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by
Esther Redmount, Arthur Snow and Ronald S. Warren, Jr.

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Department of Economics and Business
Colorado College
Colorado Springs, Colorado 80903-3298
www.coloradocollege.edu/dept/EC

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Esther Redmount
Colorado College

Arthur Snow
University of Georgia

Ronald S. Warren, Jr.
University of Georgia

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We analyze the effects of a largely ignored 1885 legislative reform in Massachusetts requiring that firms provide workers the option of receiving weekly wage payments. Using an intertemporal model of deferred compensation, we derive conditions on elasticities of labor supply that determine the effects of the reform on workers' effective wage and utility. We then examine empirically the effects of the reform, using weekly data on mill workers in Lowell. Given the implications of our theoretical analysis, the empirical findings of positive wage and reform elasticities imply that the switch to weekly payment increased workers' effective wage and well-being.

1. Introduction

During the last quarter of the nineteenth century, factory workers in several states lobbied for, and ultimately secured passage of, legislation requiring that firms provide the option of weekly wage payments, which in the past had typically been made on a monthly basis. Considerable anecdotal evidence indicates that the switch from monthly to weekly payments would have benefited workers by reducing their reliance on credit extended by opportunistic merchants, landlords, and lenders.[1] However, as a countervailing factor, the higher transactions costs of making up payrolls and distributing wages to their employees on a weekly – rather than monthly – basis would presumably have been shifted backward to workers in the form of lower wages.[2] Additionally, under nineteenth-century common law, workers could forfeit the wages due them if they failed to give between two and four weeks notice before quitting their jobs or if their employer determined that the workers had shirked, disobeyed shop rules, or committed other acts of malfeasance on the job. By paying workers monthly and threatening them with wage forfeiture, employers gained a measure of control over turnover and agency costs.[3] Insofar as weekly pay periods raised these costs, workers' wages would also be lower.

Thus, wage reform presented workers with a tradeoff. While wage-payment reform might benefit workers by reducing their reliance on usurious creditors, it would also reduce their wages as employers compensated for the higher operating costs. If workers would, on balance, have benefitted from shorter pay periods, then weekly wage payment should emerge from a competitive labor market. Indeed, some firms did offer to pay workers on a weekly basis prior to the effective date of the legislative mandate – although after the legislation was enacted – suggesting that workers were net beneficiaries of shortened pay periods. In practice, wage-forfeiture provisions may have sufficiently limited labor mobility that legislation was required to secure weekly payment of wages in the face of opposition by employers that were reluctant to lose the control that monthly wage payment afforded them over turnover and agency costs.

We examine this issue empirically using data on mill workers in Lowell, Massachusetts from January 1885 to March 1886 – a period which encompasses the introduction of the option to receive a disbursement of wages more frequently. We first analyze the theoretical effects of wage-payment reform on labor supply, the effective wage rate, and workers' welfare using a two-period model of deferred compensation. We show that, when the wage elasticity of labor supply is positive, if the effect of the payment reform on labor supplied is positive (negative), then the reform increases (decreases) both the effective wage rate and a representative worker's utility. The effects of the reform are reversed when the wage elasticity of labor supply is negative.

Our empirical estimates imply a positive wage elasticity of labor supply for both men and women and a small but statistically significant increase in average hours worked per week that is attributable to the increase in the frequency of wage payment. In light of the predictions of our theoretical model, these empirical results imply that the switch from monthly to weekly payments increased the effective wage rate and well-being of the average worker. These findings are also consistent with both the widespread political efforts by workers to secure passage of wage-payment legislation and the fact that the overwhelming majority of mill workers in our sample opted for weekly rather than monthly payments when offered a choice prior to the effective date of the legislation.

The paper is organized in the following way. Section 2 provides some additional background on the history of wage-payment legislation. Section 3 lays out a theoretical framework for understanding the relationship among length of pay period, labor supply, and workers' well-being. Section 4 describes the data sources and defines the variables we use in the empirical analysis. In section 5, we specify the empirical model, describe the estimation procedure, and report empirical results. Section 6 provides a summary of our findings and some concluding remarks.

