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WHOM DID PROTECTIVE LEGISLATION PROTECT? EVIDENCE FROM 1880

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ABSTRACT

Laws limiting the hours of work for women and children first emerged in the middle of the nineteenth century in the vanguard of progressive era legislation. Today the dominant interpretation of such legislative regulations is that they reflect successful rent-seeking by some group. Specifically, men sought such laws to restrict job opportunities for women. These laws may have had this effect in the late twentieth century. However, we believe that they emerged in the nineteenth century in response to demands by both men and women for the shorter hours that they had been unable to secure through individual or collective bargaining. As contemporaries put it, men fought the battle for shorter hours "from behind the petticoats of women." The passage of these laws brought shorter hours to both men and women and do not seem to have displaced women from the workplace at the time.

The differential impact of these hours laws between the late nineteenth and the late twentieth centuries reflects society's success in eliminating other forms of sex discrimination. In the nineteenth century, thanks to rigid gender-based occupational segregation, men and women were complementary factors of production. With the breakdown of such rules, they became substitutes and men came to reap some rents from hours regulations but these were not anticipated when the legislation was adopted.

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"Ten hours' labor per day has been the recognized work-day in nearly every mechanical and manufacturing industry in the United States, for the past thirty or forty years, except in the textile manufactories of the eastern States; and in them, as in England, *legislation has been invoked specially for women and children, and which, being secured, caused a lessening of the hours of adult male labor . . .*"*

"Although some supporters of this legislation [for women and children] apparently hoped that it would serve as a stimulus to similar policies for adult males, it failed to have this effect. The achievement of shorter hours for men was to come mainly through collective bargaining."**

INTRODUCTION: THE RISE AND FALL OF PROTECTIVE LEGISLATION

In 1874, after decades of industrial action, political agitation and lobbying by interested groups, the Massachusetts state legislature finally passed a law that became the model for similar legislation in other states. That law established statutory limitations upon the hours that women could work by prohibiting the employment of women for more than ten hours a day except to make up time lost by breakdowns or to secure a shorter working day sometime during the week and in no case were their hours to exceed sixty in any one week.[1] In addition, the law forbade employees from contracting out of the provisions either at their own or their employers behest and all existing labor contracts calling for longer hours were invalidated.

° We have benefited from perceptive comments by so many of the participants in the Harvard University, University of Chicago, University of Illinois and Yale University Economic History Workshops, the 1988 Cliometric Conference and the 1991 NBER/DAE Summer Institute, among them Lee Alston, Lou Cain, Alan Dye, Barry Eichengreen, David Galenson, Claudia Goldin, Mary Eschelbach-Gregson, Larry Neal, Joseph Reid, Elyce Rotella, Kenneth Snowden, Richard Sutch, Peter Temin, Mark Toma, Thomas S. Ulen, David Weiman, Jeffrey Williamson and Robert Zevin. They are not responsible for any remaining errors or confusions and we apologize to anyone whose contribution we have missed.

*Ohio. Bureau of Labor Statistics, *Second Annual Report of the Bureau of Labor Statistics . . . for the Year 1878*, (Columbus: Nevins & Myers, 1879), p. 266 (emphasis added).

**U.S. Presidential Railroad Commission, *Report and Appendices*, (February 1962), Appendix 4, p. 273: Testimony by Milton Derber, "The History of Basic Work Hours and Related Benefit Payments in the United States."

[1]Massachusetts, *Laws 1874*, C. 221.

Surprisingly, this law also withstood legal challenges. In the case of *COMMONWEALTH V. HAMILTON MANUFACTURING COMPANY*, the Massachusetts Supreme Court ruled that:

> [The 1874 law] merely provides . . . no person shall be engaged in labor more than ten hours a day or sixty hours a week. There can be no doubt that such legislation be maintained either as a health or police regulation . . . This principle has been so frequently recognized in this Commonwealth that reference to the decisions is unnecessary.[2]

Although this decision was not appealed to the U.S. Supreme Court, we would argue that the Massachusetts law broke with the constitutional rights guaranteed by Article I, Section 10 and affirmed in the *DARTMOUTH COLLEGE V. WOODWARD* decision that declared "no state shall pass any . . . law impairing the obligation of contracts."[3] Further, we believe that the successful prosecution of one of the largest manufacturing firms in America at the time sent a clear message to others that such laws could be enforced.[4]

The Massachusetts law, however, was to remain the exception rather than the rule until the late 1880s when Maine passed a similar law. Even by 1896, only 13 states had passed any kind of law restricting women's hours and, of these, one had been declared unconstitutional by a state supreme court.[5] Only Maine, Massachusetts and New Jersey had laws thought to be effective.[6] In 1908, however, the U.S. Supreme Court finally settled the question of constitutionality in *MULLER v. OREGON* affirming that such laws were reasonable uses of police power.[7] Consequently, by 1921 all but four states had adopted such laws.[8] The route to success——as with the Massachusetts law——lay in the appeal to public health as the defense for this use of police powers.

The Massachusetts legislation did not evolve in a vacuum. Rather it was a part of a wider movement, international in scope, to protect not only specific groups——especially women and children——but all labor in industry. For women such laws included prohibitions against nightwork[9] and required seats for women (but not men) at work stations.[10] These laws were also part of an even larger legal corpus expanding governmental interference in American economic life that began in the

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[2]*COMMONWEALTH V. HAMILTON MANUFACTURING COMPANY*, 120 Mass. 383 (1876).

[3]*DARTMOUTH COLLEGE, TRUSTEES OF V. WOODWARD* 17 US 518, 4 L ed. 629 (1819).

[4]At the 1870 Census of Manufactures, the Hamilton Manufacturing Company was reported to have a capital of $1.2 million and employed 350 men, 672 women and 32 children to produce more than 10 million yards of cloth valued at $1.3 million. See the manuscripts of the Census of Manufactures at the Ninth Census for Massachusetts, page 127, line 8.

[5]*RICHIE v. PEOPLE*. 155 Ill. 98 (1895). In 1909, Illinois adopted a new ten-hour to replace the eight-hour law overturned in *RICHIE v. PEOPLE*. Its constitutionality was almost immediately challenged and upheld in *RITCHIE v. WAYMAN*, 244 Ill. 509, 91 N.E. 695 (1910) using the new secret weapon developed for *MULLER V. OREGON*—the Brandeis brief.

[6]Elizabeth Brandeis, "Labor Legislation," in Commons et al., *History of Labour*, *op. cit.*, IV, 457.

[7]US Department of Labor, *Tenth Special Report of the Commissioner of Labor, 1904* (Washington, DC: GPO, 1904). By the time the decision in *MULLER V. OREGON* was rendered at least four state courts had sustained such legislation: *COMMONWEALTH V. HAMILTON MANUFACTURING COMPANY*, 125 Mass. 383; *WENHAM V. STATE*, 65 Neb. 394, 400, 406; *STATE V. BUCHANAN*, 29 Wash. 602; *COMMONWEALTH V. BEATTY*, 15 Pa. Sup. Ct. 5, 17. For the U.S. Supreme Court decision, see *MULLER v. OREGON*, 208 US 412.

[8]John R. Commons and John B. Andrews, *Principles of Labor Legislation*, (New York: Harper & Brothers, 1927), p. 249.

[9]For example, Massachusetts, *Laws 1890*, C. 183. See also Commons and Andrews, *History of Labor Legislation*, *op. cit.*, especially pp. 288-94.

[10]See Commons and Andrews, *Labor Legislation*, *op. cit.*, pp. 401-3. They claim that New York was the pioneer in this field, passing a law as early as 1881, but without reference to the specific statute.

latter half of the nineteenth century and traditionally dated from *MUNN V. ILLINOIS*.[11] Markets were seen as imperfect and in need of regulation to achieve newly articulated economic and social goals.

The wheel has now turned full circle completing a process begun more than twenty years ago.

On August 19, 1969 the Equal Employment Opportunity Commission ruled that "such laws and regulations [protecting women] conflict with Title VII of the Civil Rights Act of 1964 and will not be considered a defense to an otherwise established unlawful employment practice."[12] As a result, "state legislatures again made adjustments in State maximum hours laws making more job opportunities available to women."[13] For example, women in New York state upon issuance of a permit by state labor commissioner were once again permitted to work beyond the 8 hours a day and 48 hours a week standard, restoring rights denied them since 1899. In addition, women aged 18 to 21 could work until midnight and women over 21 could even work after midnight!!![14]

As with the movement towards protective legislation, these legal changes were part of a larger movement——this time towards deregulation and individual freedom. In *MULLER v. OREGON* (1908) the U.S. Supreme Court ruled that:

> "healthy mothers are essential to vigorous offspring [so that] the physical well-being of woman becomes an object of public interest and care in order to preserve the strength and vigor of the race . . . differentiated by these matters from the other sex, she is properly placed in a class by herself, and legislation designed for her protection may be sustained, even when like legislation is not necessary for men and could not be sustained."[15]

This decision, at least so far as the private (as opposed to public) regulation of work conditions as a health measure to protect women and children, has now been overturned. In the case of *INTERNATIONAL UNION, UAW V. JOHNSON CONTROLS, INC.* (1991), the U.S. Supreme Court rendered a unanimous decision declaring that Johnson Control Inc.'s "fetal protection" policy violated Title VII of the Equal Rights Act of 1978 amended to include the Pregnancy Discrimination Act.[16] Johnson Control's policy, adopted in 1982, prohibited the employment of fertile women in jobs that brought them into contact with the lead dust. The justification was to absolve company from any potential liability for birth defects that may be caused by——or blamed upon——exposure to high concentrations of airborne particles of lead even though these remained within the limits established by the EPA and OSHA.

Two objections to the rules were filed. One, on behalf of the female employees, claimed that Johnson Controls' policy denied them equal access to high-paying jobs; the other on behalf of male employees claimed that the policy of the involuntary transfer of fertile women out of those jobs involving exposure to airborne lead reduced the chances of men voluntarily seeking such transfers. An initial decision favoring Johnson Controls was rendered in 1988 by U.S. District Court for the Eastern District of Wisconsin Judge Robert Warren,[17] and affirmed by the 7th U.S. Circuit Court of Appeals.[18]

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[11] *MUNN V. ILLINOIS*, 94 US 125 (1877).

[12] *Federal Register*, 34, #158, August 19, 1969.

[13] O. G. Mitchell and C. T. Sorenson, "State Labor Legislation Enacted in 1969," *Monthly Labor Review*, 93 1 (January 1970), p. 54.

[14] *Ibid.*

[15] *MULLER v. OREGON*, 208 US 412, pp. 6-7.

[16] *INTERNATIONAL UNION, UAW V. JOHNSON CONTROLS, INC.* 111 Supreme Court Reporter 1196, Docket 89-1215.

However, Justice Robert Staniforth of the state appeals court in Orange County, California ruled in a state suit also brought against the company that "however laudable the concern by business . . . for the safety of the unborn, they may not effectuate their goals . . . at the expense of the woman's ability to obtain work for which she is otherwise qualified."[19] The U.S. Supreme Court decision was almost identical: "Johnson Controls' professed moral and ethical concerns about the welfare of the next generation do not suffice to establish a *bona fide* occupational qualification." Furthermore, the Justices argued that "decisions about the welfare of future children must be left to the parents who conceive, bear, support, and raise them."[20]

Women, however, were not the only groups protected from the marketplace. Children were, too, and from an even earlier date. Beginning in the 1830s, some states prohibited the employment of children below a certain age. Others regulated the hours and conditions under which children could work. Effective federal laws regulating child labor date from the Fair Labor Standards Act of 1937. In addition, compulsory education laws were passed ostensibly to ensure that children had some minimum opportunity to consume a social good. Sometimes these compulsory education laws were complementary with other child labor laws. Sometimes they seem to have been substitutes for other forms of regulation of child labor. These laws are not under attack. Indeed, recent newspaper stories suggest that the U.S. Department of Labor has strengthened its enforcement of the child labor laws.

In this paper we trace the origins of protective legislation focusing upon laws regulating hours of work and examine the quantitative and qualitative evidence on the impact of these laws. Our analysis raises many questions to which we seek answers: Whom did protective legislation protect? Were women and children truly protected by laws limiting their hours of work and, if so, were they the primary beneficiaries? Did these laws also benefit workers who were not covered by the regulations? Did legislation limit the employment opportunities of those affected? Did it lead to the concentration of protected workers in specific fields——the "feminization" of certain occupations? If the laws were ineffective, how widespread were violations? How important was the means of enforcement for its effectiveness?

Unfortunately, our results do not resolve all of the questions. Our quantitative data are just for one year——1880. At that time, only five states had adopted legislation specifically setting limits on women's hours. Another twelve states had passed hours laws covering all workers; 12 had passed limits on children's hours and 14 had adopted compulsory education for children to age 14 (and in some cases, for even older children). Further, many of the issues are not simple "either-or" questions. For example, men may have benefited from legislation protecting women and children without diminishing the gains to those protected. Moreover, everyone may have gained——or lost——depending upon the complementarity or substitutability between men, women, and children and between labor and other factors of production. Thus, behavior that is consistent with the tenets of "rent seeking" by male employees——namely efforts to reduce job opportunities for women and increase demand for male labor——may be motivated by altruism as much as misanthropy and be self-serving while simultaneously also serving others.

[17] 680 F.Supp. 309.

[18] 886 F.2d 871 (7th Cir. 1989).

[19] "Company loses 'fetus protection' case," *Orange County Register* (Santa Ana, California), March 2, 1990.

[20] Excerpts from the Court's decision are taken from *New York Times*, March 21, 1991, A12.

THE 1880 CENSUS SAMPLE

The quantitative data underlying this study are taken from a random sample of over 8,000 firms drawn from the 1880 Census of Manufactures.[21] These data, for most firms, include information on the employment of men, women, and children, their hours of work between May and November and between November and May, plant location, capital invested, the value of inputs and outputs, and their source of power.[22] Although firms in the food processing (SIC 20) and lumber milling (SIC 24) industries were the most numerous among the firms that reported complete employment data (Table 1), there were substantial numbers of firms in most of the industries. These firms employed almost 87,000 workers. The sample statistics generally mirror those for the nation as a whole. Unfortunately though, larger firms in some industries, most notably textiles (a major employer of women) and iron and steel (which employed virtually no women), were not among the population from which the data were drawn because the records have been lost. We do not consider this to be a serious defect.

