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Market value of Innovation: An empirical analysis on China's stock market

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Abstract

Studies on market value of innovation investment have been based on US and European database. However, few researchers investigate Chinese stock market about the market value of firm's expected R&D performance. In this paper, we use constructed panel dataset from three representative stock markets in China: Main Board Market, Small and Media-sized Enterprise Board Market and Growth Enterprise Market and then use intangible assets increment as innovation indicator to examine the innovation investment-firm performance association in both manufacturing and service industries by a dataset over an 11-year period covering 1455 firms to evaluate the differences in their relative contribution to market performance. By comparing the results of these three stock markets, we find out the effect of R&D investment and increasing R&D input to market value is insignificant in all three stock markets, resulting from the weak protection for minority investors and loose regulation of information disclosure. Different constructions of intangible assets of listed firms on MBM and GEM account for market's relatively low efficiency to reflect real value of R&D investment. On industry-level, we conclude that R&D investment in both service and manufacturing sector contributes positively to market performance of firms and R&D investment in service industry shows stronger and more significant linkage to market value than manufacturing industry.

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Key words: Market value; Innovation; R&D; China's stock market

1. Introduction

1.1. Literature Review

The researches on how to appropriately value R&D investment and to what degree the R&D performance affects firm's market value have always been interested by many scholars. They did studies based on empirical data on firm-level or industry-level from different regions. Griliches was the first one to begin studying R&D valuation on US stock market, aimed at investigating the effect of R&D expenditure to firm's performance in equity market. Then similar questions have been researched and the findings are overall accordant: there exists

a positive relationship between R&D investment and market value of US firms [1][2][3]. McCutchen Jr. and Swamidass's research shows that in biotech industry, investment in R&D positively affects firm's market value, which is especially obvious for small biotech companies under 100 million-scale [5]. From the perspective of firm-specific level, technology innovation contributes to the increase of market value of the company, and the effect of high-tech innovation is superior after 9.11 terrorist attack than before and service industry pays much more attention for the innovation effect on market value than manufacturing industry in US [6].

As for the research on market value of innovation in stock market of specific country, several scholars' findings imply that market value of innovation varies a lot in different countries. Investigation of listed firms in Israel shows that the growth of a company in the long run is backed by the continuous internal technology innovation instead of a favorable external environment, which is reflected by the stock valuation of relatively inferior firms [7]. Analysis on data of British stock market was studied by Blundell in 1999 and it demonstrates that market valuation of firm is positively affected by innovation. Empirical analysis of Japanese firms results that innovation in intangible assets is more obvious than innovation of tangible assets, in spite of the downturn of the overall Japanese stock market in the 1990s[8][9].

Regarding the factors to market valuation of innovation of given firms, investors' expectation for return of innovation is related to the market value of firms when controlling the company size and profit risk [10]. Hall and Oriani ascribe the indistinctive market value of innovation in Italy to the lack of protection for investors. Due to the weak protection for minority shareholders and loose policy on information disclosure, controlling shareholders usually leads to ineffective allocation of resources [11][12]. Chan points out that low-tech firms and high-tech firms differentiate in market valuation of innovation. For high-tech companies, technology innovation increases their market value, however for low-tech listed companies, their R&D expenditure decreases their stock valuation because that high-tech company R&D input is an active investment with expectations for new breakthrough while for low-tech company, too much input in innovation is a sign that their current product is faced of a shrinking market [9]. CHENG researches relationship between technology innovation and market share in Shanghai A share market, which illustrated an insignificant relationship [13].

From the summary of former researches in market valuation of innovation, we find out researches are focused on stock markets in different countries and there have been few investigation on Chinese markets, in part because Chinese stock market is product of government policy in early periods with serious information asymmetry, weak protection for investors and majority of individual investors, while most of US and European stock markets are the outgrowth of private firms and market economy. This distinguishing background uncovers more complication of Chinese stock market [13].

1.2. Innovation valuation in Chinese financial markets

Nevertheless, since the first stock market in China - Shanghai Stock Exchange was established in 1990, the position of stock market has been changed from solving problems for State-owned Enterprises to allocating resources efficiently, motivating innovation and leading capital to promising industries [14]. In this paper, we make contribution using data from three segmented Chinese stock markets-Shenzhen MBM, SMEM and GEM to explore questions about the relationship between R&D and market value in different board markets.

With the goal of measuring market value of R&D in three segment stock market, our investigation is motivated by the well-planned structure in Chinese capital market to support high-tech companies. Understanding the effect of characteristics of stock market to the market value of R&D investment helps finding out the advantages and disadvantages for different types of firms. We use a number of indicators to examine the effect of R&D investment to market value of firm. Another motivation of this paper arises from the weak protection for innovations in China. By figuring out the favorable feature for maximize the value of R&D in each of the three stock markets, listed firms could better adapt its innovation strategy according to the feature of stock market in which it exchanges and better profit from R&D investment.

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