2. Historical Background

Numerous local governments and state legislatures debated, and some enacted, weekly-payment laws in the late nineteenth and early twentieth centuries to reform compensation systems that typically deferred labor's remuneration until month's end. The Massachusetts law mandating weekly payment went into effect in July 1886 (having been passed in March of that year) after a prolonged discussion in newspapers and pamphlets though out the state.[4] New York passed a similar statute in 1890, Rhode Island and Illinois in 1891, and Vermont in 1906. When the courts subsequently upheld the constitutionality of these laws, they were among the first legislative victories for laborers (Commons et al., 1935). In affirming the Rhode Island law, that state's Supreme Court reasoned as follows:

> "To save labor and expenses many corporate payrolls were made up but twelve or thirteen times a year, and sometimes when corporate means were cramped, even less often, whereby employees were obliged to wait for their pay and the longer they had to wait the less it was worth to them." (*State vs. Browne and Sharpe Manufacturing Co.* 1892. Supreme Court of R.I. Providence 18 R.I. 16; 25A.246; 1892: R.I. Lexis.)

Most factory workers during this period are best described as living just above the subsistence level. As a consequence, after outstanding debts to the boarding house and various "pluck me" (high-interest-rate, short-term-lending) establishments were deducted from wages, a worker was often left with take-home pay that was barely sufficient to cover fixed expenditures over the ensuing month [Wright (1882), pp. 124-126 and 320-323]. Moreover, workers could be "trusteed" for debt in Massachusetts when they fell behind in their debt payments, meaning that a lien could be placed on their wages for these outstanding debts. The discharge of an accumulated debt often involved a lawyer's fee, set in 1883 at $3.85, or between 15% and 20% of a typical worker's monthly earnings. Thus, short-term borrowing was a very costly way of smoothing consumption in the face of financial uncertainties.[5]

These considerations suggest that a change from monthly to weekly wage payments would have improved the economic well-being of most workers. However, the theory of compensating wage differentials implies that a competitive, profit-maximizing firm would have been compelled to pay lower wage rates in exchange for bearing the additional transactions, turnover, and agency costs of providing more frequent paydays. Thus, the overall effect on workers' welfare of this wage-payment reform is indeterminate, *a priori*. In the next section, we show that whether a given worker was better or worse off because of the combined wage reduction and payment reform depends on the direction of the response of the worker's labor supply to both the wage change and the reform.

3. Theoretical Framework

To analyze the effect on an individual's labor supply and welfare of changing the payment of wages from a monthly to a weekly basis, we use the simple two-period model of deferred compensation proposed by Kim, Snow, and Warren (1996). The individual's present value budget constraint is

$$c_1 + \frac{1}{1+r}c_2 = m + \omega h, \qquad (1)$$

where c_i denotes a composite, numéraire good consumed in period *i*, h denotes hours of labor supplied, *r* is the interest rate, *m* represents endowed (non-labor) income, and

$$\omega = \left[\pi + \frac{1-\pi}{1+\hat{r}}\right]w \qquad (2)$$

is the effective wage rate which depends on the hourly wage rate *w*, the difference between the borrowing rates faced by workers and firms $\hat{r}$, and the proportion $1-\pi$ of wage earnings deferred.[6] Initially, all wage earnings are deferred and π equals zero.

We treat endowed income *m* as a constant determined by decisions made prior to any anticipation of a wage-payment reform. Thus, all effects of the reform are captured in the labor-supply response to changes in the effective wage rate ω. In the model, these changes are brought about by an increase in π, representing a reduction in the portion of wage earnings deferred, and a reduction in w as employers pass back to labor the additional expenses associated with making up their payrolls more frequently. Thus, reforming the deferred compensation system could either increase or decrease the effective wage rate since the sign of

$$\begin{aligned} \frac{d\omega}{d\pi} &= \frac{\partial \omega}{\partial \pi} + \frac{\partial \omega}{\partial w}\frac{dw}{d\pi} \\ &= \frac{\hat{r}}{1+\hat{r}}w + \left[\pi + \frac{1-\pi}{1+\hat{r}}\right]\frac{dw}{d\pi} \end{aligned} \qquad (3)$$

is theoretically indeterminate.