TABLE 1
The Industrial Distribution of Firms and Employment, by 2-digit SIC Industry, in the 1880 Atack-Bateman Sample

Industry	2-digit SIC code	Number of Firms	Number of Employees
Agricultural Services	7	56	249
Construction	17	685	5,776
Food	20	1,440	7,723
Tobacco	21	239	4,299
Textiles	22	47	789
Clothing	23	316	14,647
Lumber	24	1,224	8,878
Furniture	25	210	2,588
Paper	26	78	2,045
Printing	27	140	2,845
Chemicals	28	178	3,044
Leather	31	992	7,739
Glass/Brick	32	212	2,503
Primary Metals	33	306	4,136
Fabricated Metals	34	81	3,591
Machinery	35	444	6,996
Non-Ferrous Metals	36	3	305
Transport. Equipment	37	46	2,322
Instruments	38	8	70
Misc. Metals	39	228	3,060
Coke/Gas/Oil	49	28	1,952
Blacksmithing	76	786	1,390
All Industries		7,747	86,947

Source: Data from the 1880 Atack-Bateman sample.

[21]The data were collected by Jeremy Atack and Fred Bateman with funding by the National Science Foundation to the University of Illinois under SES 86-05637 and Indiana University under SES 86-09392. These data are available through the Inter-University Consortium for Poilitical and Social Research (ICPSR) at the University of Michigan, Ann Arbor. The regressions, reported below, use the largest possible subsets of these firms for which all of the required data were recorded. These sample sizes are shown in the appropriate tables.

[22]See Carroll D. Wright, *History and Growth of the United States Census*, (Washington DC: GPO, 1900), pp. 315-61 for a complete list of the census questions including those on the special schedules.

The reported summer (May-November) and winter (November-May) hours are assumed to be scheduled, not actual, hours of work because of the almost uniform reporting of whole numbers of hours.[23] In order the generate a best estimate of the length of the scheduled working day we averaged winter and summer hours, except for 32 firms that reported zero hours for each six month period.[24] If a firm reported no hours for just one of the six-month periods, we used the reported work hours for the non-zero six-month period as the average number of hours of work per day.[25] Given the opposition to long hours of work, we have also imposed an arbitrary limit of 14 hours on the length of the scheduled working day. For the small number of firms reporting longer hours——just over one percent of all firms that reported summer hours and well under one percent of firms reporting winter hours——we have arbitrarily assumed that they employed two shifts, each working one-half of the reported hours per day.[26]

Data in the published census volumes allow calculation of the fractions of industry employment represented by adult male and adult female workers and by children and their distribution across states. The industrial labor force numbered 2,738,892, about 20 percent of whom were adult females and 6.6 percent were children. New York had the largest number of female workers, but women made up a larger fraction of the labor force in Massachusetts and New Hampshire——about a third. In Montana, on the other hand, only 3 women were employed in industry and they represented less than one half of one percent of the industrial labor force.[27]

For the sample, as shown in Table 2, adult females also made up almost 20 percent of the labor force and about 5 percent were children. We have used the firm-level data in the sample to estimate two other useful sets of statistics. The first of these is the average proportion of each firm's labor force that was female or child by industry. This figure will be equal to that for the industry as a whole if each firm in the industry employed the same proportion of women and children. If, on the other hand, large firms employed disproportionately more women, then the average across firms will be less than average for the industry as a whole. The second reports the fraction of firms in each industry that employed any women or children. This measures how widespread the employment of women and children was in a particular industry.

Table 2 reveals that adult females made up only 4.7 percent of the labor force of the average firm while children constituted only 2.7 percent of the average firm's workforce. Nevertheless, women made up almost 20 percent of the industrial labor force and children, five percent. The inconsistencies between these figures reflect——as others have also found——the tendency for women and children to be more extensively employed by the larger firms.[28] Consider, for example, the textile industry (SIC 22). Across our sample firms in this industry women represented only 18.6 percent of the labor force in each firm, yet at least 49.2 percent of all workers in this industry were women.[29] This greater reliance upon

[23]See Jeremy Atack and Fred Bateman, "How Long Was the Workday in 1880?", *Journal of Economic History*, 51 4(December 1991——forthcoming).

[24]In addition, there were 136 establishments in which summer hours were missing (as distinct from zero), 135 with missing winter hours and 141 firms with both summer and winter hours missing. These firms were excluded from the calculations.

[25]Forty-nine firms (0.6% of the sample) reported zero hours for one of the six month periods. Of these, 31 reported not operating in winter and were typically firms in flour milling, lumber, and brickmaking. Twelve of the 18 firms that reported not working in summer were in the agricultural services industry.

[26]That is to say, firms reporting 15 hours of work were recorded for these calculations as operating 7.5 hours per worker, but 15 hours per firm.

[27]U.S. Department of the Interior. Census Office, *Compendium of the Tenth Census*, (Washington DC: Government Printing Office, 1883), p. 928.

[28]Claudia Goldin and Kenneth Sokoloff, "Women, Children and Industrialization in the Early Republic: Evidence from the Manufacturing Censuses," *Journal of Economic History*, 42 (Dec. 1982)4:741-74, especially Table 3 and pp. 751-56

women and children in larger firms is attributable to the greater division of labor in these firms that resulted in the de-skilling of jobs and the substitution of mechanical effort for human muscle.

TABLE 2
The Extent of Employment of Women and Children in 1880 by Industry
(percentages)

Industry	Composition of Labor Force				Percent. of Firms Employing[3]:		
	Percent.[1]:		Average Percent.[2]:				
	a)Women	b)Children	a)Women	b)Children	a)Women	b)Children	c)Either
Agricultural Services	2.0	10.8	1.5	13.1	5.0	23.3	28.3
Construction	0.8	2.6	1.0	2.4	1.8	8.9	10.1
Food	7.1	4.5	2.6	2.2	6.5	6.0	10.8
Tobacco	26.1	12.4	6.7	6.8	20.2	20.2	30.7
Textiles	49.2	11.4	18.6	5.6	40.8	22.4	49.0
Clothing	68.2	2.6	50.2	2.4	67.7	11.7	69.8
Lumber	0.9	3.3	0.4	1.8	2.3	7.0	8.9
Furniture	9.4	15.5	3.1	4.4	10.6	14.2	19.5
Paper	27.9	11.5	24.6	8.1	43.6	32.1	61.5
Printing	14.9	9.3	12.5	8.6	41.8	34.2	56.2
Chemicals	17.2	5.8	9.1	5.4	24.5	15.2	31.0
Leather	15.6	4.6	3.4	1.6	9.5	5.4	12.3
Glass/Brick	3.2	7.6	1.9	8.7	7.5	29.7	33.5
Primary Metals	4.0	3.6	1.2	2.0	3.7	7.5	10.0
Fabricated Metals	10.6	7.4	5.0	3.7	17.3	18.5	25.9
Machinery	0.7	3.3	0.3	2.1	1.3	9.3	9.9
Non-Ferrous Metals	10.5	8.2	25.6	2.8	66.7	33.3	66.7
Transport. Equipment	0.2	2.9	1.6	2.3	4.3	8.7	10.9
Instruments	0.0	1.4	0.0	2.1	0	12.5	12.5
Misc. Metals	23.6	6.1	8.8	5.7	19.5	16.3	31.7
Coke/Gas/Oil	0.5	0.2	0.0	1.1	3.6	3.6	7.1
Blacksmithing	0.5	0.6	0.2	0.5	0.6	1.0	1.5
All Industries	19.1	5.0	4.7	2.7	10.0	9.2	16.3

[1]Percentage of women or children employed in industry =
$[\Sigma_i(\text{Women}_i \text{ or Children}_i)/\Sigma_i(\text{Men}_i + \text{Women}_i + \text{Children}_i)] \cdot 100$, for each j where i = 1, . . ., n firms in industry j.

[2]Average Percentage of women or children employed by firms in industry j =
$\{\Sigma_i[(\text{Women}_i \text{ or Children}_i)/(\text{Men}_i + \text{Women}_i + \text{Children}_i)]/n\} \cdot 100$, for each j where i = 1, . . ., n firms in industry j.

[3]Percentage of firms employing women or children =
[(number of firms in industry j employing women or children)/(number of firms in industry j)] • 100

Source: Data from the 1880 Atack-Bateman sample.

The data show that women and children were concentrated in certain industries. Women made up at least 20 percent of the labor force in tobacco, textiles, clothing, paper, and miscellaneous metals and in another four industries——printing, chemicals, leather, and fabricated, non-ferrous metals——women made up at least ten percent of the workforce. Children made up at least 10 percent of the labor force in the agricultural services industry, tobacco, textiles, furniture and paper. We will refer, somewhat arbitrarily and loosely, to those industries where the labor force was at least 20 percent

[29]As noted above, this latter statistic is biased downward in our sample because of the separate enumeration of the large mills in the textile centers of New England—Lowell, Lawrence and Fall River—and their exclusion from our sample. For example, the published census yields an estimate of 57 percent female in the cotton textile industry. See Census Office, *Compendium, op. cit.*, p. 1125.

female as "female-dominated" industries and those where children were 10 percent or more of the workforce as "child-dominated" industries. Semantics aside, these are clearly industries in which women and children were important and where they tended to be important regardless of firm size. In these firms and industries, it is likely that women and children played an important role in the production process. Moreover, to the extent that jobs were inter-related and gender-specific (see below) their continued active participation in the production process may have been essential. At the opposite extreme, very few women (under 1 percent of the labor force) were to be found in construction, lumber, machinery, transportation equipment, instruments, coke, gas and oil, or blacksmithing. Their employment in these industries was probably not crucial. They may have been bookkeepers or performed other white-collar, non-production, tasks and whose presence in the workplace at any particular moment was not crucial .

The last columns of Table 2 provide some evidence on the number of firms that could be affected by restrictions on the employment of women and children. Some firms in virtually every industry employed women and/or children.[30] Overall, about ten percent of all firms employed at least one adult female and more than nine percent employed one or more children, with 16 percent employing one or the other or both. These represent the potential constituency that could be adversely affected by protective legislation. It was quite large. Moreover, in some industries——such as textiles, clothing, paper and printing, where forty percent or more of the firms employed at least one woman and paper and printing where perhaps a third employed children——we would expect to see organized opposition if legal restrictions in employment adversely affected profitability.

THE LENGTH OF THE WORKING DAY AND EMPLOYEE OPPOSITION TO LONG HOURS

Thus far we have not addressed the question of whether workers (male or female) wanted shorter hours. The historical evidence is somewhat mixed before the 1880s. Demands for shorter hours were among the earliest industrial disputes in the new nation. For example, in 1791 the Philadelphia Carpenters struck for shorter hours and overtime pay.[31] Over the succeeding decades, Philadelphia was to remain the center of agitation for shorter hours. In 1827, for example, the building trades struck for a ten hour day. That strike also failed but out of it emerged the first effective centralized city organization of wage-earners in the world——the Mechanics' Union of Trade Associations——which in turn gave birth to the first labor party——the Working Men's party——that led in turn to the first industrial trade union——the New England Association of Farmers, Mechanics, and other Workingmen.[32] Beyond trying to secure relief from long hours of work for individual workers, many labor groups saw shorter workdays and shorter work-weeks as the solution to unemployment and the means for increasing industrial employment generally.[33]

The Ohio Commissioner of Labor alleged that reducing the hours of work also figured prominently at all labor gatherings after the Civil War.[34] However, an analysis of the 762 strikes in the 1880 calender year that are documented in the *Weeks Report* reveals that only 7 involved demands for shorter hours. Five of these were unsuccessful and the results of the remaining two were not known.[35]

[30]The only industry in which there were no sample firms employing women was the instrument industry (SIC 38). There were only eight firms in this industry in the sample and they employed just 70 persons (see Table 1).

[31]Commons et al, *History of Labour*, I, p. 69.

[32]*Ibid*, I, p. 169

[33]We refer to this as the "lump of labor hypothesis," that is the proposition that if a firm used say 1,000 hours of labor per day, this could be supplied by 100 workers working a 10-hour day or by 125 workers working an eight-hour day—a 25 percent increase in employment as a result of the reduction in hours per day.

[34]Ohio. Bureau of Labor Statistics, *Second Annual Report, op. cit.*, p. 259

Demand for shorter hours seem to have played a much more important role in Massachusetts where about 15 percent of the documented strikes between 1825 and 1879 were to secure shorter hours.[36] The results of these strikes like those elsewhere were not encouraging. Most failed and workers either reclaimed their jobs on the same or worse terms or they were replaced.[37] Rather, most strikes were for higher wages or against a reduction in existing wage rates. Even after 1880 when there seems to have been a growing emphasis upon shorter hours, it still does not appear to have been the dominant issue in most labor disputes.[38]

At the same time, one might expect that if a sufficiently large number of workers wanted shorter hours some firms would offer shorter hours to attract these workers. Moreover, if the work produced under shorter hours were truly superior to the product of sweated labor we would expect such firms to increasingly dominate an industry. The evidence does show that hours declined significantly after 1830. According to estimates assembled by Joseph D. Weeks and corroborated by independent evidence, workers averaged 11.5 hours a day in 1830. By 1850, the average workday had been reduced to 10.9 hours. In the course of the next decade, hours declined by as much as in the preceding 20 years to 10.3 hours in 1860. During the next two decades they declined much more slowly, averaging fractionally over 10 hours a day by 1880.[39] The length of the working day then stabilized during the 1880s before declining slowly after 1890 and very abruptly during the First World War to eight-hours per day.[40] How much of this decline particularly during the nineteenth century can be attributed to strike activity, how much to changes in the industrial composition of manufacturing and size of firms, how much to laws limiting hours and how much to the success of firms choosing to offer shorter hours to attract workers is not known.

LEGAL LIMITATIONS UPON HOURS OF WORK

Despite the progressive decline in the length of the working day, direct industrial action seems to have been generally unsuccessful in securing shorter hours even where it had been the primary goal. As a result, labor looked increasingly to political agitation and lobbying for relief. Sometimes the mere threat of legislative action was sufficient to secure a (temporary) reduction of hours, but permanent

[35]US Department of the Interior. Census Office, *Report on Strikes and Lockouts. . .*, by Joseph D. Weeks, *1880 Census*, Volume 20, (Washington, DC: 1886), especially "Report on Strikes and Lockouts" Table 4, p. 25.

[36]Massachusetts. Bureau of Statistics of Labor. *Eleventh Annual Report*, "Strikes in Massachusetts," (Boston: Rand, Avery & Co. 1880), pp. 3-71, especially p. 65. See also Pennsylvania. Secretary of Internal Affairs. *Annual Report of the Secretary of Internal Affairs of the Commonwealth of Pennsylvania. Part II. Industrial Statistics, Volume 9, 1880-81* (Harrisburg: Lane & Hunt, 1882), "Labor Troubles in Pennsylvania," pp. 262-391. Also the *Weeks Report*, pp. 18-9.

