THE COST OF LOGGING ACCIDENTS[1]

G P HORGAN
Scientist FRI

"But the age of chivalry is gone. That of
the sophisters, economists and calculators
has succeeded..."   Edmund Burke

INTRODUCTION

Perhaps this indeed is the age of the economist but any economist foolish
enough to claim that he can provide a definitive answer to the question
of the cost of any sort of accident leaves himself wide open to that jibe
of Oscar Wilde's of being a person 'who knows the price of everything and
the value of nothing'. There are many 'costs' of accidents e.g. pain,
emotional distress, etc., which are not readily amenable to the
economists usual tools of trade and which are almost invariably put to
one side when calculating the impact of accidents. The costing exercise
is concentrated usually upon those things such as lost output and wages
that are more easily measured and therefore, I believe, in most cases the
real cost of accidents is significantly understated.

BACKGROUND

Despite the many problems associated with trying to measure the cost of
accidents prompted by the concern expressed by members of the logging
industry, the Accident Compensation Commission (as it then was) and the
medical profession   about the level of accidents in the New Zealand
logging industry Phillip Tempest and myself did make an attempt in
1977/78 to determine the cost of logging accidents. In our report the
logging industry's accident record was compared with that of other
industries. As well a detailed examination of three logging accidents
revealed that the financial costs, particularly the employers indirect
and in some cases the social costs, were considerable. In this paper I
have taken the cost data from our 1978 report and indexed it up into 1984
dollars. This gives, I feel a fair indication of what accidents of the
type reported in our case studies would cost the industry if they were to
occur today.

ACCIDENT RECORD

Prior to the setting up of the ACC the Department of Statistics produced
annually detailed information on industrial injuries for all sectors.
This data derived from claims made under the Workers' Compensation Act

---

[1]   Most of the material for this paper was taken from the 1978 Economics
of Silviculture Report No. 121, "The Cost of Logging Accidents" by
P. Tempest and G.P. Horgan.

showed logging to be one of the most hazardous industries. Over the period 1961 to 1973 logging had an accident frequency rate* second only to coal mining. Over the same period however the logging industry's accident severity rate** was consistently the highest because of the high number of fatalities per hour worked. Officially between 1961 and 1973 (excluding 1967 when statistics were not published) there were 66 deaths and 219 logging accidents which resulted in permanent injury.

From 1 April 1974 pursuant to the 1972 Act which set it up the ACC took over responsibility for the production of adequate data on accidents. Because "first week' incapacity does not usually result in a claim on the Accident Compensation Corporation the ACC does not, in the main, record data on accidents that result in less than one week off work. The Statistics Department figures included data on first week incapacities but excluded such things as injuries to the self employed (notably farmers) and all but a few injuries incurred travelling to and from work. The ACC now deems these latter injuries to be work-related and they are included when recorded in the injuries for the appropriate industrial group.

This means that it is no longer possible to compile, injury frequency, and injury severity rates for industries as in the past. In turn this means that it is not possible to compare the relative dangerousness of industries as in the past. This, in my view, is an unsatisfactory state of affairs. While the ACC provides a rough guide to the relative frequency of more serious injuries for various industrial and occupational groups through calculated and published "injury rates" the measure suffers from some very real deficiencies. (The ACC's "injury rate" is defined as being the number of compensated accidents per 1000 workers, labour force for any industry being taken as that reported at the last Census).

Because the measure ignores virtually all injuries that result in less than one week of work it significantly understates the real injury rate for at least some industries. As well unless the distribution of "time off" arising from accidents is the same for all industries inter industry comparisons may not be valid.

That accidents which result in less than one week off may constitute a significant proportion of all accidents is shown in Table 1.

If one assumes that the current distribution of "time off" work because of logging accidents is the same as the average for the period 1970-1973 then the ACC's figures fail to capture something like 36% of the total number of injury accidents.