Although we do not have data that would allow us to estimate empirically the change in the effective wage rate, we can obtain empirical estimates of both the wage elasticity of labor supply and the effect of the reform on labor supplied. With this information, we can infer the sign of $d\omega / d\pi$ for the payment reform and the effect on workers' utilities, since utility depends directly on ω. In particular, if the estimated wage elasticity of labor supply is positive $(\partial h / \partial \omega > 0)$ and the estimated effect of the reform on labor supply $[dh / d\pi = (\partial h / \partial \omega)(d\omega / d\pi)]$ is positive (negative), then we infer that the reform increased (reduced) the effective wage rate $[d\omega / d\pi > (<) 0]$, and therefore increased (reduced) utility. Conversely, if the estimated wage elasticity of labor supply is negative $(\partial h / \partial \omega < 0)$, then these inferences are reversed.

4. Data

The data are drawn from weekly payroll records on earnings and work hours of 210 adult employees of the Lawrence Manufacturing Company (hereafter, "the company") over the 65-week period from January 1885 through March 1886 [Lawrence

Manufacturing Company (1885-86)]. The company employed approximately 2500 individuals in functions ranging from opening and cleaning raw cotton to the bleaching, dyeing, folding, and packing of finished products (rough sheetings, union suits, and hosiery). Most of its employees were spinners and weavers, and about two-thirds were women.[7]

Prior to December 1886, the company made up payrolls monthly, handing out pay envelopes on the Saturday of the first week of the new month. December 1885 was a transitional month, with some employees opting to receive their wages at month's end but most choosing to be paid weekly. After December 1885, but well in advance of the legislative mandate, all employees received a paycheck every Saturday covering the work performed in the previous week.

A daily tally of hours worked and output generated was kept for each individual paid by piece rates, but only hours worked were recorded for individuals paid on time rates. At the end of the pay period, totals were compiled and the bookkeeper made note of workers who were fined for damaged goods, charged for "living on the corporation" and had their room, board, and energy costs deducted directly from their pay, or had been trusteed for debt. Additional information about each worker, including age, literacy, native (first) language, savings, date of marriage, and number of children, was obtained by matching these payroll records to the manuscript census and vital records of the Commonwealth of Massachusetts from 1870 to 1920. In addition, company-level data were obtained on the total number of bales of cotton in inventory, the total number of spinning and weaving looms in use, and the total number of pounds of cloth produced each week. These company-level variables were normalized by the number of employees prior to estimation.

The means of the individual-specific and company-level variables are reported in Table 1. The wage variable is the wage rate (measured in cents per hour) in week t for the i-th employee, and is estimated for men and women separately from wage equations reported in Appendix Table A. An estimated wage rate is used because, for both men and women, in approximately 40% of the possible employee-weeks over the sample period zero hours of work are recorded and, hence, no hourly wage is observed. However, all individuals in the sample were on the payroll, so they had worked at least two consecutive pay periods over the 15 months examined, and all of them were still on the payroll at the end of the sample period. Age is defined as the difference, measured in years, between the most recent pay date (or the date of the end of the current week) and the worker's birth date. Consumption and labor-supply decisions at any point in time may have been affected not only by contemporaneous marital status but also by the prospects for marriage among those who were currently unmarried. For example, an unmarried woman may have worked additional hours to save for a trousseau or dowry in anticipation of marriage in the future. On the other hand, the expectation of future marriage may have reduced her current labor supply if she believed that factory work would not be her primary occupation in the future. Because we know the date of marriage (if any) for everyone in our sample, we are able to create a continuous, forward-looking marriage variable (Married) that changes over time for those workers who were unmarried during the sample period but who would eventually marry by a known date.[8] For such workers, the marriage variable is a positive number on the unit interval which measures, as of the year (i.e., 1885 or 1886) containing the observation week, the fraction of future time observed (through 1920) that such a person is married. Persons who were married by the year containing the observation week are assigned a fixed value of 1 (the sample maximum) for this variable, and those who are never observed to be married through 1920 receive a fixed value of 0 (the sample minimum).[9]

French is a dummy variable equal to 1 if the employee's first language was French and equal to 0 if the first language was English.[10] Migrant measures, for foreign-born workers, the number of years since migration to the U.S.[e.g., the year of observation (1885 or 1886) minus the year of migration]; For native-born workers, Migrant is defined to be 0. Trusteed is a dummy variable equal to 1 if there was a lien (or garnishment) placed on the employee's earnings in a given week to discharge unpaid debt. Income_{-1} is labor earnings (*w* x *h)* lagged one period, and Consumption (*c)* is estimated from an expenditure equation reported in Appendix Table B. Summer is a seasonal dummy variable equal to 1 if the week occurred in June, July, or August and equal to 0 otherwise. This variable appears in the employment-probability and hours-worked equations for women to control for the possibility that their labor-supply decisions are affected by the summer vacations of school-aged children.

