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The Effect of California's Daily Overtime Law on Hours of Work: A Re-examination

Thomas C. Buchmueller
Graduate School of Management
University of California, Irvine
Irvine, CA 92697
tcbuchmu@uci.edu

Sarah Senesky
Department of Economics
University of California, Irvine
Irvine, CA 92697
ssenesky@uci.edu

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Abstract

In California overtime is based on a daily, rather than a weekly standard. Using a variety of datasets we examine the effects of California's daily overtime law on hours worked. Part of the analysis takes advantage of several changes in the California law that occurred during the 1990s, while other cross-sectional analysis uses data on daily hours. We compare outcomes for covered workers in California to various controls groups and, where possible, we use information on work schedules identify more precisely the workers for whom the California law is not redundant to the federal weekly overtime standard. Results using cross-state and time series variation in legislation find little effect of daily overtime. However, results exploiting within-state variation find significant negative effects of daily overtime on weekly hours.

I. Introduction

For most years since the enactment of the federal Fair Labor Standards Act in 1938 California has also required that an overtime premium be paid to employees working more than 8 hours per day even if their weekly hours do not exceed 40. The daily overtime rule was first established in 1911 and applied only to women. In 1974 the state attempted to extend these rules but, because of legal challenges, it was not until 1980 that this occurred. In the 1990s, there were several changes in the rules. For part of 1994, daily overtime was suspended in Southern California counties that were affected by the Northridge earthquake. In 1998, the daily standard was eliminated for most, but not all, covered workers statewide. This policy regime was short-lived, however, as legislation passed in 1999 reinstated daily overtime starting on January 1, 2000.

Since California is one of only a few states requiring premium pay for daily overtime these changes present an opportunity to investigate the effect of such regulations on hours worked. However, it is not clear that the effects of California's daily overtime standard should be large. An important feature of the law is that it does not require an additional premium beyond the time-and-a-half mandated by federal law for hours exceeding 40 per week, which means that for most workers it is not binding. In particular, for individuals working a standard full-time schedule—five eight-hour days—premium pay for time worked beyond eight hours in any day is identical under a daily or weekly standard. Moreover, the California law includes numerous exemptions that allow for alternative workweek schedules.

Despite the apparent weakness in the California law, two recent studies find fairly strong effects on hours worked. Hammermesh and Trejo (HT, 2000) compare changes between 1973 and 1985 for men in California, who went from being uncovered to covered, and women in California, who were covered in both years, using workers in non-Western states as additional control groups to account for national trends in hours. They find that the percentage of California men working more than 8 hours per day and more than 40 hours per week fell relative to both women in the same state and men elsewhere. Acknowledging that the new overtime rules should have been binding for very few male workers in California, they speculate that the effect they observe may have arisen from enhanced enforcement of the weekly standard after the daily law went into effect. Bhattacharya, DeLeire and MaCurdy (BDM, 2000) study the effect of the repeal of California's daily overtime law in 1998 with data on weekly hours from 1995 to 1998. Simple regressions indicate no change in hours for California workers relative to workers in other states. However, models that allow the effect of the law to vary

according to mean weekly hours measured at the industry/occupation level provide some evidence that in the first year after California's daily overtime rule was repealed hours increased for some California workers relative to workers in other states.

Like BDM, we use CPS data from the 1990s to investigate the effect of California's overtime law, though several things differentiate our work from theirs. First, since we use data on weekly hours from 1990 through 2001, our analysis includes both years in which only the weekly standard applied in California as well as two years after the daily standard was reinstated. With this additional variation we can more confidently separate real policy effects from contemporaneous shocks. The fact that we account for the fact that the overtime standard did not change for all covered workers provides an additional source of identification. Second, we conduct a similar analysis on the 1994 suspension of daily overtime in Southern California. Again, our estimation strategy takes advantage of the fact that the policy change affected some workers in the state and not others. While, as we discuss, because of the unique circumstances surrounding this "experiment" these results may not generalize to other situations, knowing how hours changed (or did not change) in response to this policy change can nonetheless contribute to a clearer understanding of the impact of daily overtime. A third innovation is that we use cross-sectional data from 1991 and 1997 to examine differences between workers in California and other states in daily work hours. While there are important limitations of a cross-sectional analysis, the fact that a daily overtime standard should have more visible effects on daily rather than weekly hours makes this an important part of our analysis.

The results indicate that California's daily overtime law tended to have a negative effect on weekly hours. The remainder of the paper is organized as follows. Section II briefly outlines the legislative history and discusses the relevant economic theory. Section III describes our data. Section IV presents descriptive and cross-sectional evidence on changes in the distribution of hours associated with the different regime changes, while Section V extends analysis to a pooled cross-sectional setting. Section VII concludes.

II. Institutional and Theoretical Background

A. History of Daily Overtime in California

Since 1980 (technically 1974), all covered workers in California have been subject to a daily overtime standard that requires time-and-a-half pay after 8 hours in a day. Exemptions to the California law are similar

to federal weekly overtime exemptions, based partially on industrial and occupational classification, and are provided through two dimensions of the state labor regulations. Regulations of working hours and compensation are codified in 15 "Wage Orders" and the Labor Code, the latter of which takes precedence in case of any discrepancy.[1] General exemptions in the Wage Orders include public employees; taxi drivers; on-site employees in construction, mining, drilling, or logging industries; agricultural occupations; and personal attendants. The latter two occupations are actually subject to less restrictive overtime standards.[2] Exemptions provided in the Labor Code include self-employed and unionized workers, and administrative, executive, and professional occupations. This latter exemption, which we will call the administrative exemption for the sake of brevity, holds only for salaried workers subject to a salary basis test. Monthly salary must be no less than twice the current minimum wage for full-time work of 40 hours per week, regardless of the employee's actual hours of work. Thus, at the end of 1999, for example, salaried administrative workers earning a minimum monthly salary of $1993.33 are exempt from the daily overtime provision. Registered nurses and pharmacists are covered by the overtime law; that is, they do not receive the professional exemption, although they can receive administrative and executive exemptions. However, workers in the health care industry are permitted more latitude in adopting alternative workweek schedules that include days of work between 10 and 12 hours.

As noted, after the daily standard was extended to men, the first change in California's overtime provisions occurred in 1994 following the Northridge earthquake of January 14. This earthquake, which measured 6.7 on the Richter scale, was centered in the San Fernando Valley and damaged major freeways, disrupting traffic in Southern California. In response to the emergency, Governor Pete Wilson sought to aid employers by suspending daily overtime requirements in some southern counties, permitting more flexibility in scheduling their commuting workers. From the day of the quake until May 14, 1994, the weekly overtime standard prevailed in Los Angeles, Ventura, Orange, San Bernardino, and Riverside counties. The emergency measures continued in Los Angeles and Ventura counties, the most seriously affected, until September 1994. In March, however, the month for which we have data, all five counties were affected by the suspension.

[1] The Wage Orders define rules on working hours and compensation for certain industries and occupations; they are determined and enforced by an independent regulatory agency called the Industrial Welfare Commission (IWC).

[2] Other exemptions that we cannot identify in our data include transportation employees subject to federal and state regulations, outside salespeople and workers related to the employer, as well as a few narrowly-defined occupations including full-time carnival ride operators and employees at ski establishments.

While earthquakes are clearly exogenous events in a general sense, the policy change cannot be viewed as strictly exogenous to hours worked, as it was motivated by an anticipated effect of the earthquake damage on labor demand and scheduling. The traffic disruptions caused by damage to freeways were expected to make standard work schedules unattractive to employers without necessarily increasing total labor demand; a contemporaneous bulletin from the IWC notes that the order "allowed employers to schedule flexible work schedules and reduce commuting without the cost penalty of daily overtime, as employees would be working the same number of weekly hours." However, the bias resulting from this endogeneity can be signed: to the extent that the earthquake itself had a direct negative effect on hours, the estimated effect of daily overtime based on this "experiment" represents a lower bound of the effect that would occur more generally.