A second problem with the ACC measure has to do with the use of Census employment data rather than actual numbers employed. For an industry experiencing rapid growth or decline the use of Census data, which can be up to five years out of date, can give misleading results. Even for an industry such as logging which has not been subjected to rapid changes in numbers employed over the last 10 years, the differences between Census

---

* Number of lost-time accidents per 100 000 manhours worked.
** Number of man hours lost through accidents per 100 000 manhours worked.

data on numbers and Labour Department data are significant. In Table 2 the injury rate for logging is given using both the relevant Census labour force figures and Department of Labour quarterly survey figures.

TABLE 1: Percentage of logging accident victims off work

Year	1 to 2 days	3 day to 1 week	1 to 2 weeks	2 to 4 weeks	More than 4 weeks
1970	5.8	30.2	30.1	15.6	18.3
71	4.5	31.0	28.0	19.7	16.8
72	6.0	29.3	29.3	17.4	18.0
73	6.4	30.3	32.6	16.2	14.5
Average	5.7	30.2	30.0	17.2	16.9

TABLE 2: Injury rate for logging

Year	Number of accidents	Labour force		Injury rate	
		Census	Dept of Labour	ACC	Dept of Labour
1980	316	2806*	3133	113	101
1981	310	3783**	3008	82	103

*   1976 Census. The Dept of Labour figure for 1976 was 2778.
** 1981 Census.

That it should prove so easy to vary the ACC's published injury rate for one industry does not give one much confidence about uncritical use of any of their other industry figures. Certainly the figures should not be taken as being absolute measures of the hazardousness of an industry. However, as a very, and I stress very, rough guide they are probably of some use. If used in this way they show logging is still one of the more hazardous occupations. The hazardous nature of the occupation is borne out by LIRA data on logging accidents. LIRA accident report data show that there are some 330 reported logging accidents per annum viz. the ACC's 310-320 compensated accidents. Finally Department of Labour statistics on causes of accidents in bush undertakings suggest that there has been virtually no change in the relative importance of the causes of accidents in the last 10 years.

TABLE 3: Causes of accidents in bush undertaking

Cause	Average % of accidents by this cause 1979-1983	% of accidents by this cause in Rotorua Employment District in 1976
Hand tools	9.9	10
Power tools	16.1	18
Falls	23.8	24
Trees	9.0	8
Logs	4.9	7
Flying objects	1.3	-
Handling objects	3.8	4
Gear failure	0.2	-
Vehicles	3.6	4
Other machinery	0.5	1
Other causes	26.4	24

Source: Anual return of accidents in bush undertakings - Dept of Labour.

As with the ACC and LIRA data this data should be used with a considerable degree of caution as it is based on accidents notified to the Labour Department not the actual number of accidents that occurred. This material does however, along with the other material mentioned, suggest that the type of accidents occurring today are very similar to those that occurred 6 to 8 years ago and in this situation case studies from that period would be relevant to the present provided suitable adjustments were made to the cost data.

ACCIDENT COSTS FROM THREE CASE STUDIES

The first of the three case studies, a felling accident in which fortunately only minor injury occurred reveals that even this type of accident can result in considerable cost to an employer. The accident occurred when a tree was felled by one worker onto another, hitting the latter across the back and shoulders. The following action was taken:

1. The gang stopped work for half an hour to assist the injured worker. The supervisor called a company ambulance which with a doctor aboard took the injured man to hospital where he was X-rayed and discharged (he returned to work one week later).

2. The company logging manager and a ranger visited the site of the accident and made enquiries which involved two witnessed and the gang supervisor for one hour.

3. The logging ranger took a Labour Department bush inspector to the site. The Labour Department prepared a report.

4. Later a general meeting was called for all bush workers, contractors, and staff to discuss the circumstances and causes of the accident.

5. Union delegates and the person who caused the accident had a meeting.

6. Company staff prepared an accident report.

As no serious damage was done one might expect that the total cost of the accident to the employer would be small. When costed back in 1978 it was found that the social costs of this accident - which in the main were those costs borne by the ACC - were less than $100. The costs of this accident to the employer however were almost $770. Fully two-thirds of this amount was indirect costs relating to production losses and time spent establishing the causes of the accident. The total cost of this accident was assessed as being $853. Now it is well known that a 1984 dollar is not the same as a 1978 one in terms of its buying power. Over the period costs and prices as measured by indices such as the CPI, Food Price Index, Export, Import Producers Price Index, and the Nominal Weekly Wage Rate Index, have doubled. Thus in todays terms the costs of this accident would be just over $1700 and the employers share of this approximately $1550.

