

5. RESULTS ON EARNINGS LOSSES AND REPLACEMENT RATES

We report our empirical results in four sections. First, we report our estimates of earnings losses and replacement rates for workers injured at private, self-insured firms. We also compare earnings losses for self-insured employers to new estimates for the same injury years from insured employers. In the second section, we examine post-injury employment patterns at self-insured employers in comparison to insured employers to evaluate the claim that return-to-work is better at the self-insured. In the third section, we examine differences in losses, replacement rates, and uncompensated earnings losses by severity of injury. In the fourth section, we explore empirically the explanation for differences between the self-insured and insured firms, focusing on the impact of firm size on proportional earnings losses, and of pre-injury earnings on replacement rates.

SELF-INSURED EMPLOYERS

In Figure 5, the average quarterly earnings of permanent disability claimants at private, self-insured firms in 1993 are reported before and after injury, along with the average quarterly earnings of their comparison group. The figure peaks at quarter 0, the quarter of injury, because in that quarter all workers are observed working at the at-injury employer for at least part of the quarter.¹ In any other quarter, some individuals (both injured workers and comparison workers) will have no EDD earnings reports and will be assumed to have earnings of zero. Examination of the 12 quarters prior to injury provides a check on the quality of the controls. The injured workers and comparison workers are matched on the basis of average quarterly earnings over the four quarters prior to injury. The average earnings difference for the 1-4 quarters prior to the match period is \$68, and during the 5-8 quarters prior to the match, it is \$32. This small difference suggests that the comparison workers are high-quality controls for the injured workers.

In the first quarter after injury, the average earnings of the injured workers drop relative to the comparison workers by 21 percent. Little evidence of recovery in earnings is observed over the quarters following injury, so that by quarter 20, five years after injury, average earnings of the injured workers are still significantly lower than the average earnings of the comparison workers.

¹ The quarter of injury is defined as the last quarter with observed earnings prior to the date of injury reported on the claims data. We changed the quarter of injury in 0.56 percent of the cases where

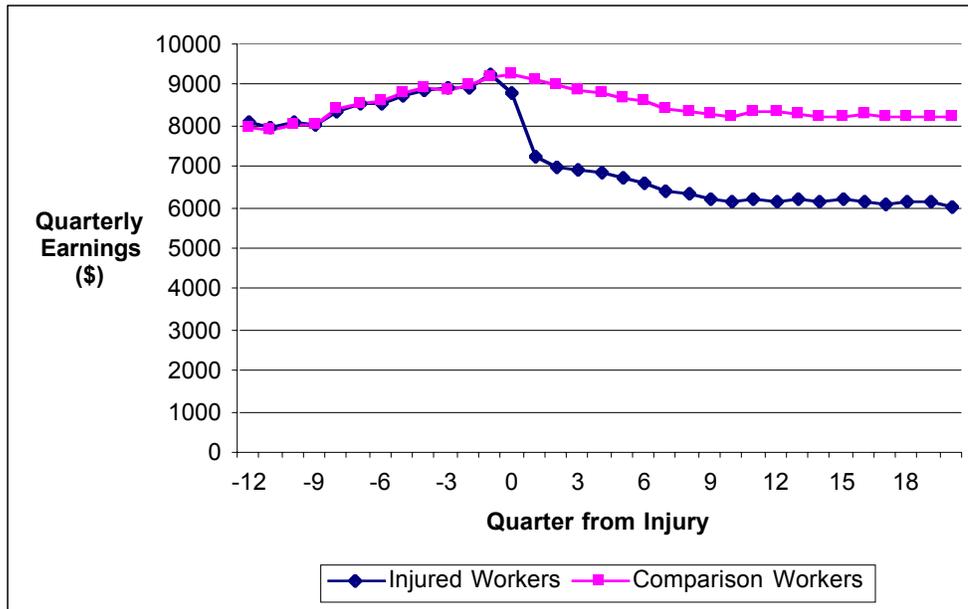


Figure 5—Earnings Before and After Injury of PD Claimants at Self-Insured Firms in California, 1993

Figure 6 reports the earnings of injured workers at self-insured firms in 1995 and their comparison worker before and after the quarter of injury. This figure provides only three years of post-injury earnings, but five years of pre-injury earnings with which to test the quality of the controls. As the figure shows, the earnings of the two groups track very closely over the years prior to injury. Even 13-16 quarters before the match period (the fifth year before injury), the difference is only \$97, or 1.3 percent. As with the 1993 earnings, the earnings of injured workers decline significantly after the quarter of injury, and the difference in average earnings is maintained over the three observed years after injury.

Table 3 reports average proportional and total earnings losses, and replacement rates (before and after-tax) for 1991-1995 at three, four and five years after injury for workers injured at self-insured employers in California.² The results for 1993 are shaded because these results, the latest year for which five years of post-injury earnings are available, are the focus of the discussion. The top panel reports before-tax earnings losses three years after injury. The shaded line shows that earnings losses were \$24,127 before-tax over the three years after injury (from 1993-1996) for workers with permanent disability claims at self-insured firms in California. This

quarter of injury had no earnings but there was a quarter with earnings within one year prior. If there was no wage data in the year prior to injury, the claim was dropped.