The repeal of daily overtime in 1998 and the reinstatement of the daily standard two year later represent cleaner experiments as both changes were determined largely by political, rather than economic factors.[3] Another important feature of these changes from an analytical standpoint is that not all workers covered by the state's overtime laws were affected. Specifically, the return to the weekly overtime standard was implemented through a modification of five Wage Orders. These Orders covered manufacturing, public housekeeping, mercantile, and transportation industries, as well as professional, technical, clerical, and mechanical occupations. (In 1998, almost 84% of California workers fell into these categories; see Appendix table B.) Workers covered by the other Wage Orders continued to receive daily overtime from 1998-2000. Although relatively few workers fall into this category, this difference generates variation in daily overtime coverage within the state which we can exploit to estimate its effect.[4] Finally, it is worth noting that the repeated nature of the experiments we consider partially alleviates the problem of bias due to serial correlation in the passage of the law that is common to difference-in-difference studies (Bertrand et al., 2001).

[3] The repeal was made by the Industrial Wage Commission, an independent regulatory body, after vigorous lobbying by Republican Governor Pete Wilson, who had long opposed California's daily standard. Wilson pursued this strategy after failing to get legislation that would accomplish the same goal through the Democratically control state legislature. The reinstatement of the daily standard was a campaign promise of Democratic Governor Gray Davis who was elected in 1998.

[4] After the exemptions for agricultural occupations and public employees, the industries which continued to be covered by daily overtime were mining; construction; finance, insurance, and real estate; service industries including business and repair, private household, entertainment and recreation, and professional and related. Additional exemptions went into effect after the year 2000. For example, employees in the computer software

B. Theoretical Context

A standard model of labor demand makes straightforward predictions about the effect of overtime regulation on hours of work. The requirement that workers be paid an overtime premium for all hours beyond a standard amount creates a kink in a firm's isocost function. Because the overtime rule raises the marginal wage for hours in excess of the hours standard, firms will respond by demanding fewer hours of existing workers. In particular, hours should fall for workers who in the absence of a mandated overtime premium would have worked more than the hours standard defined by the regulation. The density of hours at the hours standard should increase as many firms choose hours exactly at the kink in the isocost curve. Workers who would have worked shorter hours in the absence of an overtime law should not be directly affected, as their marginal cost to employers is the same in either regime.

It is less clear, however, how to model the overlaying of a daily overtime law on top of a system of weekly overtime regulation. The two previous studies take different approaches. Both assert that the changes in California's overtime regulations should not have affected individuals working too few hours to merit overtime pay under either a daily or weekly standard. However, they differ in their predictions concerning other workers. HT make reference to a model like the one just described, essentially treating the imposition of daily overtime as an increase in the overtime premium. According to this assumption, they argue that the extension of daily overtime to men in 1980 should have reduced hours for those who had been working more than 8 hours per day and increased the percentage of men with hours exactly equal to the standard.

In contrast, BDM treat changes in California's daily overtime law as equivalent to a change in the weekly hours standard – the point at which overtime must be paid. To think about how a change to daily overtime can be interpreted as a change in the weekly hours standard, consider a firm whose employees work five days a week. Under a weekly overtime law, the weekly hours standard is 40. Under daily overtime, however, it is possible for some workers to earn overtime while working less than 40 hours per week if they work long hours per day. Thus, a change from weekly to daily overtime is analogous to a decrease in the weekly hours standard. This assumption leads to the prediction that the change to daily overtime should have increased hours for long weekly-hour workers and decreased hours for workers that had been working exactly the standard number of weekly hours. The prediction for long hour workers is the exact opposite of the one

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field earning more than $41 per hour and employees in a national service program became exempt during 2000,

made by HT. However, so long as the ordering of workers is not changed – i.e., the workers who had been working the longest hours prior to the policy change still have the longest hours – the two theoretical approaches produce a common empirical prediction: the change to daily overtime should have decreased the percentage of workers with more than the standard number of hours.

Finally, as BDM point out, effects should also depend on average hours (of a firm's workers) before the imposition of the overtime legislation. Effects will differ in direction depending on whether the current average weekly hours are above, below, or at the proposed weekly hours standard. This could explain why researchers who fail to distinguish between these cases tend to find small and insignificant effects. Their argument applies in a restricted context, however. Workers are presumed to work no more than 5 days a week and to work the same number of hours each day; firms adjust only hours per day, not days per week, in response to changes in the overtime law. Furthermore, a short-run setting is assumed, whereby neither output nor levels of other inputs may be changed. Costa (2000) points out that in a long-run setting, the predicted change in weekly hours following a change from weekly to daily overtime for firms with average hours above the old weekly standard is ambiguous. While substitution effects between labor inputs lead employers to substitute hours for employees, both substitution effects between capital and labor and scale effects will tend to decrease hours.

We might think that the change from a weekly to daily system corresponds more intuitively to a change in the overtime premium, as HT argue, than a change in the weekly hours standard. For example, consider a firm whose employees work 8 hours per day. Suppose that on Monday the firm has a demand shock and keeps its workers past 8 hours. There is some probability p that the additional hours on Monday will have to be compensated as overtime. Under a daily overtime regime, this probability is 1. Under a weekly overtime regime, in contrast, the firm has some flexibility to reduce hours later in the week and avoid paying overtime, so $p<1$. Thus, the move from a weekly to daily law effectively increases the overtime premium by increasing p. An increase in the overtime premium could be expected to decrease hours for employees working more than 8 hours per day and increase the percentage of employees working exactly 8 hours. Given that most employees work 5 days per week, we would also expect a corresponding decrease in hours for those working more than 40 hours per week and an increase in the prevalence of 40-hour per week schedules. The net effect should be a

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and on-site workers gained daily overtime coverage under Wage Order 16 as of 1 Jan. 2001.

decrease in average weekly hours. This effect should hold even if hours per day vary during a week. As HT note, in this case, some employees who receive federal weekly overtime may now be eligible for more overtime compensation under the daily standard. Although fewer workers will be affected, the direction of the effect will be the same. This prediction will form the basis for much of our analysis.

III. Data and Methodology

A. Data

Any analysis of California's overtime regulations is constrained by significant limitations of the available data. HT's main results are based on data from special supplements to the May CPS containing information on work schedules; part of our analysis is based on later supplements. The greatest strength of these surveys is that they contain information on usual hours per day, the quantity for which theoretical predictions are clearest. The supplements also provide information on usual days per weeks and total overtime hours. The former variable is potentially useful for identifying workers for whom the daily standard is most likely to be binding. The main disadvantage with the work schedule supplements is they are only available for a few years. HT take advantage of the fact that the 1973 and 1985 supplements bracket the extension of the daily standard to men. However, the fact that the gap between these two surveys makes it difficult to distinguish changes that are due to the overtime law from other shocks that may have impacted the California economy differently than other states. We use data from supplements conducted in 1991 and 1997. The obvious disadvantage of the supplement data from the 1990s is that because the surveys do not bracket any changes in California's rules, only cross-sectional analyses can be done with these data.

An interesting aspect of HT's results is that while the dependent variables for most of their analyses are some measure of daily hours, the qualitative results are quite similar for regressions that use measures based on weekly hours as the dependent variable. This suggests that data on weekly hours can be used to extend the analysis by examining the more recent changes in California's overtime regulations. (It is true that this will tend to obscure the responses of days and daily hours, leading to findings of dampened responses.) BDM use data from the CPS outgoing rotation group for the years 1995-1998, which provides information on usual weekly hours. Part of our analysis is also based on repeated cross-sections from the CPS, though for a longer period (through 2001). The main advantage of this longer period is that we can examine the full period during

which daily overtime was repealed (1998-99) and also take advantage of the "reverse experiment" that occurred when the daily standard was reinstated. This should allow for a richer, more convincing analysis that is less sensitive to contemporaneous trends and labor demand shocks.

