NBER WORKING PAPER SERIES

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DIRECT EVIDENCE FROM CALIFORNIA

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Working Paper 5973

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NBER Working Paper No. 5973
March 1997
JEL No. J23
Labor Studies

## ABSTRACT

For many years California has required that most women receive time-and-a-half for hours

of work beyond 8 in a given day. In 1980 this daily overtime penalty was extended to men. This

change provides a unique opportunity to estimate the impact of an exogenous increase in the relative

price of a marginal hour of labor on the demand for hours of work. Analyzing Current Population

Survey data from 1973 and 1985, we find that the overtime penalty substantially reduced the amount

of daily overtime worked by California men compared to men in other states and to women in

California. Our estimates imply that the price elasticity of demand for overtime hours is at least

-0.70.

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# I. The Issue

Measurements of the price elasticity of demand for an hour of labor have generally been produced by examining the impact of legislated penalty rates on overtime work. These penalties are pervasive in industrialized countries, with statutory penalties ranging upward from 25 percent. Regrettably, there are no direct estimates of their effect, no estimates that infer this elasticity directly from an explicit exogenous change in the price of the marginal hour of work. The reason, of course, is that in all countries the penalty has been unchanged and quite widespread over long periods of time.[1] Absent direct estimates, the literature has instead relied on attempts to infer how changes in the relative prices of hours and employees, proxied by measures designed to capture fixed and variable costs of labor, affect the relative demand for these two components of labor inputs (e.g., Ehrenberg and Schumann, 1982, and König and Pohlmeier, 1989; see Hamermesh, 1993, Table 3.11, for a complete summary); or it has examined the related question, how changing the number of weekly hours beyond which the penalty is applied alters the demand for hours (Hart and Wilson, 1988; Hunt, 1996). Taking advantage of a unique set of data and an unusual court-imposed change in the legal setting, we provide here the first evidence on the effect on labor demand of an explicit, clearly exogenous change in the price of an hour of labor.

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[1]Increases in the penalty have been proposed in most American recessions since the 1950s, but the penalty has not been altered since the federal law was enacted. Coverage has been expanded, however, and that has provided some opportunity for inferring the law's effect on weekly hours (Trejo, 1996).

## II. The California Setting[2]

The overtime pay provisions of the federal Fair Labor Standards Act of 1938 require that covered workers be paid time-and-a-half for hours of work beyond 40 in a given week. California is one of the few U.S. states to impose any additional restrictions on overtime pay.[3] Under California law covered workers generally must receive time-and-a-half for hours worked past 8 in a given day, even when weekly hours are below 40. California's daily overtime pay requirement was instituted long before federal overtime regulation began, but for many years it applied only to women. In the wake of the Civil Rights Act of 1964, however, the standard was successfully challenged on the grounds that enforcing it for women but not men is discriminatory. The ultimate response was to broaden California's overtime pay requirement so that it covered men too. For our purposes it is important to distinguish three separate coverage regimes of overtime pay regulation in California: Before 1974 only women were covered; beginning in 1980, both men and women were covered; and as a consequence of legal battles during the intervening period to a large extent neither men nor women were covered.

In our analysis we exploit two useful features of these changes in coverage. First, sometime between 1973 and 1985 -- two years for which relevant data are available -- California introduced a daily overtime provision for men that was absent from most of the rest of the nation. Consequently, comparing changes in male outcomes in California over this period with changes occurring elsewhere

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[2]Much of the information in this section comes from California Industrial Welfare Commission (1994) and from discussions with Karla Yates of the California Industrial Welfare Commission and Daniel Cornet of the California Department of Industrial Relations. In no way does this imply, however, that these agencies or individuals endorse or necessarily agree with any of the statements made here.

[3]As of 1994 other states that imposed a daily overtime standard were Alaska, Colorado, Nevada, Oregon, and Wyoming.

can reveal the impact of a daily overtime standard. Second, because California's overtime law applied to women in both 1973 and 1985, changed outcomes for California women relative to women elsewhere do not represent the effects of overtime pay regulation but may instead reflect California-specific shocks.

