

Credit and Labor Markets during the Great Depression

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Abstract

Financial crises disrupt labor markets severely. The most dramatic example in U.S. history is the Great Depression. This paper uses a new dataset drawn from the Census of Manufactures to study the relationship between financial conditions and labor market outcomes during this period. I exploit the geographic variation in the supply of credit across states finding a large effect of bank lending on employment and wages. The relationship between bank lending and employment is found only when controlling for the industrial composition of states.

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I. Introduction.

The recent “Great Recession” and the subsequent “jobless recovery” that we experience have renewed the interest of economists and the public on the relationship between financial conditions and labor markets. As current events highlight, financial crises disrupt labor markets severely. The most dramatic example of this relationship in U.S. history is the Great Depression, when the unemployment rate reached a peak of 25%, and remained above pre-recession levels for a decade. Whereas a large literature pioneered by Bernanke (1983) has studied the role of credit during the Great Depression, there is much less research on the relationship between credit and labor market outcomes during this period. The goal of this paper is to examine the relationship between bank lending and employment and wages in U.S. manufacturing during the Depression. For this purpose, I assemble a new dataset on employment and wages disaggregated by state and by 350 narrow industry categories for 1927 and 1937. The data are drawn from the U.S. Census of Manufactures. To identify the effect of credit on labor market outcomes, I exploit the geographic variation in bank lending across states. This new data shows wide variation in the performance labor market outcomes during the Depression across industries and states. Differences in industrial composition across states explain a large fraction of the variation in employment and wages.

Two econometric issues are taken into account. First, the fact that bank loans depend partly on the demand for credit raises concerns about the endogeneity of credit growth. As in Bernanke and Lown (1991) and Calomiris and Mason (2003), I use indicators of bank’s conditions at the before the Depression for subsequent growth in loan supply. Second, the fact that the data are disaggregated by industry allows me to control for the variation in the composition of economic activity across states. To clarify the relevance of this issue, consider a state that specializes in motor vehicles and a state that specializes in textiles. A larger decline in employment in the former may be due to the fact that the car industry is more sensitive to financial conditions than the textile industry, and not to the variation in the supply of credit between states. Without controlling for the industrial

composition of states, estimates of the effect of bank lending on employment would be biased.

I also explore the differential impact of financial conditions on the employment and wages of skilled and unskilled workers. Recent research (Larrain, 2013) suggests that the availability of credit can have different effects on workers of different skills. If unskilled workers are more complementary to capital, a credit crunch is more likely to affect this type of workers.

My findings indicate that the effect of bank lending on employment was economically large during the Great Depression. Controlling for the industrial composition is crucial. The effect of credit on employment is not significant in aggregate, state-level regressions that ignore the fact that states specialized in very different industries. I also find a relevant effect of credit on wages.

This paper is related to Bernanke and Lown (1991), who study the relationship between credit and employment during the 1990-1991 recession in the U.S. As in their paper, I use the variation in bank lending across states to identify this relationship. More recently, Chodorow-Reich (2013) identifies the effect of bank lending on employment during the recent 2008-2009 financial crises using detailed data that matches lending banks to borrowing firms. Calvo et al (2012) examine the relationship between financial crises and labor market outcomes across countries.

Several authors have studied the behavior of labor markets in the U.S. during the Great Depression, looking for explanations for the high unemployment and the slow recovery. Hanes (2000) studies nominal wage rigidity during different episodes in the U.S., including the Great Depression. Hatton and Thomas (2010) provide an insightful description of the behavior of labor markets in the U.K. and the U.S. during the period. Cole and Ohanian (2004) argue that New Deal cartelization policies were partly responsible for the weak recovery in employment in the U.S. Rosenbloom and Sundstrom (1999) explore the role of industrial composition and geography in the variation of employment, output and wages during the Great Depression in the U.S.

This paper is complementary to those which focus on the effect of financial conditions on output. Calomiris and Mason (2003) and Mladjan (2011) study the effect of bank lending on output during the Great Depression. Ziebarth (2013) uses the fact that the state of Mississippi was divided into two Federal Reserve districts to compare the outcome of manufacturing plants in these two areas, where different policies were followed. Ziebarth (2012) studies the decline of productivity during the Great Depression in the U.S.

In the following section I describe the data used in the paper and present some preliminary observations on the behavior of labor markets during the Depression. In section 3 I study the relationship between bank lending and employment and wages.

II. The Data.

II.A: The "Census of Manufactures"

To study the effect of bank lending on employment and wage outcomes during the Great Depression, I construct a new dataset based on the United States' "Census of Manufactures". The data consists of observations on employment and wages by industry and by state for 1927 and 1937. There are about 350 industries in each year. The industry classification in both years is quite similar, but not exactly the same, and I develop a concordance to match them. My work extends that of Rosenbloom and Sundstrom (1999), who have created a dataset with the information for 20 major industries for 1919-1937.

The employment and wage figures correspond to "wage earners" (production workers). I am also interested in the differential impact of financial conditions on skilled and unskilled workers, so for a subset of industries, I assemble data on the wages of both "wage earners" and "salaried employees" (non-production workers).

