

Strategic reference points in family firms

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Abstract Family firms are classically seen as risk averse organizations, and this is evident in their generally lower R&D investments compared to non-family firms. Recent research, however, challenges this predominant view and suggests that family firms can embrace higher strategic risk when faced with threats to their family-centered goals. Still, the internal and external conditions that drive variations in the strategic risk taking behaviors of family firms are little known and understood. This article adds to this literature by developing and testing a conceptual model of strategic risk taking that incorporates behavioral theory, family business literature, and the logic of the strategic reference point theory. With recognition that the interplay between family and economic goals determines heterogeneity in strategic

actions of family firms, this model suggests that family managers respond differentially to the feedback information regarding internal and external reference points, and consequently identifies key drivers of variation in the R&D investment behavior of family firms. By examining the pattern in R&D investments of 437 Spanish private manufacturing firms from 2000 to 2006, this study shows how strategic inputs, strategic outputs, and external benchmarks produce variations in strategic decisions about R&D investments in family and non-family firms. The findings offer insights into how internal and external reference points are considered in family firms' decision making, thereby contributing a deeper understanding into the circumstances under which family goals cope or collide with the economic goals of the firm, and how this influences strategic risk decisions in family firms.

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1 Introduction

Risk is a critical aspect of a firm's strategic management process and an essential dimension for understanding organizational behavior and performance (Bromiley 1991; Fiegenbaum et al. 1996; Miller and Bromiley 1990). Since top managers are primary liable for determining firm strategy (Andrews 1987), research has long focused on the factors that motivate their decisions with regard to the risk dimension of firm strategy (Knight et al. 2001). In family firms, a ubiquitous form of business organization around the world (La Porta et al. 1999), the involvement of family members in key managerial positions gives the controlling family the discretion to shape strategic behavior (Chua et al. 1999) and promotes the adoption of family-centered goals such as authority, identity, social status, and dynasty (Chrisman et al. 2012). Research has traditionally assumed that these goals lead family firms to act more conservatively and to avoid strategic decisions that may increase performance variability (e.g., La Porta et al. 1999; Morck and Yeung 2003). This is evident, for example, when considering R&D investments, which are acknowledged to possibly provide opportunities for differentiation, organizational renewal, growth, and profitability, but at the same time increase the variability in performance (e.g., David et al. 2001) and have been thus long and widely considered as a key dimension for studying strategic risk at the firm level (e.g., Hoskisson and Hitt 1988; Miller et al. 2013; Miller and Bromiley 1990). Despite the potential benefits of R&D investments, a cumulative body of research indicates that family goals lead family firms to invest less in R&D than non-family firms (e.g., Block 2012; Chen and Hsu 2009; Munari et al. 2010). However, family goals do not always collide with the economic goals of the firm, such that the coexistence of economic and noneconomic motives in family firms is likely to engender more complex and heterogeneous strategic behaviors than those of non-family firms (Chrisman and Patel 2012). In particular, family firms

have been shown to accept greater strategic risk if this is necessary to preserve the family's discretionary power (Gómez-Mejía et al. 2007) or to cultivate the reputation of the family (Berrone et al. 2010). As such, the interplay of family and economic goals emerges as a primary driver guiding family firms' strategic behavior (Gómez-Mejía et al. 2007), and researchers are increasingly interested in understanding under what circumstances family firms are likely to embrace strategic risk taking and increase R&D investments as opposed to their usual risk aversion (De Massis et al. 2013).

Prior research has examined this topic from the lens of the behavioral theory of the firm (BTOF) (Cyert and March 1963). Under this perspective, a parsimonious and prevalent argument holds that managers allocate sequential attention to goals (Shinkle 2012), and family involvement—that proxies the extent to which family goals are accounted for in decision making—is hence expected to have consistent effects on strategic actions (Berrone et al. 2010; Gómez-Mejía et al. 2007, 2010). In this vein, Chrisman and Patel (2012) argued that family goals lead to lower R&D investments in family firms, but that family firms also increase considerably R&D investments when the economic goals of the firm are not met. While insightful, this parsimonious argument however does not incorporate the insights from a substantive body of knowledge that acknowledges the multidimensional nature of reference points used for strategic decisions and identifies multiple targets and points of comparison that could guide strategic action (Fiegenbaum et al. 1996; Holmes et al. 2011). Since reference points are supposed to involve both family goals and economic goals in family firms (Chrisman and Patel 2012; Gómez-Mejía et al. 2007), it is likely that family and non-family firms display important differences in the importance they attribute to diverse reference points in their decision-making processes. However, the focus of the BTOF on financial performance as a single reference point used in firms' decision-making processes provides only a partial explanation of potential variations in family firms' strategic risk-taking behaviors. To the best of our knowledge, no studies have been reported to date that explicitly explore the content of the reference points guiding strategic actions in family firms as compared to non-family firms, which leaves us with incomplete theoretical and practical understanding of how the distinctive goals

accompanying family involvement in business influence the organizational decision-making mechanisms underlying R&D investment.

