Abstract

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Title: Technological network position: effect on firms R&D expenditure and innovation

Rationality assumption is one of the basic assumptions in economics. However, researchers in behavioral economics and psychology dispute the validity of this assumption. Insufficient information and external influence drive individual behavior away from being rational. The same as individuals, organizations do not subscribe to such rational tenets, instead their behavior is influenced by experience and performance feedback (Cyert and March, 1963). According to organizational behavioral research, risk taking, is significantly influenced by a firm’s performance relative to its aspirations whereby performance that is less and greater than a firm’s aspirations respectively influences a firm’s risk taking and risk aversion. While such risk preferences draw from prospect theory, the concept of aspirations is crucial to understanding an organization’s risk preferences. There are two major factors affect firms’ risk taking behavior: a firm’s historical performance relative to aspiration level and the performance of others or social aspirations.

While understanding a firm’s aspirations have dominated much of the literature in understanding an organization’s risk preferences, such risk preferences however also operate in a greater social context. For instance, sociological studies have found that the effect of “crowding” creates social pressures on firms to examine their performance relative to their peers. Such crowding effect suggests that “crowding” may place a greater influence on firms to compare their performance to their social aspirations (i.e. performance of the comparative group) and hence crowding may appear to effect a firm’s risk preferences. Furthermore, sociological studies have also found that a firm with greater social “prestige” is less like to engage in such social comparisons and thus suggest that firms with prestige are more likely to compare their performance with their historical aspirations. Hence, this suggests that “prestige” should also influence a firm’s risk preferences. The purpose of this paper is to examine such risk preferences in the context of a biotechnology firm’s investments of R&D (i.e. R&D intensity). Specifically, as investments in R&D in the biotechnology sector entails greater risk, we develop the hypotheses as follows: 1) prestige positively moderates the influence of a firm’s performance-historical aspirations on a firm’s R&D intensity; 2) crowding positively moderates the influence of a firm’s performance-social aspirations on a firm’s R&D intensity; 3) for firms possessing crowding position, the attainment discrepancy of goal for market share is positively related to innovation rate and negatively related to R&D intensity; 4) for firms possessing crowding position, the attainment discrepancy of goal for profits is positively related to R&D intensity and negatively related to innovation rate.

The data used in this paper is panel data of biotechnology firms from year 2004 to 2013. The potential contributions to the existing literature are as listed. 1) Combining concepts of behavior theory and social network, this paper tests how firm’s historical performance relative to aspiration level and social comparison affect firm’s R&D intensity when they possessing different network positions. 2) This paper attempts to find how network positions influence firms’ goal concentration, which results in different reactions to it and then firms’ risk taking behavior.