

The Impact of Enterprises' R&D Investment on Their Business Performance

The accumulation of knowledge·technology capital through Research & Development (R&D) investment determines the economic growth of a nation. In addition, R&D activities in enterprises determine their future growth and profits. However, in Korea, there has not been enough comprehensive research on the characteristics of enterprises' R&D investment and its impact on their business performance due to a shortage of related data. This paper carries out an empirical analysis on the characteristics of enterprises' R&D investment and its connection with their business performance. A database was set up for this paper based on gathered materials concerning the R&D investment of listed companies between the year 1990~2005.

To sum up the findings of this analysis, the characteristics of enterprises' R&D investment and its relation with their business performance are as follows.

First, the R&D investment of Korean businesses, centering around the manufacturing sector and particularly the IT industry has been on a constant rise since the 1990s. However, the gap between the various business sectors in terms of R&D investment has not narrowed and R&D activities are becoming more and more concentrated on a few large corporations.

Second, corporations' R&D investment is found to be closely related to their business performance in terms of productivity, growth, profitability, and their corporate value. In most cases, investment is seen to have a positive influence on performance.

Third, the impact of R&D investment on productivity and profitability has declined, although its relation with Tobin's Q ratio, an indicator of future profitability and growth, has become closer in the 2000's. This suggests that enterprises are facing some difficulties in translating the commitment of R&D investment into actual improvement in performance, despite heightened market expectations of the outcome of R&D investment fuelled by its sharp growth within a brief period of time.

Fourth, the estimation coefficients of productivity and profitability in the IT industry are lower than those in the non-IT industry, while the impact of R&D investment on corporate value is greater. This seems to be because, although the future profitability and growth of R&D investment-driven IT companies are highly rated in the stock market, actual improvement in business performance is still inadequate, the high R&D cost-to-sales ratio notwithstanding, due to the intensified bipolarity within the IT industry and the decreasing returns to scale of R&D investment.

Fifth, piecewise regression of the relationship between R&D investment and business performance for each category of corporations' R&D cost-to-sales ratio suggests that R&D investment brings about diminishing returns on productivity and profitability, while estimation coefficients rise for the categories with a high R&D cost-to-sales ratio in relation to current and future growth related variables such as the growth rate of sales and Tobin's Q ratio.

Based on the above analysis, the following policy suggestions related to corporate R&D investment can be made.

First, policy-related efforts need to be stepped up to ensure robust R&D investment on the part of enterprises by offering improved tax and financial incentives, since R&D investment is closely related to core business performance, such as productivity, growth, profitability, and corporate value.

Next, now is the time to pay attention to boosting the efficiency of R&D investment, rather than merely expanding it, particularly since its impact on performance indicators has recently been on the decline, as it showed decreasing returns to scale in terms of performance indicators, such as growth and profitability.

The government needs to make multi-faceted efforts to develop human resources by building up and enhancing professional research personnel capital, both in terms of quantity and quality, since the key to boosting the performance and efficiency of R&D investment lies in the accumulation of R&D human resources and their improvement in terms of quality.

Last, enterprises need to constantly expand their R&D investment, while at the same time, proactively seeking to maximize the payoff from investment in terms of business performance by carrying out market-oriented R&D investment activities.