

Implications and Conclusions

6.1 Contribution to the Literature

In this section, I will discuss this work's contribution to the literature with respect to its substance and its methodological insights. Most importantly, this work considerably extends the theoretical accounting and financial economics literature on investment incentives by significantly relaxing one of its major assumptions. This assumption restricts the set of possible investments to those, which consist of a deterministic or stochastic set of cash flows and only one - the initial - investment decision. As has been illustrated in this work with some examples, this restriction clearly is a oversimplification of many practical investment problems, since adapting investment projects to new information and making new decisions on existing projects is a major task of a company's management. And indeed, many of the recommendations of the literature on investment incentives have to be qualified or at least complemented in the light of my results.

For instance, the analysis of capital budgeting for investments that have the form of a growth option demonstrated the optimality of a staged budgeting procedure that uses the arrival of new information for budgeting decisions on parts of budgets. This phenomenon can be widely observed in the context of R&D-funding, but up to now, a theoretical explanation for it was lacking. In my model in chapter 3, headquarters uses a revelation mechanism to learn the true cost of the single stages of the R&D investment and provides funding according to this information. Like in the one-period models, capital rationing occurs. As a new aspect of my model, the extent of capital rationing strongly depends on the question whether the divisional manager has some kind

of own resources, possibly from additional projects, with which she can support investment in growth options.

Recommendations by theorists as well as practitioners on the use of residual income as a managerial performance measure also have to be qualified in the presence of real options. More or less simple depreciation schedules for residual income generally do not achieve goal congruence when investment projects have some real option features. The reason is that a depreciation schedule alone is not able to capture the value of a real option, which is available immediately but has to be exercised so as to maximize the complete value of the investment project. Moreover even the direction of the distortion is not immediately clear. Depending on the type of real options associated with an investment project, overinvestment as well as underinvestment can occur. Instead of using a simple depreciation policy, the correct value of the real option has to be recognized immediately by capitalizing and subsequently depreciating it. While for external purposes this recommendations may pose serious problems due to the danger of manipulation, this adaption of residual income is shown to be optimal for performance evaluation purposes. The more general point that can be made here is that headquarters should put all available information into the performance measure. While depreciation schedules may reflect knowledge about the useful life of a project and the distribution of cash inflows, capitalization rules can be used to incorporate knowledge about valuable real options.

Besides the literature on decentral investment decision-making and investment incentives, my work complements the valuation literature on real options by analyzing the effects of incentive issues on the valuation problem. As is demonstrated in chapter 3, the valuation of a growth option significantly changes, when incentive issues are present. Due to the necessity of paying the divisional manager an informational rent in the second stage, the cost threshold, up to which investment is profitable, decreases compared to a single-person decision context. The same issue continues to hold also for the first stage. Therefore, investment in the growth option becomes less likely, which qualifies recommendations in the real options literature according to which the absolute level of investment should be strongly enlarged in the presence of growth options. Chapters 4 and 5 raise issues of implementing real option valuation in decentralized companies. It is shown that a standard application of so-called value-based management systems like Economic Value Added does not achieve a value-maximizing exercise of real options, since a divisional manager has preferences different from those of headquarters. The analysis shows that implementation issues must not be neglected