[37]See Massachusetts. BSL. *Eleventh Annual Report*, "Strikes," *op. cit.*, also Pennsylvania. *Annual Report of the Secretary of Internal Affairs . . . 1880-81, op. cit.*; US Census Office, *Report on Strikes, op. cit., and* John R. Commons et al, *History of Labour in the United States*, (New York: Macmillan, 2 vols. 1921).

[38]The increase is complaints about hours is swamped by a dramatic increase in the diversity of workers' demands. In 1880, simple, single issues such as shorter hours, more pay, or against a cut in wages had accounted for almost three-quarters of all labor demands in strikes but by the end of the decade they made up barely half of labor grievances. US Department of Labor, *Tenth Annual Report of the Commissioner of Labor. 1894. Strikes and Lockouts*, (Washington, DC: GPO, 1896), p. 29.

[39]See Atack and Bateman, "How Long Was the Workday?" *op. cit.*, especially pp. 2-22 for the full set of estimates and description of sources.

[40]See Robert Whaples, "Winning the Eight-Hour Day, 1909-1919," *Journal of Economic History*, 50 (June 1990), pp. 393-406. Also Joshua L. Rosenbloom and William A. Sundstrom, "The Decline in Hours of Work in U.S. Labor Markets, 1890-1903," Working paper, University of Kansas/Santa Clara University, August 1990.

reductions in hours of work across all firms and industries seems to date from the passage of a very specific type of state law.[41]

The widespread acceptance of changes in hours of work necessary for building a political consensus, however, was predicated on new social attitudes and these swung in labor's favor only slowly. It is not difficult to understand why. After all, why should an employer demand less of his workers than the farmer expected of himself or his family?[42] However, the extension of the peak farmday or farm-week to manufacturing produced a much longer workyear in industry. Moreover, whatever parallel there might have been between agricultural and industrial work disappeared as industry mechanized. In the one, the pace of work was set by man and the rhythms of nature; in the other, by inanimate and tireless machines. In addition, workers were increasingly concentrated in unlighted and poorly ventilated factories. The result was a marked deterioration in the conditions of workers and growing demands for change from many quarters including social reformers as well as workers directly affected by these conditions. Growing productivity and rising real wages also meant that there was little chance that the mass of workers and their dependents would fall below subsistence and so these new arguments were free to come to the fore.[43]

However, it may also be significant that much of the agitation for shorter hours and limits upon employment of women and children only began when the bargaining power of those directly affected had weakened. Adult male workers were thus in a much stronger position to press their case for shorter hours without competition from women and children and employers had less incentive to resist. Second, support for protective legislation for women and children often came from adult male-dominated labor organizations. For example, the New England Working Men's Association meeting at Lynn in January 1846 offered a resolution "in behalf of the Lowell factory girls" for adoption of the ten-hour day.[44] Commons viewed this as fraternal cooperation between labor organizations on behalf of those not yet organized but it is equally consistent with the rent-seeking hypothesis.

The feasibility of a political solution was clearly demonstrated when President Van Buren issued an Executive Order in 1840 establishing a ten-hour day——without reduction in pay——for all federal employees.[45] The lesson was further reinforced by the adoption of the eight-hour day for federal workers in 1869.[46] Rather than securing shorter hours through bargaining or industrial action on a workplace-by-workplace basis, legislation secured through political action represented a comprehensive and effective solution. The emerging coalition of labor with social, civic, philanthropic, and church groups; social reformers and humanitarians; and legislators and bureaucrats also made legislative action

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[41]See, for example, U.S. Congress. Senate, "Report on Condition of Woman and Child Wage-Earners in the United States. Volume 9: History of Women in Industry in the United States," (prepared by Helen Sumner) *61st Cong., 2d Sess, Document 645*, p. 73, argues for example, that Massachusetts manufacturers reduced hours to prevent enactment of laws.

[42]Commons, *History of Labour*, *op. cit.*, I, pp. 171-4.

[43]Towles, "Factory Legislation," *op. cit.*, p. 7. For evidence on rising productivity and real wage growth see Kenneth L. Sokoloff, "Productivity Growth in Manufacturing during Early Industrialization: Evidence from the American Northeast, 1820-1860," in Stanley L. Engerman and Robert E. Gallman, *Long Term Factors in American EConomic Growth*, (NBER Studies in Income and Wealth, Volume 51: University of Chicago Press, 1986), pp. 679-729, especially Tables 13.4-13.6.

[44]Commons, *History of Labour*, I, p. 540.

[45]Executive Order of March 31, 1840. James D. Richardson, *A Compilation of the Messages and Papers of the Presidents, 1789-1907*, (Washington, DC: 1908), III, 602. For an extended discussion of the misquotes of this Executive Order by a wide variety of labor historians from Richard Ely to John R. Commons see Matthew A. Kelly, "Early Federal Regulation of Hours of Labor in the United States," *Industrial and Labor Relations Review*, 3, 3(April 1950): 362-74.

[46]See the discussion surrounding this in Marion Cotter Cahill, *Shorter Hours*, (New York: Columbia University Press, 1932) pp. 69-71.

more certain and less risky for the individual worker. This coalition was to prove effective in state after state in securing legislation limiting hours, particularly after Massachusetts had shown the way.

The first state law setting hours of work was passed by New Hampshire in 1847. It established 10 hours as a legal day's work for everyone and provided that no person could be required to work longer "except in pursuance of an express contract requiring a greater time."[47] No provisions were made for enforcement. Nor were there any specific penalties for violators. Nevertheless, just three days before the law was to go into effect, manufacturers submitted the necessary express contracts to their employees. All who refused to sign——including between one half and two-thirds of the operatives at the Nashua Corporation——were fired and replaced.[48] One might therefore argue that such a law was totally ineffective. Similar laws were also passed in other states——Pennsylvania (1848), Maine (1848), New Jersey (1851), New York, (1853), Rhode Island (1853), California (1853), Georgia (1853), and Connecticut (1855).[49] Many improved upon the New Hampshire law by specifying penalties for violators. However, all preserved the provision that not only guaranteed the primacy of existing contracts but also imposed no limitations upon future agreements.

Such flawed legislation could, however, be made effective through collective action. Following passage of 10-hours legislation by the Pennsylvania legislature in March 1848, seven cotton mills in Allegheny shut down on July 4, 1848, after employees demanded a reduction in hours to ten. The strike/lock-out was eventually settled on August 28 with workers winning the 10-hour day but with a 16 percent reduction in daily wages.[50] Later in the year, however, at least one mill rescinded the pay cut.[51] Similar action also occurred in parts of New Jersey.[52] Nor did these strikes settle the issue one way or the other. For example, in 1866 all the large cotton mills in Allegheny City, Pennsylvania were again running 11.5 hours a day despite 10-hour strikes earlier in the year.[53]

It is claimed that the loophole provided by the contracting-out provision of the declaratory laws establishing eight or ten hours as a legal day rendered them ineffective.[54] This would seem doubly so since the Courts assumed the existence of a contract superseding the law whenever customary hours were longer.[55] One might therefore reasonably ask, why would legislatures pass such patently flawed laws? One possibility is that they sought a sop to labor and the coalition of social reformers without

[47]New Hampshire, *1847 Session Laws*, Ch. 4.

[48]U.S. Congress. Senate, "History of Women in Industry," *61st Cong., 2d Sess, Document 645, op. cit.*, p. 69 quoting *Voice of Industry*, 3 September 1847 and *Voice of Industry*, 17 September 1847. See also Commons and Andrews, *Principles of Labor Legislation, op. cit.*, p. 248.

[49]See California: California, *Session Laws of 1853*, Ch. 131, p. 187; Connecticut: Connecticut, *Session Laws of 1855,* Ch. 45; Georgia: Georgia, *Code of 1861, Sec. 1847*; Maine: Maine, *Session Laws 1848*, ch. 83; New Jersey: New Jersey, *Session Laws 1851*, pp. 321-322 (This law only applied to cotton, woolen, silk, paper, glass, and flax factories and to iron and brass works); New York: New York, *Session Laws 1853*, ch. 641; Pennsylvania: Pennsylvania, *Session Laws 1848*, Act 227; Rhode Island: Rhode Island, *Session Laws 1853*, p. 245.

[50]Pennsylvania. Secretary of Internal Affairs. *Annual Report . . . Industrial Statistics, 1880-81, op. cit.*, pp. 272-3. Since we do not know how many hours a day were worked before the lockout, we do not know whether or not the reduction changed the hourly wage rate.

[51]*Ibid.*

[52]See U.S. Congress. Senate, "History of Women in Industry," *61st Cong., 2d Sess, Document 645, op. cit.*, p. 70 and Commons and Andrews, *Principles of Labor Legislation, op. cit.*, p. 248

[53]U.S. Congress. Senate, "History of Women in Industry," *61st Cong., 2d Sess, Document 645, op. cit.*, p. 72.

[54]See, for example, Commons, et al., *History of Labour, op. cit.*, IV, p. 541.

[55]*HELPHENSTEINE V. HARTIG* (5 Ind. App. Ct. 172, 1892).

antagonizing manufacturers. Another explanation is that the laws were not made effective because they simply codified and ratified the existing situation. Some large mills in Lowell and Lawrence, for example, had adopted the 10-hour day in the late 1860s, years before the passage of Massachusetts' ten-hour law.[56] However, this was certainly not always the case. Women in most Massachusetts mills were still employed 11 hours a day until prevented by legislation.[57] Similarly, workers in New Hampshire flour mills averaged about 10.4 hours a day in 1880——more than thirty years after the passage of that state's ten hour law.[58] However, there was also a very sound legal reason why the laws were framed as they were: without the loophole these laws were viewed as an unconstitutional interference with the right to free contracting.[59] Nor was this legal question regarding constitutionality unreasonable: In 1905, the U.S. Supreme Court in *LOCHNER v. NEW YORK* stuck down a New York state law setting maximum hours for bakers.[60] The law was held invalid as an unreasonable interference with the right of free contract and an excessive use of the police powers of the state. The case is also notable for the dissent of Justice Holmes who argued that the Constitution was "not intended to embody a particular economic theory, whether of paternalism . . . or of *laissez-faire*."[61]

However, we believe it would be a mistake to assert that these laws had no effect upon hours because of this loophole. To many, the law represents a moral force, we would therefore expect that some employers at the margin might have been moved to shorten hours.[62] Compliance is not always based upon the risk of detection and the threat of punishment. Nevertheless, these laws must not have achieved all their goals because states continued to seek a better way to mandate hours for women and children.

THE EMERGENCE OF PROTECTIVE LEGISLATION

Except for the Georgia law that applied only to white labor, the laws establishing the length of a "legal day" made no distinctions between workers. Either all employees were protected or, as we have seen, none were. The passage of more discriminating laws, however, was to prove easier and the laws themselves may have been somewhat more successful in achieving their stated goal. In particular, it was also argued that women and children needed protection and deserved preferential treatment because the health of future generations depended upon them. Moreover, in the case of women, while "ordinarily men can rest when their day's toil is over, . . . there are few working girls who do not have at least mending and laundering to do in the evenings, and married women must take the entire care of their homes and children before and after work."[63] Willingness to express such paternalistic concern, however, may simply reflect the declining relative importance of women and children in manufacturing industry.[64] For the men, on the other hand, shorter hours where deemed desirable were thought of in

[56]U.S. Congress. Senate, "History of Women in Industry," *61st Cong., 2d Sess, Document 645, op. cit.*, p. 72.

[57]*Ibid.*, p. 73.

[58]Unpublished sample data from the 1880 Atack-Bateman sample.

[59]It is, however, conceivable that a legislature could have restricted the hours of labor in corporations (but not partnerships or sole proprietorships) without serious constitutional problems on the grounds that corporations were creatures of the state.

[60]198 US 45.

[61]*Ibid.*

[62]For those readers inclined to question this assertion, we ask that you reflect upon the actions of those who, finding lost property—sometimes large sums of untraceable cash—return it, or those who follow posted speed limits.

[63]Commons and Andrews, *Principles of Labor Legislation, op. cit.*, p. 202.

[64]Goldin and Sokoloff, "Women, Children, and Industrialization," *op. cit.*

terms of increased leisure, although emphasis was sometimes given to family life.[65] More often, shorter hours for men seem to have been thought undesirable, simply providing more drinking time.[66] Universal shorter hours for men thus had to wait until well into the twentieth century (and Prohibition), while women and children received protection much earlier.

Instead, men decided to "fight the battle from behind the women's petticoats."[67] In 1852, Ohio became the first state in the nation to enact protective legislation specifically limiting the hours of work for women. The law provided that women could not be compelled to work longer than ten hours a day under penalty of a $5 to $50 fine.[68] It became the model for similar legislation passed by Minnesota, Wisconsin, and Dakota.[69] The stipulation that women could not be *compelled* to work longer hours, however, supposedly rendered these laws ineffective regardless of enforcement and penalties. Commons and Andrews argue that "as most employees will voluntarily work for twelve or more hours a day when they cannot find any one to employ them for ten hours, the law became almost entirely inoperative."[70] Alternatively, one might argue that the exception permitted those whose tastes were different to work longer hours while those who did not want to could not be forced to work more than ten hours. Under this interpretation the exception was Pareto efficient though in practical terms it generally required firms to make different hours offerings and so was no different from the situation that should have existed in the absence of regulation.

The main battleground in the fight for shorter hours, however, was Massachusetts where manufacturers had long played the lead role in determining the hours of work:

> In general, the hours of labor in Massachusetts, in spite of the lack of legislation, were reduced first, other States following. When the mills of Massachusetts ran 12 hours a day, those of Rhode Island and New Hampshire ran 13 hours. When her mills came down to 11 hours a day, theirs came down to 12.[71]

Petitions requesting passage of a ten-hour law in Massachusetts had been presented to the state legislature in 1842, 1843, and 1844 but nothing came of them.[72] Nevertheless, agitation and lobbying continued, bearing some fruit in the adoption of the 10-hour day by a few mills in the 1860s although the norm remained 11 hours or longer.[73]

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[65]See, for example, Ohio. Bureau of Labor Statistics, *Second Annual Report, op. cit.*, pp. 280-6. For example, a carriage manufacturer reported: "I am strongly in favor of an eight hour system. Workingmen would be better informed if they had more rest, and would be more healthy and longer lived . . . The man who works ten hours, and does his home chores . . . is too tired to study or in any way tax his mind." (p. 281).

[66]*Ibid.*

[67]Commons, et al., *History of Labour, op. cit.*, IV, p. 462.

[68]Ohio, *Session Laws 1852*, v. 50, p. 187.

[69]Dakota: Dakota Territory Legislature. *Dakota Session Laws 1862-3*, ch. 49; Minnesota: Minnesota, *Session Laws 1858*, ch. 66; Wisconsin: Wisconsin, *Session Laws 1867*, ch. 83.

