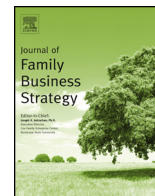




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Propensity to patent by family firms

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ABSTRACT

This paper provides new evidence of innovation processes in family firms by investigating their attitude toward the protection of innovation outputs. More specifically, the main objective is to understand, through the SEW (Socioemotional Wealth) lens, whether innovative family firms tend to use patents as a tool for protecting intellectual property. Based on a sample of 229 Italian companies that make R&D investments, our analysis highlights that degree of alignment with the family business model is a significant predictor of a firm's attitude toward protecting innovation with patents, even though not all of the dimensions of a family business have the same effect. When disentangling the effect of three different indicators (i.e., family ownership, family governance and the presence of young successors), family involvement in the board of directors is a negative significant driver, the presence of young successors is a positive driver, and ownership has no effect.

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1. Introduction

Although an important driver of diversity in managing innovation is firms' varying ability both to protect themselves from imitation and to appropriate a satisfactory proportion of innovation returns (Thomä & Bizer, 2013), managing innovation inside family firms requires consideration of such firms' long-term survival (D'allura, 2015). Accordingly, it is an integral part of family firms' innovation and survival policy to foster the use of patents as a tool to protect firm property. Indeed, it is widely acknowledged that similar to nonfamily firms, family firms target technological innovation to develop competitive advantages (McCann, Guerrero, & Haley, 2001). Nevertheless, because family ownership and involvement affect business processes (Zahra, 2005; Romano, Tanewski, & Smyrnios, 2001), we argue that family firms take a different approach than nonfamily firms to managing technological innovation and particularly in strategically choosing appropriate tools for protecting their intellectual property. That notwithstanding, with only a few exceptions, family firms' management of technological innovation and the peculiarities of family firms' innovation process have not received very much attention in the literature (De Massis, Kotlar, Chua, & Chrisman, 2014). Based on that assumption, this paper aims to provide new evidence on innovation processes in family firms by investigating their attitude towards the protection of innovation outputs. More

specifically, the primary objective is to understand, through the SEW (Socioemotional Wealth) lens, whether innovative family firms tend to use patents as an intellectual-property protection tool.

Innovators – that is, firms that develop technological innovations – aim to maximize revenues from their R&D efforts (Granstrand, 1999; Teece, 1986). This project involves managing the issue of appropriability, i.e., the degree to which returns from investments in R&D accrue to innovators or to other market participants (Levin, Klevorick, Nelson, & Winter, 1987). Although the patent system was developed to address this problem (Kitch, 1977), it is not the only or necessarily the best solution. More specifically, innovators must contemplate whether it is better to capture profit from innovations by protecting them with patents or by other means such as industrial secrecy, lead time, first-mover advantages or complementary products and services (Mäkinen, 2007).

Although the patent system is one of the most utilized intellectual-property protection tools, previous empirical literature highlights that the relationship between inventions, innovation and patents is not as simple as the one predicted by economic and innovation theories (Cohen, Nelson, & Walsh, 2004). Because not all inventions are patentable¹ and because patenting is not always perceived by firms as the most efficient and effective protection tool, only some inventions are protected by patents. In

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¹ Only inventions that are novel, industrially applicable, and substantially different from existing technologies may be patented.

short, firms have heterogeneous attitudes towards patenting; the strategic decision to patent depends on the expected benefits compared to the attitude toward risk and disclosure associated with the use of this intellectual-property protection tool.

In the empirical literature, patents have habitually been used as a measure of product of innovation. Nevertheless, the fact that not all innovations are patented is often noted as a major limitation on the use of patent statistics as an indicator of innovation (e.g., Mäkinen, 2007; Kleinknecht, Van Montfort, and Brouwer, 2002; Griliches, 1990). One concern about the validity of a patent for this purpose refers to differences in what Scherer (1983) has called the propensity to patent, which is suggested to vary among firms (Brower and Kleinknecht, 1999). In other words, with a given innovation intensity measured, for example, through R&D expenditures, different firms may patent with different levels of intensity. Whereas the number of patents is used as a measure of innovation output, the number of patents over R&D expenditures is a good measure of the propensity to use a patent (Scherer, 1983; Taylor & Silberston, 1973). In other words, the second measure evaluates the attitude towards using the patent as an intellectual-property protection tool, not the attitude towards innovating.

Accordingly, we want to know whether firms with given innovation activities differ with respect to their actual patenting intensity. Many researchers have demonstrated that the propensity to patent differs across firms, industries and type of innovation. However, little is known about the role of family firms in this strategic choice, and several issues remain ambiguous in both the empirical and theoretical literature. The interesting question is, of course, whether differences in the propensity to patent among individual firms can be ascribed to factors related to family firms.