In California state minimum wage and overtime pay standards are set through a series of 15 "orders" issued by the Industrial Welfare Commission. Each order covers a different sector of California's work force, with most of these sectors defined along industrial lines, but with a few defined according to occupation. In terms of required overtime pay, almost all of the orders specify time-and-a-half after 8 hours of daily work; the orders for agricultural workers and live-in domestics are exceptions, in that they specify looser restrictions (e.g., a 10-hour daily overtime standard for agricultural workers).[4] In addition, certain groups are exempt from state overtime pay regulation. Coverage exclusions for the self-employed, outside salespeople, and executive, administrative, and professional workers resemble the corresponding exclusions that appear in the federal overtime law. Other groups exempt from California's daily overtime standard are government workers, family workers, and workers involved in on-site activities such as construction, drilling, mining, milling and logging.

## III. Data and Basic Results

In 1973 and again in 1985 the May Multiple Jobholding Supplement to the Current Population Survey (CPS) asked workers how many days per week they usually work. Only in 1985, however, were workers also asked how many hours per day they usually work. For 1973 measures of usual

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[4]In order to facilitate alternative work schedules, changes made after 1985 give certain workers the option to relax overtime pay requirements. For example, by a two-thirds vote of the appropriate employment unit manufacturing workers may adopt a 10-hour daily overtime standard and health care workers may adopt a 12-hour daily standard.

daily hours must be constructed from the available information on usual weekly hours of work and number of workdays per week. These data on daily hours, H, for 1973 and 1985 form the basis for most of the subsequent analysis.

We use three approaches to analyze the impact of California's introducing a daily overtime penalty for men. The first calculates the double-difference:

(1) $\quad \Delta_M^2 = [X_{M,CA,85} - X_{M,OTHER,85}] - [X_{M,CA,73} - X_{M,OTHER,73}]$ ,

where M denotes men, CA is California, OTHER is some other, "control" group of geographical areas, and X is some characteristic of the distribution of men's daily hours. This approach implicitly assumes that all shocks beyond those produced by the extension of the hours legislation generated the same effect on the distribution of men's hours in California as they did on men's hours elsewhere. The second approach takes a different tack, calculating:

(2) $\quad \Delta_{CA}^2 = [X_{M,CA,85} - X_{F,CA,85}] - [X_{M,CA,73} - X_{F,CA,73}]$ ,

It thus implies that we can adjust for other shocks to the demand for the labor of California men by accounting for shocks to women's hours of work in California. While this is probably unrealistic, given the drastic changes that occurred over this period in women's labor-market behavior, it is a logical alternative to the first calculation. Any change in the distribution of men's hours relative to that of female employees is then assumed to be attributable to the mandate.

A final calculation recognizes the possibility that shocks to labor demand may have occurred differentially between California and other areas from 1973 to 1985, and differentially between men and women within California. To account for this possibility we also calculate the triple-difference:

(3) $\quad \Delta^3 = \{[X_{M,CA,85} - X_{M,OTHER,85}] - [X_{M,CA,73} - X_{M,OTHER,73}]\} -$

$\qquad \{[X_{F,CA,85} - X_{F,OTHER,85}] - [X_{F,CA,73} - X_{F,OTHER,73}]\}$ ,

4

for various characteristics of the distribution of daily hours.

We define the comparison group (OTHER) to exclude workers living in states (listed in footnote 3) that imposed any type of daily overtime pay requirement. In the 1973 CPS data these states are not separately identified, but all are located in the West. Accordingly, and to account for other Western states that had such laws earlier, we include in OTHER only workers from the three non-Western regions of the United States (Northeast, North Central, and South). $\Delta_M^2$ and $\Delta^3$ therefore compare changes in outcomes between 1973 and 1985 in California with the corresponding changes that occurred outside the West.

As discussed in Section II, some workers are either exempt from California's overtime law or are subject to a less restrictive overtime standard than the 8-hour workday. To sharpen our estimates of the law's impact we exclude such workers from both the California and OTHER samples. We use the CPS codes for industry, occupation, and class of worker to exclude the following groups: Self-employed and government workers; family and domestic workers; executives, administrators, and professionals; and persons employed in agriculture, forestry, fishing, construction, and mining. One group of exempt workers that we cannot identify in CPS data is outside salespeople, but because this group is small its inclusion is unlikely to matter much. The final samples include 2,671 workers from California and 23,638 workers from the control states in 1973, and 2,581 workers from California and 28,906 workers from the control states in 1985.