² All dollar amounts are in 1997 dollars.

is equation (1) above, discounted, in 1997 dollars, or letting r denote the discount rate,³ and t denoting quarters,

$$\text{3-year earnings loss} = \sum_{t=0}^{12} \frac{1}{(1+r)^t} (y_t^U - y_t^I) \quad (5)$$

The total earnings for the comparison group over the three years after injury is \$108,847, which represents the earnings the injured workers would have received had they not been injured, or “potential uninjured earnings.” Dividing earnings losses by potential uninjured earnings, as in equation (2) gives proportional earnings losses of .222.

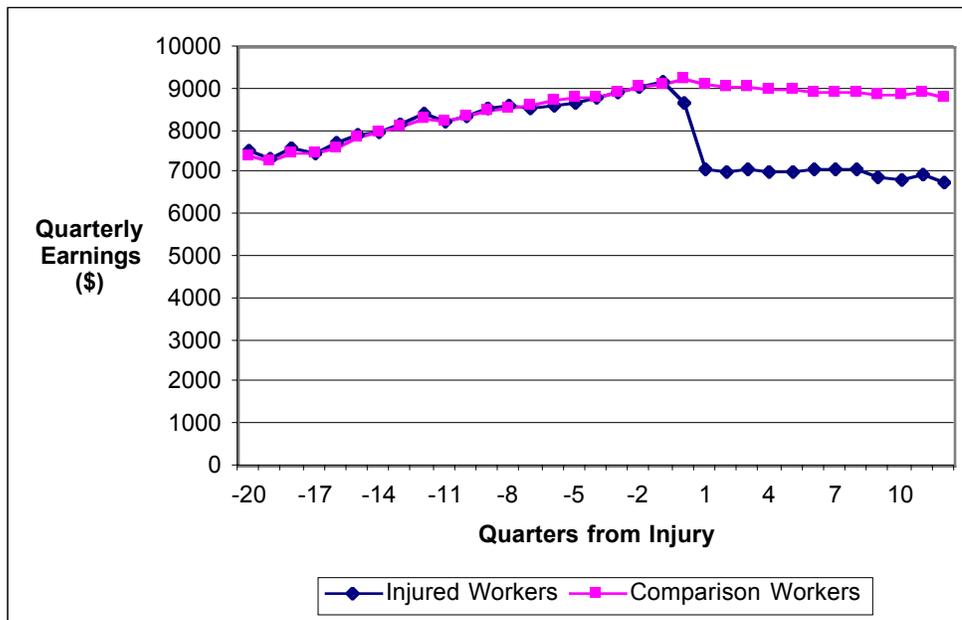


Figure 6—Earnings Before and After Injury of PPD Claimants at Self-Insured Firms in California, 1995

Therefore, workers injured at self-insured firms in California in 1993 lost 22.2 percent of their earnings over the three years after injury. Examining proportional earnings losses at three years for the other years of injury shows that proportional losses were somewhat higher in 1991 (24.1 percent) and somewhat lower by 1995 (at 20.8 percent). As noted in Reville and Schoeni (2000), proportional losses have been declining in California over the 1990s.

The total indemnity paid by three years for PPD claimants at self-insured employers in 1993 is \$15,607.⁴ This amount includes temporary disability, permanent disability and

³ An annual rate of 2.3 percent is used to discount future earnings. This is the same real discount rate used in research by the Social Security Administration.

vocational rehabilitation maintenance allowance. Dividing this amount by the total losses of \$24,127 provides the replacement rate (equation 3), which is .647, reported in the last column. Therefore, 64.7 percent of three-year pre-tax earnings losses are replaced by workers' compensation indemnity benefits. Comparing across the five injury years 1991-1995, the lowest three-year before-tax replacement rate is .581 observed for 1991. The highest observed three-year before-tax replacement rates are in 1992 and 1995, both of which are approximately two-thirds.

Table 3
Earnings Losses, Proportional Losses and Replacement Rates by Year of Injury and Quarters from Injury, Self-Insured Firms in California, 1991-1995

Years after Injury	Year of Injury	Earnings Losses	Potential Uninjured Earnings	Total Indemnity	Prop. Loss	Repl. Rate
Before-Tax						
3	91	26,081	108,255	15,157	.241	.581
	92	23,149	104,438	15,538	.221	.671
	93	24,127	108,847	15,607	.222	.647
	94	24,538	109,989	15,129	.223	.617
	95	23,403	112,681	15,511	.208	.663
4	91	33,768	137,172	16,963	.241	.502
	92	30,268	133,046	17,497	.227	.578
	93	31,818	139,264	17,588	.228	.553
	94	32,772	141,649	17,084	.231	.521
5	91	41,655	165,210	18,176	.246	.436
	92	37,004	160,993	18,882	.230	.510
	93	39,529	168,878	19,076	.234	.483
Simulated After-Tax						
5	91	31,460	126,606	18,176	.248	.578
	92	28,127	123,550	18,882	.228	.671
	93	29,846	129,149	19,076	.228	.639