As none of these data sets are ideally suited for our purposes, we will take a mixed approach, estimating a variety of models with different data sets. Each approach has its strengths and weaknesses, and we will try to be clear in identifying the latter. However, it is hoped that this combined approach will provide useful evidence on the relationship between daily overtime rules and work hours and will help us interpret that evidence in terms of causal effects.

B. Methodology

Several observations can be noted from the findings of the existing literature. Previous results on the effects of the daily overtime law appear to be sensitive to the inclusion of covariates. HT, BDM, and MaCurdy, Battacharya, and DeLeire (1999) all find that small but significant effects of the California law become insignificant when demographic controls are added. This would seem to indicate that any effects of the California law apparent from simple bivariate estimation are due to the changing relative demographic characteristics of California workers.[5] Results appear to be sensitive to the choice of control groups as well as to the inclusion of demographic and occupational and industrial factors. For example, HT find different effects when comparing changes for covered California workers to changes for covered workers in non-west states, and when additionally comparing men to women. Here we may be skeptical about interpreting the latter results as an estimate of the effect of daily overtime, since women may have a distinct trend in labor force participation over this period (1973-1985), and since employers may substitute female workers for more expensive male workers. Similarly, BDM find that the significant effects found for California workers relative to non-west workers become insignificant when additionally comparing covered to non-covered workers. They argue, however, that exempt workers provide a poor control group, as overtime regulation is likely to affect the hours of all workers.

[5] Interestingly, Kalwig and Gregory's (2000) study of British workers from 1975-1999 notes a somewhat similar result. It suggests that changes in the composition of jobs, rather than in the intensity of overtime on a given job, account for most of the decline in overtime hours during this period. In contrast, Hetrick (2000) finds that both factors help to explain the increase in overtime hours in the US during the 1990s.

We will also use a difference-in-difference approach. However, given the arguments for and against the validity of certain treatment and control groups, we attempt to perform a thorough analysis that investigates the sensitivity of the results to different conceptual design specifications. By considering various control groups with their respective caveats in mind, we may be able to interpret results more accurately. One strategy is to compare covered workers in California during the daily overtime years with similar workers in the rest of the country. This cross-state approach will be valid if there is no secular trend in hours for covered workers in California that is correlated with the daily overtime period. Both HT and BDM examine variants of this approach. Another strategy is to exploit within-state variation in the law and use other CA workers as a control group. This can include exempt workers as well as the covered workers who were subject to a weekly standard during the repeal period of 1998-99 or who were affected by the emergency daily overtime suspension in 1994. We consider each strategy in turn below.

We begin by investigating the effect of California's daily overtime law on outcomes rarely considered by the previous studies: reported overtime incidence and hours. Such effects have no clear behavioral implications, as a change in overtime rules will change the hours that are subject to premium pay regardless of any changes in work schedules or hours worked. However, this outcome is a useful starting point for our analysis as it provides an important context for interpreting our results. Within California, differences in reported overtime across policy regimes will provide a gauge of how many workers are at the relevant margin. If we find no evidence that California's daily overtime law affects reported overtime hours it would suggest that the law affects too few workers to identify behavioral effects in the CPS data. In addition, examining the pattern of reported overtime hours with respect to weekly hours in California and other states may offer insights as to the characteristics of marginal differences between these two policies.

The main focus of the research is the effect of daily overtime on hours worked. We begin by examining cross-sectional data on daily hours using data from the 1991 and 1997 Work Schedule Supplements. Finally, use the repeated cross-sections from the March CPS and a variety of alternative identification strategies to test for effects of changes in California's law on weekly hours.

IV. Results

A. Daily Overtime and Overtime Hours

Table 1 reports trends in mean overtime hours for California and the rest of the US over the period 1994-2000. The data in the first column comes from the California Department of Finance and pertains to manufacturing workers in the state. The other columns are from the March CPS-ORG.[6] For California, the level of overtime hours is different between the two sources, with the mean being between 2 and 3 hours higher in the CPS. However, the pattern with respect to the different policy regimes is quite similar. For both series, overtime hours were approximately 5% lower when only the weekly standard was in effect. In contrast, for other states the mean number of overtime hours is essentially identical in 1998-99 compared to the other years, which strongly suggests that the differences in California reflect the change in the law.

If daily overtime is redundant for many workers in California, data on all covered workers may obscure an impact on the subset most strongly affected. One way to get at this is to examine trends in overtime hours by usual weekly hours on the respondent's main job. These trends are reported in Table 2. For workers with usual weekly hours in excess of 40, overtime hours increased substantially when California's daily standard was repealed, both relative to other workers in the state and workers with long hours elsewhere. Assuming that workers in this category should be receiving premium pay for marginal hours worked under either policy, these differences should correspond to changes in actual hours worked. If so, this change runs counter to BDM's theoretical model, which predicted that the shift from a daily to a weekly standard should have decreased weekly hours for this group. In contrast, the data indicate that workers with usual weekly hours exactly equal to 40 log 16 percent more overtime hours under the daily standard (though the difference is not statistically significant). We might expect overtime hours to be lower in general, and the difference across policy regimes to be greatest for workers with lower hours, since their usual hours are below the Federal overtime standard but they may qualify for daily overtime. The data provide little support for either of these suppositions. Average overtime hours for short week workers are only slightly lower than for workers on 40-hour schedules, and in California reported overtime for this group is slightly higher during the weekly regime.

Table 3 reports results from regressions that also seek to measure the effect of California's daily overtime law on overtime hours for workers with different usual hours. The model is

$$OH = \beta_0 + \sum \beta_j WH_j + \gamma_1 D + \sum \gamma_j D \times WH_j + X\delta + u, \qquad (1)$$

[6] Overtime hours are defined as actual overtime hours on the worker's main job last week. Overtime incidence is defined as working any overtime on the main job last week. Weekly hours categories are computed from

where *OH* represents overtime hours and the *WH*'s are dummy variables for different categories of usual weekly hours and the dummy variable *D* equals one for observations where the daily standard applies.[7] The expectation is that the daily standard should have no impact on workers with very low hours (the reference category) because they will tend not to qualify for premium pay under either standard or workers with very high hours, because the daily standard is essentially redundant. However, overtime hours should be higher for workers with usual hours at or just under the weekly standard. The point estimates are consistent with these hypotheses, though are imprecisely estimated. Like the tabulations in Tables 1 and 2, these results suggest that the California's daily overtime law is not completely redundant, which implies the plausibility of an effect on hours worked.

B. Daily Overtime and Daily Hours

The evidence presented by HT suggests that in the 1970s, California's daily overtime rules reduce the prevalence of long days in the state and increase the percentage of individuals who work exactly 8 hours per day. Although it is not possible to exactly replicate their specification to test for the effects of daily overtime laws in the 1990s, we can examine the same outcomes using data from the Work Schedule Supplements of the May 1991 and 1997 CPS.[8] Due to the inconsistency in the data available in each Work Schedule Supplement, we examine usual weekly and daily hours in 1997 and actual weekly and daily hours in 1991.

Tables 4 and 5 present data from 1997 and 1991, respectively, on the combinations of weekly and daily hours for covered workers in California and other states. Using data from the May 1991 (and 1997) Work Schedule Supplements to the CPS, we find that about 3% (4%) of all workers, and about 18% (25%) of those usually working more than 8 hours per day, would potentially be affected by daily overtime. In comparison, nearly one quarter of all workers are potentially eligible for weekly overtime.

The figures in the last column show much more bunching at 8 hours per day in California than elsewhere, which is consistent with the findings of HT. (This bunching is more prominent for actual hours than

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usual weekly hours on the main job.