Before turning to the empirical results, consider what economic theory predicts will happen when California mandates a daily overtime penalty. For the most part economists have analyzed overtime pay regulation using static models of the firm's demand for workers and hours (Hamermesh, 1993; Trejo, 1996). Such models imply that California's overtime law will produce systematic effects

on the distribution of daily hours of work. An overtime penalty after 8 hours of daily work raises the marginal cost to employers of assigning overtime. Firms should respond by reducing the incidence of long workdays and shortening the workdays of employees who continue to work more than 8 hours per day. Moreover, applying the overtime penalty should increase the prevalence of 8-hour workdays, because some firms will find it optimal to avoid paying this penalty by limiting workdays to 8 hours.[5] Indeed, the simplest labor-demand models imply that that the overtime penalty will not affect workdays under 8 hours, so that the increased incidence of 8-hour workdays should equal the decline in the occurrence of overtime workdays.

Table 1 presents the estimated effects of California's daily overtime pay requirement on three relevant aspects of the distribution of daily hours: $Pr\{H>8\}$, the fraction of workers whose workdays exceed 8 hours; $E[H-8|H>8]$, the average daily overtime hours of workers who put in overtime; and $Pr\{H=8\}$, the fraction of workers whose workdays are exactly 8 hours. For each of these outcomes Table 1 reports the estimates of $\Delta^2_M$, $\Delta^2_{CA}$ and $\Delta^3$ with standard errors in parentheses, as well as the averages by sex and region that underlie these calculations.

The top panel of Table 1 indicates that the extension of California's overtime law to male workers was accompanied by a substantial decline in the prevalence of daily overtime among California men compared to men in the non-Western regions of the United States. In 1973, before the California daily overtime pay requirement applied to men, 17.1 percent of California men and 20.1 percent of men in the control group worked more than 8 hours per day. By 1985, after California extended overtime coverage to men, the incidence of daily overtime among male workers had dipped

[5]Put differently, the statutory overtime premium creates a kink in the cost function at 8 hours of daily work. This kink induces some firms that would otherwise assign overtime to adopt instead the corner solution of an 8-hour workday.

## Table 1. Means, Double- and Triple-Differences, Hours/Day, 1973 and 1985[a]

| | MALE | | FEMALE | |
|---|---|---|---|---|
| | Other | CA | Other | CA |

### Pr{H > 8}

| | Other | CA | Other | CA |
|---|---|---|---|---|
| 1973 | .2013 | .1712 | .0597 | .0396 |
| 1985 | .2279 | .1689 | .0689 | .0719 |

| | $\Delta_M^2$ | | $\Delta_{CA}^2$ | |
|---|---|---|---|---|
| | -.0289 | | -.0346 | |
| | (.0150) | | (.0169) | |

| $\Delta^3$ | -.0520 |
|---|---|
| | (.0179) |

### E[H - 8 | H>8]

| | Other | CA | Other | CA |
|---|---|---|---|---|
| 1973 | 1.667 | 1.673 | 1.517 | 1.475 |
| 1985 | 2.229 | 1.952 | 2.243 | 2.124 |

| | $\Delta_M^2$ | | $\Delta_{CA}^2$ | |
|---|---|---|---|---|
| | -.284 | | -.371 | |
| | (.112) | | (.313) | |

| $\Delta^3$ | -.206 |
|---|---|
| | (.330) |

### Pr{H = 8}

| | Other | CA | Other | CA |
|---|---|---|---|---|
| 1973 | .6048 | .6356 | .5392 | .6259 |
| 1985 | .6248 | .6897 | .5869 | .6306 |

| | $\Delta_M^2$ | | $\Delta_{CA}^2$ | |
|---|---|---|---|---|
| | .0341 | | .0494 | |
| | (.0188) | | (.0264) | |

| $\Delta^3$ | .0771 |
|---|---|
| | (.0278) |

### Number of Observations

| | Other | CA | Other | CA |
|---|---|---|---|---|
| 1973 | 13074 | 1460 | 10564 | 1211 |
| 1985 | 14649 | 1344 | 14257 | 1237 |

[a]Standard errors in parentheses below the $\Delta$'s here and in Table 2.

slightly in California to 16.9 percent, but had risen to 22.8 percent in the non-West. The implied $\Delta^2_M$ = -2.9 percentage points (t = -1.93), which represents a 17-percent decline in the proportion of California men working daily overtime between 1973 and 1985. When we calculate the impact using changes in the labor market for women in California as the control, we find a similar result: The implied $\Delta^2_{CA}$ = -3.5 percentage points (t=-2.13), a 20-percent drop in the fraction of California men working overtime.