In this study we attempt to provide a more complete portrait of the effects of family involvement on strategic risk taking to develop an understanding of risk-seeking actions in family firms, a topic that several scholars have considered in need of further examination (Chrisman and Patel 2012; Gomez-Mejia et al. 2010; Lumpkin et al. 2011). We add to prior research by investigating a model of strategic risk taking based on the strategic reference point theory (SRPT) (Fiegenbaum et al. 1996), which explicitly considers the influence of managers in deliberately choosing among various reference dimensions that shape strategic risk taking in their firms and offers the opportunity to extend the BTOF to incorporate the role of multiple reference points in strategic decision making processes. Specifically, the conceptual model that we propose explores the impact of strategic inputs, strategic outputs, and external benchmarks on the organization's strategic risk taking; it predicts that family management not only reduces overall strategic risk taking behaviors, but it also moderates the influence of aspirations lying on the internal and external reference dimensions. By doing so, we complement existing research on family goals and strategic risk taking in family firms and develop a more elaborate formulation of reference points for strategic risk taking in family firms. Revealing that the same stimuli are interpreted differently in family and non-family firms contributes to our understanding of strategic decision processes in family firms. Through our richer explanation and empirical assessment of reference points chosen by family and non-family firms for strategic decisions, we attempt to contribute to a greater understanding of the relationship between family involvement and strategic risk taking.

This article is structured as follows: in Sect. 2 we present the theoretical background of our study. More specifically, we discuss how R&D investments relate to strategic risk in general, and in family firms in particular, and we then introduce two alternative theories, the BTOF and the SRPT, and their different perspectives on managerial decisions involving strategic risk. In Sect. 3 we present our conceptual model and develop our hypotheses. Following the methods in Sects. 4 and 5 we present and discuss our results. Finally, in Sect. 6 we draw our conclusions,

highlighting the theoretical and practical contributions of our study, as well as its limitations.

2 Theory background: strategic risk taking and strategic reference points

In the strategic management literature strategic risk is broadly defined as the possibility of suffering harm or loss in pursuit of a desired organizational outcome (e.g., Miller and Bromiley 1990; Knight et al. 2001). Strategic risk is thus embedded in most long-range firm decisions (Baird and Thomas 1985), and can be captured by a number of financial ratios (Miller and Bromiley 1990). In this study we focus on R&D investment decisions, that are a key element of the firm's innovation strategy, as well as a particularly suitable dimension along which to examine the impact of family involvement on strategic risk taking. In the first place, R&D investments capture the extent to which a firm engages into explorative processes toward the development of new processes or products. As such, R&D investments increase strategic risk relative to the future economic performance of the firm owing to technological and market uncertainty: the former stems from the unfeasibility of precisely foreseeing the outcomes of R&D activities, the latter relates to the possibility that other players introduce innovations that affect the value of R&D projects at their completion (Miller and Bromiley 1990). In this regard, a firm that invests in R&D will face higher market and financial risks than a firm that redirects resources toward exploitative strategic choices such as those aimed at increasing production efficiency or maximizing sales through marketing promotions (e.g., Benner and Tushman 2003; March 1991). What is more, R&D investments have been previously used in the family business literature to study strategic risk taking behaviors of family firms (e.g., Chen and Hsu 2009; Chrisman and Patel 2012; Munari et al. 2010), particularly because R&D investments increase strategic risk relative to the noneconomic goals typically pursued by controlling families (Chrisman and Patel 2012). First, R&D investments entail high risk of bankruptcy (Miller and Bromiley 1990). As noted by Gomez-Mejia et al. (2010) bankruptcy also entails the loss of all socioemotional wealth associated with the family's control of the firm and the family's wealth. Second, R&D investments reduce the amount of

resources freely available to managers, and consequently represent a threat to family managers' discretion. Third, increasing R&D investments often requires putting family control at risk through increasing leverage or seeking external equity, because family owners have typically limited funds due to their undiversified position in the firm (Schulze et al. 2001). Fourth, R&D investments require adequate planning activities (Miller and Cardinal 1994), which may in turn force family managers to disclose strategic information and cede authority to external professionals with the technical background and experience required to administer such activities, with consequent loss of family's control over decision-making (Gomez-Mejia et al. 2010). Finally, increasing R&D investments may also represent a hazard for the identity aspects of controlling families' socioemotional wealth, which depend on the close identification of the family with the firm's products (Donnelley 1964; Kotlar et al. 2013; Dunn 1996). In sum, R&D investments engender multiple strategic risks relative to both the firm's economic goals and the controlling families' non-economic goals, and consequently involve unique tensions in family firms, such as those between risk-taking and long-term orientation, and between tradition and innovation, that are vital to the strategic conduct of family firms (e.g., Chrisman and Patel 2012). For these reasons, studying R&D investments offers a unique opportunity to get a deeper understanding of risk-seeking behaviors in family firms.

Management research has emphasized two alternative theoretical explanations of risk-related firm behaviors such as R&D investments. The BTOF initially developed by Cyert and March (1963) uses organizational performance relative to aspirations to predict strategic risk taking, such that organizations are expected to be risk-seeking and to start searching for new routines, business or technological opportunities when their organizational performance falls below aspirations, in order to realign aspirations and results (Holmes et al. 2011). According to the formal model of Cyert and March (1963), managers consciously or unconsciously adopt social and historical performance comparisons as reference points. For example, Chen (2008) used past industry median and historical performance (i.e., return on assets) to proxy aspiration levels. Because managers according to the BTOF are supposed to give sequential attention to

goals (Cyert and March 1963), the idea of satisfying organizational performance suggests that prioritization exists (Shinkle 2012) and that economic goals are favored.

