

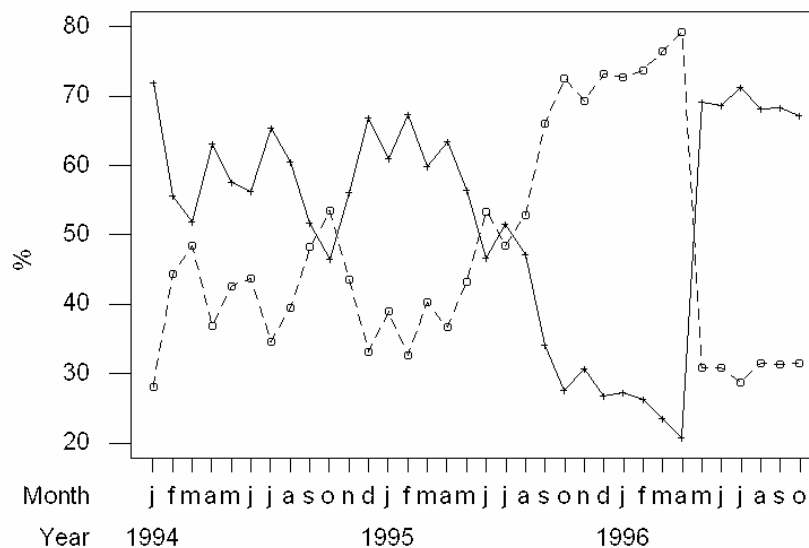
Lost Sales - Solution

We have

$$\text{Sales worth agreed} = \text{Actually paid} + \text{Withdrawals \& non-paid}$$

The data may be split in three periods: 20 months prior to the period affected by bad publicity (Jan. 1994 to Aug 1995), 8 months believed to be affected by bad publicity (Sept. 1995 to April 1996), and 6 months after this period (May 1996 to October 1996)

Percent paid (+) and cancelled (o)



Total: Sales, Paid, Cancelled

	Sales	Paid	Cancelled
Period 1	8999100	4997032	4003268
Period 2	11314368	3322969	7997299
Period 3	3791531	2615643	1161488

Mean per month: Sales, Paid, Cancelled

	Sales	Paid	Cancelled
Period 1	449955	249852 (58%)	200163 (42%)
Period 2	1414296	415371 (27%)	999662 (73%)
Period 3	631922	435940 (69%)	193581 (31%)

If the percentages paid are computed from the totals in each period instead of averaging the monthly percentages we get 55%-29-66% in the three periods.

Two-Sample T-Test and CI: %Paid; Period

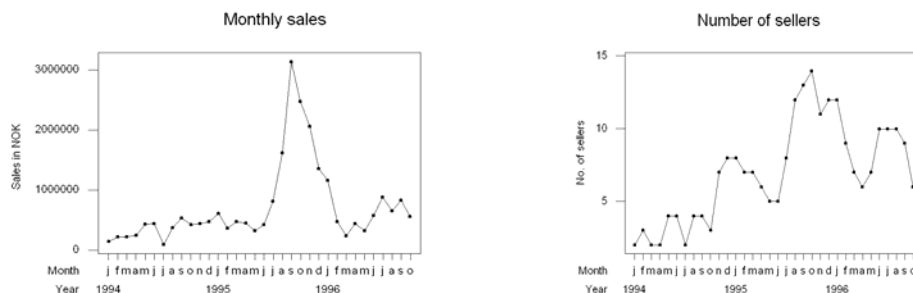
Period	N	Mean	StDev	SE Mean
1	20	57.87	7.27	1.6
2	8	27.06	4.07	1.4

Difference = mu (1) - mu (2)
 Estimate for difference: 30.81
 95% CI for difference: (25.16; 36.45)
 T-Test of difference = 0 (vs not =): T-Value = 11.22 P-Value = 0.000 DF = 26
 Both use Pooled StDev = 6.57

The difference between the first and second period is statistical significant.

We see that the percentage paid in the third period is back to a level even higher than before the bad publicity began. This rules out the possibility that the market for the service broke down completely about the time of the bad publicity, for this reason or not. Since no convincing explanation for this could be given, it seems reasonable not to include the third period when estimating the lost amount due to the cancellations. An inclusion could easily be attacked by the defence in court.

One should look for other possible explanations for the change. One critical issue becomes clear from a plot of monthly sales and the number of sellers:



There is an increase in sales volume in the period of bad publicity. This may be due to the increase in the number of salesmen, some possibly with less experience, and perhaps using more aggressive sales methods that lead to more complaints, more cancellation and also attention of the media. It is also possible that the extra sales efforts attracted marginal customers, who were not that eager to have the service after all, and therefore more likely to cancel or not pay. These are arguments that are likely to be used by the defence of the magazine in court.

With this insight we are prepared to give an estimate of the total amount lost for the period of bad publicity, which could hopefully be supported in court.

The excess cancellations in period 2 over period 1 (“normal”) based on the average of the percentages for the months in each period is $57.9\% - 27.1\% = 30.8\%$. We then get

$$11\,314\,368 \times 0.308 = 3\,484\,825$$

However, if we use the percentage of the totals of the two periods the difference is instead $55.5\% - 29.3\% = 26.2\%$. We then get a somewhat lower amount

$$11\,314\,368 \times 0.26 = 2\,964\,464$$

From the discussion above it follows that the first calculation may be heavily affected by the very deviating sales activity in the middle of the bad publicity period.. This could easily be “a gift” to the defence lawyer, and the second calculation seems safer.

Another question is whether the orders lost in the period of bad publicity are lost forever. Since the service is a subscription for one year at a time, it is not just a postponement of payment if the customer is regained next year. If the customer is lost for many years or forever, the computed loss in the period of bad publicity is an underestimate of the damage done to the firm. A claim of about NOK 3 mill. may therefore be possible to defend in court.