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How does the financial environment affect the stock market valuation of R&D spending?

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Abstract

This paper investigates the role of the financial environment in the stock market valuation of research and development (R&D) spending by firms. We examine the importance of equity financing relative to bank financing and the importance of both relative to the size of the economy on the stock market valuation of R&D expenditures. Empirical analysis of the Compustat Global Vantage firm-level data indicates that, the more market-based a financial system is, the more R&D expenditures are valued by the stock market. The degree of financial development does not appear to be important. Our results remain materially unchanged after controlling for numerous firm and country differences.

JEL classification: G15; M40

Keywords: R&D; Stock market; Valuation; Financial system

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1. Introduction

Schumpeter's (1934) seminal work on economic development stresses the importance of innovation. Because a wellspring of innovation is the research and development (hereafter R&D) process, it is only natural that economists, economic policy makers and others are interested in understanding its nature and providing an environment that enables R&D activities to be successful. Success, however, requires more than new ideas. It also requires that these ideas need to be implemented and financed. The latter typically means that the firm is incorporated and has access to various forms of equity and debt capital via the financial environment that it faces. Wide-ranging discussions concerning the role of financial infrastructure and its impact on the firm appear in the academic and popular business presses (e.g., Beck and Levine, 2002, and The Economist, 2003, respectively). Some discussions argue that the ease with which investments are financed depends on whether the financial system in which the firm operates is primarily market-based or bank-based, while others suggest that it is not the type of financial system that matters but is whether the system is cost effective. Encompassing these views is the notion that effective financing cannot exist unless there is a viable legal system.

In the last 30 years or so, there have been numerous studies that quantify the effect of R&D expenditures on the financial performance of the firm. Some studies (e.g., Jaffe, 1986, Megna and Klock, 1993, Hall, 2000) develop models that indicate that market value is a function of, among other things, a firm's technological capital stock. Others (e.g., Lev and Sougiannis, 1996, Chan et al., 2001, Eberhart et al., 2004) address the question of how various R&D based measures can explain and predict long-run stock returns and operating performance of the firm. Still others (e.g., Chan et al., 1990, Woolridge and Snow, 1990, Doukas and Switzer, 1992) investigate the short-run reaction of stock prices to announcements concerning R&D efforts. With few published exceptions, these studies use US data. Exceptions include Johnson and Pazderka (1993), Xu and Zhang (2004), and Hall and Oriani (2004). Johnson and Pazderka (1993) document that R&D spending by Canadian firms is reflected in their market value, and Xu and Zhang (2004) report that the average market returns of Japanese firms are positively affected by R&D expenditures. Hall and Oriani (2004) examine the relationship between market value and R&D expenditures in France Germany, Italy, the UK and the US. They motivate their research by noting that the continental European capital markets and corporate governance systems differ from those found in the Anglo-Saxon hegemony. Their empirical results, which are obtained by examining each country independently, support the notion that the market value of a firm is a positive function of its investment in knowledge. This relationship holds for Italy, however, only after controlling for stock ownership concentration. Moreover, in the case of France, adding ownership concentration to the mix strengthens the observed relationship between R&D and market value. The general finding of all these empirical studies is that R&D expenditures increase a firm's future cash flows and current market value but that the strength of the effect varies across countries and samples.

In addition, there are several theoretical papers that provide insights into understanding the role of equity and debt capital in financing R&D spending and into explaining why R&D spending is reflected in market values differently in different countries. More specifically, these papers address the importance of a financial system's degree of development