Whereas for men the prevalence of daily overtime rose between 1973 and 1985 in the other states but not in California, essentially the opposite occurred among women. The incidence of overtime increased from 4.0 to 7.2 percent for female workers in California, but grew only from 6.5 to 6.9 percent among women in the OTHER group. Because California's overtime law applied to women in both 1973 and 1985, in calculating $\Delta^3$ we assume that the excess growth of 2.8 percentage points among California women measures the impact of California-specific shocks that had the same effect on the overtime hours of male workers. Accounting for the differential effects of shocks both between California and other states, and between men and women within California by calculating $\Delta^3$ yields an even larger estimate of the response to California's daily overtime pay requirement. This calculation implies that extending overtime coverage to California men reduced their incidence of daily overtime by 5.2 percentage points, or 30 percent.[6]

The middle panel of Table 1 presents analogous calculations of the impact of California's overtime law on the average amount of daily overtime worked by overtime workers. In 1973, men working overtime averaged 1-2/3 hours of overtime per day, regardless of whether they lived in

[6]Although the distributions of daily hours in 1973 look reasonable, they are computed as weekly scheduled hours divided by usual days, and the calculations in Table 1 are based on unrounded calculated daily hours. If we round all caclulated daily hours to the nearest integer, the $\Delta$'s are essentially unchanged in all three panels in the Table.

California or the control states. By 1985, however, the conditional mean of male overtime hours was significantly higher in the control states than in California, with the resulting estimate of $\Delta^2_M = -0.284$ (t = -2.33). This finding implies that California's overtime law reduced by slightly less than a third of an hour, or 17 percent, the amount of daily overtime worked by men who put in overtime after they became subject to the law. Among female overtime workers average daily overtime hours increased by almost as much in California as in the control states, and as a result $\Delta^3$ is roughly the same magnitude as $\Delta^2_M$. The estimated $\Delta^2_{CA}$ is also similar in magnitude. Both $\Delta^3$ and $\Delta^2_{CA}$ are estimated imprecisely, however, because the calculations are partly based on the small numbers of California women who work daily overtime.

The bottom panel of Table 1 examines the effect of California's daily overtime premium on the prevalence of 8-hour workdays. It is worth noting initially that the means of this probability are not greatly different across the two years, suggesting that creating a measure of usual daily hours for 1973 by dividing usual weekly hours by usual days worked is not generating much noise. The 8-hour day became more popular for all groups between 1973 and 1985; but for men the increase was larger in California than elsewhere, whereas for women the situation was reversed. The estimates of $\Delta^2_M = $ 3.4 percentage points (t=1.48), of $\Delta^2_{CA} = 4.9$ percentage points (t=1.87), and of $\Delta^3 = 7.7$ percentage points (t=2.21) indicate that California's overtime law increased bunching at 8-hour workdays, just as the theory of labor demand predicts. Also in line with the theory is these estimates' opposite signs and similar magnitudes to the corresponding effects on $\Pr\{H>8\}$, with the implied effects on $\Pr\{H<8\}$ ($\Delta^2_M = -0.0052$; $\Delta^2_{CA} = -0.0148$, $\Delta^3 = -0.0251$) not significantly different from zero at any conventional level.

Overall we find striking evidence that the distribution of daily work-hours responded to the California overtime law exactly as the theory of labor demand predicts. In particular, after California's daily overtime standard was extended to men, overtime hours and the incidence of overtime workdays declined substantially among male workers in California relative to those elsewhere, and the prevalence of 8-hour workdays rose by roughly the same amount that the incidence of overtime fell. These results persist when we use analogous comparisons for women to control for idiosyncratic shocks that may have affected the California labor market.

The multi-differencing method ignores the possibility that other changes might have affected the "treatment" group (California males) differently from the "control" group. While this seems unlikely and cannot in any case be fully addressed, we can deal with it in part by estimating probits of the variables $\Pr\{H>8\}$ and $\Pr\{H=8\}$, and least-squares regressions of $E[H-8|H>8]$, including controls for the CPS demographic variables -- age, education, marital status, race and ethnicity -- and for (two-digit) industrial attachment. These adjustments made essentially no difference to the estimates of the $\Delta$'s.[7] The estimates in Table 1 are robust to controlling for a large variety of measurable factors that might affect the distribution of daily hours.