When more years after injury are observed, earnings losses, potential uninjured earnings, and total benefits increase. The last row of the before-tax panel in Table 3 shows that by five years, total before-tax earnings losses are almost \$40,000. With potential uninjured earnings of \$168,878, proportional earnings losses are 23.4 percent. In most years, we find that proportional losses do not increase with time from injury, indicating that total quarterly losses do not change by much as time from injury increases. This is apparent from Figure 5 where there is little evidence on average of either recovery or further deterioration. However, for the majority of

⁴ We do not observe the actual benefit stream paid. We cap total indemnity for large claims to reflect the rate at which benefits are paid according to the schedule. For details, see Appendix A.

claimants, all benefits are paid before three years and if benefits are still being received, they are paid at the lower weekly amount of PPD rather than the TTD rate.⁵ By the end of year five, benefits have increased to \$19,076, which leads to a replacement rate or earnings losses for PPD claimants at self-insured firms of slightly less than one-half.

The bottom panel in Table 3 shows simulated after-tax earnings losses and replacement rates. Both earnings losses and potential uninjured earnings are approximately one-quarter lower, though earnings losses are reduced by a slightly larger amount than potential uninjured earnings, reflecting the fact that the tax system is progressive and losses are taxed at a marginal rate, while potential uninjured earnings are taxed at an average rate. As a result, proportional earnings losses are slightly lower after-tax. However, since indemnity is not taxed, replacement rates are considerably higher after tax. We estimate that by five years after injury, indemnity replaces 63.9 percent of after-tax earnings losses for injuries in 1993.

Since losses are continuing by five years, but only 15 percent of the injured workers would still be receiving indemnity benefits, we simulate losses to ten years and report the estimates, before- and after-tax, for 1993, 1994 and 1995 injuries in Table 4. Losses are projected by assuming that the losses observed in the last year of injury continue at the same quarterly amount for ten years. This assumption is based upon observation of Figure 5, where the gap between earnings the earnings of injured workers and comparison workers does not decline.⁶ For indemnity benefits, we use the full incurred indemnity. For each of the three years, we estimate a before-tax replacement rate of approximately one-third. We estimate a ten-year after-tax replacement rate of less than one-half. With “permanent” losses, but benefits that are typically paid only over the first few years after injury, the time period over which the loss estimates are calculated is critical: Longer periods lead to considerably lower replacement rates.⁷

One hypothesis for the losses observed in Figures 5 and 6 could be that some injured workers never return to work, but most return to work and resume the earnings path expected

⁵ We do not know the exact timing of benefits, but we assume that permanent disability benefits begin being paid after temporary disability and vocational rehabilitation allowance are fully paid. See Appendix A.

⁶ The difference between losses in year 4 and losses in year 5 is \$20.

⁷ Ultimately, if losses are observed far enough in the future, they will be zero because the entire sample will have retired (or died). This projection method does not capture the inevitable decline associated with retirement. As an upper bound on this decline, we set losses to zero in the projection period for every worker as they reach 65. This is an overstatement of the rate of decline because no attempt is made to eliminate gains associated with comparison workers over 65 (since age for these workers is not available in our data). This simulated projection led to before-tax replacement rates for 1993 injuries of .40, and after-tax replacement rates of .532.

without the injury. If, for instance, 20 percent retired at the date of injury and the rest suffered no permanent consequences, Figures 5 and 6 may be observed.

Table 4
Ten-Year Projected Losses, Before and After Tax, Self-Insured Firms, 1993-1995

	Year of Injury	10-Year Projected Losses (\$)	Total Indemnity (\$)	Replacement Rate
Self-Insured				
Before-tax	93	71,027	24,643	0.347
<i>After-tax</i>	93	53,342	24,643	0.462
Before-tax	94	73,295	23,147	0.316
<i>After-tax</i>	94	55,096	23,147	0.420
Before-tax	95	66,034	22,987	0.348
<i>After-tax</i>	95	49,389	22,987	0.465

Figure 7 explores this hypothesis and demonstrates that it is not an accurate description of the data. The figure shows the fraction of PPD claimants for which a particular quarter is the last quarter in which they are observed. In other words, the figure shows the attrition rate from the sample, which includes permanent labor force exit due to injury but also retirement and migration out of the California labor force. The figure shows that all but about 1.1 percent (considerably less than 20 percent) of the injured workers are observed with earnings reports to EDD following injury. These findings suggest that almost all workers have at least one return to work.⁸

The comparison worker attrition rate captures the pattern of retirement and migration out of California without injury: .085 percent of the comparison workers are never observed after the quarter of injury, almost as much as the amount observed for the injured workers. The figure also shows that in every quarter after the quarter of injury, the fraction that attrit is greater than the fraction of their uninjured counterparts that attrit suggesting that an injury puts the injured workers at greater risk of California labor force exit, but there is no tendency for this to happen in the immediate aftermath of the injury.