Because the plan to switch to weekly wage payments was announced well in advance of its implementation, individuals would have been able to make small adjustments each period in their labor supply as implementation of the reform drew closer in time. Therefore, following LaHaye (1985), we specify the reform variable as a distributed lag of the form $\{1 / [1 + \exp(52 - t)]\}$. The price-level variable, denoted *p,* is the price index reported by Balke and Gordon (1986), with 1972 = 100. Endowed or non-labor income (*m*) is not observed but is estimated as $m = c - (w \times h)$.

5. Empirical Model and Results

We specify and estimate a model of labor supply, adapted from Blundell, et al. (1987), which allows us to incorporate both demand- and supply-side determinants of observed weekly variations in hours of work. First, we introduce an index function

$$E^*_{it} = \underline{\theta}\, \underline{Z}_{it} + v_{it} \tag{4}$$

where $E^* > 0$ if the demand for and supply of labor by the i-th individual in week t are equal at a positive number of hours, and $E^* \leq 0$ otherwise; $\underline{Z}$ is a vector of explanatory variables containing both individual characteristics determining labor supply and time-varying, company-specific characteristics determining the demand for labor; $\underline{\theta}$ is a vector of associated parameters; v is a symmetrically distributed random error with mean zero; $i = 1, \ldots, N = 210$ indexes the workers, and $t = 1, \ldots, T = 65$ indexes time (weeks). Thus, the data comprise a panel with $N \times T = 13{,}650$ observations.

Although we cannot observe the supply of hours out of equilibrium, we do observe whether or not an employee is working in a given week; that is, we can define an observable counterpart to E^* such that $E = 1$ if $E^* > 0$ and the employee is observed to be working and $E = 0$ if $E^* \leq 0$ and the employee is not at work. Probit estimation of (4), conditional on the wage, allows us to incorporate the effect of changes in the demand for the mill workers over the sample period above and beyond that due to changes in market wages.[11]

To specify the labor-supply equation, we again follow Blundell, et al. (1987) and use a functional form that generalizes the Linear Expenditure System. Preferences for goods and leisure are represented by the indirect utility function

$$V(w, p, m; \underline{d}) = [m + a(w, p, \underline{d})] / [b(w, p, \underline{d})] \quad (5)$$

where w is the wage rate, p is the price level, m is endowed (asset or non-labor) income, and $\underline{d}$ is a vector of demographic (taste-shifter) variables. The functional forms for $a(w, p, \underline{d})$ and $b(w, p, \underline{d})$ are, respectively,

$$a(w, p, d) = \alpha_{ff}(\underline{d})w - 2\alpha_{fc}(\underline{d})w^{1/2}p^{1/2} - \alpha_{cc}(\underline{d})p \quad (6)$$

$$ln\_b(w, p, \underline{d}) = \beta_f(\underline{d})ln\_w + [1 - \beta_f(d)]ln\ p \quad (7)$$

to ensure zero homogeneity of $V(w, p, m; \underline{d})$ in $w, p,$ *and* m. Using Roy's Identity, the hours-of-work (labor-supply) equation is

$$h(w, p, m; \underline{d}) = \alpha_{ff}(\underline{d}) - \alpha_{fc}(\underline{d})p^{1/2}/w^{1/2} - \beta_f(\underline{d})[m + a(w, p; d)] / w\ . \quad (8)$$