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[7]We did not adjust for shocks reflected in the state unemployment rates. Such shocks should not affect the estimates of $\Delta^2_{CA}$ or $\Delta^3$, since any California-specific shocks not already captured by the variables in the probits and regressions presumably affected men's and women's overtime proportionately; but they might affect the estimates of $\Delta^2_M$. In fact, the unemployment rate in 1973 in California was 7.0 percent, much higher than the national rate of 4.9 percent. In 1985 the California rate was 7.2 percent, the same as the national rate. Thus, if anything, shocks reflected by the changing difference in the unemployment rates would have generated positive biases in the estimates of the impact on $\Pr\{H>8\}$ and $E[H-8| H>8]$. Because data on union membership are available for only a quarter of the sample in 1985, we also did not adjust for this factor. Unions probably increase compliance with overtime laws, and presumably thereby induce employers to use less overtime. If the incidence of unionism changed differentially between California men and men elsewhere, our estimates could be biased. Using the Outgoing Rotation Groups of the CPS for May-August 1985 (the same households included in the May 1985 CPS) and applying the industry and occupational exclusions used to generate the samples underlying Table 1, we find that union density fell from 1973 by about 12 percentage points among California men and by a similar amount (13 percentage points) among men elsewhere. The impact of differentially changing unionism on our results is thus likely to be very small.

## IV. Price Elasticities and Cross-Price Effects

We can use the estimates from Section III to calculate the price elasticity of demand for overtime hours at the daily margin. Average overtime hours per worker are simply the product of the probability of working overtime, $\Pr\{H>8\}$, and the average amount of overtime worked by overtime workers, $E[H-8|H>8]$. The change in the average overtime hours of California men induced by the daily overtime penalty is therefore:

$$(4) \qquad Z = E[H-8|H>8] \cdot \Delta\Pr\{H>8\} + \Pr\{H>8\} \cdot \Delta E[H-8|H>8] \ .$$

The estimates of this change are -0.100 hours using the $\Delta^2_M$ from Table 1; -0.121 hours using the $\Delta^2_{CA}$; and -0.122 hours using the $\Delta^3$. Taking the averages of the 1973 and 1985 data for California men in the top and middle panels of Table 1, and recognizing that the legislation imposed a 50-percent increase in the price of overtime hours, the estimated price elasticity of demand for overtime hours ranges from $\eta_H = -0.70$, based on the $\Delta^2_M$, to -0.80, based on the $\Delta^3$. These sizeable elasticities, the first estimates of the effect of an explicit change in the price of an hour of labor, suggest that employers can fairly easily reduce their demand for one dimension of work time when its price is mandated to increase. We stress that these estimates do not measure the elasticity of demand for labor. Instead, they measure the elasticity of demand for one particular component of the input of labor, namely hours of work per day.

For a couple of reasons the estimates of the price elasticity of demand for overtime hours reported here are likely to understate the pure demand response. First, although the daily overtime premium discourages firms from assigning overtime, at the same time it makes overtime hours more attractive to workers. To the extent that the labor market changes we observe from California's overtime law reflect both demand and supply responses, the observed reduction in overtime will be

smaller than if offsetting supply effects were absent. Indeed, under standard characterizations of labor market equilibrium, compensating differentials in straight-time hourly wages can arise to mitigate the effects of a mandatory overtime penalty (Trejo, 1991).

Another source of understatement is our assumption that California's overtime law produced a 50-percent rise in the price of overtime hours. For this to have occurred, it would have had to be the case that nobody received an overtime premium before the law was imposed, and that afterward compliance was perfect. Because both of these conditions fail, the actual increase in the average overtime wage was less than 50 percent, and therefore the true demand elasticity is larger than the above calculations indicate.

What makes this issue particularly important is the considerable overlap between state and federal overtime pay regulation. The federal requirement for time-and-a-half after 40 hours of weekly work would seem to render California's daily overtime standard redundant for most workers. By this argument, the California law raises the marginal wage only for workers whose schedules satisfy the following two conditions: Daily hours exceed 8, and weekly hours are no greater than 40. Only about 1 percent of male workers in California, or less than 10 percent of men with workdays longer than 8 hours, display this combination of long daily hours but short weekly hours. How, then, can the California overtime law produce the large impact that we estimate it to have, over and above the effects of federal overtime pay regulation?