The SRPT advanced by Fiegenbaum et al. (1996) takes a different standpoint and provides an alternative explanation of strategic risk taking. As an organization-level application of prospect theory (Kahneman and Tversky 1979), the SRPT shares with the BTOF the idea that firms are more likely to take strategic risks when their performance falls below aspiration levels, but it provides a different rationale regarding the nature of aspirations and content of reference points. Specifically, it posits that managers, rather than reflexively taking decisions based on performance feedbacks, purposefully select aspirations that parallel their personal preferences and culture, and use such reference points to focus the attention of organizational members on desired outcomes. Treating managers as active and aware rather than passive or unaware agents, the model proposed by Fiegenbaum et al. (1996) also disputes the existence of a single reference dimension (i.e., economic performance) and suggests that managerial attention is rather paid simultaneously to multidimensional and multivariate reference points that reflect the managers' consideration of both internal capabilities and external conditions (Shinkle 2012).

Drawing on various theories that provide prescriptions for the selection of specific reference points, the SRPT identifies an overarching set of factors, that lay along the internal and external reference dimensions and are supposed to drive firm decisions involving strategic risk. Derived from the insights of motivation theory and the resource-based view, the internal reference dimension consists of strategic inputs and strategic outputs (Fiegenbaum et al. 1996). Specifically, strategic inputs refer to the ability to build core competences, which is considered a critical prerequisite to competitive success (Barney 1991). As firms are required to build multiple competencies simultaneously in order to achieve sustainable advantages (e.g., Hamel and Prahalad 1991), in this study we focus on available resources as a key input target that may affect the managers' willingness to embrace strategic risk (Bourgeois 1981). Strategic outputs are instead described as economic targets that managers set for their firms. As managers are expected to react to historical comparisons (Cyert and March 1963;

Shinkle 2012), strategic outputs are formalized consistently with the BTOF as performance discrepancies from aspirations, expressed in terms of the focal firm's past performance.

In addition to the self-reflective information considered by managers, which are described along the internal reference dimension, the strategic reference point theory draws on the industrial economics, resource dependency, and institutional theory perspectives to argue that firms may adjust their strategic behavior based on information describing their position relative to important actors and circumstances in the external environment (Fiegenbaum et al. 1996). Although there are several and diverse external factors that could potentially be relevant, for purposes of conciseness we focus our study on the influence of three major groups of external stakeholders: competitors, buyers, and suppliers.

These factors, that describe the internal and external reference dimensions used by managers in strategic decision making, have the potential to provide important insights into the strategic risk taking behaviors of family and non-family firms by revealing the relevant differences engendered by family management in processing feedback information and setting their strategy. Following this logic, we now turn to explore the direct impact of various reference points on strategic risk taking and the effect of their interaction with family management to provide a richer understanding of what leads family and non-family firms to take strategic risks.

3 Antecedents of strategic risk taking and the role of family managers

Although BTOF and its derivations have dominated research on strategic behavior of family firms (e.g., Berrone et al. 2010; Chrisman and Patel 2012; Gómez-Mejía et al. 2007; Zahra 2012), we argue that the SRPT can contribute much to understanding the antecedents of strategic risk taking in family firms. This is for at least two reasons. First, there is cumulating evidence that the strategic choices of family firms are less susceptible to economic performance than those of non-family firms, and that family firm behavior is rather guided by family goals (Berrone et al. 2010; Gómez-Mejía et al. 2007, 2010). Second, family goals have been shown to interfere with the economic goals

of the firm, leading to more heterogeneous strategic choices in family than in non-family firms (Chrisman and Patel 2012). For these reasons, applying the strategic reference point theory to the analysis of strategic risk taking in family and non-family firms has the potential to reveal the organizational factors and the elements of the surrounding environment that the controlling family cares most about and, as a consequence, the type of information that is especially considered in family firms' decision making processes. In this study, we assume that strategic behavior of organizations can be influenced directly by top managers' choice of reference points (Fiegenbaum et al. 1996). Consistently with this view, we propose a model that accounts for reference points distributed along multiple reference dimensions, thus providing an accurate description of strategic risk taking in family firms, also delineating some important conditions under which family goals and economic goals of the firm converge or collide. The theoretical model is presented in Fig. 1 and developed in the following sections.

3.1 Direct effect of family management on strategic risk taking

As said, an important trait that distinguishes family from non-family firms is the presence of an additional group of stakeholders, i.e. the family, that has the power and authority to pursue family goals in addition to the firm's economic goals (Chrisman et al. 2012; Kotlar and De Massis 2013). These goals stem from the controlling families' willingness to protect their accumulated endowment of socioemotional wealth (Gómez-Mejía et al. 2007, 2010), which includes the ability to exercise unconstrained authority over business operations and strategy, to fulfill needs for belonging, affect, and intimacy, to cultivate family values through the firms, to discharge familial obligations, to act altruistically toward family members using firm resources, to preserve the family firm's social capital, and to renew family bonds through dynastic succession (for a review of the dimensions of socioemotional wealth, see Berrone et al. 2012).