Figure 7 also separately breaks out the attrition for workers aged 25-55, workers who are not, without injury, at risk of retirement. This group of injured workers also has a higher probability of dropping out in every quarter after injury than their uninjured counterparts (which

includes workers over 55, and therefore at risk of retirement). In general, Figure 7 demonstrates that the employment consequences of a permanently disabling workplace injury are complex. This issue will be explored further in the discussion of return to work below.

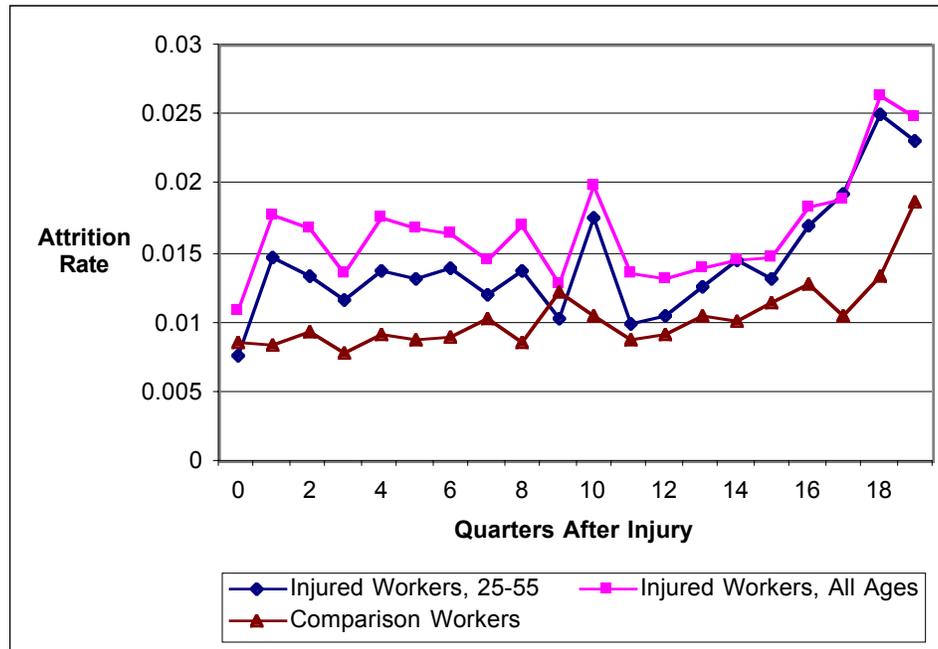


Figure 7—Attrition (Retirement) Among Injured Workers, All and Aged 25-55, PPD Claimants at Self-Insured Firms in California, 1993

We explored at some length the possibility that wage losses were generated by early retirement behavior among workers over 55, a hypothesis raised by some participants in meetings with stakeholders. We estimated wage losses after restricting the population of injured workers to those aged 25-55. Since the comparison workers would still include workers under 25 and over 55, estimates of wage losses for this group would be underestimates.⁹ We found that the underestimate of five-year before-tax proportional wage losses for PPD claimants in 1993 aged 25-55 was still 19.3 percent. Therefore, estimated earnings losses in this report are not generated by early retirement behavior of workers over 55.¹⁰

⁸ Some workers may not return to work but would have salary continuance reported to the Employment Development Department as wages. We do not know how often this is the case.

⁹ The EDD data do not include information on the age of the worker, and therefore we do not have this information for any of the comparison workers. Most of the self-insured employers provided us with birth date of the injured worker. An unbiased estimate of the impact of the age of the worker on losses would require the information for both the injured worker and the comparison worker.

¹⁰ In general, if the age of the comparison workers is below the age of the injured workers, then estimated earnings losses would be overstated because the comparison workers would not reflect the

Wage loss can occur because permanently disabled workers withdraw from the labor force for relatively long periods of time, or because they return to and stay at work, but have wages or hours on the job that are below what they would have been had the injury not occurred. Figure 8 shows average earnings each quarter only for the injured workers with PPD claims at self-insured employers in 1993 who have some reported earnings for that quarter. It also shows the average earnings for the controls chosen for those workers and with reported earnings in the quarter. Both injured workers and controls with no earnings are eliminated from the sample in each quarter. Figure 8 shows clearly that labor force withdrawal is not the only reason for persistent wage loss among PPD claimants. In the quarter after injury, quarterly wages are 19.5 percent lower for injured workers than comparison workers. By quarter 20, quarterly wages are 12 percent lower. Since quarterly wages can be lower for workers without any reduction in hourly wages if the worker only works a partial quarter, as many certainly do during the quarter after injury, Figure 8 represents an upper bound on the reduction in weekly or hourly wages after injury.