We conjecture that California's 8-hour workday is more visible and easier for firms to monitor than the federal 40-hour workweek. For one thing, supervisors can usually observe with little effort whether the workers on their shifts put in daily overtime, whereas detecting weekly overtime may require coordination between two or more supervisors (e.g., a weekday supervisor and a weekend

11

supervisor). If our conjecture is correct, then California's daily overtime penalty might be binding even for some workers whose long workweeks make them subject to the federal overtime premium. In effect, the 8-hour daily standard can increase compliance with the federal 40-hour weekly standard.[8]

Our conjecture therefore implies that California's daily overtime penalty should reduce weekly as well as daily overtime.[9] Table 2 presents evidence that supports this hypothesis. The focus is on the probability that weekly hours (days x daily hours) exceed 40, so that this tableau is the weekly analogue to the first panel in Table 1. The double- and triple-differences show that the probability of long workweeks among male employees in California was reduced differentially between 1973 and 1985 relative to its change among female Californians and/or relative to the change among men and women elsewhere. The multi-differences are of similar magnitude to those in the top panel in Table 1 and suggest that the extension of the state's daily overtime provisions to males affected weekly as well as daily schedules. We infer that the ease of monitoring daily schedules makes some employers account for the daily overtime penalty rather than the less stringent federal weekly limit when they plan employees' work schedules.

We have estimated a total price elasticity of demand for male hours that represents a combination of substitution and scale effects. The mandated change also induces substitution effects in favor of at least one of the other dimensions of male labor (days and workers), female labor or non-

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[8]Compliance with the federal overtime law is far from perfect, with one estimate suggesting that it is below 80 percent (Ehrenberg and Schumann, 1982).

[9]Indeed, for employees working 5 days per week and a stable number of hours per day, overtime hours are the same whether defined according to an 8-hour daily standard or a 40-hour weekly standard. Among the California men in our 1973 sample who worked more than 8 hours per day (the group directly affected by the expansion of the state overtime law that occurred in 1980), 53 percent worked exactly 5 days per week.

**Table 2.  Means, Double- and Triple-Differences, Weekly Hours, 1973 and 1985**

| | MALE | | FEMALE | |
|---|---|---|---|---|
| | Other | CA | Other | CA |
| | | Pr{DH >40} | | |
| 1973 | .2633 | .2226 | .0694 | .0429 |
| 1985 | .2656 | .2024 | .0804 | .0744 |
| $\Delta^2_M$ ; $\Delta^2_{CA}$ | -.0226 | | -.0520 | |
| | (.0163) | | (.0181) | |
| $\Delta^3$ | -.0430 | | | |
| | (.0192) | | | |

labor inputs. It also produces negative scale effects because it raises the price of one of the inputs (male hours). The data allow us to draw some inferences about how the overtime premium alters the demand for other dimensions of men's labor services, particularly their days of work and the number of male workers. The double-difference for average days worked, calculated analogously to (1), is 0.011 (t = 0.31); the double-difference calculated as in (2) is -.112 (t=-2.30), and the triple-difference is -0.110 (t=-2.13). Raising the price of hours certainly does not induce an increase in workdays per week. There is some evidence of substitution toward additional male employees when the price of male hours increases: The analogue to $\Delta_M^2$ for the fraction of males in the covered industries and occupations in California is 0.020 (t=1.32). Although this estimate is not significantly different from zero, there is at least some hint that raising the price of hours may increase the relative demand for workers.

## V. Conclusions

The mandated extension of California's daily overtime penalty to men in 1980 provides a unique opportunity to estimate the impact of the price of an hour of labor on the demand for hours. Using CPS data we find that this penalty resulted in a cut in men's daily hours consistent with an hours-demand elasticity of at least -0.70. The results clearly show that a higher penalty rate for overtime induces employers to reduce labor demand along the margin of hours per worker. Overtime laws do affect the demand for hours of work.[10]

This finding is important, not just as the first direct confirmation of a downward-sloping demand curve for hours per worker, but also as clear evidence supporting the notion that labor-

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[10]This may explain why recent proposals to repeal California's daily overtime penalty have generated heated responses from partisans on both sides of the issue (Los Angeles Times, January 25, 1997).

demand relations slope downward. Much criticism has been levelled recently, both implicitly (e.g., Card and Krueger, 1994) and explicitly (e.g., Topel, 1997), that simultaneity and other econometric problems render the massive evidence (Hamermesh, 1993, Ch. 3) of negative labor-demand elasticities highly suspect. Here we have a truly exogenous event whose impact we evaluate using a simple yet powerful method (pioneered by Lewis, 1963, Chapter 3, and reintroduced by Card, 1990) to compare several labor markets at times before and after the event and thus measure its full effects. That the evaluation produces elasticities that are reasonably consistent with those in the large literature on labor demand suggests that any possible econometric difficulties in that literature may generate offsetting biases. The main point is that labor-demand curves slope down.

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