[70]Commons and Andrews, *Principles of Labor Legislation, op. cit.*, p. 249.

[71]U.S. Congress. Senate, "History of Women in Industry," *61st Cong., 2d Sess, Document 645, op. cit.*, pp. 72-3.

[72]Charles E. Persons, "The Early History of Factory Legislation in Massachusetts From 1825 to the Passage of the Ten Hour Law in 1874," in Susan Kingsbury (ed.), *Labor Laws and Their Enforcement with Special Reference to Massachusetts*, (Longmans for the Women's Educational and Industrial Union, 1911) pp. 1-129. especially pp. 24-27.

[73]U.S. Congress. Senate, "History of Women in Industry," *61st Cong., 2d Sess, Document 645, op. cit.*, p. 72.

For example, in 1845, the Massachusetts House received at least four petitions requesting that the legislature "pass a law providing that ten hours shall constitute a day's work" and that no one "shall be allowed . . . to employ one set of hands more than ten hours per day." Two petitions were submitted from Lowell; one was signed by 851 "peaceable, industrious, hard working men and women of Lowell, the other, by 301. A petition from Fall River contained 489 signatures and one from Andover had 501 signatures. All signatories to the Fall River petition were male; most of the Lowell signers were female and those signing the Andover petition were equally divided between the sexes.[74] The number of persons petitioning for legal limits on hours was thus large and did not represent a single interest group——men——whose sole purpose might have been rent-seeking.

In response to these petitions, the Massachusetts legislature appointed a special committee to investigate hours of labor. As part of the investigation they heard and reported testimony by working men and women. They also arranged to visit Lowell and some of the mills. At the Massachusetts and Boott Mills they found "in most of the window sills were numerous shrubs and plants, such as geraniums, roses and numerous varieties of the cactus . . . they were to the Committee convincing evidence of the elevated moral tone and refined taste of the operatives."[75] At the Lowell and Middlesex mills, "grass plats have been laid out, trees have been planted, and fine varieties of flowers in their season, are cultivated within the factory ground . . . everything in and about the mills, and the boarding houses appeared, to have for its end, health and comfort."[76] (!!!——the authors)

It is impossible to say what impact the apparent health and comfort of mill work had upon the Committee. Although the Committee was at pains to emphasize that they did not wish it to be thought that there were no abuses in the system, nothing came of their investigation, the petitions, or the testimony.[77]

Manufacturers subsequently further reduced hours in a vain effort to forestall legislation.[78] Despite this last ditch effort the Massachusetts legislature passed a law in 1874 that circumvented the traditional problems by arguing that, since the health of future generations depended upon the health of the mothers, the regulation of hours of work for women fell within their police powers——a view with which the courts concurred. This law therefore superseded contracts.[79] It also contained provisions for penalties against employers who were found guilty of "willfully employing" women for longer hours. Although some have argued that this stipulation weakened the law because willful intent was difficult to prove, at least one offender was successfully prosecuted and convicted under the statute and that conviction survived appeal. Nevertheless, in 1879 the law was rewritten to strike the word "willful," making prosecution easier.[80] Thus, by 1880, women were covered directly and indirectly by a wide variety of different laws regulating their hours of work. These are summarized in Table 3.[81]

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[74]Massachusetts. *House Document No. 50*, March 1845 quoted in John R. Commons, et al. (eds.), *A Documentary History of American Industrial Society*, (New York: Russell and Russell, 1958), VIII, pp. 133-51.

[75]*Ibid.*, p. 140-1.

[76]*Ibid.*, p. 141.

[77]*Ibid.*, p. 150-1.

[78]*Ibid.*, p. 73.

[79]Massachusetts, *Laws 1874*, C. 74. The same principle was eventually established at the federal level in 1908 in *MULLER v. OREGON* (208 US 412).

[80]See, for example, *Report of the Convention of the International Association of Factory Inspectors, 1894*, p. 65 quoted in Josephine Goldmark, *Fatigue and Efficiency*, New York: Russell Sage Foundation, 1912, p. 213

[81]There is, apparently, no complete summary of legislation regulating hours for work. That given above and summarized in Table 1 has been complied from a wide variety of sources, among them: Women's Bureau, "Chronological Development," *op.*

Laws regulating children's hours presented none of the legal dilemmas of those protecting women. As minors, children could not legally enter into contracts. Moreover, the principle that minors could be treated as wards of the state was enshrined in the English common law tradition. As a result, the constitutionality of protective legislation covering children was not questioned, and the legal obstacles that stood in the way of legislation protecting men and women did not exist. The appeal to humanitarian concerns was also much easier for children. For example, the 1832 convention of the New England Association passed a resolution declaring, in part, that:

> children should not be allowed to labor in the factories from morning till night, without any time for healthy recreation and mental culture; as it not only endangers their own well-being and health, but ensures to the country the existence of a population, in the approaching generation, unfitted to enjoy the privileges and to exercise the duties of citizens and freemen.[82]

TABLE 3
State Maximum Hours Laws Affecting Women in 1879-1880

State	Year Passed	Per Day	Max. Hours Per Week	Enforce-ment	Contracting Out Allowed?
California*[a]	1853	10	—	none	Yes
Connecticut*[a]	1855	10	—	none	Yes
Dakota	1863	10	—	$10-100	Yes
Florida*[a]	1874	10	—	none	Yes
Georgia[b]	1853	daylight	—	$100	Yes
Illinois*[a]	1867	8	—	none	Yes
Maine*[a]	1848	10	—	$0-100	Yes
Massachusetts	1874	10	60	$0-50	No
Minnesota	1858	10	—	$10-100	Yes
Missouri*[a]	1867	8	—	none	Yes
New Hampshire*	1847	10	—	none	Yes
New Jersey*[a]	1851	10	—	none	Yes
New York*[a]	1853	10	—	none	Yes
Ohio[c]	1852	10	—	$5-50	Yes
Pennsylvania*	1848	10	60	none	Yes
Rhode Island	1853	10	—	$20	Yes
Wisconsin	1867	8	—	$5-50	Yes

*Made no distinction between men and women
[a]The law established the length of the "legal day."
[b]Applied to white labor only.
[c]Repealed 1879 effective January 1, 1880.

Source: See text.

Others stressed the evils of the workplace:

> Worse than physical hardship, more blighting than cold or ill-treatment is the inevitable insight of the childish mind into duplicity and vice. A gradual hardening

cit., Commons, *History of Labour, op. cit.* I, pp. 541-5 and Sidney C. Sufrin and Robert Sedgwick, *Labor Law*, (New York: Thomas Crowell, 1954), p. 78. The Women's Bureau compilation for example, misses the early legislation in California, Connecticut, Georgia, New York, and Rhode Island. Also Persons, "The Early History of Factory Legislation in Massachusetts" *op. cit.*; Elizabeth F. Baker, *Protective Labor Legislation with Special Reference to Women in the State of New York*, (New York: Columbia University Press, 1925 (*Studies in History, Economics and Public Law*, vol. 114, no. 2) p. 109; Towles, "Factory Legislation," *op. cit.*; Alba M. Edwards, "The Labor Legislation of Connecticut," *Publications of the American Economic Association*, 3d Series, vol 8, 3 (1907), 413-734.

[82]Quoted by Commons, *History of Labor, op. cit.*, I, p. 321.

> of the sensibilities ensures from constantly hearing words unfit for the ears of youth witnessing the degrading acts and ugly passions which are too frequent in some work rooms where the sexes indiscriminately mingle. Little beings that should be sheltered by mothers' love are only taught the alphabet of sin.[83]

Consequently, laws protecting children were passed by many states quite early on——earlier in fact than other protective labor legislation. Connecticut and Massachusetts passed laws in 1842 limiting children to no more than 10-hours work per day.[84] By 1879, thirteen states had such laws on their books.[85]

TABLE 4
State Compulsory Education and Child Labor Laws in 1879-1880

State	——Education Law—— Year	Ages	Requirement	—— Child Labor Law—— Year	Max. Hours	Ages
California	1874	8-14	16 weeks	—	—	—
Connecticut	1872	8-14	in sess.	1857	10/58	<15
Indiana	—	—	—	1867	10	<16
Kansas	1874	8-14	12 weeks	—	—	—
Maine	1875	8-15	16 weeks	1848	10	<18
Maryland	—	—	—	1876	10	<16
Massachusetts	1852	8-14	20 weeks	1842	10/60	<18
Michigan	1871	8-14	4 months	—	—	—
New Hampshire	1871	6-15	12 weeks	1846	10	<14
New Jersey	1875	7-16	20 weeks	1851	10/60	<21
New York	1874	8-14	14 weeks	—	—	—
Ohio	1877	8-16	20 weeks	1852	10	<14
Pennsylvania	—	—	—	1848	10/60	<21
Rhode Island	1854	7-15	3 months	1853	11	<15
Vermont	1867	8-14	20 weeks	1868	10	<15
Washington	1871	8-18	3 months	—	—	—
Wisconsin	1879	7-15	12 weeks	1853	10	<14

Source: See text.

Legislatures constrained——"protected"——juveniles in other ways, too. Most common was the passage of compulsory education laws. According to Landes and Solmon, by 1879, sixteen state had enacted laws that typically required at least 3 months school attendance a year for children under 15, with not less than 6 weeks of the attendance in consecutive weeks (Table 4).[86] These laws complicate our analysis. Rhode Island, for example, passed a law in 1840 requiring that children under 12 (revised to 15 in 1854) attend school for at least 3 of the 12 months preceding employment but not until 1853 did the state legislature pass a law prohibiting the employment of children under 12 and limiting the hours

[83]Clare de Graffenried, "Child Labor" *Publications of the American Economic Association, 5, (March 1890), 195-271, esp. pp. 198-9.*

[84]Connecticut: Connecticut, *Laws 1842*, C. 28; Massachusetts: Massachusetts, *Laws 1842*, C. 60.

[85]This list is assembled from William F. Ogburn, *Progress and Uniformity in Child Labor Legislation*, (*Columbia University Studies in History, Economics, and Public Law*, 48, 2, 1912), Table 30, pp. 108-9 but corrected for the omission of Maine that had passed compulsory schooling legislation in 1875. See also Table 1, William M. Landes and Lewis C. Solmon, "Compulsory Schooling Legislation: An Economic Analysis of Law and Social Change in the Nineteenth Century," *Journal of Economic History*, 32, (March 1972):56-7 quoting Ogburn, *Progress and Uniformity, op. cit.*. The list in Landes and Solmon, however, includes Indiana, Iowa, and Colorado, which do not appear in Ogburn's compilation, but excludes Connecticut and Illinois.

[86]The states were California, Connecticut, Kansas, Maine, Massachusetts, Michigan, Nevada, New Hampshire, New Jersey, New York, Ohio, Vermont, Washington, Wisconsin, and Wyoming. See Landes and Solmon, "Compulsory Schooling Legislation," *op. cit.*, pp. 56-7

of work of those aged 12-15 to a maximum of 11 hours a day.[87] They thus denied some children the opportunity of work in factories, but the laws did not apply to all minors. As a result, compulsory education laws——to the extent that they were effective——probably affected the distribution of the labor force between adults and children more than hours legislation.

SOME QUALITATIVE EVIDENCE ON ENFORCEMENT AND THE IMPACT OF HOURS LAWS ON EMPLOYER BEHAVIOR.

How effective many of the laws were, we do not know. We know that workers in parts of Pennsylvania and New Jersey successfully resisted efforts to force them to sign explicit contracts for long hours of work in advance of laws setting a shorter maximum. On the other hand, hundreds of employees in New Hampshire were discharged and blacklisted over their refusal to sign such contracts in advance of the New Hampshire 10-hour law.[88]

We have suggested above that the law represents a moral force. Some people change their behavior to comply with legal requirements regardless of whether or not the law is enforced and what penalties might apply. We even have a name for such people——we call them "law-abiding," not "law-fearing." However, we are reluctant to rest our case upon this argument, especially in light of the repeated reference to provisions for enforcement, penalties and the existence of loopholes.

Much of what we know about the impact of hours, child labor and compulsory education laws, unfortunately, comes just for one state——Massachusetts. The evidence, though circumstantial and qualitative, suggests that these laws were effective in reducing the hours of women and limiting the employment of children and that these laws were enforced. It is also, as we will show, consistent with our quantitative evidence.

The circumstantial evidence on hours of work, assembled from the Weeks Report, is summarized in Figure 1.[89] This shows the average hours of work in Massachusetts textile mills, a Massachusetts paper mill and all manufacturing in that state each quinquennium between 1830 and 1880 together with the average hours in all U.S. industry. We would have liked to show the hours in boots and shoes (another important employer of women) as well but no Massachusetts boot and shoe manufacturer gave a complete history of their hours of work to Weeks. Until 1875, hours of work in the textile and paper mills were, on average, much longer than hours in other industries. Thereafter, they were shorter. This reversal coincides with passage of Massachusetts' 10-hour law in 1874. The textile industry, while not the only employer of women in the state, was undoubtedly the one most directly and seriously affected by the passage of this law. In 1870, the industry employed more than 30,000 women——more than a third of all female employees in the state——and perhaps as much as 62 percent of its employees were covered by the law.[90] Another 2,300 women were employed in the Massachusetts paper mills in the Connecticut River valley.[91]

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[87]Towles, "Factory Legislation," *op. cit.*, p. 25.

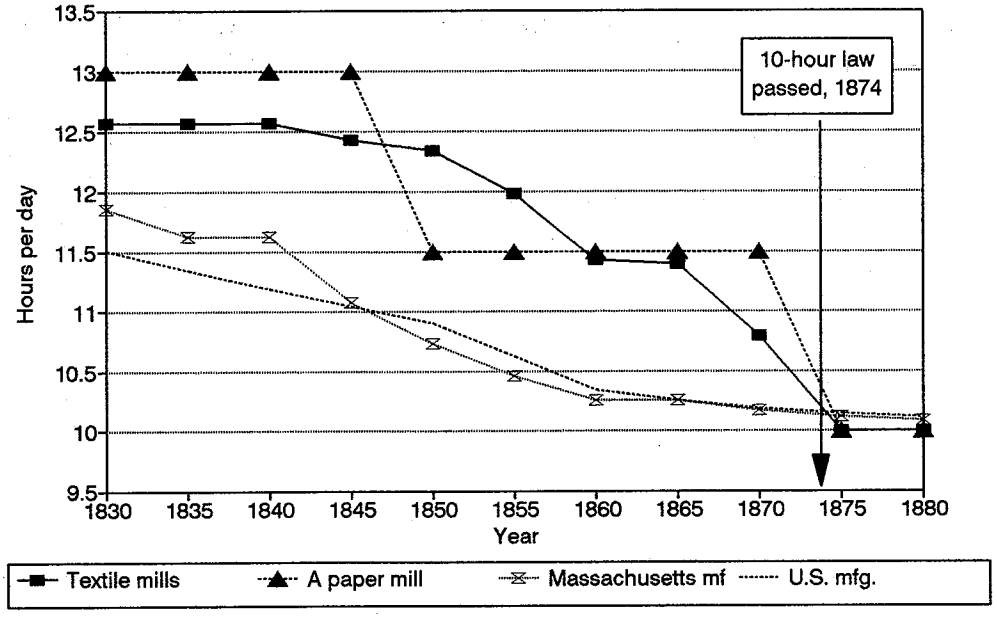
[88]These blacklists were also circulated throughout New England, making it difficult for these workers to find new work. See U.S. Congress. Senate, "History of Women in Industry," *61st Cong., 2d Sess, Document 645, op. cit.*, pp. 69-70 and 94-6.