Acknowledging the need for focused empirical research to support empirical and theoretical studies on the drivers underpinning family firms' management of technological innovation, this paper investigates how the distinctive characteristics of innovative family firms affect the strategic choice to use patents as intellectual-property protection tool (i.e., propensity to patent). In line with authoritative contributions to the literature on family businesses (Sciascia, Mazzola, Astrachan, & Pieper, 2013; Litz, 2008; Klein, Astrachan, & Smyrniotis, 2005; Sharma, 2004; Chua, Chrisman, & Sharma, 1999), we argue that creating a dichotomous contrast between family firms and nonfamily firms does not allow the distinctive features of family firms to be captured. In contrast, a multi-dimensional characterization can enrich our understanding of how different family firm models affect the propensity to patent. In particular, we focus our analysis on key organizational attributes highlighted in the literature, namely, ownership, participation of family members on the board of directors and the presence of young successors.

This study makes several contributions to the research on family business. First, the paper is the first to investigate family firms' propensity to patent within the general conceptual framework of SEW. We decide to use this theoretical lens because the common theme across almost all studies (see, e.g., the review by Berrone, Cruz, & Gomez-Mejia, 2012) is that in family firms, SEW protection represents a key non-economic reference point that is always present for decision making, which can lead the firm to make strategic and managerial decisions that cannot be understood through traditional economic logic. In other words, we believe that the SEW approach seems to be a suitable perspective for advancing the field of management of innovation because it illustrates the distinctiveness of family firms' identity through the consideration of non-economic factors. Second, by analyzing patenting activities, which imply key strategic and risk-taking decisions, we provide a better understanding of how family presence and influence affect strategic choices, in this case related to how to protect innovation. In other words, we focus on the

innovative family firm in an attempt to examine whether family affects the strategic decision to adopt patenting as an intellectual-property protection tool. Third, our study examines the separate effects of three attributes of family firms, assuming that the degree of alignment with family firm characteristics can vary across different family firm dimensions. By adopting this approach, we acknowledge the heterogeneity of the family firm and can assess which and how various dimensions of family ownership and family involvement in the firm's operations influence the management of technological innovation. Fourth, we examine the consequences of family firms' propensity to patent for management and policy making.

The analysis is conducted using a database of 229 innovative Italian companies. The dataset is heterogeneous in terms of degree of family ownership and involvement and therefore includes pure family firms, pure nonfamily firms and a wide range of intermediate situations.

Our findings show that the degree of alignment with the family firm model is a significant predictor of the propensity to patent even though not all dimensions of the family firm have the same effect. When disentangling the effect of three different indicators (i.e., family ownership, family governance structure and the presence of young successors), family members' involvement in the board of directors is a negative significant driver and the presence of young successors is a positive driver, whereas ownership has no effects. The results hold for various model specifications.

The rest of the paper is organized as follows. Section 2 surveys the existing literature on family firms and innovation, focusing on family firms' patenting practices, and identifies the key organizational dimensions of family firms as defined in the literature. The hypotheses that drive our empirical analysis are then derived by discussing the potential impact of family firm dimensions on the propensity to use patents as an intellectual-property protection tool. The third section presents the sample and the empirical methodology. The fourth section discusses the results of the empirical analysis and the fifth section provides our concluding remarks.

2. Family business and patents: literature review and hypotheses

2.1. Family firms and propensity to patent

Decades of research on innovation and family firms have produced contrasting results. For a conceptual framework see De Massis et al. (2014); for a review, see De Massis, Frattini, and Lichtenhaler (2013). In particular as concern existing studies on family involvement on innovation are limited and have focused so far on the effect on innovation input, outputs and activities (De massis, Di Minin, & Frattini, 2015). In particular, in this paper we focus on innovation activities and how those are handled differently in family firms. A recent review article by De Massis et al. (2013) indicates that studies concerning family firm innovation management is very much in its early stage and, when present, results are mixed and sometimes inconsistent. Moreover, although De Massis et al.'s (2013) in the same literature review underlines that prior studies provide strong evidence of a relationship between family involvement in a firm and the firm's innovation process, it presents no evidence about the strategies adopted to protect the output of that innovation process (De Massis et al., 2014). Indeed, empirical studies on propensity to patent generally have been confined to the use of industry- and firm-level data (Mäkinen, 2007); thus, we have no idea of how propensity to patent varies across family and non-family firms. What we do know is that studies using patents as a proxy of a firm's

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