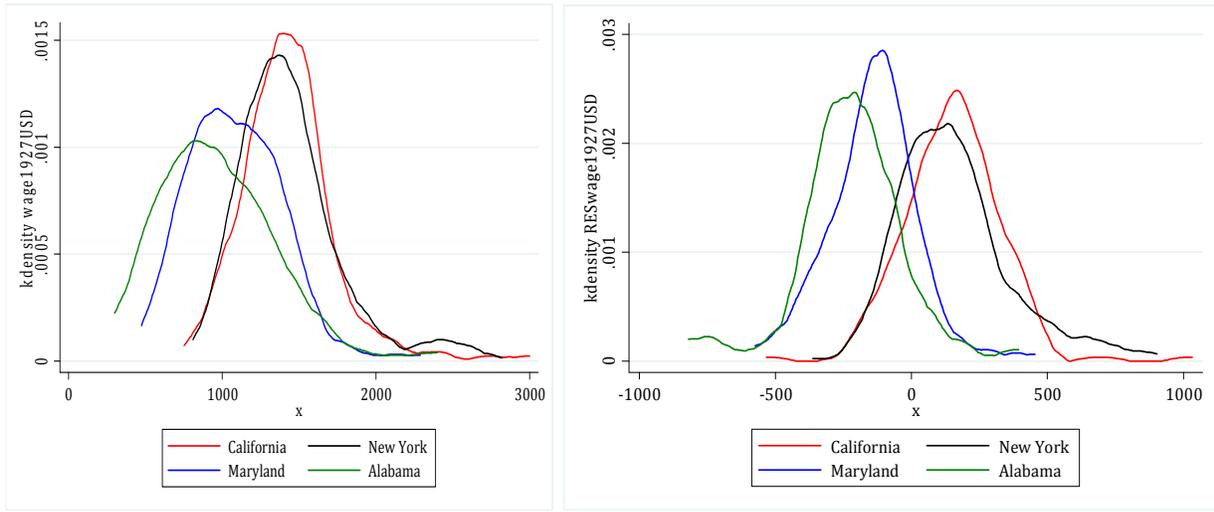
II.B: The “Annual Report of the Comptroller of the Currency”

Data on bank balance sheets by state come from the “Annual Report of the Comptroller of the Currency”. The measure of bank lending I use is “loans and discounts (including rediscounts)” by all active banks (national, state (commercial), savings, and private banks) in the U.S., which are reported separately by state. As in Bernanke and Lown (1991) I compute growth in lending in nominal terms. I also use data on banks’ conditions at the beginning of the time frame under study which will serve as instruments for the growth in bank lending. These are capital-asset ratios and total assets in 1927.

II.C: Initial Observations

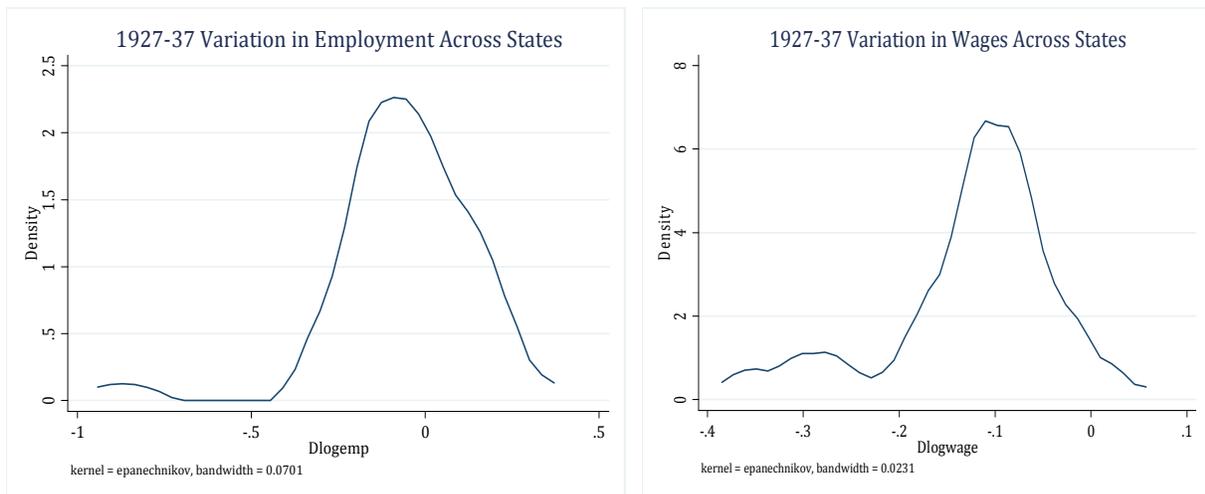
A first observation from the employment and wage data comes from decomposing the variation in wages into the share explained by industries and by states. In both the 1927 and the 1937 cross-sections independently, I find that industrial composition explains roughly twice as much of the variation in both wages and employment than state fixed effects. More importantly, the variation in employment between 1927 and 1937 is largely industrial composition rather than geography. I compute the uncorrelated variance share (see Gibbons et al 2012) finding that the share of the overall variance in employment growth explained by state fixed effects is only 3.5%, while industry fixed effects explain 41.6% of the variance. Geography is only slightly more relevant in the case of the variation in wages. Figure 1 shows an example of the distribution of wages across industries in four states. The left side shows the raw data, and the right side, the residuals after removing industry fixed effects.