[89]*Weeks Report, op. cit.*.

[90]U.S. Census Office, *Statistics of Wealth and Industry of the United States at the Ninth Census*, (Washington DC: Government Printing Office, 1872), Table 8, p. 430 and 489.

[91]*Ibid.*, p. 463.

FIGURE 1
Hours of Work in Massachusetts Industry



Source: Weeks' Report data.

Our belief that the dramatic change in hours in Massachusetts textile mills after 1874 was a direct result of the passage of the 10-hour law is further supported by contemporary statements of manufacturers. For example,

> From 1830 to 1865, all classes worked 13 hours a day; from 1865 to 1875, 11 hours, and since 1875, 10 hours. *The reduction to 10 hours was made because the state allows women and minors to work but 60 hours a week and the proprietor desired all hands work the same time.* (Emphasis added)[92]

The decision to reduce hours for everyone, rather than just for women, is consistent with employer monitoring to avoid shirking that included the regulation of entry and egress from the factory[93] and the establishment of rigid work rules including hours.[94]

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[92]*Weeks' Report, op. cit.*, p. 394.

[93]Montgomery quotes the Senate testimony of R. D. Layton that the five hundred workers at the carriage works of James Cunningham and Sons in Rochester, New York, were locked up from starting time to quitting time so that no pieceworker could finish a stint and leave. See David Montgomery, *The Fall of the House of Labor*, (Cambridge University Press, 1987), p. 152.

[94]See, for example, Illinois. Bureau of Labor Statistics, *Fourth Biennial Report*, (Springfield, Illinois: H. W. Rokker, 1886), pp. 501-26, especially p. 506.

Our assertions of the existence of "law-abiding" citizens notwithstanding, compliance was not automatic. As we have noted, the Hamilton Manufacturing Company was successfully prosecuted for violating the law. Moreover, some businesses continued to violate the law even after this successful test of the statute. For example, during 1886, in 377 factory inspections, 27 violations were found, four of them deemed worthy of prosecution.[95] In his report, the Chief of the District Police remarked:

> In former reports I had occasion to mention the attempt that had been made to evade the [1874] statute and to secure an extension of the daily hours in certain factories, upon the pretext that the time so taken was required to get up a proper rate of speed of machinery preparatory to the process of production. The margin over ten hours thus claimed and constantly taken by mill superintendents and agents *in some sections of the Commonwealth* amounted to twenty minutes or more daily. The difficulty of obtaining evidence was not lessened by the natural desire of the operatives to retain their employment by withholding information which might incriminate employers. *In every case where there appeared sufficient evidence to show that there had been a substantial violation of the law and the warning of our officers had not been heeded, I felt it my duty to make complaints in court* . . . (emphasis added)[96]

The inspector for Middlesex County (which includes Boston and Lowell and home to the Hamilton Manufacturing Company) reported some continuing problems:

> Nearly all the mills are now running by a schedule arranged for 60 hours a week, several having changed their time from 65 or 66 hours to 60 within a year or two.
>
> Occasional violations are detected, or reported to me, where there is temporary overwork to fill orders at the stipulated time, or to catch up in some department. In some cases, where the engine is started several minutes before the schedule (sic) time, complaints are made that the women, generally weavers, go to work five or ten minutes before the proper time, thus gaining one or two hours a week.
>
> Violations of this latter class are much more difficult to deal with than the other. The women want to work, and usually remember that they lose sufficient time during the day to make up for the time gained morning or noon.[97]

In general, however, by 1886 the inspectors thought that there was general compliance with the law. Consider, for example, the following remarks: from Worcester County: "I find little cause for complaint; the manufacturers in my district are generally strictly complying with the law;"[98] from Hampden and Hampshire counties: "more fully complied with during the last two years than ever before;"[99] from Bristol, Barnstable, Dukes and Nantucket counties: "The law . . . is much better

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[95]Massachusetts, *Report of the Chief of the Massachusetts District Police for the Year Eding December 31, 1886. Public Document 32* (Boston: Wright and Potter, 1887), p. 12. Most of the violations were apparently minor technical violations of the section requiring posting of a notice stating the hours of work that was amended during 1886. See Massachusetts, *Laws 1886*, C. 90.

[96]*Ibid.*, p. 18.

[97]*Ibid.*, p. 55.

[98]*Ibid.*, p. 63.

[99]*Ibid.*, p. 71.

observed than formerly."[100] Lastly, no problems whatsoever were reported for Essex County which encompasses the textile center of Lawrence and the shoe-making cities of Lynn and Danvers.

The laws regulating the employment of children and requiring school attendance almost invariably contained enforcement and penalty provisions. They also seem to have been frequently violated, perhaps because prosecution was uncertain even when violators were identified. For example, in his third report as Massachusetts Commissioner of Labor, Carroll Wright drew attention to the situation at Pacific Mills at Lawrence for which:

> no children are returned, although it is *known by investigation that children under 15 and many under 10 years of age are constantly employed in this establishment, contrary to law.* This is a well known fact in Lawrence, and an effort was made through the State Police to remedy this evil, but without effect. . . . *Our investigations warrant us saying that the School Law is universally broken.* (emphasis added)[101]

At the time, Pacific Mills was the largest manufacturing enterprise in America.

Fifteen years later, the inspector for Middlesex County wrote:

> In regard to the law regarding the employment of minors in factories, I think it can be safely said that few laws on the statute book are better complied with . . .
>
> When I began work in this department, seven years ago, not one in ten of the children under fourteen years of age employed in factories had certificates on file to show they had attended school as required by law . . .
>
> Now, ninety-nine out of a hundred such children have properly signed certificates showing the required attendance. Then, it was a common thing to find children under ten years of age at work in the mills; now, none under twelve are employed.[102]

Others echoed similar sentiments: "during the past year I have had no occasion to enter prosecution for the employment of children under sixteen years of age. In fact it is rare to find children under fourteen employed."[103]

Unfortunately, we have found very little information as yet about what happened outside of Massachusetts. What evidence we have found suggests that, while little or no effort was made to enforce hours laws for adults outside of Massachusetts, some effort was made to ensure compliance with the child labor and child education laws.

PROTECTIVE LEGISLATION AND HOURS OF WORK

In a 1980 study, Elisabeth Landes concluded that the legislation protecting women by limiting hours of work had two effects: First, it dramatically shortened work hours for women, but second, it also

[100] *Ibid.*, p. 69.

[101] Massachusetts. Bureau of Statistics of Labor. *Third Annual Report of the Bureau of Statistics of Labor* (Boston: Wright and Potter, 1872), pp. 162-3.

[102] Massachusetts, *Report of the Chief of the Massachusetts District Police, op. cit.*, p. 55.

[103] *Ibid.*, p. 63.

limited employment opportunities for women.[104] Those conclusions have been questioned by Claudia Goldin.[105] She argues that Landes' model is misspecified because it forces the entire impact of restrictions in women's hours to fall on women hours and denies the possibility that men might have gained from the restrictions. By removing implicit restrictions from the equation, Goldin shows that protective legislation reduced the hours of all workers.

Our model elaborates upon that used by Landes and Goldin. Consider the following identity for the firm:

$$H \equiv \alpha_f H_f + \alpha_y H_y + (1 - \alpha_f - \alpha_y) H_m \quad [1]$$

where $0 \leq \alpha_f, \alpha_y \leq 1$

and $\alpha_f + \alpha_y \leq 1$

which simply expresses the average daily hours of work for the firm as the weighted average of male hours (H_m), female hours (H_f) and child hours (H_y), where α_f and α_y are the proportions of the firm's labor force that was female and child. This may be rewritten as:

$$H = H_m + \alpha_f(H_f - H_m) + \alpha_y(H_y - H_m) \quad [2]$$

which now expresses hours of work in terms of male hours of work and the weighted differences between male and female or child hours.

Suppose now that a law, represented here by *LAW*, is passed restricting the hours that one group, say women, can work. Let the maximum hours of work that women are permitted to work under this law be H_{fmax}. If $H_{fmax} > H_f$ then the law is irrelevant for the firm and has no effect upon it. If all firms were working less than the maximum permissible hours before the law was passed then it merely codifies and fixes in place existing custom. If, however, $H_{fmax} < H_f$ then the firm is in violation of the law and must decide whether to risk prosecution or comply with the law. Whether or not the firm chooses to risk prosecution presumably depends, in part, upon the probability of detection and conviction and the size of the likely penalty relative to the gains versus the costs of complying. This will be determined by factors such as:

- whether or not there is any mechanism for enforcement, such as factory inspectors who have the right to make unannounced visits, review payroll records and interview employees;
- the risk that this firm would be visited by inspectors——Was it, for example, in an industry known traditionally to have employed the affected group for longer hours than now permitted by law? Did the firm draw attention to itself by vocal opposition to the law?;
- the possible seriousness of the violation measured, for example, by how many people were affected; the visibility of the firm——its size, location, etc.;
- the size of the maximum penalty upon conviction;

[104]Elisabeth M. Landes, "The Effect of State Maximum-Hours Laws on the Employment of Women in 1920," *Journal of Political Economy*, 88 (June 1980): 476-94.

[105]Claudia Goldin, "Maximum Hours Legislation and Female Employment in the 1920s: A Reassessment," *Journal of Political Economy*, 96 1(February 1988), pp. 189-205.

- how easily adjustments could be made through, for example, the substitution of other factors of production to compensate, the rearrangement of schedules, or changes in employment either to eliminate the affected factor or even increase the numbers employed so as to maintain the same total number of labor hours for this factor.

This list is not intended to be exhaustive.

Suppose that the law is binding and the firm complies by reducing the hours of work for women covered by the law from H_f to H_{fmax}, or by $(H_{fmax} - H_f)$. As a result, daily hours of work for the firm will be reduced by $(H_{fmax} - H_f)\alpha_f$ hours and the marginal impact of this law on women's hours, q, may be approximated:

$$q = (H_f - H_{fmax})/H_f \qquad [3]$$

We can now rewrite equation [1] to include firms operating in states with and without laws setting maximum hours of work for women by including the dummy variable *LAW* that assumes a value of 1 if the state has a maximum hours law for women and zero otherwise:

$$H = \alpha_f H_f + \alpha_y H_y + (1 - \alpha_f - \alpha_y)H_m + qH_f\alpha_f(LAW) \qquad [4]$$

This specification is that used by Landes. It assumes that because the law applies only to women it can only affect women hours. It thus contradicts the claims by contemporaries that the hours of all workers were cut in response to binding limits on women's hours. We believe that this reflected complementarity between men, women and children in nineteenth century factories, resulting from rigid gender- and age-based job discrimination. There was "women's work" and there was "men's work," and only rarely did the 'twain meet.

In a study of the boot and shoe industry, for example, it was asked: "Why should cutting continue to be so exclusively man's work?" The answer was:

> Long continued custom is no doubt a weighty reason. . . . Yet custom is not all. The material handled in the cutting room is heavy and clumsy, while the manipulation of hammer or machine requires considerable muscular force, which the operator must exercise while standing. Women brought up in towns will shun any operation to which these conditions are attached. There are few exceptions . . .
>
> . . . in the lasting room, there is no question of its unfitness for women . . .[106]

As a result:

> men and women do not often work in competition in the same industry. Occupations are apt to be assigned to one sex or the other, and even when both work nominally at the same occupation there is apt to be a difference in the kind of work done or the methods employed.[107]

[106]U.S. Department of Labor. Buraeu of Labor Statistics, "The Boot and Shoe Industry in Massachusetts as a Vocation for Women," *Bulletin 180*, (Washington DC: Government Printing Office, 1915), p. 34 and 39.

[107]*Ibid.*, p. 40.

Such statements are to be found in industry after industry: In canning and preserving: "there was a well-defined line of demarcation between the occupations of men and women . . .;"[108] in cans and boxes: "Competition between the sexes does not seem to have arisen to any serious extent . . .;"[109] in confectionery: "Candy making is sometimes called a woman's industry, because although *men do the actual making*, the women, who do everything else, outnumber them so greatly . . .;"[110] in core making: "since women are used only for making the lighter and less difficult cores, and since they never learn the trade as a whole, there seems little prospect that they will ever prove dangerous rivals of men in this work . . .;"[111] in paper box making: "in the highly organized factories the men and women had different occupations, so that competition did not exist . . .;"[112] *et cetera, et cetera*.

If, then, men and women had different occupations and played different role within the firm, they were complementary factors. In highly-integrated operations, this interdependence would dictate common starting and stopping hours. So too would ease of administration, supervision and the maintenance of discipline and control. Consequently, shorter hours for women very probably translated into shorter hours for men——an outcome for which men themselves had often agitated, lobbied, and struck.

This so, we can capture the impact in our model by approximating the marginal impact of hours legislation for women upon men by:

$$r = (H_m - H_{fmax})/H_m \quad [5]$$

and the marginal impact of hours legislation for women upon children by:

$$s = (H_y - H_{fmax})/H_y \quad [6]$$

The impact of these changes on the firm's hours is the given by:

$$rH_m(1 - \alpha_f - \alpha_y) \quad [7]$$

and

$$sH_y\alpha_y \quad [8]$$

We can now rewrite equation [4] to admit the possibility that adoption of an effective law governing women's hours may affect the hours of men and children as well as those of women:

$$H = \alpha_f H_f + \alpha_y H_y + (1 - \alpha_f - \alpha_y)H_m + qH_f\alpha_f(LAW) + sH_y\alpha_y(LAW) + rH_m(1 - \alpha_f - \alpha_y)(LAW) \quad [9]$$

where the first three terms are the contribution of female, youth and male hours to the firm's hours and the last three terms represent the impact of an hours law for women upon each of these contributions.

Rearranging terms in equation [9]:

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[108]U.S. Congress. Senate, "Report on Condition of Woman and Child Wage-Earners in the United States. Volume 18: Employment of Women and Children in Selected Industries," *61st Cong., 2d Sess, Document 645*, p. 42.