[7] This variable is zero for all non-California observations. Within California it equals one throughout the period for workers in industries and occupations not affected by the 1998 repeal. For workers who were affected, D equals one from 1994 to 1997, zero in 1998 and 1999 and one again in 2000. Our control variables include an indicator for those occupational categories that were affected by the regime change as well as a California dummy.

for usual hours, contrary to expectations.) A closer look will help us to determine the extent to which this pattern is a result of California's daily overtime rules. First, if those rules were the main explanation there should be a corresponding reduction in the incidence of long days. Workers outside California are more likely to work long days, and moreover the difference in the prevalence of long days explains almost 60% of the difference in the prevalence of 8-hour days in 1991. Only about a third of the difference can be explained in this way in 1997, but the usual hours data may be less reliable. However, in both years, the difference in the percentage of workers with long days is driven mainly by workers for whom the daily regulation is not binding: those working more than 40 hours per week. The daily overtime rules should matter most for individuals who work long days but short weeks. Among workers with weekly hours less than 40, the percentage with daily hours exceeding 8 is essentially the same in the two groups in both years.

Table 6a attempts to distinguish potentially affected workers even more precisely by examining work schedules in 1991 by actual days per week. Workers with few days per week, shown in the top panels, are more likely to be affected by daily overtime. About 18% of these workers, and almost 79% of those usually working more than 8 hours per day, would potentially be affected by daily overtime. In comparison, only about 5% of these workers are potentially eligible for weekly overtime. For these workers, 8-hour days are more prevalent, and long days less prevalent, in California than in the rest of the US, but these differences are slight. Furthermore, while the daily overtime rules would suggest that fewer workers in California with short weekly hours should tend to work long days, this difference is also small. These results show little support for the impact of daily overtime. The 1991 data also provides information on overtime incidence (though not overtime hours) that we can examine by work schedule. Table 6b shows that among workers with fewer than 5 days per week and short weekly hours, California workers with long days are more likely to have worked any overtime last week. However, the prevalence of overtime among all workers with short weeks is virtually identical both inside and outside of California.[9] Again, the results shown provide only weak evidence that California's daily overtime law affects weekly working hours.

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[8] The sample is limited to workers who, according to their industry and occupational classification, would be subject to California's daily overtime regulations.

[9] Notice that some workers report overtime even though they should not be eligible based on their reported working hours. This could be the result of rounding or recall error, but it may reflect the fact that some employers' individual overtime policies are more generous than the federal standard.

Table 7 presents the data in a form that allows a more direct comparison with the earlier work by HT. We compare California and non-California workers in terms of the probability of having daily hours exactly equal to or exceeding 8, and average daily hours. In the top panel we present these results for all covered workers. In the next two panels we focus on workers who because they work short weeks are more likely to be affected by daily, but not weekly overtime rules. Such workers include those who work less than 5 days per week (middle panel) and those who work less than 40 hours per week (lower panel). For all outcomes we report raw and regression-adjusted differences.

Some of the results are quite similar to HT's main findings. The unadjusted differences in the upper panel indicate that compared to other states, workers in California are 0.085 percentage points more likely to work exactly 8 hours per day and less likely to work longer days; HT finds that these workers are 2.2 percentage points and -2.9 percentage points, respectively. Also, as with HT's analysis the differential is greatly reduced when we control for observable worker characteristics. The difference in the prevalence of 8 hour days is cut nearly in half, but remains statistically significant, whereas the regression-adjusted difference in the prevalence of long days is no longer significant. Mean daily hours are actually higher in California, though this difference is not significant when we add covariates to the model.

In the middle panel the sample is limited to individuals who usually work fewer than five days per week. For this group, the probability of working exactly 8 hours per day was roughly 4 percentage points higher in California, an effect that is significant at the .11 level. For the percentage working more than 8 hours per day, the California effect has the opposite sign with a comparable magnitude and slightly lower significance level. In contrast, when we limit the sample to individuals working fewer than 40 hours per week, the difference between California and the other states is not significant.[10]

The main difficulty in interpreting these cross-sectional results is that there may be other differences between California and other states that affect daily work schedules. For example, if other factors lead to longer workdays in California relative to the rest of the US, this "California effect" will offset the effect of the daily overtime law and the differences reported in Table 7 will understate the true effect of the law. However, if

[10] An alternative way to perform this type of test is to define an indicator variable that equals one for workers who work more than 8 hours per day but less than 40 per week (i.e., workers who would receive overtime pay under a daily standard but not a weekly one) and regress this variable on the California dummy and the covariates. Results from such a regression also indicate no significant difference between California and the rest of the country.

other state-specific factors apply equally to covered and exempt workers, we can use the latter as an additional control group in a DD framework. The regression equation for such a model is (suppressing notation for the control variables):

$$H = a_1 + b_1 CA + b_2 COV + b_3 CAxCOV + u_1, \qquad (2)$$

where H is some measure related to hours, and the indicators CA and COV equal one for workers in California and those who, according to their industry and occupation, are covered by the overtime rules. If there are California-specific factors other than overtime regulations that, ceteris paribus, increase daily hours, b_1 will be positive. Assuming these factors have a comparable effect on exempt and non-exempt workers, the effect of daily overtime will be given by b_3. If other California-specific factors are not important determinants of hours worked, b_1 will be zero and b_3 will give the same effect as the simpler models presented in Table 8.[11]

The results of the DD regressions, reported in Table 8, show that while exempt workers in all states tend to work longer days than covered workers, among exempt workers there is no evidence of a "California effect": the coefficient on CA is zero. The models without covariates suggest that California's daily overtime law is related to a lower prevalence of long workdays and a greater prevalence of 8-hour days, but a substantial part of these differences are explained by worker characteristics. The regression-adjusted differences for the full sample appear to reflect "effects" of the California law on workers with long workweeks, for whom the overtime premium should be the same under a daily or weekly standard. In summary, like the simple differences model, these DD estimates provide weak support at best for the argument that California's overtime regulations reduce daily hours.

C. Daily Overtime and Weekly Hours

1. Cross-State Results

[11] BDM include exempt workers in some of their regressions, but suggest that the results of these models be interpreted cautiously as California employers may respond to the daily overtime rule by substituting exempt for covered workers. It is not clear that this is a major problem since such substitution would represent an effect of the law, as opposed to bias due to spurious correlation. To the extent that such substitution occurs it should result in larger estimated effects. In contrast, if there is strong complementarity between covered and uncovered workers, this identification strategy will lead to an underestimate of the effect.

Using multiple years of data from the March CPS it is possible to estimate the effect of California's daily overtime law on weekly hours using workers in other states as a control group and changes in the law as a source of identification. Specifically, we compare covered workers in California to "covered" workers in the rest of the US (that is, those who would be covered if they worked in California). The universe of our repeated cross-sections includes working civilian adults (defined as having worked some positive hours last week) aged 16 and older who are/would be covered by California's daily overtime law, for a total sample size (after nonresponses) of 411,555.[12]

The two changes occurring in the 1990s are the repeal of daily overtime in Southern California after the 1994 Northridge earthquake and the statewide repeal in 1998 and 1999 for workers in manufacturing and several other industries. While they were in effect for similar lengths of time, there are important differences between these two repeals. The Northridge repeal was announced as a temporary measure and was made in response to conditions that may have independently affected labor demand in the affected areas. In contrast, the later repeal and reinstatement were intended to be permanent and were motivated largely by political concerns. Both repeals affected a subset of California workers, though different ones. The 1994 repeal was targeted by region whereas the 1998 repeal affected workers in certain industries. While we will consider these "experiments" separately later on, we will begin by considering their average effect, constraining their individual impacts to be equal.

Our treatment group will therefore be defined as all workers in all years who are covered by daily overtime. Specifically, the dummy variable D will take a value of 1 for

- covered California workers, whose Wage Orders were changed in 1998, during the daily overtime years (1990-1997, 2000-2001), except those in the "Northridge" counties in 1994,
- covered California workers, whose Wage Orders were not changed, throughout the sample period, except those in the "Northridge" counties in 1994.