Hours worked per week (h) are a function of the market wage (w), non-labor income (m), personal and household characteristics ($\underline{d}$), and a measure of the timing of the payment reform (*Reform*). Substituting from (6) and (7) and introducing the reform variable as influencing labor supply multiplicatively through the wage rate, the labor-supply equation is

$$ln\_h = (\alpha_{ff} - \beta^0\,\alpha^0_{ff}) - \beta^0\,(m/w) - \beta^1\,[(m/w) \text{ x } Reform] - (\alpha_{ff}\,\beta^1)\,Reform$$
$$+ 2\,(\alpha_{fc}\,\beta^0)\,[(p/w)^{1/2}] + 2\,(\alpha_{fc}\,\beta^1)\,\{[(p/w)^{1/2}] \text{ x } Reform\}$$
$$+ (\alpha_{cc}\,\beta^0)\,[(p/w)] + (a_{cc}\,\beta^1)\,[(p/w) \text{ x } Reform]. \quad (9)$$

Estimating the labor-supply equation required dealing with several important issues. First, non-labor income is defined as weekly income minus weekly consumption, but the latter is not observable and had to be estimated. Second, an observation of zero hours worked in a given week may represent either a voluntary choice on the part of the worker or a demand-side decision by the company not to offer employment to the worker that week. Therefore, a "selection" equation determining whether or not an employee worked in a particular week was specified as a function of the wage rate, a set of demographic characteristics affecting labor supply, and a set of time-varying, company-specific variables affecting labor demand. Third, the labor-supply equation was specified as a censored-regression (Tobit) model to account for the fact that we include observations on those employees for whom hours worked and labor-market earnings in a given week were zero. Finally, the wage rates used in the selection and labor-supply equations were instruments obtained from the predicted values of an estimated reduced-form wage equation. The selection equation was estimated jointly with the labor-supply equation in order to obtain consistent estimates of the effects of changes in the wage rate and of the wage-payment reform on labor supply. A random-effects estimator was used to estimate the selection and labor-supply equations because of the inclusion of time-invariant explanatory variables representing individual worker (or household) characteristics. The model was estimated separately for male and female workers.

Estimates of the empirical model are presented in Tables 2a, 2b, and 2c. Standard errors are in parentheses below the associated coefficients, and were corrected by both the Murphy-Topel procedure for models with generated regressors and by the White procedure to allow for heteroscedasticity. We use asterisks to denote the probability of falsely rejecting the null hypothesis of no effect, given the estimated test statistic (** = p-value < 0.01; * = p-value < 0.05). Under the null hypothesis that all of the slope coefficients are jointly zero, the test statistic $- 2 \ln[L(0)/L(\beta)]$ is distributed as a $\chi_{(\nu)}$

random variable with ν degrees of freedom, where L(0) is the value of the restricted log-likelihood function and L(β) is its unrestricted value. R^2_{MZ} is the value of the pseudo-R^2 proposed by McKelvey and Zavoina (1975). The first set of results, reported in Table 2a, gives the Probit estimates of the coefficients on the variables in the selection equations. The second set of results, in Table 2b, reports the Tobit estimates of the coefficients of the variables in the labor-supply equations. Table 2c provides the Wald estimates of the underlying preference parameters in equation (9).

In Table 2a, the coefficients on the (estimated) wage-rate variables are positive, as expected, and significantly different from zero for both women and men. For men, the coefficient on Married is positive and statistically significant, indicating that men who were already married and those who would be married in the near future were more likely than other men to be at work in any given week, *ceteris paribus*. On the other hand, married women and those soon to be married were less likely than their unmarried, late-married, or never-married counterparts to be employed. Not surprisingly, men who were literate were more likely to be at work than those who could not read or write. However, literacy did not affect the employment probability of women. Men and women who spoke French as their first language had a lower probability of working in a given week than native English speakers, but the effect is not precisely estimated. The coefficient on the contemporaneous demand variable Cloth is positive and significantly different from zero for men as well as for women, as predicted, but neither the (lagged) number of bales of cotton in inventory nor the (lagged) number of spinning and weaving looms in use affected the probability of working in a given week. Finally, for women the coefficient on the seasonal dummy variable Summer is positive, as expected, and statistically different from zero.