[109]*Ibid.*, p. 58.

[110]*Ibid.*, p. 129, emphasis added.

[111]*Ibid.*, p. 140.

[112]*Ibid.*, p. 243.

$$H = H_m + \alpha_f(H_f - H_m) + \alpha_y(H_y - H_m) + rH_m(LAW) + \alpha_f(qH_f - rH_m)(LAW) + \alpha_y(sH_y - rH_m)(LAW) \quad [10]$$

expresses the firm's average daily hours in terms of the hours worked by men each day adjusted by the weighted difference between female or child and male daily hours, the impact of a maximum hours law for women upon male hours per day and the weighted difference between female or child and male hours per day under a maximum hours law for women. This impact will vary not only with terms of the law but also its effectiveness. If the law is ignored, its impact will be zero.

Male, female and child hours, however, were not reported by the Census. As a result we cannot estimate H_m, H_f, and H_y directly or examine the difference female or child hours per day and those for men. Instead, the census simply reported daily scheduled hours for the firm as well as the average number of men, women and children employed. These yield estimates of H, α_f and α_y. Though unobserved, we can estimate the scheduled hours of work for separate groups and determine whether there is any systematic association between these hours and the passage of maximum hours laws. Consider the OLS regression equation based upon equation [10] above of the form:

$$H = \beta_0 + \beta_1\alpha_f + \beta_2\alpha_y + \beta_3(LAW) + \beta_4(\alpha_f LAW) + \beta_5(\alpha_y LAW) + u \quad [11]$$

The constant term, β_0, is an estimate of the average daily hours for men in states with no maximum hours law; β_3 is an estimate of the impact of a maximum hours law for women on the average daily hours for men; and β_1, β_2, β_4, and β_5 are estimates of the difference between female or child daily hours and male daily hours in states without and with a maximum hours law for women. A statistically significant estimate for β_3 would then be evidence in support of the Ohio Commissioner of Labor's view that female hours legislation was associated with a shorter workday for men. Statistically insignificant estimates for β_1, β_2, β_4, and β_5 would be evidence that employers required men, women and children to work the same hours. A statistically significant estimate for β_4 would imply that, in those states where there was a maximum hours law for women, women worked shorter hours than men. It is important to note that *we make no inferences regarding cause and effect* based upon the regression results. We do **not** interpret the results as showing that protective legislation limiting the length of the working day for women led or did not lead to shorter hours for men, women or children; merely that shorter hours were, or were not, associated with such legislation. It is the contemporary evidence we have uncovered that makes this linkage explicit

IMPACT OF HOURS LEGISLATION IN 1920 COMPARED WITH 1880

Ignoring for the moment the question of child labor and the impact of child labor and compulsory education laws upon the labor force composition and hours, Table 5 reproduces Goldin's replication of Landes' equation and the results from her respecified model. In Goldin's model, scheduled hours were regressed on the percent of the industrial labor force that was female, the interaction between this variable and a dummy representing whether or not a state had adopted a maximum hours law for women, the maximum hours law dummy variable, the percent of the state population that was urban and a dummy variable for the southern states. In Landes' specification, the maximum hours law dummy variable was not included. These estimates for 1920 were made using state-level data. The same variables with firm-level data were used in the 1880 equations except that urban was a dummy variable for whether or not the firm was located in an urban area, defined by the Census as an incorporated town or city with at least 2,500 inhabitants.

Landes concluded that women worked longer hours than men ($\beta_1 > 0$) but that women's hours were sharply reduced in those states that had adopted a maximum hours law for women ($\beta_4 < 0$). Goldin's respecification, however, suggests that male and female hours were the same ($\beta_1 = 0$ and $\beta_4 = 0$) but that hours for both men and women were substantially lower in states that had passed a

maximum hours law for women ($\beta_3 < 0$). In both, urbanization was associated with shorter hours while scheduled weekly hours of work in the South were substantially longer than those elsewhere.[113]

For 1880 we also conclude that the scheduled work-week was shorter in urban areas. Our estimates for 1880, however, are markedly different in a number of important respects.[114] First, our estimate of the coefficient on percentage of the firm's labor force that was female suggests that firms in those states without a maximum hours law where women were a larger proportion of the workforce had a shorter scheduled work-week ($\beta_1 < 0$). Whereas Landes' concluded that women were longer hours than men in those states where women were an important component of the labor force, we find that firms scheduled shorter hours. Second, although four states had passed a law regulating women's hours of work by 1880, hours of work in those states were not statistically different from those in states that had not passed such laws ($\beta_3 = 0$). Third, women's hours were no different from men's hours in those states that had passed these laws ($\beta_4 = 0$). Together, these two results suggest that the laws may have had little or no effect. Fourth, the scheduled work-week was substantially shorter, not longer, in the South. This implies that sometime between 1880 and 1920 the southern states went from having shorter scheduled working hours to having longer scheduled working hours than other states. Indeed, one can make a strong case that overall the underlying structure in 1880 was almost completely different from that in 1920 and in what follows we focus solely upon 1880.

TABLE 5
The Impact of Hours Legislation for Women on Scheduled Weekly Hours in 1920 Compared with 1880. [a]
(t-statistics)

Independent Variables	1920 data: Landes by Goldin	Goldin	1880 data: Landes model	Goldin model
Constant	53.4 (80.7)	54.8 (88.1)	63.6 (536.4)	63.6 (508.0)
SOUTH	1.34 (2.27)	1.51 (2.60)	-0.69 (-3.39)	-0.73 (-3.51)
URBAN[b]	-0.058 (-3.72)	-0.058 (-3.83)	-2.116 (-13.43)	-2.103 (-13.30)
% Female (β_1)	0.142 (2.36)	0.030 (0.36)	-1.416 (-2.86)	-1.482 (-2.96)
% Female*LAW (β_4)	-0.105 (-2.04)	0.055 (0.56)	-1.031 (-0.98)	-0.723 (-0.66)
LAW (β_3)		-2.162 (-1.87)		-0.205 (-0.97)
R^2	0.613	0.642	0.027	0.028
Number of observations	49	49	7,605	7,605

[a]We have converted average daily scheduled hours of work in 1880 to a weekly basis by multiplying by 6 to put them on the same basis as those for 1920.
[b]In 1920, URBAN = % of state population living in urban areas. In 1880, URBAN = Dummy variable = 1, if firm was located in a town or city with a population of 2,500 or more.

Source: 1920: Claudia Goldin, "Maximum Hours Legislation and Female Employment in the 1920s: A Reassessment," Journal of Political Economy, 96 1(February 1988), Table 1. 1880: 1880 Atack-Bateman sample.

[113]The means of the independent variables in 1920 were: *SOUTH* = 0.31; *URBAN* = 41.0; % Female = 12.3; *LAW* = 0.694.

[114]The means of the independent variables in 1880 were: *SOUTH* = 0.18; *URBAN* = 0.49; % Female = 0.049; *LAW* = 0.186.

MEASURING THE IMPACT OF HOURS LEGISLATION IN 1880

While child labor——ignored by Landes and Goldin——was of little and declining importance by 1920, it was by no means extinct. In 1918, for example, U.S. Supreme Court in *HAMMER V. DAGENHART* declared the Congressional prohibition of interstate commerce in goods produced by child labor unconstitutional.[115] Not until the passage of the Fair Labor Standards Act in 1938 was there an effective law against the use of child labor.

In 1880, children were much more important. They made up more than five percent of the industrial labor force in our sample and in some industries were a seventh of the workforce (see Table 2). Consequently, with respect to 1880 at least, the model in Table 5 is misspecified. We must include the possibility that scheduled hours of work might be just as easily affected by limits on children's hours of work as by maximum hours laws for women. Moreover, despite their declaratory nature, it is possible that "legal day" laws may also have had an effect. We have also taken advantage of this opportunity to recognize that the effects may differ between male- and female-dominated industries. We use two different approaches. In one (Table 6) we created one dummy variable for male-dominated industries, defined as those industries in Table 2 where women made up less than 2 percent of the labor force and another dummy variable for female-dominated industries defined as those where women were at least 20 percent of the work force.[116] In the other, we have used separate industry dummies with the textile industry as the omitted variable. This regression equation (Table 7) uses separate dummy variables for the Massachusetts maximum hours law for women, other states' maximum hours laws for women, legal day laws and child labor laws.

The regression results for equation (1) in Table 6 are similar to those for 1880 in Table 5. Shorter working days were associated with urban location and the southern states and women apparently worked a statistically significantly shorter day (about 12 minutes a day or an hour or so per week) than men in those industries whose workforce was 2 to 20 percent female. The coefficient on the dummy variable for state maximum hours law for women and the interactions between this dummy variable and the proportion of each firm's workforce that was female or child are statistically insignificant and small. When we separated the Massachusetts law from those of the other three sampled states that had passed laws limiting the hours of work for women (Ohio, Minnesota and Wisconsin), the coefficient on the Massachusetts law was significant and negative implying that scheduled work hours in Massachusetts in these mixed industries averaged about 20 minutes less per day than in all other states. This finding proves robust across all specifications that separately identify Massachusetts. Introduction of a dummy variable for those states that had adopted a legal day (equation (3)) suggests that such laws were probably introduced in states that had longer hours and were ineffective in securing shorter hours for men. However, women in these states did have shorter scheduled work hours than men——about 25 minutes a day. It seems unlikely that this was a result of the law. More likely, the result reflects the industrial distribution of the female labor force and the customary hours in those industries. More importantly, the introduction of the legal day dummy variable erased any statistical significance for the coefficient on the percent of the firm's workforce that was female. This coefficient, it will be recalled, measures the divergence between male and female scheduled hours of work. This result is robust with respect to the inclusion of child labor laws and the breakdown of the male- and female-dominated industry groupings into 2-digit SIC codes (Table 7). Two industries, SIC 20——food processing, a gender-mixed industry——and SIC 49——oil, gas and coke, a male-dominated industry——had significantly longer workdays than textiles and most other industries. Only one industry, printing (SIC 27) had significantly shorter working days.

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[115] 247 U.S. 251, 38 Supreme Court 529 (1918) declaring unconstitutional United States, *C. 432, 64 Cong., 1 sess.*.

[116] Male-dominated industries: SIC codes 7, 17, 24, 35, 37, 38, 49 and 76; Female-dominated industries: SIC codes 21, 22, 23, 26, and 39. See Table 2 above.

TABLE 6
The Impact of Hours Laws on the Length of the Scheduled Workday, 1880
(t-statistic)
Number of observations = 7,630

Variable	Equation (1)	(2)	(3)	(4)
constant	10.75	10.74	10.68	10.66
(H_m)	(414.70)	(413.57)	(333.76)	(331.62)
% Female	-0.195	-0.197	0.076	.043
(H_f - H_m)	(-2.09)	(-2.12)	(0.63)	(0.27)
% Children	-0.049	-0.054	-0.263	-0.261
(H_y - H_m)	(-0.37)	(-0.41)	(-1.44)	(-1.42)
SOUTH	-0.145	-0.140	-0.084	-0.091
	(-4.19)	(-4.07)	(-2.20)	(-2.39)
URBAN	-0.343	-0.321	-0.328	-0.320
	(-12.85)	(-11.92)	(-12.17)	(-11.86)
LAW_1 (Legal H_{fmax})	-0.050	--	--	--
(rH_m)	(-1.41)			
LAW_1*% Female	-0.091	--	--	--
(qH_f - rH_m)	(-0.49)			
LAW_1*% Children	0.090	--	--	--
(sH_y - rH_m)	(0.29)			
LAW_2 (Legal H_{fmax} Massachusetts)	--	-0.311	-0.242	-0.408
(rH_m)		(-5.24)	(-3.85)	(-5.68)
LAW_2*% Female		0.123	-0.141	-0.218
(qH_f - rH_m)		(0.46)	(-0.48)	(-0.64)
LAW_2*% Children		0.470	0.681	0.666
(sH_y - rH_m)		(0.64)	(0.91)	(0.83)
LAW_3 (Legal H_{fmax} Not Massachusetts)	--	0.065	0.132	-0.031
(rH_m)		(1.59)	(2.90)	(-0.53)
LAW_3*% Female	--	-0.043	-0.306	-0.384
(qH_f - rH_m)		(-0.18)	(-1.13)	(-1.22)
LAW_3*% Children	--	-0.084	0.131	0.115
(sH_y - rH_m)		(-0.25)	(0.37)	(0.25)
LAW_4 (Legal Day: H_{max})	--	--	0.110	0.055
(rH_m)			(3.33)	(1.57)
LAW_4*% Female	--	--	-0.414	-0.406
(qH_f - rH_m)			(-2.25)	(-2.17)
LAW_4*% Children	--	--	0.441	0.422
(sH_y - rH_m)			(1.69)	(1.47)
LAW_5 (Child Labor legal H_{ymax})	--	--	--	0.175
(rH_m)				(4.66)
LAW_5*% Female	--	--	--	0.116
(qH_f - rH_m)				(0.60)
LAW_5*% Children	--	--	--	0.012
(sH_y - rH_m)				(0.04)
Male-dominated industries	-0.263	-0.259	-0.257	-0.255
	(-9.70)	(-9.55)	(-9.52)	(-9.45)
Female-dominated industries	-0.301	-0.307	-0.314	-0.320
	(-6.54)	(-6.68)	(-6.83)	(-6.98)
Adjusted R^2	.040	.044	.046	.049
F-ratio	36.8	30.4	25.6	22.9

Source: 1880 Atack-Bateman sample.

We draw two important inferences from these regressions. First, the lack of statistical significance and the small coefficients attached to the proportion of the labor force that was female or child under all of the less restrictive equation specifications supports the contemporary assertions and evidence that men, women and children all worked the same hours. As a result the determination of the labor force composition is independent of hours. Second, wherever Massachusetts is singled out, the coefficient on the legal dummy variable for Massachusetts is consistently and statistically significantly negative and large. It may be argued that this simply reflects some unique, but non-specific, attribute of Massachusetts manufacturing. We think not. Despite our reluctance to assert causal relationships, we believe that the quantitative and qualitative evidence support the assertion that the shorter working day in Massachusetts was the result of the passage of Massachusetts Ten Hour law for women. Furthermore, consistent with the claim of the Ohio Commissioner of Labor, this legislation "being secured caused a lessening of the hours of adult male labor," while women reaped no differential specific gain. This is not entirely true, for as Figure 1 suggests, the dominant employer of women in

Massachusetts, the textile industry, had a longer working day than was customary in other industries prior to the passage of the Ten Hour law.

