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Innovative intensity and its impact on the performance of firms in Brazil

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ABSTRACT

This article evaluates whether firms that invest in research and development (R&D) have better future performance and if stock market fully value such intangible investment. The results of annual cross-sectional regressions indicate a strong association between the intensity of R&D and future performance, even after controlling for other variables that affect future performance. However, after controlling for firm characteristics and risk factors, the innovative intensity was not significant in predicting future returns. In general, the results suggest that the R&D intensity is not useful for firm valuation in Brazil.

1. Introduction

The growing importance of intangible assets in a firm's value, and more specifically, the importance of investment in research and development (R&D) in the economy, has generated considerable interest in the subject in recent years, especially in developed countries, regarding the way the capital market establishes prices and/or reacts to investments in R&D.

However, it is not a simple task to accurately reflect the intangible benefits of investing in R&D in the value of assets, mainly because the accounting information does not adequately reflect such intangible assets.

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Moreover, even if it was expected that the price of an asset incorporated all the available information, including any information relating to intangible assets as well as the benefit of investment in R&D, several studies show that the market does not fully and immediately incorporate even publicly available information. This contradicts the hypothesis of market efficiency (DellaVigna and Pollet, 2009; Hirshleifer et al., 2009; Hou et al., 2009).

Thus, it is expected that the ability to incorporate intangible information into asset prices would be even more valuable. In reality, investors have more difficulty assessing information when it is intangible (Daniel and Titman, 2006) or difficult to process (Song and Schwarz, 2010) as is the case of investment in R&D, where results are highly unpredictable and often associated with untested technologies or processes.

Moreover, the long-term nature of investment in R&D may be incompatible with the time frame with which investors are concerned, as suggested by Hall and Hall (1993) who conclude that investors fail to identify rewards arising from long-term investments.

The issues mentioned concerning the difficulty of accounting for investment in innovation (which assume even greater importance in a modern economy, where much of a firm's value may be a function of its intangible assets), together with the magnitude of recent public policies to encourage innovation[1] in Brazil, demand an analysis of the impact of such investments on business performance and how the market in Brazil reacts to this information.

The inexistence of studies of this nature in Brazil shows the importance of the contribution of our study, with the aim of helping companies and authorities formulate R&D policies in Brazil. In additions, it sheds light on the issue for emerging economies.

This article evaluates the relationship between the intensity of R&D expenditures and (1) operational performance and (2) returns on equity. Given that R&D expenditures bring long term benefits, we analyze the impact in up to 3 years after the expenditures. We opted for 3 years instead of 5, as commonly seen in the literature, because of limitations on the quality and quantity of data, required for such a study, in Brazil. To consider 5-year effects of R&D would lead to considerable loss of data observations.

We treat R&D efforts as innovation intensity, for which we use as proxy Investment in R&D divided by sales (R&D/sales) or divided by equity market value (R&D/MV), as proposed by Chan et al. (2001).

If indeed investors do not incorporate quickly and adequately investments in R&D, be it because of difficulties in the evaluation of its implications, be it because of difficulties in identifying such investments from financial reports, then we would expect firms which invest more in innovation to be undervalued when compared to firms with little investments in D&D.

Therefore, if the investment in innovation is in fact underestimated, as appears to be the case in the studies developed in the US and England, the investment in company innovation could be inhibited, given the benefits granted by investors to less innovative companies

This study evaluate the market's ability to incorporate the intangible benefits of investing in R&D.

We perform cross-sectional Fama–MacBeth regressions, as described in Hirshleifer et al. (2013) and find a positive and significant relationship between innovation intensity and performance, where performance is measured by Return on Assets (ROA). However, even with better future performance, companies with more intensity in innovation do not appear to show better returns than those with less investment in innovation. These results were found with the use of buy-and-hold portfolio techniques, as commonly seen in the literature. These results were confirmed by cross-sectional Fama–MacBeth annual regressions between returns and innovation intensity, controlling for other characteristics of the firms.

Additionally, for every year we form 3 portfolios based on innovation intensity at the beginning of July and carry them for 12 months. After regressing the excess returns of these portfolios against the returns for the Fama–Fench 3-factor model, we again did not find abnormal alfas.

[1] In 2013, Brazil launched the largest integrated plan in its history to promote investment in innovation in order to raise the competitiveness of the Brazilian economy. The Innovate Company Plan foresees the involvement of different ministries, through which more than US$ 30 billion will be invested in innovation by 2014 (http://www.finep.gov.br/inovaempresa/). The goal of the plan reveals the expectation of improvement associated with the expansion of investment in innovation.