Table 2b reports estimates of the selectivity-corrected labor-supply equations for both women and men. Because of multicollinearity, the interactions of the Reform variable with $(p/w)^{1/2}$ and p/w in equation (9) were dropped from the reported estimating equation. Nevertheless, all of the behavioral parameters (presented in Table 2c and discussed below) are uniquely identified. These results reveal that the coefficients on the inverse-Mills-ratio variable (IMR) are negative and statistically significant, thereby justifying the use of a selectivity correction procedure. The estimated coefficients on the individual variables containing some function of the wage rate are difficult to interpret, owing to the nonlinearity of the functional form. However, with the exception of the coefficients on the inverse-real-wage variable p/w (for both men and women) and on the m/w variable (for men), each of these is significantly different from zero. The estimated coefficients on the Reform variable and its interaction with m/w are also significantly different from zero for men and women.

Table 2c presents the estimates of the structural parameters, obtained by imposing the cross-equation (Wald) restrictions, embedded in the coefficients of the labor-supply equation. With the exception of α_{cc}, all of the estimated parameters are significantly different from zero and are consistent with expected labor-supply behavior; the estimates imply that leisure is a normal good and the labor-supply equations are everywhere upward-sloping for both men and women [Blundell, et al. (1987, p. 50)].

The wage elasticity of labor supply can be calculated by substituting the estimated labor-supply parameters reported in Table 2c into the expression

$$\partial ln\_h\partial/ln\_w = \beta^0 (m/w^2) + \beta^1 [(m/w^2) x Reform] - (\alpha_{fc} \beta^0) [(p/w)^{1/2}]*(1/w)$$

$$- (\alpha_{cc} \beta^0) [(p/w^2)]. \quad (10)$$

Similarly, the elasticity of labor supply with respect to the payment reform can be obtained by substituting the relevant estimated parameters from Table 2c into

$$\partial ln\_h/\partial ln\_Reform = -\beta^1 (m/w) - (\alpha_{ff} \beta^1). \quad (11)$$

Evaluating these expressions at the sample means of the included explanatory variables, the wage and reform elasticities for women and men are computed as follows:

	Women	**Men**
Wage Elasticity	**0.322**** **(0.030)**	**0.008**** **(0.001)**
Reform Elasticity	**0.022**** **(0.011)**	**0.025**** **(0.012)**

The estimated wage elasticity of labor supply is positive and statistically different from zero for both men and women. Moreover, the estimated elasticity of labor supply with respect to the weekly-payment reform is also positive and statistically significant for men and women. These empirical estimates, combined with the implications our theoretical model, allow us to conclude that the change from monthly to weekly payment of wages increased the average worker's effective wage and economic well-being.

6. Concluding Remarks

In the late nineteenth century, workers lobbied various state legislatures (primarily in the Northeast) to enact laws mandating that employers allow their employees to receive wage payments on a weekly basis, rather than biweekly or monthly as had been common practice. In response to these efforts, several states, beginning with Massachusetts in 1886, passed such legislation which was in the vanguard of the labor movement that gained prominence in the first part of the twentieth century. The increase in the frequency of wage payments presumably benefited workers by reducing their dependence on costly credit provided by employers, merchants, landlords, and other lenders. On the other hand, the more frequent disbursement of wages increased the costs to firms of payroll administration, and these costs would presumably have been passed on to workers in the form of lower wages. Thus, it is not clear *a priori* that the legislative reform of the timing of pay was beneficial for workers. We then analyzed a two-period model of deferred compensation to determine the effects of wage-payment reform on workers' labor supply, effective wage rate, and welfare. We showed that if the wage elasticity of labor supply is positive and the effect of the implementation of the reform increases labor supplied, then the reform also increases the effective wage rate and the representative worker's well-being.

Using data on male and female mill workers in Lowell, Massachusetts for the sixty-five-week period from January 1885 to March 1886, during which time the mill voluntarily gave its workers the option of receiving pay on a weekly basis, we estimated a labor-supply model for both men and women to ascertain the effect of the payment reform and changes in the hourly wage rate on labor supply. We inferred from these estimates that the wage elasticity on labor supply was positive and significantly different from zero and that the implementation of the reform increased average hours worked per week. Together, these findings allow us to conclude that the switch from monthly to weekly disbursement of pay increased the effective wage rate and well-being of workers at the cotton mill. This conclusion is consistent not only with the fervent efforts of many workers and lawmakers at the time to push for legislation mandating this reform but also with the observation that ninety percent of the mill workers in our sample chose to be paid weekly rather than monthly when given the choice in advance of the legislative mandate.