A large body of literature suggests that the adoption of family goals is likely to affect the risk preferences of family firms, leading to the avoidance of those decisions that may reduce the controlling family's socioemotional endowment (Berrone et al. 2010;

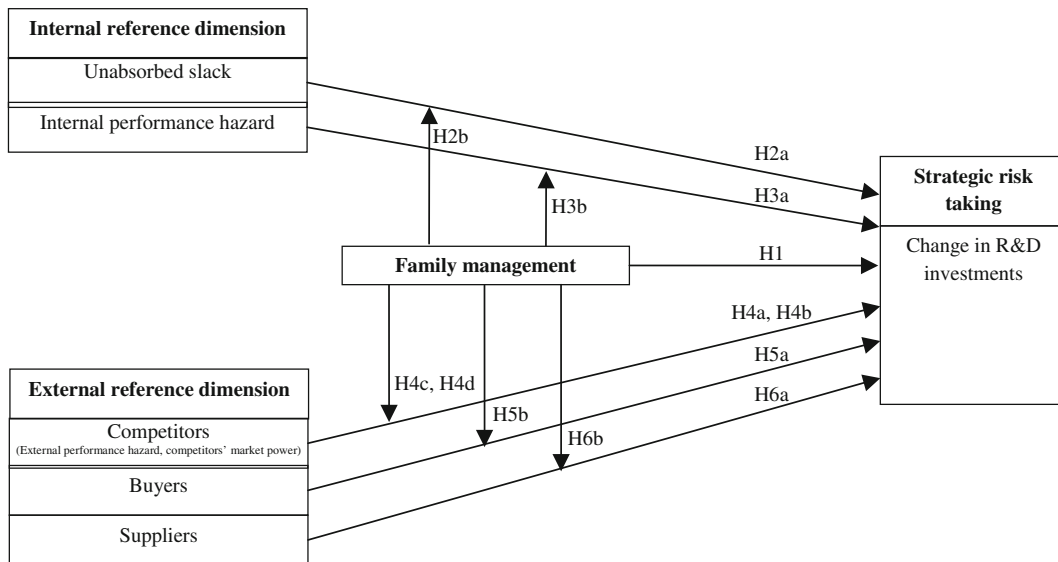


Fig. 1 The theoretical model

Chrisman and Patel 2012; Gómez-Mejía et al. 2007). As said, R&D investments increase strategic risk relative to both economic goals and family-centered goals. Thus, in the view of managers who belong to a controlling family the decision to increase R&D investments is particularly critical since they fear that doing so might jeopardize both their firm's economic performance and their family goals, including control, discretion, and identity. Consistently with the SRPT view of managers as active players that deliberately make decisions concerning strategic decisions rather than passive or unaware agents as they are treated in the BTOF (Fiegenbaum et al. 1996), these arguments suggest that different identities of top managers will correspond to different preferences toward strategic risk. Given that family managers' pursuance of family-centered goals is in conflict with R&D investments, they propose the following hypothesis:

Hypothesis 1 (H1) There is a negative relationship between family management and strategic risk taking (in the form of increasing R&D investments across periods).

Although we expect that family firms are on average reluctant to take strategic risks, we acknowledge that such general tendency can be weaker, and family firms can even display risk-seeking strategic behaviors, under certain circumstances dictated by the interplay between family goals and the economic

goals of the firm (Berrone et al. 2012; Chrisman and Patel 2012; Gómez-Mejía et al. 2007; Kellermanns et al. 2012). Thus, we apply the SRPT to explore how the interface between family goals and factors internal and external to the focal firm shapes strategic risk taking in family firms as compared to non-family firms.

3.1.1 Effect of strategic inputs: unabsorbed slack resources

Slack resources are excess, uncommitted liquid resources that grow in firms that are performing well, and we specifically focus here on those slack resources that are available to managers for discretionary use (Wiseman and Bromiley 1996). An important function of slack resources is to absorb fluctuations in the environment and allow firms to pursue their own agendas (Cyert and March 1963). For example, evidence suggests that slack resources tend to shrink during times of crisis or budget cutbacks (e.g., Staw et al. 1981). From this perspective, financial slack relaxes constraints on resources posed by internal and external coalitions in organizations, facilitating organizational inertia (Leonard Barton 1992), and leading firms to favor exploitation of existing competencies over exploration of new (Hu et al. 2011). Put differently, we expect firms to unlikely substitute the current stream of income for an unknown one when

past strategy has yielded slack resources (Greve 1998).¹ Thus, we hypothesize that:

Hypothesis 2a (H2a) There is a negative relationship between unabsorbed slack resources and strategic risk taking.

3.1.2 Joint effect of unabsorbed slack and family management

As illustrated above, family firms are likely to take lower strategic risk because it can compromise the controlling family's socioemotional endowment (Gómez-Mejía et al. 2007), but the conflict resolution function of financial slack (Cyert and March 1963) is likely to relax potential conflicts between family goals and the firms' needs of renewing their competitive advantage through the pursuit of long-term risky projects. Also, prior research suggests that family firms prefer relying on internal funds in order to invest in risky projects, and that family firms are characterized by strong parsimony in managing excess resources (Chrisman et al. 2012). As a consequence, the prosperity of financial slack is likely to be interpreted as a favorable context for taking strategic risks in family firms. For example, this view is consistent with the evidence provided by Kim et al. (2008), who find a positive interaction between family ownership and slack resources in affecting R&D intensity. Accordingly, we hypothesize that:

Hypothesis 2b (H2b) The relationship between unabsorbed slack resources and strategic risk taking is moderated by family management such that family-managed firms will decrease strategic risk less than non-family firms when slack resources are available.