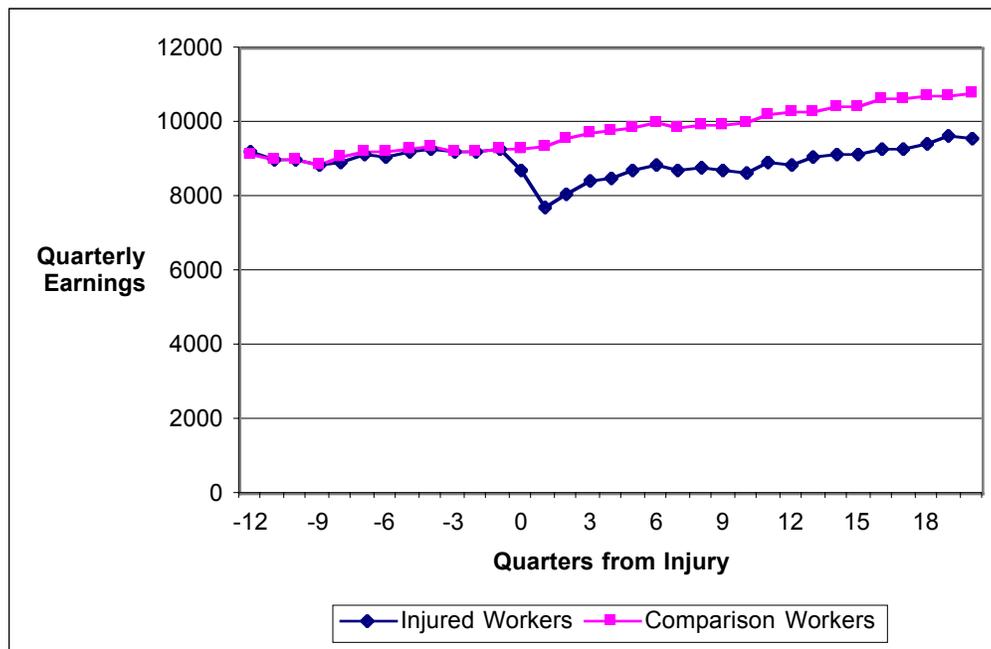


Figure 8—Quarterly Wages Before and After Injury of PD Claimants at Self-Insured Firms in California

Peterson *et al* (1998) reported two estimates for wage losses, which they referred to as an upper and lower bound. The upper bound estimate for wage losses were calculated using the

potential (uninjured) retirement behavior of the injured workers. Given the findings described in the paragraph, it is unlikely that this possibility is a large source of bias for the results.

method in Table 3. It does not distinguish between time out of work immediately after injury and subsequent time out of work: all losses during time out of work at any time after injury are equal to the earnings of the comparison worker during that period. The lower bound on wage losses only counts losses from time out of work before the first return to work. All later time out of work in the lower bound estimate was assumed to be unrelated to injury and was ignored. We estimate this lower bound on proportional wage loss to be 14.7 percent for workers injured at self-insured firms in 1993.

IMPACT OF SAMPLING AND RESPONSE BIAS ON ESTIMATES

As noted above, the sample of self-insured employers responding to the request for data differed in many ways from the population of self-insured employers. Typically, they are larger firms, paying higher earnings, and concentrated in particular industries. We constructed firm-level weights to account for sampling and response bias, and re-estimated the results in Table 3 weighting each individual using the weight appropriate for the firm in which they were injured. The method for constructing these weights is described in detail in the appendix. In effect, this technique increases the weight in the calculations to smaller firms that pay less, and to firms in industries where other firms were less likely to provide data. The results of the weighted analysis are reported in Table 5.

Comparing Table 3 and Table 5, the weighted results for earnings losses in Table 5 are consistently higher. The weighted potential uninjured earnings are consistently lower, reflecting the adjustment for firms with lower average earnings. As a result, proportional losses in Table 5 are consistently higher than in Table 3, suggesting that sampling and selected response among employers led to estimates of proportional losses that are too low. For instance, five-year before-tax proportional losses for 1993 PPD claims are 23.4 percent in Table 3, but after weighting the proportional losses in Table 5 for these claims is 25.3 percent

The indemnity benefits paid in Table 5 are also consistently higher (except in one cell, 1993 injuries at 4 years) than in Table 3. This finding may reflect lower temporary indemnity benefits paid because return to work is easier at larger firms, or the fact that more highly paid workers return to work sooner. It may also reflect less severe permanent disabilities among the responding sample. The result, however, is that replacement rates are not always lower in Table 5 than in Table 3 since both the denominator and the numerator declined in equation 3. In particular, replacement rates for 1993 injuries at self-insured employers are almost identical for the weighted and unweighted estimates. In general, however, replacement rates for the weighted estimates are lower than for the unweighted estimates.

