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Innovation in pyramidal ownership structures

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ABSTRACT

We examine the association between a pyramidal ownership structure and the intensity of high-tech companies' investments in innovation. We find that companies in pyramidal business groups invest in innovation with greater intensity than similar companies that are not part of such an ownership structure. Furthermore, the intensity of investment in innovation is significantly higher the lower the firm is situated in the pyramid, where the ultimate owner has a smaller share of the equity. However, these findings are statistically significant only for biotechnology firms. It seems that for biotech companies, the pyramidal structure serves to transfer the immense investment risk inherent in them away from the ultimate owners further down the pyramid where they have a lower stake in profits and losses. In that sense, the inclusion of biotech firms further down the pyramid is, in effect, a particular kind of tunneling.

1. Introduction

This study examines the association between a pyramidal ownership structure and the intensity of investment in innovation in the high-tech companies included in the pyramidal group. The existence of a high-technology firm depends on the novelty of its research and developed products. Pyramidal ownership structures are particularly interesting in the context of investment in innovation. Given the

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relatively limited access of entrepreneurs to outside capital,[1] a pyramidal ownership structure may be advantageous to high-tech companies by creating an internal capital market that enables the transfer of financial and other resources between companies in the group (e.g., Belenzon and Berkovitz, 2010; Guzzini and Iacobucci, 2014).

While pyramids are still common in most capital markets, to date the association between pyramidal holding structures and innovation in high-technology firms has not been examined. Using data on European firms, Belenzon and Berkovitz (2010) examine the relationship between innovation and business groups in general. They find that group affiliates are more innovative than stand alones. In this study, we focus on pyramidal ownership structures. Focusing on pyramids allows us to add to standard internal capital market explanations offered in studies of business groups in general (e.g., Belenzon and Berkovitz, 2010). In pyramidal holding structures, the discrepancy between ownership and control rights—a main feature of pyramids—may create incentives for control holders to transfer resources from firms where they have fewer cash flow rights (firms further down in the pyramid) to firms where they have greater rights (firms higher up in the pyramid). This transfer of resources is called "tunneling" (Johnson et al., 2000). Hence, while a pyramidal ownership structure may be advantageous to high-tech companies by creating an internal capital market, the tunneling of resources throughout the pyramid may lead to a lower, rather than higher, intensity of investment in innovation, particularly further down the pyramid.

Focusing on pyramids also enables to attain a direct measure of the specific situation of a high-tech firm within the business group (e.g., the layer within the pyramid in which the high-tech firm is located) and examine the influence of the specific position of the firm within the group on its innovation. A second contribution of our study is in differentiating between high-tech firms based on their innovation attributes. We distinguish between biotechnology and other high-technology companies, given the considerable differences in the innovation patterns between the two groups. These differences arise from the magnitude of the investment, lengthy time period (as long as 20 years), source of entrepreneurship, and riskiness and complexity of the R&D investments, all of which are higher in the biotech sector (e.g., Kaufmann and Schwartz, 2008; Callen et al., 2010). Unlike other high-tech industries, the success of biotech products is largely affected by regulatory requirements, thereby extending the firm's risk on one hand and limiting the firm's control over its risk on the other (e.g., Cooke, 2008; Luukkonen and Palmberg, 2014). Intrinsically, in studies of innovation, high-tech firms should not be considered one homogenous group. Differentiating between types of high-tech firms that differ in their innovation patterns improves our understanding of the preferences and motivations of pyramid group owners in investing in innovative, high-risk companies.

Lastly, we contribute to the literature by using a homogenous sample from a single country. Focusing on a single country has the advantage of maintaining institutional, legal and economic factors constant across all sample firms and avoids the need to control for the different economic, cultural and institutional differences required in typical cross-country studies.

2. Data

The data for this study is based on all of the publicly traded Israeli firms on the Tel Aviv Stock Exchange (TASE) classified as being high-tech companies and that are owned by pyramidal holding groups. The Israeli case is an archetypal setting for our research given the high degree of ownership concentration and the large number of pyramidal business groups in Israel (e.g., Kosenko, 2008). During the sample period, 20 pyramidal business groups controlled about 26% of the public firms in Israel. For comparison, in Europe about 10% of the public firms are controlled by pyramids. The public firms controlled by a pyramidal business group comprise about 50% of the total market of public firms in Israel. About 80% of the affiliated companies in Israel were included in pyramidal business groups.[2]

[1] The challenges, frequent changes and ongoing uncertainty that characterize the high-tech sector imply an extremely high cost of capital. Moreover, collateralizing assets against debt may not be an option for high-tech companies that focus on developing intangible assets.

[2] Business Groups in Israel – Description, Analysis and Implications. Report presented to the sub-committee of the Israeli Knesset Finance Committee. June 20, 2010.