3.1.3 Effect of strategic outputs: internal performance hazard

In addition to strategic inputs, firms set reference points based on explicit performance targets that represent the organization's strategic outputs, or the results of the

¹ Research on innovation and organizational search also provides an alternative view of slack resources, linked with organizational adaptiveness and strategic flexibility, suggesting that a curvilinear relationship exists between slack and search (e.g., Nohria and Gulati 1996). For the sake of parsimony, we only examine linear effects here.

firm's operations (Fiegenbaum et al. 1996). When faced with declining performance, managers are generally expected to frame problems as opportunities and to pursue projects that increase outcome variance, since projects with lower variance are likely to preserve the status quo (Singh 1986). As such, behavioral theory and previous empirical studies (Bromiley 1991; Chen 2008) suggest that higher strategic risk taking is likely to occur in organizations whose performance falls below the aspiration level and that need to improve their chances of achieving their target in the future. When considering the internal reference dimension, aspirations are typically modeled in terms of past performance, consistently with the historical performance comparison process described in the model of Cyert and March (1963). Thus, we hypothesize the following effect of strategic outputs on strategic risk taking:

Hypothesis 3a (H3a) There is a positive relationship between the internal performance hazard (negative discrepancy of performance from a historical performance target) and strategic risk taking.

3.1.4 Joint effect of historical aspiration level and family management

As discussed above, R&D investments are likely to be kept low in family firms because they may be seen as a threat to the controlling family's socioemotional wealth. However, as noted by Gomez-Mejia et al. (2010) and by Chrisman and Patel (2012), family goals are likely to converge with the economic goals of the firm when the risk of failure, that becomes manifest in performance declines, increases. Indeed, family firms are characterized by high ownership concentration, and family wealth is typically undiversified (for the most part invested in the family firm), suggesting that if the firm does not survive, all the family's economic and socioemotional wealth will be lost (Gomez-Mejia et al. 2010). For this reason, declining performance may alarm managers in family firms even more than in non-family firms, and family firms are thus likely to increase overall strategic risk more than non-family firms when they observe negative performance gaps. Thus, consistent with the findings of Chrisman and Patel's (2012) study on a sample of manufacturing firms listed on the Standard & Poor's 1500 index, we hypothesize that:

Hypothesis 3b (H3b) The relationship between the internal performance hazard and strategic risk taking

is moderated by family management such that family-managed firms will increase strategic risk taking more than non-family firms when performance falls below the historical performance target.

3.1.5 Effect of competitors

In addition to strategic inputs and outputs that refer to the internal strategic dimension, risk taking decisions also involve the comparison of the focal firm with external benchmarks (Fiegenbaum et al. 1996). The most accepted external point in the strategic management literature derives from industrial economics and has to do with competitors (e.g., Porter 1980). First, industry averages serve as targets for financial goals for many firms (Frecka and Lee 1983), so that firms are expected to respond to negative social comparisons by undertaking projects with higher variability in the potential outcomes, but also with an upside potential to recover the firm's competitive advantage, resulting in a higher strategic risk. Thus, we argue that:

Hypothesis 4a (H4a) There is a positive relationship between external performance hazard (negative discrepancy of performance from referent firms) and strategic risk taking.

In addition to comparing financial performance with external benchmarks, firms are also expected to consider the relative power of competitors as a factor influencing their strategic actions (Porter 1980). Setting the current competitive landscape as a reference point, firms may thus be expected to increase strategic risk when they face threats in the form of an increase in the market power of direct competitors. Similarly, firms are likely to feel less pressure, and thus to maintain lower levels of strategic risk, when the market power of direct competitors decreases. In sum, we hypothesize that firms consider competitors' market share as a reference dimension for strategic risk taking, such that:

Hypothesis 4b (H4b) There is a positive relationship between the change in the benchmark competitors' market power and strategic risk taking.

3.1.6 Joint effect of competitors and family management

Whereas managers in family firms are expected to perceive lower performance as compared to historical

results as a hazard to the family's economic and socioemotional wealth, and to respond by increasing strategic risk in order to realign results with economic aspirations, this may not be the case for comparisons with external benchmarks. Indeed, although prior research has not explicitly differentiated the role of historical and social comparisons in family firms (e.g., Chrisman and Patel 2012; Gómez-Mejía et al. 2007), there are reasons to believe that the arguments used for hypothesizing that family firms' strategic risk will increase with the negative discrepancy between current and past performance do not fully apply to social comparisons. Specifically, declining performance can be interpreted by managers as an antecedent of organizational failure (Gómez-Mejía et al. 2007), and in family firms this can be seen as a threat to socioemotional wealth as well. However, having lower performance than the industry average does not necessarily determine a higher risk of failure, and it seems reasonable that family owners and managers can accept lower returns than those of competitors, as long as this allows them to obtain other utilities such as protecting their socioemotional endowment (e.g., keeping low strategic risk). As a consequence, family goals are likely to take priority over the economic goals of the firms, and family firms may feel satisfied with a lower return as compared to those of competitors. Put differently, family goals can be expected to be salient to family firms more than, or at least as much as, meeting an external performance target, so that the family firms' reaction to performance discrepancies from external benchmarks should be lower than those of non-family firms.² Thus, we propose that:

Hypothesis 4c (H4c) The relationship between the social aspiration level and strategic risk taking is moderated by family management such that family-managed firms will increase strategic risk taking less than non-family firms when performance falls below the performance of referent firms.

Likewise, a change in the competitors' market power can be expected as well to have less impact on strategic risk taking in family firms than in non-family

² Chrisman and Patel (2012) tested this hypothesis considering historical and social performance comparisons as alternative measures of the same construct. We propose that internal and external performance gaps are interpreted differently in family firms.

firms (Cruz and Nordqvist 2012). For example, seminal research on strategy in family firms has emphasized that family firms tend to be more “inward oriented” than their non-family counterparts (Dunn 1996), and research has shown that this is likely to result in less accurate consideration of competitors in strategy formulation (Donckels and Fröhlich 1991; Dunn 1996; Harris et al. 1994). Thus, we argue that:

Hypothesis 4d (H4d) The relationship between the change in the benchmark competitors’ market power and strategic risk taking is moderated by family management such that family-managed firms will increase strategic risk taking less than non-family firms when the benchmark competitors’ market power increases.