TABLE 7
The Impact of Hours Laws on the Length of the Scheduled Workday, 1880
(t-statistic)
Number of observations = 7,630

Variable	Coefficient	Variable	Coefficient
constant	10.36	SIC 21	-0.191
(H_m)	(63.78)		(-1.10)
% Female	0.027	SIC 23	-0.048
(H_f - H_m)	(0.17)		(-0.28)
% Children	0.032	SIC 24	0.102
(H_y - H_m)	(0.17)		(0.63)
SOUTH	-0.147	SIC 25	-0.143
	(-3.89)		(-.82)
URBAN	-0.194	SIC 26	0.174
	(-6.85)		(0.87)
LAW_2 (Legal H_{fmax} Massachusetts)	-0.371	SIC 27	-0.372
(rH_m)	(-5.27)		(-2.04)
LAW_2*% Female	-0.261	SIC 28	0.205
(qH_f - rH_m)	(-0.78)		(1.15)
LAW_2*% Children	0.680	SIC 31	0.062
(sH_y - rH_m)	(0.87)		(0.38)
LAW_3 (Legal H_{fmax} Not Massachusetts)	-0.013	SIC 32	-0.135
(rH_m)	(-0.22)		(-0.77)
LAW_3*% Female	-0.495	SIC 33	-0.164
(qH_f - rH_m)	(-1.61)		(-0.96)
LAW_3*% Children	-0.198	SIC 34	-0.251
(sH_y - rH_m)	(-0.44)		(-1.27)
LAW_4 (Legal Day: H_{max})	0.049	SIC 35	-0.198
(rH_m)	(1.45)		(-1.18)
LAW_4*% Female	-0.408	SIC 36	-0.123
(qH_f - rH_m)	(-2.23)		(-0.19)
LAW_4*% Children	0.236	SIC 37	-0.304
(sH_y - rH_m)	(0.84)		(-1.35)
LAW_5 (Child Labor legal H_{ymax})	0.170	SIC 38	-0.206
(rH_m)	(4.63)		(-0.50)
LAW_5*% Female	0.144	SIC 39	-0.255
(qH_f - rH_m)	(0.75)		(-1.46)
LAW_5*% Children	-0.045	SIC 49	0.549
(sH_y - rH_m)	(-0.14)		(2.13)
SIC 7	-0.131	SIC 76	0.163
	(-0.60)		(0.99)
SIC 17	-0.184		
	(-1.12)		
SIC 20	0.645	Adjusted R^2	0.095
	(3.97)	F-ratio	22.7

Source: 1880 Atack-Bateman sample.

THE IMPACT OF HOURS LEGISLATION ON LABOR FORCE COMPOSITION

Although a firm's hours do not seem to have been simultaneously determined with the labor force composition, the passage of laws limiting the hours of work for women and children may still have affected the labor force mix. Rather than comply with the law by reducing hours or violate the law, firms may have met its conditions by eliminating those workers whose employment would otherwise constrain the firm's scheduled work day. This is a plausible alternate scenario wherever and whenever states made efforts to enforce the laws. A rent-seeking model of the passage of hours laws for women and children would emphasize male support for these laws in the hope that employers would reduce employment of those workers affected by the law and increase demand for those who remained unconstrained. Again, we cannot rigorously test this proposition with cross-sectional data for a single year but we can see if the evidence is consistent with the hypothesis.

We have shown that in most industries occupations were segregated by gender. Men traditionally performed tasks that required physical strength and stamina; women worked at those tasks that emphasized quickness and nimbleness. So too did children. Women and children may therefore have been regarded as closer substitutes for one another than men and women or men and children. Men could, however, be used in place of either. Indeed, the data on labor force composition in Table 2 above show that most firms in most industries employed no women or children. Nevertheless, there were some firms in many of the industries (except textiles, glass and brick, all metals and gas, coal and oil) that reported employing only women or children or both, although these were clearly the exceptions. Excepting textiles, all of the industries in which no firms exclusively employed women or children were ones that placed a premium upon physical strength and endurance such as carrying bricks, stoking fires, and tapping furnaces.

Our model specifies that firms simultaneously determined the proportions of female and child workers they employed and that these proportions were influenced in part by laws governing the employment of each kind of labor. We have combined state compulsory education laws and child labor laws into a composite dummy variable representing constraints upon the employment of children. The impact of laws on labor force composition, however, depends critically upon whether or not any effort was made to enforce the laws. There is some evidence of at least haphazard enforcement of compulsory education and child labor laws. With respect to laws setting maximum hours for women, however, the only evidence of enforcement is from Massachusetts. We therefore restricted consideration to the Massachusetts 10-hour law.

Other factors also entered the decision such as traditional industry practices with respect to the employment of each, the size of the labor force (as a proxy for the potential extent of the division of labor), the firm's capital-labor ratio (a proxy for the extent of mechanization), use of steam or water power (to capture the substitution of inanimate power for human muscle) and dummy variables representing the southern states and urban locations. The inclusion of the *SOUTH* dummy reflects Goldin and Sokoloff's argument regarding differential regional relative valuations for women and children compared with men in agricultural versus industrial pursuits.[117] The *URBAN* dummy is to capture differential labor market conditions and opportunities between cities and rural areas.

More formally our model is:[118]

$$\alpha_f = \beta_{f0} + \phi_{fy}\alpha_y + \beta_{f1}X_1 + \beta_{f2}X_2 + \ldots + \beta_{f10}X_{10} \qquad [12]$$

$$\alpha_y = \beta_{y0} + \phi_{yf}\alpha_f + \beta_{y2}X_2 + \beta_{y3}X_3 + \ldots + \beta_{y10}X_{10} + \beta_{y11}X_{11} \qquad [13]$$

where X_1 = the Massachusetts 10-hour law; X_2 = number of employees; X_3 = Capital/Labor ($1,000/person); X_4 = male-dominated industry; X_5 = female-dominated industry; X_6 = child-dominated industry; X_7 = use of waterpower; X_8 = use of steam power; X_9 = *SOUTH*; X_{10} = *URBAN* ; and X_{11} = laws affecting the employment of children (includes both children's hours and compulsory education laws). Notice that X_1 is included in equation [12] but not [13] while X_{11} is included in equation [13] but not [12]. Except for employment and the capital-labor ratio, all of the X_i variables are binary. In the model as specified the proportion of the workforce that was female does not directly depend upon the adoption of laws regulating the employment of children, nor does the

[117]See Claudia Goldin and Kenneth Sokoloff, "The Relative Productivity Hypothesis of Industrialization," *Quarterly Journal of Economics*, 99 (1982), pp. 461-88 and Goldin and Sokoloff, "Women, Children, and Industrialization," *op. cit.*, pp. 760-1, Table 5.

[118]We are grateful to Alan Dye for deriving these equations and their reduced forms and for demonstrating that they are exactly identified.

proportion of children in the workforce depend directly upon laws limiting the hours of work for women.

The reduced forms of [12] and [13] are:

$$\alpha_f = \pi_{f0} + \pi_{f1}X_1 + \ldots + \pi_{f11}X_{11} \quad [14]$$

$$\alpha_y = \pi_{y0} + \pi_{y1}X_1 + \ldots + \pi_{y11}X_{11} \quad [15]$$

where:

$$\pi_{f0} = (\beta_{f0} + \phi_{fy}\beta_{y0})/(1 - \phi_{fy}\phi_{yf})$$

$$\pi_{f1} = (\beta_{f1} + \phi_{fy}\beta_{y1})/(1 - \phi_{fy}\phi_{yf})$$

$$\ldots$$

$$\pi_{y11} = (\beta_{y11} + \phi_{yf}\beta_{f11})/(1 - \phi_{fy}\phi_{yf})$$

Including the zero restrictions on β_{y1} and β_{f11}, this system is just identified and we can thus use the indirect least squares approach to estimate the parameters of the structural equations. The coefficients of the reduced form equations are first estimated using OLS and these unbiased and consistent estimates are then used to calculate the structural equation parameters. For example:

$$\pi_{y1}/\pi_{f1} = (\beta_{y1} + \phi_{yf}\beta_{f1})/(\beta_{f1} + \phi_{fy}\beta_{y1})$$

Using the restriction that $\beta_{y1} = 0$,

$$\pi_{y1}/\pi_{f1} = \phi_{yf}\beta_{f1}/\beta_{f1} = \phi_{yf}$$

The resulting estimates are consistent but biased since they depend upon the ratio of the reduced form coefficients.

The coefficients of the reduced form equations are shown in Table 8. Most coefficients in each equation are statistically significantly different from zero at better than the ninety-five percent level and the equation to estimate the proportion of each firm's labor force that was female performed particularly well. Based upon these coefficients we have estimated the parameters of the structural equations. These are shown in Table 9.

As might be expected from the formulation of the structural equations, women and children appear as substitutes for one another. However, what was unexpected was the magnitude of the effect for women. The structural parameter ϕ_{fy} implies that a one percentage point increase in the proportion of children employed is associated with a 2.6 percentage point decline in the proportion of women in the workforce. Conversely, of course, women stood to gain a substantial increase in their employment share from anything such as compulsory school attendance that caused the proportion of children a firm employed to decline. Were women therefore only concerned about the welfare of children when they agitated for compulsory school attendance and the passage of restrictions upon the employment of children? A one percentage point decrease in the proportion of women in the workforce, however, increased child employment by less than one percentage points.

TABLE 8
The Impact of Maximum Hours Legislation in 1880 upon Firm Labor Force Mix.
(t-statistic)

Dependent variable: Proportion of adult females in the firm's labor force		Dependent variable: Proportion of males under 16 and females under 15 in the firm's labor force	
Variable:	Coefficient		Coefficient
Constant (π_0)	0.0304		0.0278
	(6.39)		(8.17)
Massachusetts 10-Hour Law (π_1)	0.0274		-0.0179
	(3.80)		(-3.49)
Number of employees (π_2)	0.0004		0.00005
	(12.65)		(2.34)
Capital/Labor (π_3)	-0.0043		-0.0040
	(-4.07)		(-5.42)
Male-dominated industry (π_4)	-0.0249		-0.0141
	(-6.80)		(-5.36)
Female-dominated industry (π_5)	0.2256		-0.0012
	(35.61)		(-0.26)
Child-dominated industry (π_6)	-0.0815		0.0384
	(-11.93)		(7.86)
Waterpower (π_7)	-0.0122		-0.0060
	(-2.27)		(-1.56)
Steam power (π_8)	-0.0011		0.0101
	(-0.26)		(3.29)
SOUTH (π_9)	-0.0071		0.0050
	(-1.38)		(1.36)
URBAN (π_{10})	0.0073		0.0143
	(1.97)		(5.40)
Children's Laws (π_{11})	0.0078		-0.0030
	(1.84)		(-0.98)
Adjusted R^2	0.2305		0.0280
F-ratio	211.75		21.31

Source: 1880 Atack-Bateman sample.

Laws restricting job opportunities for children through hours laws and compulsory schooling had the expected effect of reducing the proportion of children employed. However, its impact was very small. In states that had adopted such laws, the proportion of children employed was only 0.3 percentage points lower than that in an otherwise identical firm operating in a state without such a law. The positive parameter for the Massachusetts 10-hour law for women, however, implies that the proportion of female employees was increased by the law. This seems unlikely although we note that organized labor had argued for shorter hours as a means of increasing employment. Instead, we believe that this probably reflects the greater proportion of female workers in Massachusetts than elsewhere. That is, this dummy variable is picking up state-specific phenomena that may dominate the impact of the 10-hour law. Substituting a dummy for all states that had passed hours laws for women in place of the dummy representing the Massachusetts law yields a parameter estimate that is negative but very small (-.00065) and not statistically significantly different from zero. It would appear, therefore, that women experienced no serious employment effects as the result of the passage of maximum hours laws for women although since the laws were thought to be ineffective everywhere except Massachusetts we may be simply measuring the degree to which those laws were ignored.

TABLE 9
Parameter Estimates of the Structural Equations for the Impact of Enforced Laws Restricting Employment on Employment Shares: 1880.

Dependent variable: Proportion of adult females in the firm's labor force		Dependent variable: Proportion of males under 16 and females under 15 in the firm's labor force	
Variable:	Parameter Estimate		Parameter Estimate
Constant (β_{i0})	-0.1464		-0.683
Proportion of children (ϕ_{fy})	-2.6000		—
Proportion of women (ϕ_{yf})	—		-0.6533
Massachusetts 10-Hour Law (β_{i1})	0.0274		—
Number of employees (β_{i2})	0.0016		0.0004
Capital/Labor (β_{i3})	0.0211		0.0098
Male-dominated industry (β_{i4})	0.0882		0.0435
Female-dominated industry (β_{i5})	0.3187		-0.2093
Child-dominated industry (β_{i6})	-0.0263		0.0212
Waterpower (β_{i7})	0.0398		0.0200
Steam power (β_{i8})	-0.0360		-0.0134
SOUTH (β_{i9})	-0.0085		-0.0005
URBAN (β_{i10})	-0.0637		-0.0273
Children's Laws (β_{i11})	—		-0.0030

Source: Computed from the reduced-form coefficients in Table 8.

COMPLIANCE AND PROTECTIVE LEGISLATION

Our discussion so far has focused on the extent to which businesses tried to comply with maximum hours laws and restrictions upon the employment of children by reducing hours or curtailing employment of the protected groups. There was, however, a third option——to break the law and risk prosecution and conviction. Some firms——the Hamilton Manufacturing Company to name but one——preferred this to the alternatives.[119] Why? What factors entered that decision?

If the law was something less than a compelling moral force then compliance demanded enforcement. There had to be a mechanism for the detection and punishment of violators. In Massachusetts the District Police were charged with enforcement and, as we have seen, did on occasion bring charges against those who ignored warnings. These resulted in conviction and fines. We have not yet located information on the prosecution of cases in the local courts of the other states that had passed laws limiting the hours of work for women or children but believe that such evidence of enforcement does exist. The contracting-out provisions of all but the Massachusetts law, however, made hours law enforcement for adults, difficult although not impossible. The Massachusetts Supreme Court, for example, had no difficulty deciding that the Hamilton Manufacturing Company had "willfully" violated the law. There is no reason why it should have been more difficult for other courts to decide whether coercion had been used. This was, after all, a concept well-established in criminal law. The enforcement of child labor laws, however, might have been more difficult where the courts demanded evidence that firms had "knowingly" violated the law. Such evidence presumably required the continued employment of a minor after the firm had been advised of the violation.

[119]For cases decided at the state supreme court level, see *COMMONWEALTH V. HAMILTON MANUFACTURING COMPANY*, 125 Mass. 383; *WENHAM V. STATE*, 65 Neb. 394, 400, 406; *STATE V. BUCHANAN*, 29 Wash. 602; *COMMONWEALTH V. BEATTY*, 15 Pa. Sup. Ct. 5, 17; *RICHIE v. PEOPLE*. 155 Ill. 98 (1895).

