International Review of Financial Analysis 32 (2014) 132–142

Contents lists available at ScienceDirect

International Review of Financial Analysis

Innovation efficiency and asymmetric timeliness of earnings: Evidence from an emerging market

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ARTICLE INFO

Article history:
Received 17 June 2013
Received in revised form 26 January 2014
Accepted 29 January 2014
Available online 7 February 2014

JEL classification:
M41

Keywords:
Innovation efficiency
Asymmetric income timeliness
Information asymmetry
Litigation risk

ABSTRACT

This study investigates the impact of intellectual capital output on the asymmetric income timeliness of firms in Taiwan, which is an emerging economy with a high concentration of research and development (R&D)-intensive firms but poor investor protection. The higher growth opportunities and increased risk faced by R&D firms make them more vulnerable to shareholder litigation. Specifically, I examine whether companies that are less efficient at transforming new ideas or techniques into granted patents are more timely in their recognition of losses and less timely in their recognition of gains in response to higher expected litigation costs. Indeed, I observe a negative relationship between innovation efficiency and asymmetric income timeliness and this is more evident among highly R&D-intensive firms. In a parallel analysis, I also find that the observed greater earnings conservatism of low-innovation-efficient firms is more evident following the introduction of the Securities and Futures Investor Protection Act in the year 2003, when a class action litigation mechanism was established. Together, these findings highlight the role of accounting conservatism in mitigating the potential litigation risk faced by high-tech industries.

1. Introduction

This study examines whether non-financial information based on innovation efficiency reduces asymmetric information and litigation risk. Research and development (R&D) is one of the most important corporate strategies that firms have to take, despite the fact that investments in R&D do not always result in immediate product innovation. Barth and Kasznik (1999) argue that firm investment in intangible assets induces greater information asymmetry than does investment in tangible assets. A firm's R&D expenditure is a major contributor to information asymmetry and the outcome of such innovation inputs plays a key role in mitigating shareholders' concerns about managerial expropriation. A less innovation-efficient firm may be more vulnerable to shareholder litigation than a high innovation-efficient firm that is more capable of transforming new ideas into granted patents.

Specifically, I examine whether innovation efficiency affects conservative reporting, manifested through less timely gain recognition and more timely loss recognition. Earnings conservatism facilitates efficient contracting and could increase firm value by reducing contracting and litigation costs (Watts, 2003a,b). Recent literature confirms the economic benefits of timely loss recognition in financial reporting by documenting that conservative accounting choices mitigate information asymmetry and reduce the costs of capital (e.g. Garcia Lara, Garcia Osma, & Penalva, 2011). Since R&D and other internally developed intangibles are generally expensed, investors have little information on the value and productivity of firms' R&D investments. Prior studies show that management may disclose private information through conference calls to reduce R&D-related asymmetric information (Tasker, 1998a,b). Unlike these previous studies, I examine the role of patents, which are a direct output from R&D activities, in mitigating information asymmetries and reducing litigation risks.

Conservative reporting defers earnings and generates lower net assets and emerges as a defensive response by managers and auditors to reduce the likelihood of being sued in a shareholder lawsuit (Watts, 2003a). Technology firms are likely to have greater conservative income as they are subject to both shareholder litigation risk and conservative accounting practices (Chandra, 2011). Taiwan is a natural laboratory for studying this issue since it has an economy dominated by high-tech industries, where investors see R&D as a crucial determinant of firm value but are poorly protected by regulation. Shareholders are especially sensitive to the agency problems that ensue from R&D expenditures in intellectual capital-intensive firms as a result of the high correlation between innovation input (which enhances competitiveness) and proprietary information (which reduces disclosure incentives). Such agency problems can easily lead to corporate litigation, especially shareholder litigation. Given the relative lack of transparency of Taiwanese financial reporting and the potential inability of the public to understand the details released in conference calls about firms' innovation efforts, patents are important as they certify the credibility of otherwise hard-to-verify voluntary disclosures regarding R&D successes. The introduction of the Securities and Futures Investor Protection Act in Taiwan in 2003 also provides a natural choice in which to observe how an exogenously induced change in the shareholder

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http://dx.doi.org/10.1016/j.irfa.2014.01.014

litigation environment affects asymmetric income timeliness, especially among innovation-intensive firms. By evaluating the impact of this regulation, my study also substantiates the view that litigation risk is one of the main driving forces behind earnings conservatism, especially in high-tech sectors.

Some argue that it is costly for outside investors to acquire R&D-related information since it requires a significant investment in gathering scientific knowledge, analyzing financial statements, and participating in conference calls (Aboody & Lev, 2000; Hirshleifer, Hsu, & Li, 2013). Hirshleifer et al. (2013) indicate that information about new technologies is difficult for investors to process as it requires knowledge of how the economic fundamentals are changing as well as an analysis of the innovation process – from the generation of a new idea to the release of the final product on the market – since the expected profit is highly uncertain. Investors may be unable to respond fully and immediately to the arrival of relevant public information on innovative activities.[1] Levitas and Mcfadyen (2009) also argue that new knowledge of innovation may not be easily diffused to external investors, resulting in knowledge asymmetries between management and external suppliers of capital. In the light of these studies, investments in R&D increase a firm's intangible resources but also contribute to the information asymmetry between management and outside investors.