3.1.7 Effects of buyers and suppliers

In addition to competitor’s actions, managers can also consider other external actors along the firm’s value chain for making strategic decisions (Fiegenbaum et al. 1996). This is also consistent with the idea that industry characteristics are important contingencies for strategic risk (Baird and Thomas 1985). However, while the negotiation and bargaining power lines of research are both well established (Hickson et al. 1971; Pfeffer and Salancik 1978; Porter 1980), their use as strategic reference points and their effect on strategic risk taking have not been explicitly considered so far. Bargaining power is generally described as a function of the costs necessary to replace a stakeholder (Porter 1980). As the percentage of purchases a firm makes from a limited number of key suppliers—or as the percentage of revenues it earns from few key buyers—increases, the firm has to comply with higher demands from its vertical parties, it has a lower possibility to negotiate quantities and prices, and a threat of its exit is less credible (e.g., Kotter 1979). Thus, the firm is expected in this case to frame a raise of the suppliers’ or buyers’ bargaining power as a threat to its ability to generate profits, and it is likely to react by taking strategic actions that may increase the likelihood of survival and, if possible, guarantee more independence from external constraints in the future (Oliver 1991) through, for example, R&D investments aimed at scouting new technologies and, in general, through undertaking

higher strategic risk (Baird and Thomas 1985). For these reasons, we hypothesize that:

Hypothesis 5a (H5a) There is a positive relationship between an increase in buyers’ bargaining power and strategic risk taking.

Hypothesis 6a (H6a) There is a positive relationship between an increase in suppliers’ bargaining power and strategic risk taking.

3.1.8 Joint effects of buyers and suppliers and family management

The effects associated with the bargaining power of buyers and suppliers are also likely to be contingent on family management. Specifically, an increase in the bargaining power of suppliers and buyers not only has implications for the focal firm’s ability to maintain satisfactory profitability in the future, but it also means that, on the one hand, resources that are critical to the firm’s operations are harder to be obtained from alternative sources, and on the other hand, the firm must respond more carefully to the demands of buyers (Kotter 1979; Pfeffer 1972). This increasing resource dependency is likely to enhance the constraints to managerial actions, up to the point of leaving managers with little control over strategic choice (Hrebiniak and Joyce 1985; Jawahar and McLaughlin 2001; Pfeffer and Salancik 1978). Managers in general do not like to be dependent on factors outside their control (Pfeffer 1972), but this threat is likely to be perceived even more strongly by family managers because it directly jeopardizes the controlling family’s socio-emotional endowment that stems from the family’s ability to control decision making (Gómez-Mejía et al. 2007, 2010). Thus, we hypothesize that:

Hypothesis 5b (H5b) The relationship between the buyers bargaining power and strategic risk taking is moderated by family management such that family-managed firms will increase strategic risk taking more than non-family firms when buyers bargaining power increases.

Hypothesis 6b (H6b) The relationship between the suppliers bargaining power and strategic risk taking is moderated by family management such that family-managed firms will increase strategic risk taking more than non-family firms when suppliers bargaining power increases.

4 Methods

4.1 Sample

To test our hypotheses, we obtained data on Spanish manufacturing firms from the database ESEE (Survey on Business Strategies) created by Fundación Empresa Pública, a public institution financed by the Spanish Ministry of Industry. The Fundación surveys a sample of Spanish manufacturing firms in order to produce a representative picture of the country's manufacturing industry. The survey has been administered annually since 1990 and is an unbalanced panel. All companies with more than 200 employees were surveyed (and approximately 70 % completed the survey), and smaller companies with more than 10 employees were selected on the basis of a stratified sampling. The database includes a broad range of information regarding several aspects of firms' operations, including their main activities, products, markets, suppliers, buyers, competitors, technological activity, as well as the firms' accounting balance sheets.

Since we are interested in R&D investments as a strategic decision that involves substantial risks relative to both economic and family-centered goals, the focus on manufacturing industries is considered particularly appropriate. Indeed the typically high degree of obsolescence of manufacturing firms' products—that is due to their relatively short life-cycle—suggests that R&D investments are likely to be commonly used to search for sustainable competitive advantages. Also, although families operate in a broad array of firms, family firms appear to be a very common organizational form among private firms and in manufacturing industries (Astrachan and Shanker 2003). Moreover, the unbalanced feature of this dataset implies that firms enter and exit from the survey in the same way the companies appear and disappear in the economy. For this reason, this dataset allows observation of enough degrees of variance in terms of discrepancy from target performance and other aspiration levels. Restricting the sample of companies to observations in the same time period would affect the randomness of the sample, and there would be a much lower likelihood of including firms facing declining performance. After excluding observations with missing data, we have 1,019 time-series cross-sectional observations, consisting of 437 companies operating in 20 different manufacturing

industries over the period 2000–2006. Of the 437 firms included in our sample, 30 % have one or more members of the controlling family involved in the top management. While R&D investments are observed in all industries, descriptive statistics indicate differences in R&D intensity across industrial sectors, the highest values being found in the industries “Other transport equipment” (3.87 % of sales) and “Chemical and pharmaceuticals” (2.18 % of sales), and the lowest values found in the sectors “Leather and footwear” (0.02 %) and “Paper and publishing” (0.01 %).

