

POTENTIAL DIFFICULTIES WITH THE MACHINE COSTING METHOD

W Liley  
Consultant  
Groome Poyry Limited

**Depreciation - Fixed or Variable?**

One variation proposed for the basic costing method is to recognise that depreciation may have both fixed and variable components. This argument certainly has some validity and an example format is demonstrated in the costing method employed by the Former NZ Forest Service.

**Major unknown factors in the machine rate calculation**

The major components of the machine rate, are depreciation, interest and R & M. Underpinning these three items are three values in particular:

C - machine capital value  
R - resale value  
N - life of machine

Depreciation for instance is based on

$$\frac{(C - R)}{N}$$

R & M is based on the depreciation ie.

$$\frac{C - R}{N} \quad \text{again}$$

Interest is based on the ACI ie.

$$\frac{(C - R)(N + 1)}{2N} + R$$

Of all the necessary inputs to the process, R and N are those which we may find hardest to accurately determine.

That so much of the calculation depends on these values would appear to shake the method's credibility.

There is no easy answer to this problem. In the absence of good experience on which to base the estimate of machine life one can only adopt a generally accepted industry standard. (This process is not of course helped by the enthusiasts who proudly announce that they have got 15 000 hours out of their original unit).

Similarly the resale market for logging machinery can be expected to fluctuate with changes in industry activity, changes in tax regimes, changes in the exchange rate, interest rates and the like.

What you can do however, when in possession of a flexible costing system such as that demonstrated, is run several versions of the costing and test the effect of changed machine life or resale values. (This is referred to as sensitivity analysis).

**Review of the logging rate**

It would certainly be unrealistic to persist with your originally tendered logging rate just because you happen to be in possession of the same machine that the tender was based on. Your machine rate must recognise that you need to keep pace with inflation in order to have the funds in hand to make a deposit on the replacement.

There are different approaches to keeping the rate abreast of inflation:

- Annually recalculating these rates with revised, updated input values.

-Linking the rate to an index which measures inflation (such as the consumer price index or producers price index).

Both approaches are employed in the industry.

### Allowing for inflation

Rigorous allowance for inflation may require more than just the measures described above.

There are further areas in which inflation may have an effect :

- Inflation reduces in real terms any payments which are related to historic values. The notable examples are hire purchase (strictly 'conditional purchase') instalments, which once established are not altered during the period of the finance agreement. Such payments are geared to the historic value of the machine and become relatively easier to meet as the contract rate is adjusted upwards with inflation reviews.

-Countering the above effect is the fact that interest rates include an extra margin to allow for inflation. Finance instalments are higher because of this.

-Similar to the first effect, but opposite in result, is the effect of inflation in reducing the tax deductibility of certain items. The notable example is depreciation, which although only a notional payment, is claimed as an expense and is therefore tax deductible. Because depreciation relates to the historic purchase value it becomes less in real terms as the years proceed. You can claim less against your income and are assessed for more tax as a result.

Writers on the subject of inflation stress that it is hard to generalise on the overall effect - it depends very much on the financial structure of the business. Some preliminary analysis by the author nevertheless suggests that

logging businesses are most likely to be penalised by higher inflation, even though the contract rate may be annually updated. This is an interesting subject for further investigation, although with inflation rates currently declining, should become of less consequence.

The major problem referred to by many users of the costing method is that the theoretically derived rates are not competitive

Where, the question arises, can the rate be trimmed to give the tenderer a chance of being successful. Four possible approaches could be suggested:

#### Approach 1

Reduce the owner's returns wherever they are contained within the rate calculation.

Since the contractor cannot escape paying his fuel bills, his machine costs and must pay his gang sufficient rates to keep them, the only one left who might make do with less is the contractor himself. The categories within the costing which are potentially subject to this pruning effort include :

Interest - the owner's return on his own funds invested

Wages - if the owner has allowed wages for his own efforts he could review his pay rate.

R & M - this allowance may include wages. If much of the time spent is by the owner himself again he might review his wages rate.

Administration - this may include an allowance for some of the owner's own time.

Profit - the owner can elect to reduce his profit margin.

None of these reductions are particularly palatable. Moreover they are not entirely at the owner's discretion to reduce. Once the financiers consider that the profit or

contingency margins are too light they may withdraw their support for the venture.

Approach 2

Use a cheaper machine.

If the machine being costed is genuinely more than the job requires then there may be some validity in this approach. Not uncommonly the situation arises where the contractor has a fleet of equipment in hand which has served him faithfully, with which he is well familiar and from which he is reluctant to part. If the machinery is more than is required for the tender it is hard to justify basing the calculation on other than what is strictly required.

Costing the contract on a cheap second hand machine can however, badly backfire. The cheap machine may incur lower financial charges but is more likely to incur high R & M costs and lose major profit opportunities through downtime. Apart from those situations where the cheap machine has such light duties that it can be assured a reasonably long life there is no justification for basing costings on its actual capital value.

Approach 3

Overproduce

There may be some justification in this if you can reliably anticipate that you will consistently overproduce. I would suggest that in the current unsettled nature of the industry you would may be being either brave or foolhardy if you rely unduly on being allowed to overproduce.

The following simple example illustrates how, because of the existence of fixed costs, overproduction may markedly improve profitability. The example also illustrates how the reverse effect also applies.

Approach 4

Walk away

There comes a point when business and sentimentality do not mix. If your rate has to be too cutthroat to be competitive, back off.

In concluding this discussion of potential difficulties with the costing format it should be apparent that none of the points raised suggest that the calculations should not be performed. The reverse is the case - the more familiar you are with the method, and the more recalculations you have performed, the more familiar you will be with your business's position.