We estimate various specifications of the regression equation (suppressing the *i* subscripts)

$$H = a + b_1 D + b_2 CA + b_3 Daily + b_4 WGO + b_5 Daily \acute{} WGO + X g + u.$$

[12] The definition of daily overtime coverage used here includes exemptions for self-employed workers; government employees; administrative, executive, and professional workers (except for registered nurses and pharmacists); workers in agricultural or private household occupations; taxi drivers; and workers in on-site occupations in the mining, construction, and logging industries. According to this definition, over 51% of

Estimation controls for demographic factors including sex, age, marital status, race and hispanic ethnicity, and educational category. We will also account for broad industry and occupation effects by including 13 industry and 9 occupational controls.[13] These covariates are represented by the matrix X above. In addition to the treatment dummy D, main effects for various components of the treatment group are included. These variables are dummies for California (CA), daily overtime years (Daily), Wage Order unchanged (WGO), and an interaction of daily year*Wage Order unchanged (Daily x WGO)s.[14]

Table 9 presents the results of this analysis. Columns 1 and 2 examine simple specifications. The first column shows the unconditional effect of daily overtime on weekly hours, while the second column shows the conditional effect after controlling for demographic characteristics, industry and occupation categories, and any secular trend in hours over this period. Results of both specifications indicate that mean weekly hours are significantly lower for workers covered by daily overtime. However, column 3 indicates that this effect reflects lower mean hours in California. Column 4 investigates the contributions of other main effects for the daily overtime period overall (1990-1997, 2000-2001), the workers whose Wage Orders remained unchanged, and an interaction of these terms. It appears that these workers, who were covered by daily overtime throughout the sample period, tend to have significantly lower hours on average. The inclusion of this control is critical since we would like to distinguish the causal effect of daily overtime from the effects of working in these industries or occupations. Nevertheless, there is no additional effect of the overtime legislation.

It may be the case that the California economy was evolving differently from the rest of the country during this period. The rise of the "new economy" may have contributed to an increase in hours, or an increase in hours in booming industries that may be disproportionately located in the state. Since these effects could obscure contemporaneous effects in the overtime environment, we attempt to control for them in columns 5 and 6. The results show that California does not appear to have a differential trend in hours. However, industrial

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California workers were covered by overtime in 1998. (See Appendix table B.) Means of the variables used are presented in Appendix table A.

[13] Industries are nondurable and durable manufacturing; transportation, communication and public utilities; wholesale and retail trade; finance, insurance and real estate; business and repair services; personal services; entertainment and recreation services; professional and related services; agriculture, forestry and fishing; mining; and construction. Occupations are sales, clerical, service, crafts, operators, laborers, technical, managerial and professional specialty, and farming, forestry, and fishing.

[14] Some interactions are excluded if they define a component of the treatment group. For example, while we allow for the possibility that industries for which the Wage orders were not changed were subject to unique shocks in 1998-99 (by including the interaction between daily period and Wage Order unchanged) we constrain such possible effects to be the same in California and elsewhere.

trends are jointly but not individually significant, indicating that sectoral changes are important. Accounting for this, the treatment effect of daily overtime remains insignificant.

Other states in the western US (Nevada, Colorado, Alaska, Wyoming, and Oregon) also required some daily overtime during this period. The form of this legislation varied between states, however. For example, Colorado required overtime only after 12 hours in a day, Wyoming's law covers only businesses not covered by FLSA, and Nevada's coverage depends on gross firm revenues and employee wages. These states thus may not be a good control. However, results show little difference when these states are omitted from the sample, as shown in column 7.

Column 8 presents results from a different approach to analysis. The daily overtime treatment effect has been defined as equal to 1 for each observation covered by the law. However, due to the fact that some California workers were unaffected by the law change and remained covered by daily overtime throughout the period, this effect is not a simple interaction as in other, more straightforward differences-in-differences approaches. Thus, while our main effects include dummies for California, Wage Order unchanged, and daily overtime period, we do not include all the interaction effects since some compose part of the treatment effect. We can take a different approach by omitting the workers whose Wage Orders would have been unchanged from the sample, and retaining the exempt workers as a control group. The main effects are now dummies for California, covered, and daily overtime period; all interactions are included, and the coefficient β_1 on the 3-way interaction captures the treatment effect:

$$H = a + b_1\, CA\acute{}\, Daily\acute{}\, cov + b_2\, CA + b_3\, Daily + b_4\, cov +$$
$$b_5\, CA\acute{}\, cov + b_6\, CA\acute{}\, Daily + b_7\, Daily\acute{}\, cov + X\, g + u.$$

Results show that hours are lower for covered workers in California during the daily overtime regime, though this effect is only marginally significant.

We also investigate results based on a more exact definition of coverage that includes the minimum salary exemption for administrative, executive, and professional workers, as well as the union coverage exemption. Column 9 shows that our results are not sensitive to this alternative coverage definition.

In sum, we do not find significant effects of California daily overtime legislation on weekly hours when comparing covered workers in California with similar workers in the rest of the US.

2. Within-State Results

It may be that workers outside of California are a poor control group if labor market conditions in California tended to be different from the rest of the country during the sample period. We can abstract from pure "state effects" by exploiting the rich variation in daily overtime policy within California in the 1990s to identify the effects of daily overtime. This variation allows us to use different groups of California workers not subject to the daily overtime provisions as a control for overall labor market conditions in the state. First, there is variation in the daily overtime treatment since some workers are exempt from the law. We may be concerned that conditions in exempt occupations and industries tend to differ systematically from conditions in covered occupations and industries, however, which would make exempt workers a poor control group. In this case, the effect for covered workers would not be due to the legislation, but to their class of job. We can use some covered workers as a control group since the daily law was repealed for certain workers on two occasions during the sample period: for some covered workers, based on their Wage Order categorization, for the years 1998-1999; and for covered workers in some southern counties in 1994.

We analyze California workers from the March CPS data described above (sample size 69,540). The treatment dummy is defined in the same way as above. Main effects include dummies for covered workers, daily period, 1994, Northridge counties, and Wage Orders unchanged. All interactions *I* of the 5 main effects are included except for those composing part of the treatment effect.[15] This allows us to determine the effects of the treatment group relative to the various control groups as described above. The regression estimated is

$$H = a + b_1 D + b_2 cov + b_3 Daily + b_4 WGO + b_5 Quake$$

$$+ b_6 1994 + S b_k I_k + X g + u.$$

Results are shown in Table 10. Simple specifications in columns 1 and 2 indicate that weekly hours are unconditionally lower for workers covered by daily overtime by more than 2 hours, although this effect is insignificant conditional on demographic factors, industry and occupation categories, and a time trend. The specification in column 3 includes main effects and interactions as well as regional dummies. Notice that most effects are insignificant, including those for covered workers, daily overtime period, and Wage Order unchanged, although hours in the counties affected by the Northridge earthquake tend to be higher throughout the sample period, especially in 1994 for covered workers whose Wage Orders remained unchanged. Column 4

allows for the possibility of distinct regional and industry/occupation trends in California by including separate trends by various effects (for northern California, Northridge, covered, and Wage Order unchanged workers). Except for the trend for covered workers and the Northridge counties, these effects are highly significant. The treatment effect becomes marginally significant (p-value = .052), indicating that, nor surprisingly, it is highly correlated with these variables. Weekly hours are approximately 38 minutes shorter under the daily overtime standard.

