Improving the relevance of Financial Performance Measures

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Financial and non-financial performance measures:

The set of performance measures used in an organisation is likely to include a combination of both financial and non-financial measures. Over the last two decades, there has been considerable interest in the idea of using multiple measures of performance which reflect the organisation's critical success factors (CSFs). The CSFs are specific to an organisation and are especially likely to reflect the industry in which it operates and its chosen strategy. For example, the CSFs for a low-cost / high-volume retailer are likely to include footfall (i.e., the number of visitors to the store), turnover per square metre, and market share.

However, the traditional financial performance measures have not fallen into disuse in performance measurement systems. On the contrary, the importance of CSFs such as those listed in the previous paragraph is that they are ultimately cogs in the chain driving financial success. The underlying logic is that if success on these factors is achieved in the current year then financial success is likely to be achieved in future years. Furthermore, "financial success" continues to mean what it has always meant, i.e., healthy profit margins and an adequate (or more than adequate) return to investors on the capital that they have invested.

Return on Investment (ROI) as a performance measure:

For many firms, Return on Investment (ROI) remains a very important measure of performance. Organisations continue to measure ROI and to use it in their managerial control and reward systems. For example, division managers may have considerable operating autonomy but may be controlled through a form of results control whereby their bonuses and/or career prospects depend on their measured performance in terms of ROI and perhaps a number of CSFs. In these circumstances it is important to consider whether ROI will achieve goal congruence (i.e., encourage a manager to take decisions which are in the shareholders' best interests) or whether it might in fact create dysfunctional incentives (i.e., motivate the manager to act in ways which are *detrimental* to shareholders' interests).

To illustrate this point, the following example will be used throughout this article. A division manager has a capital investment opportunity open to him. The division's cost of capital is 7% per annum. The investment would require him to invest capital immediately ("Time 0"), and there would then be a series of cash inflows at the end of the subsequent three years:

Investment at Time 0	Cash Inflow at Time 1	Cash Inflow at Time 2	Cash Inflow at Time 3
Outflow €8,100	€2,000	€3,500	€4,511

Basic analysis of the example:
A calculation the project's internal rate of return (IRR) shows that the IRR is 10%, which is significantly more than the cost of capital (7%), so it seems likely that acceptance of the proposed investment would be in the shareholders' best interests.

Suppose, however, that the manager is evaluated at least partly on the basis of his division's ROI, and that the division's accounting rules involve using straight-line depreciation and the net book value of assets at the beginning of the financial year. In these circumstances the ROI in each year of the project's life will be as follows:

	Year 1	**Year 2**	**Year 3**
Cash flow	€2,000	€3,500	€4,511
Depreciation = €8,100 / 3 years =	€2,700	€2,700	€2,700
Profit (loss)	(€700)	€800	€1,811

	Year 1	**Year 2**	**Year 3**
Net book value of assets at start of year	€8,100	€8,100 - €2,700 = €5,400	€5,400 - €2,700 = €2,700

	Year 1	**Year 2**	**Year 3**
ROI = Profit (loss) / Net book value	(8.6%)	14.8%	67.1%

There is a strong possibility that the division manager will reject this investment opportunity. Its negative ROI in Year 1 means that it will negatively affect his measured performance. In Year 2, the ROI is significantly positive, but if the division manager is earning an ROI of (say) 16% from his other investments then acceptance of this investment would decrease his measured average ROI performance. Of course, the 67.1% in Year 3 is potentially attractive, but there is no guarantee that a manager will choose to suffer today in return for the promise of a favourable outcome measure in three years time.

Changing the basis of calculation of ROI:
The reason for the pattern in ROI over the 3-year period is easy to explain. The net book value of an asset decreases over its life (because of depreciation) and unless the cash inflows are shrinking significantly year-by-year then the ROI will increase year-by-year. Therefore the ROI in the early years of the project's life somewhat understate its benefits and make it unattractive to managers. To achieve a smoother pattern of ROI a different depreciation method should be adopted.

A theoretically elegant solution is to use "capital recovery depreciation", which has the effect of ensuring that the ROI of the project in each year of its life is exactly equal to its IRR. The argument for this approach is that it gives the division manager an incentive to assess the project in the same way as the shareholders (on whose behalf the manager is supposed to be acting) would assess it. However, like many theoretically elegant solutions, capital recovery depreciation has found almost no acceptance in practice. For the sake of completeness, an illustrative example of capital recovery is provided in the Appendix to this article, but what is really needed is a simpler (but still effective) solution. Such a solution is presented in the next section.

Revised analysis of the example:
A smaller depreciation charge in early years and a larger depreciation charge in later years can greatly reduce the degree of variation in ROI from year to year.

Sum-of-years digits (SYD) depreciation is normally used as a simple algorithm for *accelerating* depreciation, but SYD is sometimes "inverted" so as to *slow down* depreciation (i.e., back-load it into later years rather than front-load into early years). For example, under this inverted SYD approach, if an asset has a 3-year expected useful life then the depreciation calculation would be as follows:

- Years: 1 + 2 + 3 = 6.
- The cost of the asset would be depreciated as follows:
- Year 1: 1/6 of asset cost.
- Year 2: 2/6 (i.e., one-third of asset cost).
- Year 3: 3/6 (i.e., one-half of asset cost.

