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The economic value of the R&D intangible asset

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Abstract

This study utilizes firm-specific time-series data to estimate the economic value of the research and development (R&D) intangible asset to the firm. The study uses a sample of 1,000 firms from the S&P 500 index, representing the persistence of R&D intangible asset. The study estimates the economic value of R&D intangible asset using a procedure that involves the use of firm-specific data and a two-digit SIC code industry classification. The study also includes a parameter for the intensity and the concentration of the industry. Differences in the persistence of

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earnings are related to the concentration ratio. Finally, differences in the estimated economic value of the R&D asset are associated with the profitability of the company as measured by its return on assets. We further compare the associations between the three different estimates of the R&D asset and subsequent stock returns, as well as the contemporaneous difference between the market and book value of companies. Results indicate that the time-series estimates of the R&D asset show stronger associations with both variables, followed by the intra-industry and the cross-industry cross-sectional estimates. Overall, our results provide evidence that market participants behave as if R&D expenditures have significant future economic benefits to the firm, and show that the cross-sectional and time-series approaches followed when assessing its economic value provide significantly different estimates.

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Notes

- ¹The only variable that is not included in the regression is the size of the company, measured by the natural logarithm of sales.

²An exception is made for the specific R&D expenditures, which are measured as a percentage of sales.

³The assumption of a constant life cycle of R&D expenditures is not realistic, as R&D expenditures are expected to increase over time.
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⁴We thank an anonymous reviewer for drawing our attention to capital expenditures besides drilling expenses.

⁵The model in this paper assumes a world without taxes, just like the Ohlson ([1995](#)) model.

⁶In a prior version of this paper, we repeated the analysis with quarterly data. Parameter estimates and further analyses were very similar to those reported for the annual results.

⁷We also used market values three months after the fiscal year-end with very similar results to those reported in the text.

⁸One must bear in mind that the companies in Panel C are not representative of the entire Compustat population; they are selected to the sample if they disclose R&D expenditures for at least ten years between 1985 and 2001. Thus, R&D is likely to be an important concern for these firms which have also survived for a long time. Our sample selection criteria may have different implications for size and growth opportunities in these companies than in the rest of the population.

⁹A note of caution should be interjected here. The comparison above is necessarily based only on firms that have sufficient history data to estimate the time-series model. These firms may have been more successful at deploying their R&D expenditures, and more reliant on it. Thus, the impact of R&D on the difference between market and book value and future returns may be more closely estimated from the time-series model.



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