Given that the changes in the overtime law were generated by different sources – responding to legislative vote in 1998 and 2000, and to a natural disaster in 1994 – it may be appropriate to distinguish their separate effects on hours. Column 5a examines specifications where 3 treatment effects are included: one for the daily overtime regime (1990-1997 and 2000-2001, D early or late), one for those workers who were covered by daily overtime throughout (D always), and an additional effect for covered workers in the counties affected by the Northridge earthquake in 1994 (D quake). Note that D quake estimates the *differential* effect of the overtime suspension on workers in these counties beyond the effect of D early or late. Note also that this is the only treatment effect variable representing a group covered by *weekly* overtime. Results show that the daily overtime regime had a significant negative effect on weekly hours, reducing them by almost 45 minutes (.73 hours). In column 5b, allowing for separate treatment effects under the earlier and later regimes, we find that this result is driven by the significant negative effect of the earlier regime, which reduced weekly hours by almost 70 minutes (1.159 hours). In contrast, the suspension of daily overtime following the Northridge earthquake had no significant effect on weekly hours. There is also no effect for those workers covered throughout the period. Since the regional time-invariant effects are often significant, we also investigate whether the daily overtime treatment effects differ by region. Results shown in column 6, allowing separate effects of the earlier and later regimes for the Northridge counties, do not indicate regional differences in the effect of the law. (Results allowing additional separate effects for northern California, not shown also indicate no separate regional effects.)

Time trends appear to explain a great deal of variation in hours over the sample period. In columns 7a-7c, we estimate a more flexible specification that allows for separate year effects. The year effects are nearly all

[15] These interactions are quake*cov, quake*WG0, quake*daily, quake*1994, cov*1994, WG0*daily, WG0*1994, quake*WG0*daily, quake*WG0*1994, quake*cov*1994, and quake*cov*WG0*1994. The latter two interactions are excluded from the model when a separate "quake" treatment effect is included.

significant and not monotonic, indicating that the inclusion of a time trend alone may not accurately model the secular changes in hours throughout the period. Column 7a indicates that the overall treatment effect D remains essentially unchanged, negative and significant. The effect of daily overtime (D early or late) remains similarly unchanged (column 7b). However, we now find only a small and marginally significant difference between the earlier and later regimes in column 7c, with effects slightly larger in the earlier period.

In sum, we find that daily overtime tends to significantly reduce weekly hours by about 38 minutes. This effect appears to be driven by the effect on those workers whose Wage Orders were changed (about a 45 minute reduction), and is slightly stronger in the earlier overtime regime.

V. Conclusions

We employed a variety of data sources and approaches to estimation to investigate the effects of recent changes in California's daily overtime law on hours of work. Our attempts to use data on work schedules to identify more precisely the workers who would be most affected provided only weak evidence of an impact. However, the cross-sectional nature of the work schedule data does not allow for very powerful tests. Other results using pooled cross-sectional data yielded further insights. Although we found little effect of the law when using workers outside of California as a control group, we find significant negative effects on hours using within-state data. Moreover, these results suggest distinct effects of each law change. Interestingly, the suspension of daily overtime following the Northridge earthquake had little effect on weekly hours, while the 1998-1999 repeal of daily overtime tended to increase them. One explanation for this finding could be the deleterious effects of the earthquake on the Southern California economy.

Future research will extend this study in several ways. First, we will investigate more sophisticated approaches to identifying those workers who should be most affected by the daily overtime law. A propensity score approach can allow us to account for the likelihood that a worker will receive a differential effect from the daily standard. Second, we will consider the effects of the law on other outcomes. In addition to exploring other measures of working hours, we can examine effects on employment and wages. The latter may represent an important impact of the law if employers were able to adjust wages to offset changes in hours. The combination of outcomes would allow for more robust tests of the predictions of a labor demand model. Finally, we will attempt to exploit information on daily overtime legislation in other states in order to estimate

the average effect of state daily overtime. Such an approach would allow us to abstract from effects of "California overtime," and may thus allow us to draw more general conclusions.

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Table 1. Mean Overtime Hours In California and the Rest of the US, 1994 to 2000

Year	CA CA-DOF	CA CPS-ORG	Rest of US CPS-ORG
1994	----	8.37	8.20
1995	----	8.25	8.03
1996	----	6.83	7.75
1997	4.96	7.66	8.05
1998	4.72	7.56	7.99
1999	4.69	7.30	7.94
2000	4.99	7.92	7.91
Means by CA Regime			
(a) Daily (1994-97; 2000)	4.98	7.86	8.00
(b) Weekly (1999-98)	4.71	7.45	7.97
Difference: a - b	0.28	0.41	0.03
[% difference: (a -b)/a]	[5.6%]	[5.2%]	[0.4%]

Notes: Data from the California Department of Finance (CA-DOF) are for workers in manufacturing. The figures for each year represent an average of seasonally-adjusted monthly data. Data from the outgoing rotation group of the CPS (CPS-ORG) are for all workers subject to Federal overtime laws.

Table 2: Mean Overtime Hours by Usual Weekly Hours, California and the Rest of the Country, 1994-2000

	CA			Rest of the US		
Year	**<40/wk**	**40/wk**	**>40/wk**	**<40/wk**	**40/wk**	**>40/wk**
1994	5.53	9.10	9.06	7.24	8.48	8.19
1995	9.20	7.98	11.33	7.38	7.48	9.68
1996	6.00	6.12	9.73	7.42	7.27	9.01
1997	7.14	8.00	7.39	7.06	7.99	8.73
1998	8.79	6.74	10.86	6.77	7.40	10.14
1999	6.88	6.11	12.33	6.71	7.75	9.11
2000	8.50	7.18	10.73	6.31	7.53	9.60
Means by regime						
(a) Daily	7.28	7.68	9.65	7.08	7.75	9.04
(b) Weekly	7.83	6.42	11.60	6.74	7.57	9.62
Difference (a - b)	-0.56	1.25	-1.95	0.34	0.18	-0.58
[% difference: (a -b)/a]	-7.6%	16.3%	-20.2%	4.8%	2.3%	-6.4%

Source: March CPS ORG, 1994-2000, all covered workers. Variables are defined as any overtime last week and actual overtime hours on main job last week.

Table 3: Regressions of overtime hours on hours categories

	(1)	(2)	(3)
26<=hrs<=39	-0.760 *	-0.744 *	-0.810 *
hrs=40	0.192	0.230	-0.414
41<=hrs<=50	0.656 *	0.763 *	0.140
hrs>=51	6.403 * *	6.422 * *	5.555 * *
Daily Overtime in Effect (D)	7.503 * *	-0.117	-0.295
D×[26<=hrs<=39]		0.366	0.838
D×[hrs=40]		0.699	0.934
D×[41<=hrs<=50]		-0.236	-0.218
D×[hrs>=51]		1.916	1.646
trend		-0.063	-0.058
Covariates?	no	no	yes
R-squared	0.044	0.050	0.071

Source: March CPS ORG, 1994-2000. N=6204. **=significant at 5% level, *=significant at 10% level.

Table 4: The Distribution of Daily and Weekly Hours in California and the Rest of the US

California
(N=1986)

	Weekly Hours			
Daily Hours	**<40/week**	**40/week**	**>40/week**	**Total**
<8/day	18.98	5.09	1.06	25.13
8/day	1.86	54.03	0.86	56.75
>8/day	1.91	2.77	13.44	18.13
A. Total	23.05	53.54	23.41	100.00

Other States
(N=23660)

	Weekly Hours			
Daily Hours	**<40/week**	**40/week**	**>40/week**	**Total**
<8/day	2.29	6.10	2.19	30.58
8/day	1.72	45.80	0.72	48.25
>8/day	1.92	3.06	16.18	21.17
B. Total	25.94	54.97	19.10	100.00

Table 5: Fractions of workers with different daily and weekly hours schedules (cell percentages)

California
n = 4913

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	17.18	1.49	0.49	19.15
8	5.62	50.46	3.56	59.64
>8	1.32	2.42	17.46	21.21
Total	24.12	54.37	21.51	100

Rest of US
n = 57009

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	19.4	1.36	0.48	21.24
8	6.41	44.44	3.84	54.69
>8	1.42	2.84	19.81	24.07
Total	27.24	48.64	24.12	100

Source: May 1991 CPS, Work Schedule Supplement.