Existing accounting research documents that conservatism in financial statements facilitates efficient contracting between managers and outside investors in the presence of agency problems (e.g. LaFond & Watts, 2008; Watts, 2003a,b). Watts (2003a) provides four main explanations for earnings conservatism – namely, contracting incentives, taxation, litigation and regulation – and states that conservative reporting provides economic benefits from both the contracting and litigation perspectives. Following the registration of patents, the asymmetric information is alleviated as investors acquire wealth benefits from these investments, which also reduces the probability of shareholder litigation lawsuits. As firms differ in their abilities to convert R&D into tangible outputs and future performance, I investigate the extent to which asymmetric income timeliness is conditional on the success of a firm's R&D efforts.

Prior studies show that the asymmetric timeliness of earnings is higher in periods when shareholder litigation is more prevalent in the US (Basu, 1997; Lobo & Zhou, 2006). Emerging markets generally have less transparency in their information environments and weaker investor protection than mature markets. In Taiwan, the Securities and Futures Investor Protection Act, which went into effect on January 1, 2003, aims to ensure the protection of investors by establishing a class action litigation mechanism. Since the introduction of the act, firms in Taiwan have faced a greater probability of shareholder class action lawsuits, which is likely to have induced them to report economic losses in a more timely fashion. I exploit this unique setting of an investor protection regime change in an emerging market to examine the extent to which mandatory patent granting could alleviate the asymmetric information and expected litigation costs arising from R&D, thereby reducing litigation-driven earnings conservatism. The sample comprises firms listed on the Taiwan Stock Exchange from 2000 to 2008. Compared to the world level, business innovation in Taiwan is quite active (Chin, Lee, Wang, & Kleinman, 2007). According to the report '*How technology sectors grow: Benchmarking IT industry competitiveness 2008*', IT competitiveness in Taiwan is ranked second in the world, slightly behind that of the US (Yeo, 2008). The country's strong performance in R&D is the main contributor to improvements in IT competitiveness, in an emerging market that is strongly connected to the global network of production and innovation (Ernst, 2010). Moreover, the nation has been ranked top in the field of patents by generating one patent for every 2000 persons (Yeo, 2008). These statistical facts make the findings of this study even more interesting and provide out-of-sample evidence regarding the role of conservatism in mitigating asymmetric information in an environment with poor investor protection.

To measure the degree of earnings conservatism, this study applies the Basu (1997) model by regressing reported earnings on stock returns and allowing the return coefficient to change with the sign of the return. The quantity of patents granted indicates the non-financial attributes of a firm's innovation process, provides valuable information to shareholders, and reduces information asymmetry, agency costs, and expected litigation risk. The results show that innovation efficiency, measured as patent count scaled by R&D capital, is negatively associated with asymmetric income timeliness. Specifically, companies that are less efficient in transforming new ideas into granted patents are more timely in recognizing losses and less timely in recognizing gains. Such evidence is more pronounced among R&D-intensive firms, which face severe information asymmetry and greater expected litigation costs. In parallel, I seek evidence of the impact of an exogenous change in the shareholder litigation environment on conservative reporting. I find that the asymmetric income timeliness is more evident in the period since the introduction of the Investor Protection Act, when the shareholder class action litigation mechanism became effective. The effect of this is more pronounced among less innovation-efficient firms that are more vulnerable to shareholder class action lawsuits. The findings of this study contribute to the accounting literature on the beneficial role of conservatism in financial reporting and highlight the importance of strengthening investor protection mechanisms in developing economies.

The paper is organized as follows. Section 2 reviews the literature and develops hypotheses. Section 3 describes the methodology, sample and data. Section 4 reports the empirical findings. Conclusions are given in Section 5.

2. Literature review and hypothesis development

2.1. Institutional environment in Taiwan

2.1.1. Patent disclosures

Companies in Taiwan seldom disclose innovative activities in their financial statements, due to concerns over proprietary costs, and if they do disclose any information about patents, the majority of that information is concerned with patent infringements. Thus, the Taiwan Intellectual Property Office's (TIPO) announcement of the number of patents granted each year complements the hard information in financial statements and verifies the soft information of voluntary disclosures through conference calls, press releases or conversations with analysts. According to the annual statistics provided by TIPO, the majority of patents are granted in the electronics sector.[2] Industrial development in Taiwan is focused on made-to-order manufacturing services and researching and developing manufacturing processes so as to attract orders from large international companies and improve the efficiency of producing high-tech products. Taiwanese companies are proficient in original design and are dominant manufacturers in certain areas, such as desktop personal computers, notebooks, LCD screens, and motherboards (Einhorn, 2005). In recent years, several companies have pursued an aggressive strategy of filing protective patents in the face of increasing global competition. Although there has been rapid growth in the quantity and quality of innovation carried out by companies in Taiwan, the high patent count is highly concentrated in terms of

[1] As investors may place less weight on information that is more difficult to process, the limited attention investors pay to innovation activities could lead to return predictability. Indeed, Hirshleifer et al. (2013) find that innovation efficiency strongly predicts subsequent stock returns in the US. They argue that investors underreact to information concerning innovative activities due to the difficulty in evaluating their economic implications, and that those innovation-efficient firms may be undervalued by investors.

[2] For instance, Taiwanese companies are major global suppliers of made-to-order chips (e.g., Taiwan Semiconductor Manufacturing Co.) and manufacturers of DRAM memory chips (e.g. Mosel Vitelic Inc. and Winbond Eletronics Co.).