Endnotes

[1] See the discussion in Steinfeld (2001, pp. 311-312).

[2] Friedman (1969, p. 60) makes this point in the context of a discussion of the relationship between the length of the pay period and the demand for money.

[3] Steinfeld (2001, pp. 17-19 and pp. 303-305.) Fishback (1992, pp. 142-143) argues that the practice by company stores of issuing script provided a convenient method for workers to synchronize income and consumption between infrequent paydays, while allowing the company to economize on the bookkeeping and interest costs of weekly or biweekly payrolls. However, script was generally not issued beyond what had already been earned because of the risk that the worker would quit before repaying the advance.

[4] The relevant passage from the Massachusetts law is the following: "[employers] shall pay weekly each and every employee engaged in its business the wages earned by such employee to within six days of the date of said payment." *Annotated Laws of Massachusetts* (ALM GL, 149 sec. 148). Matthew Bender and Co. Inc. (LexisNexis), 2007.

[5] In testimony before the United States Senate, one speaker pointed explicitly to these short-term costs: "I will say in regard to my own city that for a long time we have been trying to get weekly payment of wages enforced by legislation. I think that change has been a benefit to the working men. It certainly has been a benefit to thrifty people, but I don't know that it has done any good to the thriftless. But the man that has a lot of little children, trying to bring them up, and to educate them and provide for them in every respect, it has enabled that man to get his pay weekly and in that way to purchase his necessaries a little cheaper, because he can get as much for a dollar cash as he could get for $1.20 or $1.25 on credit." (Anonymous testimony before the U.S. Senate Committee on Education and Labor, August 1883.)

[6] The discount rate for deferred wages, which incorporates a rate of return, is the difference between the borrowing rates faced by workers and firms. This difference is

assumed to be positive because of the capital-market imperfections discussed in the preceding section.

[7] For a thorough discussion of the organization of cotton textile production, see Copeland (1912, pp. 54-111).

[8]Let $\delta = 0$ if in week t the worker is unmarried and let $\delta = 1$ if the worker is married. Furthermore, define yobs as the year (1885 or 1886) in which week t occurs and yom as the year of marriage. Then, Married = $\delta + (1 - \delta)\{1 - [(yom - yobs)/(1920 - yobs)]\}$. For example, someone who was not married prior to 1887 but who will marry in 1890 would have a value for Married in, say, week 35 (of 1885) equal to $0 + 1\{1 - [(1890 - 1885)/(1920 - 1885)]\} = 0.857$.

[9] Our conclusions, discussed in section 5 below, are unaffected by the use of an alternative, forward-looking marriage-tenure variable, defined to equal 0 for those who never marry, negative and equal to the number of years until marriage for those unmarried persons who will marry in the future, and positive and equal to the number of years of marriage for those who are currently married.

[10]Although there were workers on the payroll who spoke Italian or Greek as their first language, none of them is in the final sample we used to estimate the model.

[11]There is considerable anecdotal evidence from this period that the number of hours worked each week by most mill workers was largely demand-determined. See Keyssar (1985, pp. 162-172) for a discussion.

TABLE 1: Sample Means of Variables

Variable	Mean	
Individual	**Women**	**Men**
Hours (per week)	31.8	35.7
Wage (cents per hour)	4.39	7.59
Working (E = 1)	0.58	0.63
Age (years)	22.3	26.9
Married	0.656	0.820
Dependents	0.56	0.56
Literate (Yes = 1)	0.71	0.76
French (Yes = 1)	0.34	0.42
Migrant (years in U.S.)	6.011	8.14
Trusteed (Yes = 1)	0.057	0.067
Consumption (cents per week)	238.5	428.6
$Income_{-1}$ (cents per week)	242.5	429.6
N	116	94
T	65	65
N x T	7540	6100

Firm	**Mean**
$Bales_{-1}$ (# per week)	544.85
$LoomUse_{-1}$ (# per week)	3221
Cloth (lbs. per week)	186842
Reform	0.19
Price Level	16.4
T	65