Table 5**Weighted Earnings Losses, Proportional Losses and Replacement Rates by Year of Injury and Quarters from Injury, Self-Insured Firms in California, 1991-1995**

Years after Injury	Year of Injury	Earnings Losses (\$)	Potential Uninjured Earnings (\$)	Total Indemnity (\$)	Prop. Loss	Repl. Rate
Pre-Tax, Estimates Weighted for Sampling and Nonresponse						
3	91	29,014	101,818	15,452	0.285	0.533
	92	25,862	99,846	16,052	0.259	0.621
	93	24,439	101,822	15,866	0.240	0.649
	94	26,410	99,848	15,363	0.265	0.582
	95	24,175	101,076	15,770	0.239	0.652
4	91	36,941	128,876	17,355	0.287	0.470
	92	33,658	127,098	18,154	0.265	0.539
	93	32,128	130,209	17,845	0.247	0.555
	94	35,095	128,715	17,426	0.273	0.497
5	91	45,373	155,153	18,680	0.292	0.412
	92	41,116	153,534	19,613	0.268	0.477
	93	39,950	157,941	19,329	0.253	0.484

The weighted estimates suggest that sampling and nonresponse biases understate proportional wage losses at self-insured employers and may overstate replacement rates somewhat. However, the weighting methodology led to large weights for some employers and therefore for the injured workers at these firms, which increased volatility in estimates considerably when comparing across smaller samples such as by quarter or subsamples by firm size, severity, or preinjury earnings. For this reason, we will report unweighted estimates in the remainder of the report.

COMPARING INSURED AND SELF-INSURED

Figure 9 reports earnings for PPD claimants at insured firms in 1993 over the three years before and the five years after their injury, together with the earnings of their matched comparison workers. This figure compares to Figure 5, which reports comparable estimates for the self-insured. The pattern in the two figures is similar.

Over the three years prior to injury, the earnings paths of the injured workers and the comparison workers are very similar. As with the self-insured, the earnings during the first four quarters prior to injury are used to match controls to injured workers, and the eight quarters prior to that period can be used to test the quality of the controls. The average difference between the injured workers and the comparison workers is \$16 during the first four quarters prior to the

match period, and the average difference is \$24 during the second four quarters prior to the match (9-12 quarters before injury).¹¹

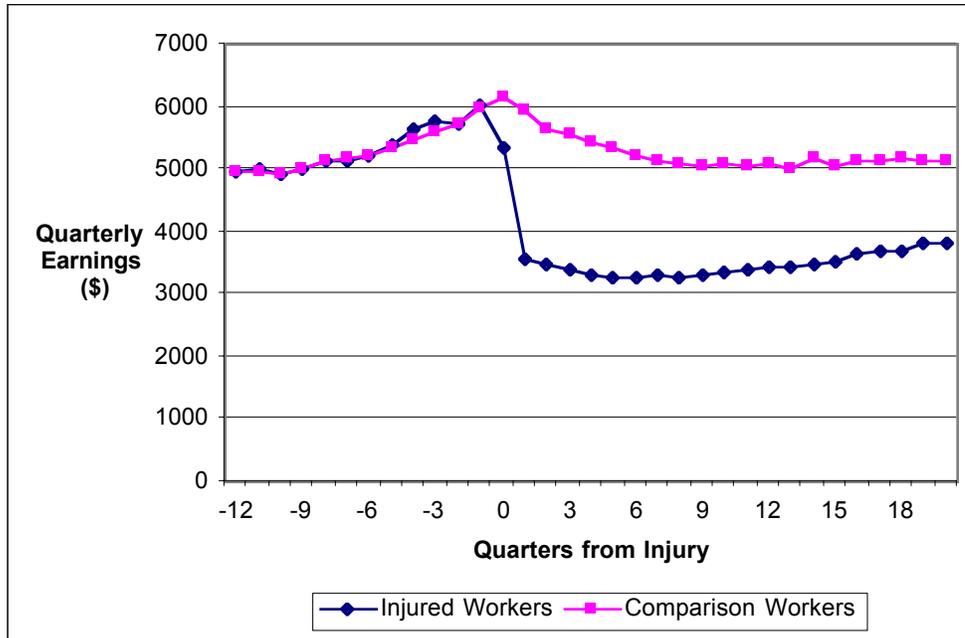


Figure 9—Earnings Before and After Injury of PPD Claimants at Insured Firms in California, 1993

The drop in average earnings at the time of injury for workers at insured firms is more pronounced than the drop for workers at self-insured firms. Earnings drop in the first quarter after injury by almost 40 percent. As with the self-insured, the gap between injured workers and their comparison workers continues over the 20 quarters after injury.

Figure 10 directly compares the earnings impact of a disabling injury at insured firms and self-insured firms. The figure reports the earnings of the injured workers as a fraction of comparison worker earnings for injuries at both insured and self-insured firms in 1993. This fraction is equal to one over the three years prior to injury because the earnings of the injured workers and the controls are equal prior to injury.

¹¹ As discussed earlier, the controls are selected for the insured without matching on tenure. We found that though matching on tenure significantly improved match quality for the self-insured, it did not improve the quality of the match for the insured claims. In particular, during the 9-12 quarters before injury for 1993 claims, the average difference for the insured claims between injured workers and comparison worker using the tenure criterion was \$27 – essentially identical match quality to the match without tenure. At the same time, the sample size declined from 7937 to 6073, a reduction that was more likely to eliminate claims from small firms.