Table 6a: Fractions of workers with different daily and weekly hours schedules

Conditional percentages

California

Days per week < 5
n = 640

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	47.19	0.62	0.16	47.97
8	28.28	1.09	0.31	29.69
>8	7.66	10.00	4.69	22.34
Total	83.12	11.72	5.16	100

Days per week = 5
n = 3628

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	13.01	0.69	0.22	13.92
8	2.56	66.92	1.6	71.09
>8	0.33	1.38	13.29	14.99
Total	15.9	68.99	15.1	100

Days per week > 5
n = 645

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	10.85	6.82	2.33	20
8	0.31	6.82	17.83	24.96
>8	0.62	0.78	53.64	55.04
Total	11.78	14.42	73.8	100

Rest of US

Days per week < 5
n = 8011

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	50.91	0.25	0.06	51.22
8	24.49	1.20	0.14	25.83
>8	8.06	10.52	4.37	22.96
Total	83.46	11.97	4.57	100

Days per week = 5
n = 40360

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	14.58	0.93	0.16	15.67
8	4.01	60.83	2.31	67.16
>8	0.28	1.57	15.32	17.17
Total	18.87	63.34	17.79	100

Days per week > 5
n = 8638

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	12.69	4.39	2.36	19.44
8	0.87	7.95	14.39	23.21
>8	0.64	1.62	55.09	57.35
Total	14.19	13.96	71.85	100

Source: May 1991 CPS, Work Schedule Supplement.

Table 6b: Percent with any overtime last week

Cell percentages

California

Days per week < 5
n = 640

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	0.09	0.50	0.00	0.15
8	0.13	0.00	0.00	0.11
>8	0.20	0.10	0.20	0.13
Total	0.15	0.10	0.20	0.13

Days per week = 5
n = 3628

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	0.12	0.11	0.00	0.12
8	0.10	0.07	0.45	0.08
>8	0.00	0.18	0.25	0.24
Total	0.11	0.07	0.29	0.09

Days per week > 5
n = 645

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	0.00	0.08	0.14	0.06
8	0.00	0.22	0.21	0.21
>8	0.00	0.00	0.17	0.14
Total	0.00	0.14	0.19	0.15

Rest of US

Days per week < 5
n = 8011

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	0.19	0.00	0.00	0.17
8.00	0.16	0.05	0.33	0.14
>8	0.11	0.10	0.25	0.13
Total	0.15	0.09	0.25	0.13

Days per week = 5
n = 40360

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	0.06	0.06	0.18	0.06
8.00	0.08	0.08	0.23	0.08
>8	0.12	0.12	0.27	0.24
Total	0.07	0.08	0.26	0.10

Days per week > 5
n = 8638

	Hours per week			
	<40	40	>40	Total
Hours per day				
<8	0.06	0.04	0.16	0.07
8.00	0.14	0.10	0.25	0.18
>8	0.00	0.09	0.18	0.17
Total	0.07	0.08	0.22	0.15

Source: May 1991 CPS, Work Schedule Supplement.

Table 7: The Probability of Working Various Daily Hours in California and the Rest of the US

	California	Other States	Difference (CA-Other States) Unadjusted	Adjusted
All Workers				
(N=25646)				
Prob(H_D = 8)			0.085**	0.049**
			(0.012)	(0.012)
Prob(H_D > 8)			-0.030**	-0.012
			(0.010)	(0.010)
E(H_D)			0.116*	0.063
			(0.53)	(0.053)
Fewer than 5 Days/Week				
(N=3619)				
Prob(H_D = 8)			0.029	0.036
			(0.022)	(0.023)
Prob(H_D > 8)			0.025	-0.035
			(0.032)	(0.029)
E(H_D)			0.873**	0.350
			(0.296)	(0.289)
Weekly Hours <40 (N=6589)				
Prob(H_D = 8)			0.010	0.010
			(0.013)	(0.013)
Prob(H_D > 8)			0.015	0.019
			(0.012)	(0.013)
E(H_D)			0.133	0.080
			(0.112)	(0.114)

Table 8: The Probability of Working Various Daily Hours in California and the Rest of the US: Difference-in-Difference Estimates

	$Pr(H_D=8)$		$Pr(H_D>8)$		$E(H_D)$	
All Workers (N=47902)						
California	0.007	-0.004	-0.008	0.001	-0.081	-0.088
	(0.012)	(0.012)	(0.015)	(0.010)	(0.058)	(0.056)
Covered	0.080	0.117	-0.120	-0.057	-0.367	-0.097
	(0.005)	(0.007)	(0.004)	(0.006)	(0.023)	(0.036)
CA x Covered	0.078	0.054	-0.022	-0.013	0.197	0.149
	(0.017)	(0.016)	(0.015)	(0.014)	(0.081)	(0.078)
covariates?	No	Yes	No	Yes	No	Yes
<5 Days/Week (N = 5891)						
California	0.018	0.019	-0.044	-0.056	-0.180	-0.379
	(0.022)	(0.022)	(0.033)	(0.029)	(0.335)	(0.320)
Covered	0.001	0.046	-0.055	0.026	-0.506	0.354
	(0.009)	(0.014)	(0.014)	(0.019)	(0.140)	(0.206)
CA x Covered	0.012	0.021	0.069	0.020	1.052	0.642
	(0.031)	(0.031)	(0.047)	(0.040)	(0.470)	(0.442)
covariates?	No	Yes	No	Yes	No	Yes
<40Hrs/Week (N=11295)						
California	0.020	0.273	0.005	0.006	-0.152	-0.189
	(0.122)	(0.012)	(0.013)	(0.014)	(0.124)	(0.122)
Covered	0.010	0.036	-0.007	0.015	0.119	0.678
	(0.005)	(0.007)	(0.005)	(0.008)	(0.050)	(0.070)
CA x Covered	-0.005	-0.006	0.005	0.003	0.284	0.280
	(0.017)	(0.017)	(0.019)	(0.019)	(0.172)	(0.168)
covariates?	No	Yes	No	Yes	No	Yes

Table 9: Effects of daily overtime on weekly hours
(p-values in parentheses)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
D	-0.263 *	-0.583 *	-0.035	0.064	0.026	0.064	0.062	-0.528	0.118
	(0.002)	(0.000)	(0.834)	(0.712)	(0.884)	(0.710)	(0.719)	(0.107)	
trend		-0.009	-0.008	-0.011	-0.009	0.123	-0.014 *	-0.020 *	-0.014 *
CA			-0.573 *	-0.649 *	-0.510 *	-0.649 *	-0.639 *	-0.895 *	-0.634 *
daily				-0.081	-0.076	-0.088	-0.084	-0.014	-0.055
WO not changed				-0.713 *	-0.709 *	-0.788 *	-0.702 *		-0.266
daily*WO not ch.				-0.111	-0.116	-0.025	-0.113		-0.203
CA*trend					-0.016				
covered								-0.386 *	
CA*covered								0.498	
CA*daily								0.403	
daily*covered								-0.086	
Covariates?	no	yes	yes	yes	yes	yes	yes	yes	yes
Industry trends?	no	no	no	no	no	yes	no	no	no
Nonwest states excluded?	no	no	no	no	no	no	yes	no	no
R-squared	0.002	0.207	0.207	0.207	0.207	0.207	0.208	0.173	0.187
n	411555	411555	411555	411555	411555	411555	38513	652781	571641
F-test of joint significance of industry trends						2.91			

Source: March CPS Annual Demographic Survey, 1990-2001, all covered workers. *=significant at 5% level. D is the treatment effect, defined as all observations covered by daily overtime. In column (8), this is CA*covered*daily.