The ESEE database has already been used in previous strategy and family business studies. Additional information about the firms included in the ESEE database and, more specifically, about family and technology-related measures can be found in prior work³ (e.g., Albarran et al. 2013; Greenwood et al. 2010; Kotlar et al. 2013).

4.2 Dependent variable

4.2.1 Change in R&D investments

The variable *change in R&D investments* captures the extent to which a firm changes its level of R&D investments across periods. We operationalize this variable by subtracting the ratio of expenses for R&D to sales at the period t_{-1} to the ratio at t_0 . As noted above, the level of R&D investments varies substantially across industries. Thus, we controlled for industry influences by adjusting the change in R&D investments by industry level. In particular, the dependent variable used in the regression analysis is obtained by subtracting from each firm's change in R&D expenses to sales in year t the median industry level of change in R&D intensity in the same year.

4.3 Independent variables

4.3.1 Family management

We define family firms as firms with a particularistic vision of business and goals resulting from the active involvement of a controlling family (Chua et al. 1999). However, a direct measure of family vision and goals was not available, so our analysis cannot directly test

³ For a complete list of publications based on this database, see http://www.fundacionsepi.es/esee/en/eesee_articulos_1.asp.

some of our theoretical contentions. This is a common problem to which prior research has typically obviated by assuming that family vision and goals are highly correlated to the extent of family involvement in the firm (e.g., Berrone et al. 2010; Gomez-Mejia et al. 2010). This assumption has also received empirical validation (Chrisman et al. 2012; Chrisman and Patel 2012), so we adopt an objective measure of family influence on decision making in our analysis and, consistently with other studies (e.g., Cruz et al. 2010; Sirmon et al. 2008), we focus on the family status of the top management team. For all those firms that are family owned, our database includes the number of owners and owner's relatives that occupy top managerial positions. Based on this information, we build the continuous variable *family management* which measures the number of family members in top managerial positions and use it to test H1, that links family management directly to strategic risk taking.

4.3.2 Unabsorbed slack

To test hypotheses H2a and H2b—that examine the link of unabsorbed slack resources to strategic risk taking—we adopt a measure of unabsorbed slack that has been used in earlier work (e.g., Bromiley 1991; Greve 2003). For our purposes, we specifically focused on unabsorbed financial slack, calculated as the ratio of quick assets (cash and marketable securities) to sales, which indicates uncommitted and high-discretion resource availability. Similar measures have been used in other research on strategic risk in family and non-family firms (Chrisman and Patel 2012; Kim et al. 2008). The variable is one-year lagged.

4.3.2.1 Internal performance hazard Internal performance hazard, defined as the negative distance between performance and internal aspirations (Cyert and March 1963), is a common proxy of negative strategic outputs, and can thus be used to test H3a and H3b. Following prior research (Chen 2008; Chrisman and Patel 2012) we build a continuous variable to measure negative gaps between aspirations and performance, reflecting the assumption that, as negative discrepancies between the firm's performance and its historical performance widen, decision makers are more likely to perceive gaps between current performance and aspirations (Chrisman and Patel 2012). This gap

measure refers to the magnitude of performance shortfalls between periods and is measured for each firm as the difference, in percentage terms, between a firm's sales at time t_{-1} and t_{-2} . A score of zero means that the target was achieved or exceeded, whereas a positive score indicates a negative historical target discrepancy. For example, 0.10 indicates a 10 % decrease of sales between year t_{-2} and year t_{-1} .

4.3.3 Competitors

H4a, H4b, H4c, and H4d deal with family-managed and non-family firms' reaction to performance discrepancies along reference points that pertain to competitors. We examine two types of variables to account for competitor reference points (Fiegenbaum et al. 1996). One is the *external performance hazard*, calculated as the difference ratio between the focal firm's performance (i.e., sales) in each period and the average performance of other firms in the relevant two-digit NACE industry. This variable indicates the social comparison of the focal firm with respect to the industry as a whole. Similarly to internal performance hazards, a continuous ratio variable is built to measure negative gaps between firm performance at t_{-1} and the other firms in the industry at t_{-2} . The other variable is the *competitors' market power*, which indicates the change in market power of a focal firm's key competitors. For each year the ESEE database reports the market share of the major four competitors in each of the firm's main market. Based on this information, we calculate the ratio difference between the score at time t_{-1} and t_{-2} . A positive value means that the focal firm's major competitors have increased their market share, and it thus indicates increasing competitors' market power.