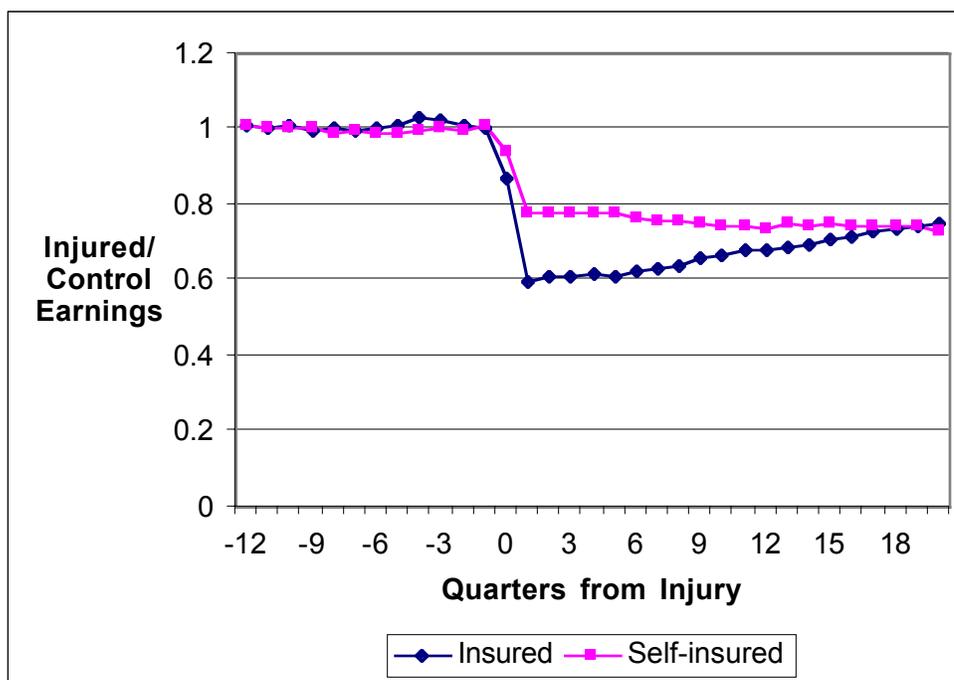


Figure 10—Ratio of Injured Workers' Earnings to Comparison Workers' Earnings, 1993 Injuries, Self-insured and Insured

However, this fraction is less than one after injury, and considerably lower for injuries at insured firms than for injuries at self-insured firms. Workers injured at insured firms earn 60 percent of what their comparison workers earn in the quarter after injury, while workers injured at self-insured firms earn 80 percent of what their comparison workers earn. Over the five years after injury, there is evidence of convergence in proportional losses between the two groups so that by five years after injury, workers injured at both insured and self-insured employers are on average earning approximately 80 percent of their comparison workers. Therefore, it appears that there are significant differences between firms in the impact of a disabling injury around the time of injury, though the differences decline with time from injury. These differences will be explored further below when return to work is compared at self-insured and insured firms.

Table 6 reports the estimates of earnings losses, proportional losses and replacement rates for PPD claimants at insured firms, corresponding to the estimates for self-insured firms in Table 3.¹² PPD claimants in 1993 lost \$22,951 over the three years after the injury, according to the

¹² Early versions of some of the estimates in Table 6 were reported as Method II in Table 5.3 of Peterson *et al* (1997). These estimates were based on earnings data through the second quarter of 1996 and earlier report levels from the Workers' Compensation Insurance Ratings Bureau. The estimates in that table are somewhat higher (e.g. 5-year losses for 1991 of \$46,677). There are two reasons for this difference. First, the estimates for 1991 at five years are for the first and second quarter of 1991 only. Losses fell from 42 percent during the first and second quarter of 1991 to 38 percent during the third and

shaded line in the top (3-year) panel in Table 6. The comparison workers earned \$66,846 over the same time period, and therefore proportional losses at three years for 1993 injuries were 34 percent. The table shows clearly that both total losses and proportional losses declined at insured firms from 1991-94, falling from three-year proportional losses of 43 percent in 1991 to 31 percent in 1994.