The second example isn't really of a logging accident. The case study is of an accident to a company contractor and illustrates the costs borne by a forest-owning company, when one of its contractors was injured.

An empty log cradle came off a truck crushing the contractor, who received multiple fractures and lacerations. The contractor was alone at the time and while this accident was not the responsibility of the forestry company, a logging gang was first on the scene and the company incurred a considerable cost in arranging to have the man hospitalised.

As in the previous example indirect costs to the company were substantially greater than the direct costs. Direct costs were some $300-$600 in todays terms - and half of this was attributable to the hire of a helicopter by the company to transport the man to hospital. (An ambulance was sent to the scene but it was decided that an ambulance ride was likely to aggravate the mans injuries). Indirect costs were much greater than might be expected because the gang used its first aid kit in treating the contractor. Because the gang's $10 first aid kit had been used up in treating the injured man the gang would not begin working until it had been replenished. This resulted in two hours of downtime and a cost to the company of some $960 ($1920 in todays terms) of which some 83 percent was attributable to lost wood production. Data on social costs were not available for this accident.

The third example is of a bushman caught in a rope while breaking out logs from a gully. This accident resulted in permanent disability as the bushman received severe bruising and crushing of his pelvis and now walks with a limp. The man was off work for six weeks and when he did return to work it was to light duties around the company office workshop complex.

After the accident occurred the following took place:

1. The gang (11 men) stopped work for 2 hours to assist the injured man and answer questions about the accident.

2. An ambulance called from company headquarters to site picked up patient and rendezvoused with a doctor on the way to the hospital.

3. Logging superintendent, supervisor, safety officer, and two union delegates took two vehicles to the site and spent two hours there.

4. Accident reports were prepared.

The direct company costs of running the ambulance replacing a first aid kit and paying the injured man's wages for the first week were in todays terms assessed as being slightly in excess of $400. The indirect costs, which includes such things as the value of lost production while the gang stopped work and the costs associated with supervisory staff visiting the site and preparing an accident report were some $2100. In addition it could be argued that part of the wages paid the injured man in his new job after the accident represented a continuing indirect cost of the accident to the company. This argument would have some force if for example the man, because of his injuries had more sick leave, or was slower at doing tasks than an able bodied worker in the same job. Social costs of this accident were some $3600, two-thirds of which related to a 15 day hospital stay.

CONCLUSIONS

The three case studies reveal one point very clearly namely that the indirect costs on employer faces because of an accident are very much greater than the direct ones. In these examples the indirect costs were between 2 and 5 times the direct ones. This result is in line with those found in many other studies. In some of these studies, not admittedly of the logging industry, indirect costs have ranged up to 20 times the direct costs so by this standard 2 to 5 times is rather modest.

Data on the logging industry from 1961 to 1973 show that numbers employed varied from 2500 to 2900 (about todays level) and that on average there were some 850 lost time accidents per year. This plus data on the distribution of "time off" when coupled with the relationship between employers direct and indirect costs revealed by the case studies allowed Tempest and myself to estimate that logging accidents were costing the industry in excess of an extra fortnights pay for every person employed. Our estimating techniques were admittedly crude but our estimate of the cost of logging accidents was, perhaps surprisingly, of the magnitude which might, on the basis of data for other industries, be expected.

While the logging accidents that occur now seem to be very similar in type to those that occurred in the mid 1970s there must be less certainty about number similarity. Then total reported numbers were some 850 per annum, ACC and LIRA figures for the present though are only some 40 percent of this figure. This implies that either there has been a substantial improvement in the safety record of the industry or alternatively that there is significant under reporting of accident numbers. Either way it would be unwise of me to claim that accidents are still costing the logging industry as much relatively as estimated in the

late 1970s. A much safer stance would be to conclude that accidents will still be costing the industry a substantial amount and to call for further research to settle one way or the other whether the large reduction in the reported numbers of accidents is due to increased under reporting or alternatively effective accident prevention or perhaps a little of both.