Table 10: Effects of daily overtime on weekly hours, within CA
(p-values in parentheses)

	(1)	(2)	(3)	(4)	(5a)	(5b)	(6)	(7a)	(7b)	(7c)	(7d)
D	-2.364 *	0.195	-0.474	-0.644				-0.645			
	(0.000)	(0.158)	(0.127)	(0.052)				0.051			
D always					-0.038	-0.227	-1.119		-0.028	-0.035	0.159
					(0.940)	(0.657)	(0.115)		(0.956)	(0.946)	(0.750)
D always*quake							1.795 *				
							(0.034)				
D early or late					-0.728 *				-0.730 *		
					(0.029)				(0.028)		
D early						-1.159 *	-1.046 *			-0.746	-0.399
						(0.002)	(0.041)			(0.062)	(0.211)
D early*quake							-0.221				
							(0.726)				
D late						-0.316	-0.418			-0.715	-1.016 *
						(0.386)	(0.444)			(0.071)	(0.007)
D late * quake							0.205				
							(0.776)				
D quake					-0.503	-0.502	-0.401		-0.505	-0.505	-0.500
					(0.538)	(0.538)	(0.628)		(0.536)	(0.536)	(0.540)
trend		0.011	0.018	-0.092	-0.090	-0.096 *	-0.086	-0.133 *	-0.131 *	-0.132 *	-0.042
cov			0.583	1.064 *	1.049 *	1.706 *	1.755 *	1.068 *	1.052 *	1.076	0.531
daily			0.441	0.522	0.564	0.541	0.541	0.924 *	0.967 *	0.964 *	1.153 *
WO not changed			-0.066	-1.469	-1.696 *	-1.866 *	-1.626 *	-1.463	-1.695 *	-1.702 *	-0.317
quake			0.789 *	0.311	0.312	0.295	0.564	0.310	0.311	0.310	1.041 *
year 1994			0.595	0.625	0.627	0.637	0.642	0.241	0.243	0.247	0.224
daily*WO not ch			-0.217	0.190	0.148	0.176	0.199	0.168	0.124	0.126	-0.304
quake*cov			0.244	0.232	0.224	0.225	0.095	0.233	0.224	0.224	0.220

quake*wg0			-0.653	-0.681	-0.700	-0.686	-1.204	-0.691	-0.710	-0.710	-0.712
quake*daily			-0.040	-0.188	-0.183	-0.176	-0.176	-0.189	-0.184	-0.184	-0.319
quake*1994			-0.338	-0.392	-0.617	-0.615	-0.637	-0.388	-0.613	-0.613	-0.672
cov*1994			-0.148	-0.200	-0.203	-0.113	-0.155	-0.198	-0.201	-0.198	-0.273
wg0*1994			-1.028	-0.844	-0.864	-0.906	-0.857	-0.830	-0.850	-0.852	-0.995
quake*cov*1994			-1.359	-1.526				-1.529			
quake*daily*wg0			-0.337	-0.280	-0.288	-0.304	-0.355	-0.266	-0.274	-0.275	-0.290
quake*wg0*1994			1.174	1.186	2.207	2.203	2.144	1.185	2.204	2.204	2.211
quake*cov*wg0*1994			3.153 *	3.137 *				3.128 *			
North CA			0.275	-0.965 *	-0.970 *	-0.971 *	-0.959 *	-0.948 *	-0.953 *	-0.954 *	-0.506
north*trend				0.183 *	0.184 *	0.184 *	0.183 *	0.181 *	0.181 *	0.181 *	0.115 *
covered*trend				-0.050	-0.054	-0.123 *	-0.122 *	-0.050	-0.054	-0.057	
WO not ch*trend				0.156 *	0.152 *	0.175 *	0.174 *	0.156 *	0.152 *	0.153 *	
quake*trend				0.090	0.090	0.092	0.071	0.090	0.091	0.091	
Covariates?	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Separate quake treatment effects?	no	no	no	no	no	no	yes	no	no	no	no
Year effects?	no	no	no	no	no	no	no	yes	yes	yes	yes
R-squared	0.008	0.146	0.147	0.148	0.148	0.148	0.148	0.148	0.148	0.148	0.148

Source: March CPS Annual Demographic Survey, 1990-2001, all California workers. N=69,540. *=significant at 5% level. D is the treatment effect, defined as all observations covered by daily overtime. In column (8), this is CA*covered*daily.

Table A: Means, 1990-2001

Variable	Mean	Std. Dev.	Min	Max
hours	39.155	13.958	1	99
fem	0.469	0.499	0	1
age	38.988	12.846	16	90
year	1995.321	3.473	1990	2001
marr	0.599	0.490	0	1
racewhi	0.870	0.336	0	1
raceblk	0.083	0.277	0	1
raceoth	0.046	0.210	0	1
hisp	0.127	0.333	0	1
edu1	0.130	0.336	0	1
edu2	0.341	0.474	0	1
edu3	0.274	0.446	0	1
edu4	0.167	0.373	0	1
edu5	0.087	0.282	0	1
ca	0.091	0.287	0	1
nonwest	0.848	0.359	0	1
northca	0.026	0.159	0	1
sfoak	0.010	0.098	0	1
lalongb	0.039	0.194	0	1
sandiego	0.006	0.077	0	1
sanjose	0.004	0.065	0	1
quake	0.054	0.226	0	1
w	0.537	0.499	0	1
waep	0.759	0.428	0	1
org	0.213	0.409	0	1
waep2	0.764	0.425	0	1
waepu	0.741	0.438	0	1
waepu2	0.745	0.436	0	1
wph	0.541	0.498	0	1
wgorch	0.851	0.356	0	1
early yrs	0.682	0.466	0	1
late yrs	0.160	0.366	0	1
all daily yrs	0.842	0.365	0	1
inds1	0.048	0.214	0	1
inds2	0.067	0.250	0	1
inds3	0.092	0.289	0	1
inds4	0.069	0.253	0	1
inds5	0.038	0.192	0	1
inds6	0.168	0.374	0	1
inds7	0.066	0.247	0	1
inds8	0.061	0.240	0	1
inds9	0.039	0.193	0	1
inds10	0.016	0.124	0	1
inds11	0.242	0.429	0	1
inds12	0.028	0.165	0	1
inds13	0.006	0.078	0	1
inds14	0.059	0.236	0	1
occs1	0.000	0.021	0	1
occs2	0.119	0.324	0	1

occs3	0.150	0.357	0	1
occs4	0.141	0.348	0	1
occs5	0.108	0.311	0	1
occs6	0.102	0.303	0	1
occs7	0.038	0.192	0	1
occs8	0.032	0.177	0	1
occs9	0.281	0.450	0	1
occs10	0.027	0.163	0	1

Source: March CPS Annual Demographic survey, 1990-2001. N=766,838.

Table B: Overtime coverage rates according to various definitions

	National all coverage 1	California all coverage 1	National all WO changed	California all WO changed	National ORG = 1 coverage 2	California ORG = 1 coverage 2
1990	0.545	0.528	0.850	0.844	0.732	0.723
1991	0.544	0.537	0.854	0.852	0.736	0.731
1992	0.550	0.546	0.855	0.851	0.739	0.732
1993	0.542	0.534	0.854	0.846	0.740	0.724
1994	0.540	0.535	0.854	0.846	0.743	0.733
1995	0.534	0.536	0.853	0.842	0.744	0.746
1996	0.533	0.520	0.851	0.851	0.749	0.754
1997	0.533	0.515	0.854	0.857	0.754	0.751
1998	0.533	0.513	0.850	0.838	0.756	0.745
1999	0.528	0.510	0.850	0.829	0.754	0.744
2000	0.528	0.525	0.845	0.831	0.752	0.741
2001	0.527	0.512	0.846	0.831	0.753	0.743

Source: March CPS Annual Demographic Survey, 1990-2001.
Coverage 1: exemptions include self-employed; administrative, executive, and professional workers except RNs and pharmacists; government workers; agricultural occupations; private household occupations; workers in on-site activities; and taxi drivers.
Coverage 2: monthly minimum salary exemption for administrative, executive, and professional workers, and union coverage exemption.