Table 6

Earnings Losses, Proportional Losses and Replacement Rates by Year of Injury and Quarters from Injury, Insured Firms in California, 1991-1995

Years after Injury	Year of Injury	Earnings Losses (\$)	Potential Uninjured Earnings (\$)	Total Indemnity (\$)	Prop. Loss	Repl. Rate
Before-Tax						
3	91	26,929	62,604	14,276	.430	.530
	92	23,837	63,116	14,416	.378	.605
	93	22,951	66,846	14,674	.343	.639
	94	21,399	68,818	14,945	.311	.698
	95	23,113	70,844	15,803	.326	.684
4	91	32,651	78,348	16,085	.417	.493
	92	28,998	79,548	16,243	.365	.560
	93	28,422	85,250	16,412	.338	.577
	94	26,356	88,459	16,711	.298	.634
5	91	37,600	93,361	17,288	.403	.460
	92	33,551	95,747	17,459	.350	.520
	93	33,158	103,456	17,603	.321	.531
Simulated After-Tax						
5	91	29,275	73,356	17,288	.403	.590
	92	26,057	75,063	17,459	.347	.670
	93	25,616	80,744	17,603	.317	.687

After three years, PPD claimants at insured firms in 1993 have received \$14,674 in benefits, including temporary disability, permanent disability, and vocational rehabilitation maintenance allowance. This represents a before-tax replacement rate of 64 percent. As with the decline in proportional losses from 1991-1994, the table shows that three-year replacement rates have increased from 58 percent in 1991 to 68 percent in 1995.

fourth (see Reville and Schoeni, 2000). In addition, Peterson *et al* assumed that losses were missing when both the injured workers and the comparison were missing. An alternative approach has been adopted in this report that assumes that losses are zero when both are missing. Averaging in zeros when both the injured worker and the comparison worker are retired lowers average losses somewhat. It also lowers potential earnings somewhat, and therefore has very little effect on proportional losses. However, this approach raises replacement rates since benefits are not affected by the calculation though losses are on average smaller.

Directly comparing our preferred estimates of five-year losses for 1993 injuries in Table 7, summarizing Table 3 and Table 6, we see that five-year total earnings losses are lower at insured firms (\$33,158) than at self-insured firms (\$39,529), but potential uninjured earnings are much lower at insured firms, and therefore the proportional losses are higher at insured firms (32 percent compared to 23 percent).¹³ This result was suggested by Figure 10.

Table 7

Earnings Loss and Replacement Rates, Self-Insured and Insured Firms, 1993 Injuries

	5-year before tax	5-year after-tax
Self-Insured		
Earnings Losses	\$39,529	\$29,846
Potential Uninjured Earnings	\$168,878	\$129,149
Total Indemnity	\$19,076	\$19,076
Proportional Loss	.234	.228
Replacement Rate	.483	.639
Insured		
Earnings Losses	\$33,158	\$25,616
Potential Uninjured Earnings	\$103,456	\$80,744
Total Indemnity	\$17,603	\$17,603
Proportional Loss	.321	.317
Replacement Rate	.531	.687

One would expect that if proportional losses are lower at some firms, then replacement rates would be higher. However, replacement rates are not based on proportional losses but on total losses and workers with higher earnings are at risk of greater total losses, even if proportional losses are lower. The benefits at self-insured firms at five years (\$19,076) are comparable to benefits at insured firms (\$17,603), and since total losses are higher at self-insured firms, replacement rates are lower at self-insured firms. In particular, the five-year before-tax replacement rate at insured firms for workers injured in 1993 is 53 percent. It is 48 percent for workers injured at self-insured firms.

Table 8 which corresponds to Table 4 for the self-insured reports ten-year projected losses at insured firms. The table shows that ten-year projected replacement rates for 1993 are 40 percent before tax, and 57 percent after tax. These replacement rates continue to be higher than

¹³ The “lower bound” on proportional earnings losses, calculated on the assumption that no time out of work following the initial return to work is injury-related, is 23.9% in 1993 at insured firms. As noted earlier, the lower bound on proportional losses is 14.7% for self-insured firms in 1993.

the replacement rates of self-insured firms reported in Table 4 (repeated in Table 8 for convenience: 35 percent before tax and 46 percent after).¹⁴

Table 8
Ten-Year Projected Losses, Before and After Tax, Insured Firms, 1993-1995

	Year of Injury	10-Year Projected Losses (\$)	Total Indemnity (\$)	Replacement Rate
Insured				
Before tax	93	53,438	21,201	0.397
<i>After-tax</i>	93	40,842	21,201	0.520
Before tax	94	51,869	20,946	0.404
<i>After-tax</i>	94	39,703	20,946	0.528
Before tax	95	61,066	22,163	0.363
<i>After-tax</i>	95	46,648	22,163	0.475
Self-Insured				
Before tax	93	71,027	24,643	0.347
<i>After-tax</i>	93	53,342	24,643	0.462

¹⁴ As noted earlier, the projection method assumes that quarterly wage loss in the future is equal to the last observed quarterly wage loss. For the self-insured, this assumption seemed appropriate based on the trend in the observed period. However, for the insured, annual wage loss declined from year 4 to year 5 by 13 percent. We therefore estimated an alternative projection that assumed a 13 percent rate of decline. This method led to a before-tax replacement rate at ten years of .438 and an after-tax replacement rate of .572. In addition, as with the self-insured, we estimated a projection model that set wage losses to zero as the injured worker reached age 65, as discussed for the self-insured in footnote 7. This, in addition to the 13 percent decline, led to a before-tax replacement rate of 0.479 and an after-tax replacement rate of 0.625.