Where no penalties existed, compliance depended solely upon the moral force argument. Where fines could be levied, compliance was likely to be a function of the expected penalty. This depends upon the magnitude of the likely fine and the probability of detection. As we have argued, detection might be expected to be a function of firm location (urban areas were more likely to be policed and the existence of violations more widely known), industry (by custom or technological constraint, some industries had longer working days), the number of employees covered (the larger the number of protected employees the greater the likelihood of complaint and the greater the incentive for the authorities to seek compliance). In addition, we believe that two other, firm-specific factors might influence the decision: whether or not the firm used steam power and the size of the firm's fixed capital. Steam power involved fixed costs associated with firing the boilers and building up steam. The firm's capital investment is a proxy for the firm's fixed costs of production.

Whether or not a firm violated the law is, however, unobserved except in the few cases that were prosecuted. Instead we assume that scheduled hours in excess of the prescribed maximum **and** employment of the protected group are *prima facie* evidence of violation. This reliance upon the self-reporting of violations almost certainly biases the measure downwards. However, it seems preferable to one alternative we considered that classified as potential violators all those firms that claimed to be just in compliance. We may be certain that some of those firms that employed covered groups and reported scheduled hours of work exactly equal to the maximum allowed violated the law. The objective evidence——scheduled hours of work——suggests that the law was probably a binding constraint upon them. They therefore had the incentive to violate it. As the Chief of the Massachusetts District Police observed:

> Occasional violations are detected, or reported to me, where there is temporary overwork to fill orders at the stipulated time, or to catch up in some department. In some cases, where the engine is started several minutes before the schedule (sic) time, complaints are made that the women, generally weavers, go to work five or ten minutes before the proper time, thus gaining one or two hours a week.[120]

However, we cannot distinguish these firms from the others that not only claimed to comply but in fact did comply with law. Hence our preference for the self-reported violations measure despite the downward bias.

For women's maximum hours laws we have restricted consideration to the four sample states that had passed such law: Massachusetts, Minnesota, Ohio and Wisconsin and use samples of firms from the individual states rather than those firms from these states that appear in the 1880 Atack-Bateman national sample. The total sample size is consequently much larger——2,118 firms. Of these, 235 employed at least one women and hence could have violated the law. Of these, 139 reported scheduled hours that were exactly equal to the maximum permitted by their state laws for women. Perhaps more surprisingly, 54 firms (4 in Massachusetts, 2 in Minnesota, 13 in Ohio and 35 in Wisconsin), almost a quarter of the total, self-reported violations——that is, they reported scheduled hours of work in excess of the maximum permitted for women. In "male-dominated" industries such as lumber a majority of firms that employed at least one woman worked longer than the maximum permissible hours. The largest number of self-reported violations, however, was in the clothing trade where 14 of 56 firms reported longer hours than allowed by law. Most firms that employed women in Wisconsin which had the most restrictive law——8 hours per day——violated the law but presumably the women had "voluntarily" accepted contracts for longer hours. At the opposite extreme, only 4 percent of the Massachusetts firms employing women reported hours in excess of the legal maximum, consistent with the statutory prohibition on contracting-out and the apparently fairly rigorous enforcement of the law.

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[120]Massachusetts, *Report of the Chief of the Massachusetts District Police, op. cit.*, p. 55.

TABLE 10
WHAT INFLUENCED A FIRM'S DECISION TO VIOLATE MAXIMUM HOURS LAWS FOR WOMEN IN 1880?

Logit Estimates (0 = in compliance; 1 = out of compliance) Number of obs = 216
Chi-square(9) = 71.78 Prob > chi-square = 0.0000
Log Likelihood = -78.526328

Variable	Coefficient	Std. Error	t	Prob >t	Mean
VIOLATE					.2222222
Maximum fine ($)	-.0085625	.0197104	-0.434	0.664	51.38889
URBAN dummy	-1.002342	.4354745	-2.302	0.022	.7361111
MASSACHUSETTS dummy	-2.804866	.5963419	-4.703	0.000	.5092593
Number of female employees	-.0133848	.0170828	-0.784	0.434	11.83796
Capital/Labor ($1,000 per employee)	.5684085	.3898243	1.458	0.146	.6185841
Capital Invested ($1,000)	.0186874	.0363419	0.514	0.608	18.14815
Capital Invested squared	-.00028	.0003592	-0.779	0.437	1975.935
STEAM POWER dummy	-1.11795	.6078146	-1.839	0.067	.2685185
FEMALE-DOMINATED INDUSTRY dummy	-.7594951	.4503048	-1.687	0.093	.4537037
Constant	1.004376	1.164657	0.862	0.389	1

Comparison of Outcomes and Probabilities

Outcome	Pr < .5	Pr > = .5	Total
Failure	157	11	168
Success	22	26	48
Total	179	37	216

Source: Calculated from the 1880 Atack-Bateman state samples.

Logit estimates to determine what factors affected the probability that a firm would chose to violate the law are shown in Table 10. Two variables, the urban dummy and the Massachusetts dummy, were statistically significant at better than the ninety-five percent level and indicate that the probability of violation was lower in urban areas and in Massachusetts than elsewhere. Two other dummy variables, use of steam power and "female-dominated" industry, were statistically significant at better than the ninety percent level. These also indicate that the probability of violation was lower in steam-powered plants and in female-dominated industries. Only the impact of steam power is contrary to that which we expected.[121]

As the matrix at the bottom of Table 10 indicates, these estimates do a good job of predicting whether or not a firm was out of compliance with their state law limiting the hours that women could be employed. We correctly identify 93 percent of those in compliance (157/168) as being in compliance and

[121]It seems unlikely that this is the result of multicolinearity with any of the obvious variables. For example, use of steam power was weakly negatively correlated with urban location (R = -0.064).

correctly predict 54 percent of the firms that were apparently out of compliance (26/48). Overall, our predictions were correct 85 percent of the time.

TABLE 11
IMPACT OF FIRM CHARACTERISTICS AND LOCATION UPON THE PROBABILITY OF VIOLATING MAXIMUM HOURS LAWS FOR WOMEN IN 1880.

Base characteristics: Maximum fine = $50; URBAN = 1; Massachusetts = 0; 10 female employees; Capital/Labor = $1,000/employee; Capital invested = $20,000; STEAM POWER = 1; "Female-Dominated" industry = 1

Differential Characteristic	Probability	Differential Characteristic	Probability
No changes	0.167	Not "female-dominated"	0.300
Not Steam-powered	0.380	Massachusetts firm	0.012
Not urban	0.353	100 female employees	0.057
K/L = $2000/employee	0.261	Capital invested $100,000	0.057
Impact of different maximum fines:			
Massachusetts-based firms			
Urban, $0 fine	0.018	Rural, $0 fine	0.048
Urban, $100 fine	0.008	Rural, $100 fine	0.022
Urban, $500	0.0003	Rural, $500 fine	0.0007
Non-Massachusetts-based firms			
Urban, $0 fine	0.235	Rural, $0 fine	0.456
Urban, $100 fine	0.116	Rural, $100 fine	0.263
Urban, $500	0.004	Rural, $500 fine	0.011

Source: Computed from Table 9.

The estimates in Table 10 can be used to generate estimates of the probability of compliance or violation for firms with differing characteristics. These are calculated as:

$$p(\text{violate}) = 1 - p(\text{comply}) = 1 - \{1/[1 + e^{(b_0 + b_i X_i^*)}]\}$$

for the set of characteristics defined by the vector X_i^*. Some estimates (an infinite number are possible) are shown in Table 11. The probability that an urban, steam-powered firm employing ten women in a female-dominated industry with a an invested capital of $20,000 and a capital-labor ratio of $1,000/employee in a state other than Massachusetts with a $50 fine for violation of the maximum hours law would violate the law was 0.167. In Massachusetts, the probability that this same firm would violate the law would have been only 0.012. On the other hand, if the same firm were located in a rural area outside Massachusetts, the probability that it would violate the law rises to 0.353. As an extreme case, a rural firm outside of Massachusetts that employed just one woman in a water-powered, non-female-dominated industry with a capital labor ratio of $500 and only $5,000 invested capital——say a flour mill——would be expected to violate the law more than 70 percent of the time if the maximum fine was $50 and 80 percent of the time if there was no fine.

Although we cannot specifically identify the source of the greater compliance with the law in Massachusetts, we believe that it reflects the cut-and-dried nature of the law with its prohibition on contracting out. Even so, some firms would still violate the law, especially in small rural areas and in industries not usually associated with female employment. In this respect, the Hamilton Manufacturing

Company's decision to disregard the law was unusual though perhaps the successful state prosecution in that case helps explain our findings.

Unfortunately, the coefficient on the size of maximum fine that could be levied was not statistically significant. Perhaps this reflected the widespread irrelevance of the punishment so long as Massachusetts was the only state that enforced its law and levied the fine. Nevertheless, it had the expected sign——stiffer fines were associated with greater compliance. As a result, compliance in Massachusetts could have been virtually assured if the legislature had been willing to raise the maximum fine for violation to, say, $500. All this of course begs the question whether the legislature would have passed the law if the penalties had been that high and whether the courts would have been willing to levy the maximum fine even in cases of flagrant, willful and repeated violation. At the $500 level, however, only 3 urban firms in 10,000 and 7 rural firms in 10,000 would have broken the law. Even in those states that permitted contracting out, sharp increases in fines would probably have encouraged much greater compliance.

CONCLUSION

As with much of the recent debate over the origins of regulation in the American economy, the emergence of protective legislation limiting hours of work for women and children has been interpreted by many as the result of rent-seeking by male workers. As a result, protective legislation has been under attack in Congress and the Courts for more than twenty years. It has now perhaps had its last gasp in the U.S. Supreme Court decision in *INTERNATIONAL UNION, UAW V. JOHNSON CONTROLS, INC.*.

Our analysis of the early origins of this legislation, however, paints a quite different picture of motivation at its inception. Rather than being a symbol of the exercise of political power of men to obtain rents at the expense of women, the early laws, particularly those setting maximum hours for women, were proof of the inability of men to secure the shorter hours that many desired on their own either through industrial or legislative action. Instead, a coalition of social reformers and labor groups portrayed women as the fair and weaker sex in need of protection through shorter hours for the health and security of the nation. Had not women workers also sought shorter hours the interpretation would, of course, be quite different but there is ample documentary evidence that this ploy was adopted only after more direct methods had failed to achieve the desired result——shorter hours for everyone. Nor does the passage of early laws restricting women's hours of work appear to have adversely affected job opportunities for women.

For the twentieth century, Claudia Goldin's study suggests that protective legislation to limit hours had the effect of reducing hours of work for both men and women. In the nineteenth century this seems to have been true only in Massachusetts. Elsewhere the laws apparently had little or no effect. This conclusion suggests that enforcement played a crucial role. Only the Massachusetts law superseded contracts and prohibited contracting out prior to the late 1880s and only in Massachusetts does there seem to have been a rigorous and systematic effort to uncover and prosecute violations. The efficacy of this approach did not go unnoticed and the Massachusetts law became the model for similar laws in other states. Not all those laws, however, were found acceptable. For example, the Illinois Supreme Court struck down the Illinois eight-hour law for women in *RICHIE V. PEOPLE*[122] in 1895 while the US Supreme Court denied New York in *LOCHNER V. NEW YORK*[123] but upheld the state of Utah in *HOLDEN V. HARDY*.[124] The distinction between them seems to be that a clear case had to be established for the exercise of the police powers of the state to protect health to supersede and "freedom

[122]*RICHIE V. PEOPLE*, 155 Ill. 98 (1895).

[123]*LOCHNER V. NEW YORK*, 198 US 45 (1905).

[124]*HOLDEN V. HARDY*, 169 US 366 (1898).

of contract" under the 14th Amendment. This case was clearly made in the Massachusetts law and affirmed by the Massachusetts Supreme Court in *COMMONWEALTH V. HAMILTON MANUFACTURING COMPANY*[125] as it was in the other decisions affirming state laws at the federal level such as *MULLER v. OREGON.*[126]

No such case was made for the declaratory "legal day" laws. They seem to have been totally ineffective in reducing daily hours of work. Indeed our results suggest that firms in states with such laws generally had longer scheduled hours of work than elsewhere. These laws stressed that workers could not be "compelled" to work longer hours but were free to contract to do so. However, one might argue, as many did, that the presentation of a contract for signature upon pain of dismissal constituted compulsion although the Courts never addressed the issue. Equally, employers were free to find an substitute work force that would be willing to work longer hours should the current work force be unwilling. Worker health was never a consideration.

Since children as minors had no freedom of contract, legal obstacles to restrictions on children's hours and work opportunities were minimal. Where laws were passed, they generally contained enforcement provisions and penalties and our results suggest that women may have benefited from increased employment opportunities where these laws were effective in removing some children from the factories. Many of the laws, however, were easily evaded especially where they declared that employers could not "knowingly" employ underage children for longer hours or children without the requisite educational attainment. Despite extensive policing efforts even Massachusetts seems to have found it harder to enforce the child labor laws in part because of the possibility of deception as to age and schooling by the parents or the children. Thus companies might unwittingly violate the law. Carroll Wright in his survey of the impact of the Ten Hour law in Massachusetts alluded to this in his diatribe against the French-Canadians in Massachusetts:

> They will not send their children to school if they can help it, but endeavor to crowd them into the mills at the earliest possible age. To do this they deceive about the age of their children with brazen effrontery. They also deceive about their schooling . . .[127]

Within each firm, men women and children kept the same hours quite independent of any laws. This is consistent with the rigid sexual segregation of jobs common in the nineteenth century that resulted in men and women being complements rather than substitutes within the firm as well as with the desire by employers to monitor their workers, particularly in the larger plants. However, there were systematic variations in hours from industry to industry, between city and countryside and between North and South, reflecting forces such as custom, preferences and the demands of technology.

In the twentieth century, however, the breakdown of rigid gender-specific tasks in the workplace eliminated much of the complementarity between men and women which allowed this strategy to work to the advantage of both sexes. Instead, men and women increasingly became substitutes for one another with the result that men became the principal beneficiaries of legislation restricting hours of work for women. Such laws have now disappeared.

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[125]*COMMONWEALTH V. HAMILTON MANUFACTURING COMPANY*, 120 Mass. 383 (1876).

[126]*MULLER v. OREGON*, 208 US 412, (1908).

[127]Massachusetts. Bureau of Labor Statistics, *Twelfth Annual Report*, (Boston: Rand, Avery & Co., 1881), Public Document No. 15, Part III, "Uniform Hours of Labor," pp. 323-475, especially pp. 470-1.