TABLE 2a: Empirical Results

Employment Probability Equation: Probit ML

Variable	Women Coefficient (std. error)	Men Coefficient (std. error)
Constant	-0.476** (0.103)	-0.500** (0.135)
Wage	0.099** (0.005)	0.121** (0.005)
Age	-0.00006 (0.002)	-0.0005 (0.001)
Married	-0.014* (0.007)	0.051** (0.015)
French	-0.001 (0.006)	-0.006 (0.009)
Literate	0.005 (0.007)	0.032** (0.009)
$Bales_{-1}$	-0.027 (0.029)	-0.031 (0.043)
$LoomUse_{-1}$	-0.015 (0.026)	-0.003 (0.033)
Cloth	0.084** (0.020)	0.067** (0.024)
Migrant	0.0003 (0.002)	-0.0007 (0.001)
Summer	0.056** (0.009)	—
Reform	-0.004 (0.010)	-0.007 (0.013)
$2\ln [L(0)/L(\beta)]$	351.23 (11)	227.00 (10)
R^2_{MZ}	0.357	0.362

TABLE 2b: Empirical Results

Labor-Supply Equation: Selectivity-Corrected Tobit ML

Variable	**Women** Coefficient (std. error)	**Men** Coefficient (std. error)
Constant	4.103**	4.107**
	(0.008)	(0.008)
IMR	-0.182**	-0.201**
	(0.026)	(0.023)
m/w	0.002**	-0.00008
	(0.0003)	(0.0003)
m/w x Reform	-0.005**	0.016**
	(0.002)	(0.006)
Reform	0.023**	0.023**
	(0.011)	(0.011)
$(p/w)^{-1/2}$	0.045**	0.047**
	(0.005)	(0.006)
p/w	-0.00006	0.00008
	(0.0005)	(0.00006)
Summer	-0.044**	--
	(0.010)	
$-2\ln[L(0)/L(\beta)]$	79.80 (7)	100.19 (6)
R^2_{MZ}	0.322	0.392

TABLE 2c: Empirical Results

Labor-Supply Parameters: Wald Estimates

	Women	Men
Parameter	**Coefficient (std. error)**	**Coefficient (std. error)**
α_{ff}	4.095**	4.107**
	(0.008)	(0.008)
β^0	-0.002**	-0.00009
	(0.0003)	(0.0003)
β^1	0.005**	-0.016**
	(0.002)	(0.006)
α_{fc}	0.045**	0.046**
	(0.006)	(0.006)
α_{cc}	-0.016	0.013
	(0.143)	(0.012)

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APPENDIX TABLE A

Wage Equation: OLS*

	Men	Women
Variable	**Coefficient (std. error)**	**Coefficient (std. error)**
Constant	--	--
Age	0.386 (1.142)	0.098 (0.338)
c_{t-1}	1.146* (0.625)	1.268** (0.139)
c_{t-2}	-0.132 (1.072)	0.119 (0.314)
Married	3.382 (23.962)	1.560 (1.735)
Trusteed	0.549** (0.219)	0.637** (0.143)
R^2	**.725**	**0.534**
	Mean (Std. Error)	**Mean (Std. Error)**
$\hat{w}$	7.584 (6.334)	4.396 (3.065)

*Individual fixed effects were included in the wage equation to control for unobserved, person-specific characteristics.

APPENDIX TABLE B

Consumption Equation: Tobit ML*

Variable	Men Coefficient (std. error)	Women Coefficient (std. error)
Constant	--	--
Age	0.116 (0.148)	0.173 (0,133)
$Income_{t-1}$	0.054* (0.028)	0.059* (0.032)
$Income_{t-2}$	0.500** (0.205)	0.462** (0.223)
Married	-3.326 (5.211)	9.713 (7.481)
Trusteed	0.617** (0.287)	0.332* (0.186)
R^2	**0.219**	**0.204**

	Men Mean (Std. Error)	Women Mean (Std. Error)
$\hat{c}$	4.285 (3.756)	2.384 (1.821)
$\hat{m}$	-0.0382 (2.24)	-0.0272 (1.543)

*Individual fixed effects were included in the consumption equation to control for unobserved, person-specific characteristics.