose wives were in the 30 to 34, 30 to 39 or 30 to 44 years old age bracket in 1940 (if $t=1960$) and symmetrically in 1920 (if $t=1940$). 1940 covariates are interacted with a year dummy. All state covariates apart from current failures are matched by state of birth. Contemporaneous failures are assigned by the respondent's state of residence. The sample includes white, non-farm, ever married women, who were born in the United States and were not in group quarters. The *D-cohort* of women was 50 to 64 years old in 1960. All specifications are estimated using the appropriate sampling weights. Standard errors are clustered by state of birth and year. ***, **,* indicate significance at 1%, 5% and 10% levels respectively.

1940 and in 1920 respectively. We subsequently assign the 1940 (1920) state and age-specific averages to ever married women in the 1960 (1940) sample who are 50 to 54, 50 to 59 and 50 to 64 years old respectively. Finally, we re-estimate equation (3) with either the employment indicator or weeks worked as dependent variables.

The results are reported in Table 13. As can be seen, regardless of the labor supply measure, lower male occupational earnings are associated with significantly increased female employment in later decades, especially for the women in the younger age group. For the latter, decreased husbands' scores between 1920 and 1940 (by 1.44, see Panel I of Table 12) imply an increase in their work shares by 7.6% [0.009*1.44/0.17] and in weeks worked by 9.6% [0.513*1.44/7.73] from their 1940 averages (0.17 and 7.73 respectively).

To conclude, while other channels likely also contributed to explaining this remarkable increase in the participation of this cohort - such as having had fewer children, having accumulated work experience when young or having lost homes or accumulated substantial debt in the 1930s - these results suggest that the *Added Worker Effect* can have long-term effects when the negative shocks are large and persistent.[38]

[38] In an unreported analysis but available upon request, we repeated the same analysis using the 1940-1950 pooled sample. In contrast to the 1940-1960 samples, in this case we can compute men's occupational score averages in 1930 and 1940 by SEA and match them in the same fashion as described in the main text to women in 1940 and 1950 respectively by their appropriate age group and SEA of residence. In line with the reported results, we also find that lower occupational scores of men between 1930 and 1940 predict more work for women in the *D-cohort* in 1950 (relative to women of the same age in 1940). The facts that SEA-level husbands' occupational scores contain a lot more variation than state-level husbands' occupational scores and that the same results hold for our cohort when younger, makes us confident that this channel is relevant in explaining women's persistent stay or entry in the labor market when older.

VII. Conclusion

This paper documents a novel link between the dramatic increase in the labor supply of older women in the 1950s and events dating back to the Great Depression. In states were economic conditions deteriorated the most, married women 20 to 34 years old in 1930, entered the market in the short-run to compensate for income or asset losses and either remained or exited and re-entered the labor market, where they 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. This result is found across several IPUMS samples and is robust to a wide range of specification and identification exercises as well as measures of the economic downturn. Moreover, it is 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. Our estimates further suggest that in these states, the occupational income scores and the wages of the men married to women in this cohort were systematically lower many years after. Our results show that this decline increased the propensity of women to work longer and suggest as one plausible channel the reduction in households' permanent income.

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