Figure 1: Distribution of wages across industries in four states.



The following figures show the variation in employment and nominal wages between 1927 and 1937. Most states observed a decline in both variables, and the figures show a large tail on the left side representing states with a very large in employment and wages.

Figure 2: Distribution of the 1927-1937 Change in Employment and Wages across States .



III. The Effect of Bank Lending on Labor Markets.

In this section I study the relationship between bank lending and labor market outcomes. I use the geographic variation in the growth of bank loans across states to identify its effect on employment and wages in manufacturing industries. I begin by estimating equations with aggregate state-level employment and wages as dependent variables:

$$\Delta y_s = \Delta loans_s + \varepsilon_s \quad (1)$$

, where y represents the different labor market outcomes (employment, wage bill, and wages) and $\Delta y = \log(y) - \log(y_s^{1927})$ is the growth in these variables between 1927 and 1937. The independent variable $\Delta loans_{is} = \log(loans_{is}^{1937}) - \log(loans_{is}^{1927})$ is the variation in bank loans during the same period.

An important consideration is the demand for loans will be affected by the economic condition in each state. The objective is to identify the effect of the supply of credit on employment and wages. For this purpose, one needs to instrument for the growth in loans with variables will have an effect on lending but not on employment and wages. This issue has been acknowledged in the literature, and following the Bernanke and Lown (1991) and Calomiris and Mason (2003) I use capital-asset ratios and total bank assets in 1927 as instruments for $\Delta loans_s$.

Table 1 shows the results for the OLS estimates of equation (1). I find a positive but small and statistically insignificant relationship between growth in bank lending and growth in employment, wage bills and wages. In every column, I control for the initial level of employment in the state and include fixed effects by geographic region (of which there are six). Table 2 shows the IV results. In this case the effect of bank lending on wages is positive and economically large. The effect on employment is large but not statistically significant.

Table 1: Effect of Growth in Bank Lending on Labor Market Outcomes. State-level regressions.

OLS Estimates.

Dependent Variable	$\Delta Employment_{is}$	$\Delta Wagebill_{is}$	$\Delta Wage_{is}$
Growth in bank loans 1927-1937	0.0938 (0.0897)	0.0985 (0.104)	0.00472 (0.0468)
Log Employment 1927	0.0744*** (0.0251)	0.0900*** (0.0290)	0.0155 (0.0131)
Number of Observations	45	45	45
R-squared	0.439	0.441	0.170
Region Fixed Effects	Yes	Yes	Yes

Table 2: Effect of Growth in Bank Lending on Labor Market Outcomes. State-level regressions.

IV Estimates.

Dependent Variable	$\Delta Employment_{is}$	$\Delta Wagebill_{is}$	$\Delta Wage_{is}$
Growth in bank loans 1927-1937	0.504 (0.321)	0.878* (0.472)	0.374* (0.219)
Log Employment 1927	0.0447 (0.0360)	0.0334 (0.0529)	-0.0113 (0.0246)
Number of Observations	45	45	45
R-squared	0.123	-	-
Region Fixed Effects	Yes	Yes	Yes

Notes: The growth in bank loans 1927-1937 is instrumented by the capital-asset ratio in 1927 and (log) total bank assets in 1927.

Next, I take into account that the industrial composition varied substantially across states, as I discussed in the previous sections. Industry fixed effects explain a much larger share of the variance in wages than state fixed effects, and the same is true for the variation in labor market outcomes during the 1927-1937 period. I estimate equations with observations defined at the industry and state level.

$$\Delta y_{is} = \Delta loans_{is} + \varphi_i + \varepsilon_{is} \quad (2)$$

The subindex “i” stands for an industry (there are 350 categories). By including industry fixed effects (φ_i), I compare the effect of credit on labor market outcomes within industries across states. That is, I control for the different industrial composition of the various states. Table 3 shows the new results. In this case, the effect of bank lending on both employment and wages is statistically significant and of relevant magnitudes.

Table 3: Effect of Growth in Bank Lending on Labor Market Outcomes. Industry-and-State level regressions. IV Estimates.

Dependent Variable	$\Delta Employment_{is}$	$\Delta Wagebill_{is}$	$\Delta Wage_{is}$
Growth in bank loans 1927-1937	0.839*** (0.163)	0.710*** (0.165)	0.140* (0.0763)
Log Employment 1927	-0.130*** (0.0108)	- 0.116*** (0.0110)	-0.00101 (0.00463)
Number of Observations	2,445	2,445	2,445
R-squared	0.416	0.456	-
Industry Fixed Effects	Yes	Yes	Yes
Region Fixed Effects	Yes	Yes	Yes

Financial conditions and wage inequality.

To be written.

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