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Increasing goal congruence in project evaluation by introducing a strict market depreciation schedule

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Abstract

The economic accuracy of accrual-based managerial performance measures is most essential for value added investment decisions in decentralised firms. Contemporary EVA-literature often lends support to annuity-based depreciation schedules for accomplishing congruence between capital budgeting criteria, like NPV, and accounting measures, like ROI and RI. This is incongruent with the principal agent literature aiming at designing managerial incentive contracts. We introduce a strict market-based depreciation schedule which is shown to be superior to ordinary straight-line, annuity-based or IRR-based depreciation schedules. It gives the right managerial investment incentives also in the case of growth, inflation or technological development.

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1. Introduction

Both within single firms and in the society a lot of efforts have been put down over the years in order to develop routines and adequate decision criteria for accepting profitable investment alternatives and rejecting unprofitable ones. The rationale behind these efforts is in accordance with the principal agent theory (Jensen and Meckling, 1976), describing the costs that arise due to asymmetric information and goal incongruence between the principal (in first hand the owners) and the agent (management). Decision authority is

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also delegated throughout the organisation leading to arising agent costs also on lower levels within the organisation. In hierarchical organisations, there exist a number of principal agent relationships where "a middle level manager might be the agent of managers above him and the principal to employees below him" (Lambert, 2001, p. 6). The development and implementation of accurate information systems and incentive control mechanisms are essential for minimising agent costs due to conflicts of interest. However, for obtaining goal congruence and efficient resource utilisation in the long run it is also vital to stimulate decision-makers (managers) to use adequate investment appraisal or capital budgeting techniques, like a discounted cash flow (DCF) technique in the form of the net present value (NPV) formula.

In surveys of the use of investment appraisal techniques it is repeatedly discovered that managers are often using and, in some cases, even seeming to favour simpler and less advanced techniques and decision criteria, like the pay-back criterion (Sandahl and Sjögren, 2003). Moreover, only in a few firms the manager is relying on one single capital budgeting technique implying that users of the (slightly) more advanced NPV-formula are considering other criteria as well (Arnold and Hatzopoulos, 2000; Graham and Harvey, 2001). Many of them even adopt ordinary accounting measures, like return on investment (ROI) and residual income (RI) (cf. Drury et al., 1993), as complementary decision criteria. This is likely to be explained by the fact that managerial compensation as well as the evaluation of firm/division performance is usually based on accounting income instead of economic profit (Antle and Smith, 1986; Stern et al., 1996; Biddle et al., 1997; Rogerson, 1997; Sullivan and LaScola Needy, 2000; Dutta, 2003). Hence, before accepting a new project, managers are interested in finding out what impact it would have on the book of accounts.

A common argument among advocators of bringing in new managerial incentive programmes is that investment appraisals based on accruals (accounting figures) are likely to lead to either under- or overinvestment. Accounting measures are widely known to be subject to significant errors, which "arise in large part because accounting methods of depreciation do not adequately measure true depreciation" (McFarland, 1990, p. 521). In general firms are using a linear or straight-line depreciation schedule (Berliner and Brimson, 1988; Ask and Ax, 1997), assuming implicitly that the decline in value of a project is the same in each period (year) of its economic life. In many cases the loss in (market) value is thereby overestimated during the first part of the project's life, which means too high initial capital charges in the form of interest and depreciation charges. This implies that the financial performance of the manager in charge of the project would look worse than it actually is. Hence, managers may be reluctant to approve certain projects even if the projects are profitable in terms of NPV. In the case of intangible assets, i.e. investments in R&D, education of employees, marketing, etc., the effect of underinvestment is emphasised even more. Such projects are in principle fully depreciated at the first period (i.e. year) of their economic life.

This may give the impression that there is an inherent and unsolvable conflict between economic profitability and accounting profitability. That is not necessarily the case, though. Economic profitability is project oriented and concerns cash flows generated during the whole economic life of a project, whereas accounting profitability is period oriented and may be seen as a partial estimation of a project's profit (operating income) for a certain period of time, often a year. Even so they need not to be in contradiction with each other. Preinreich (1938) was early to point out that there exists a fundamental relationship between the economic measure, NPV, and accounting measures, like RI. As will be shown in this paper, NPV equals the sum of the discounted periodical RI estimations over the economic life of a project regardless of the depreciation rate chosen (O'Hanlon and Peasnell, 1998). As the forecasted accounting measures are in line with the expected NPV, managerial compensation based on RI would thus compensate managers correctly in the long run. From a managerial incentive perspective, however, the use of this kind of accrual-based managerial performance measurement criterion might still not lead to goal congruence. As Lambert (2001, p. 79) asserts, it is essential that the evaluation criterion is also displaying the true value in each period of the project's economic life. "In order to get residual income to correctly motivate the agent's investment choice, the principal must calculate the 'correct' depreciation schedule. To do this, the principal must be able to 'match' the depreciation to the time pattern of the cash flows generated by the investment." Hence, in order to achieve a higher level of goal congruence the depreciation schedule in use should reflect the economic decline in the (asset) value of the project.

Today there exist a number of value-based management methods (residual income methods) for measuring managerial performance. These methods are also being increasingly used as determinants for managerial compensation. An important motive for implementing managerial performance measures is to oblige managers to act in a way that will maximise the welfare of share-

¹The relationship between NPV and relative accounting measures, like ROI, is not as evident, though. Quite the contrary "...there is a built-in incentive not to accept projects which reduce the average ROI. This selection criterion also generally lacks congruence with the usual discounted cash flow model" (Bromwich and Walker, 1998, p. 397).

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