Let's apply this now to the example in this case:

	Year 1	**Year 2**	**Year 3**
Cash flow	€2,000	€3,500	€4,511
Depreciation	€8,100 * (1/6) = €1,350	€8,100 * (2/6) = €2,700	€8,100 * (3/6) = €4,050
Profit	€650	€800	€461

	Year 1	**Year 2**	**Year 3**
Net book value of assets at start of year	€8,100	€8,100 - €1,350 = €6,750	€6,750 - €2,700 = €4,050

	Year 1	**Year 2**	**Year 3**
ROI = Profit / Net book value	8.0%	11.9%	11.4%

From these figures, it is clear that a significant degree of smoothing of ROI has been achieved. More specifically, the ROI is reasonably close to the project IRR of 10% in each year of the project's life (although not exactly equal to the project IRR of 10%, which it would be under capital recovery depreciation). The ROI in each year of the project's life exceeds the cost of capital (7%), whereas when straight-line depreciation was used a significantly negative ROI resulted in Year 1. The approach demonstrated here – or any approach which delays depreciation until later years – can alleviate the problem that projects which are financially very desirable in the long-term may (if straight-line depreciation is used) be turned down by managers because of a negative short-term impact on ROI.

To be clear, the method demonstrated here does not *guarantee* goal congruence, i.e., it does not guarantee that division managers will always take the decisions which are in shareholders would prefer. No method can do this, since IRR (or NPV) are forward-looking measures of cash flow while ROI is a ratio based on retrospective measurement of accounting profit. What this method achieves is a degree of practical solution to the goal congruence problem, but not theoretical perfection. It may be wise to allow division managers to vary the methods of depreciation used for different capital investments so as to achieve reasonable consistency in ROI from year to year.

Conclusion: Performance measurement and the reward function

ROI is often one of the performance measures used in assessing a manager's performance and in determining his or her rewards (including bonuses in the current period and future career prospects). If organisations are often surprisingly relaxed about the possibility that the use of ROI will lead to dysfunctional decision-making by managers, there may be at least three reasons for this.

First, as indicated at the start of this article, ROI is likely to be complemented by a number of other performance measures which encourage managers to think of the long-term implications of their choices. Second, as illustrated here, a change in the basis of calculation of ROI can reduce the likelihood that "good" investments will show "bad" ROI figures in any years of their lives.

The third reason lies in how the reward system is operated in practice. Merchant & Van der Stede (2012) distinguish between the "direct link" and "subjective link" approaches to incentive systems. Under the direct link approach, rewards are given only if predefined targets are precisely achieved or exceeded. Therefore, if a division manager's targets are ROI of 9% and market share growth of two percentage points, then (under the direct link approach) the manager will be denied a bonus if he actually achieves ROI of 8.9% even if he exceeded his market share growth target considerably. Under the subjective link approach, as the name suggests there is some discretion, e.g., a manager who falls just short of her ROI target may nevertheless receive her bonus if it is clear that the reason for falling short of the target was that the manager took on new capital investments whose financial benefits will be realised in future rather than current periods. Merchant & Van der Stede argue that both the "direct link" and "subjective link" approaches have their merits, and neither is obviously more common in practice. Nevertheless one advantage of the subjective link approach is that it reduces the likelihood that division managers will feel the need to take dysfunctional decisions just for the sake of achieving ROI targets.

Reference

Merchant, Ken A. & Van der Stede, Wim A. (2012). *Management control systems* (3nd ed.). Harlow, Essex: FT Prentice Hall.

Appendix: An illustration of capital recovery depreciation

- Under capital recovery depreciation, the annual depreciation charge is calculated on the basis of a "fiction".

- The fiction is that the cash flow received in each year (from Year 1 onwards) consists of partly of "interest on capital" and partly of the recovery (or repayment) of the capital invested at Year 0.

- In this calculation of "interest on capital", the interest rate used is the project IRR and it is applied to the net book value of the asset at the beginning of the year.

- Hence, in the example used in this article:

	Year 1	**Year 2**	**Year 3**
Book value at start of year	€8,100	€6,910	€4,101
Cash flow	€2,000	€3,500	€4,511
Interest	10% * €8,100 = €810	10% * €6,910 = €691	10% * €4,101 = €410
Repayment of capital = depreciation	€2,000 - €810 = €1,190	€3,500 - €691 = €2,809	€4,511 - €410 - €4,101
Book value at end of year	€8,100 - €1,190 = €6,910	€6,910 - €2,809 = €4,101	€4,101 - €4,101 = NIL

	Year 1	**Year 2**	**Year 3**
Cash flow	€2,000	€3,500	€4,511
Depreciation	€1,190	€2,809	€4,101
Profit	€810	€691	€410

	Year 1	**Year 2**	**Year 3**
Net book value of assets at start of year	€8,100	€6,910	€4,101

	Year 1	**Year 2**	**Year 3**
ROI = Profit / Net book value of assets at start of year	10%	10%	10%

- One curious feature of this method is that it can lead to negative depreciation charges in some years. Also, by manipulating the future cash flow estimates, a manager can come up with quite different depreciation figures.