4.3.4 Suppliers and buyers

To test H5a, H5b, H6a, and H6b we need to measure the bargaining power of firms' buyers and suppliers. For each year the ESEE database reports the percentage of purchases a firm made from its three largest suppliers, as well as the percentage of sales earned from its three largest buyers. Scores close to zero indicate that a firm caters from a large number of suppliers/sells to a large number of customers, whereas scores close to 100 mean that a firm has less than four suppliers/buyers overall. Based on this

Table 1 Means, standard deviations, and correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8	9
1 Change in R&D investments	0.01	1.52	-								
2 Family management	0.46	0.81	-0.05	-							
3 Negative external performance aspiration	0.48	0.60	0.00	0.20	-						
4 Negative internal performance aspiration	0.03	0.08	-0.02	-0.01	0.05	-					
5 Change in supplier's bargaining power	0.14	2.56	-0.02	-0.02	-0.03	0.00	-				
6 Change in competitors' market power	-0.02	0.32	-0.02	-0.05	-0.01	-0.05	0.01	-			
7 Change in buyers' bargaining power	0.17	2.85	-0.01	-0.02	-0.03	0.00	0.01	0.03	-		
8 Unabsorbed slack	0.05	0.24	-0.01	0.05	0.06	0.03	-0.01	0.02	-0.01	-	
9 positive external performance aspiration	0.76	2.48	0.00	-0.15	-0.25	-0.06	0.13	0.02	0.00	-0.05	-
10 Positive internal performance aspiration	0.14	1.02	0.00	-0.03	-0.03	-0.06	0.00	-0.05	0.00	0.00	0.05
11 Firm age	31.26	21.80	-0.04	-0.14	-0.23	-0.01	-0.02	0.04	-0.01	0.01	0.16
12 Firm size	16.63	1.98	0.05	-0.33	-0.57	-0.13	0.09	0.06	0.05	-0.09	0.50
13 ROA	2.61	13.90	0.00	0.07	0.01	-0.07	0.00	0.02	0.02	-0.02	-0.02
14 Absorbed slack	0.76	0.17	-0.04	0.00	0.09	0.19	0.01	0.03	0.03	0.07	-0.03
15 Previous R&D activity (R&D intensity $t - 2$)	0.45	1.71	0.02	-0.05	-0.06	-0.04	-0.01	-0.04	-0.02	0.09	0.02
16 Product diversification	0.22	0.57	-0.02	0.02	-0.03	-0.01	0.04	-0.04	-0.01	0.04	0.10
17 Financial aid for R&D	5.38	42.98	0.09	-0.07	-0.04	-0.03	-0.01	-0.04	-0.01	0.14	0.13
18 Change of market dynamics	0.13	0.50	0.07	0.02	-0.04	0.12	-0.01	-0.01	0.06	0.03	0.01
19 Import intensity	0.05	0.09	-0.08	-0.13	-0.12	-0.04	0.01	0.03	0.01	0.07	0.15
20 Yearly average firm performance	2.69	1.40	-0.05	-0.06	-0.07	0.03	0.05	0.02	0.02	-0.17	0.00
Variables	10	11	12	13	14	15	16	17	18	19	20
11 Firm age	-0.04	-									
12 Firm size	0.04	0.34	-								
13 ROA	0.02	-0.02	-0.05	-							
14 Absorbed slack	-0.04	-0.05	-0.12	-0.18	-						
15 Previous R&D activity (R&D Intensity $t - 2$)	0.00	0.10	0.14	-0.03	-0.05	-					
16 Product diversification	0.09	-0.06	0.02	0.03	0.04	-0.03	-				
17 Financial aid for R&D	0.00	0.02	0.12	-0.02	-0.01	0.38	0.07	-			
18 Change of market dynamics	-0.02	-0.02	0.05	0.04	-0.01	0.01	-0.02	0.01	-		
19 Import intensity	-0.02	0.14	0.29	-0.05	0.07	0.25	-0.01	0.13	-0.03	-	
20 Yearly average firm performance	0.05	-0.08	-0.05	0.09	-0.03	-0.25	0.07	-0.11	-0.01	-0.42	-

All correlations above |0.03| are significant at 0.05 or lower for a two-tailed test. All correlations above |0.09| are significant at 0.01 or lower for a two-tailed test

information, we build the variable *suppliers' bargaining power* as the ratio difference between the score at time t_{-1} and t_{-2} . A positive value means that the number of a firm's suppliers is decreasing, and thus indicates rising supplier concentration and bargaining power. We build a similar variable indicating the *buyers' bargaining power*, calculated as the ratio difference between the percentage of sales earned from the three major buyers at time t_{-1} and t_{-2} .

4.3.5 Multiplicative terms

To examine interactive effects between family management and the various reference points (i.e., H2b, H3b, H4c, H4d, H5b, H6b) we need to include product terms of both internal and external reference points and family management as a moderator variable (Cohen et al. 2003). Accordingly, we pay specific attention to potential multicollinearity problems. Although the correlations among variables are moderate (see Table 1), we use standardized values of the independent variables (described above) to calculate all multiplicative terms (Cohen et al. 2003).

4.3.6 Control variables

Following prior literature in strategic risk and R&D investments, we include several one year-lagged control variables to exclude alternative explanations. First, we include *firm size* (i.e., logarithm of sales at time t_{-1}) and *organizational age* (i.e., years from foundation) as controls for organizational inertia (Kelly and Amburgey 1991). Second, we include the return on assets ratio (ROA) at time t_{-1} to control for overall firm efficiency (Chrisman and Patel 2012). Third, we include the variables *internal positive performance gap* and *external positive performance gap*, which were constructed mirroring the procedure for the independent variables internal and external performance hazard, to control for performance exceeding internal and external targets, respectively. By doing so, the model includes two sets of measures relative to both the internal and external performance gaps. The negative gaps are the focus of our hypotheses, whereas the latter are used as controls. Also, we control for the amount of resources absorbed by the organization and thus unavailable to managerial discretion, by including the variable *absorbed resources*, calculated as the ratio of selling and general

expenses divided by sales at time t_{-1} (George 2005). Fourth, we include the variable *previous R&D investments*, that is the ratio of R&D expenses to sales at time t_{-2} to control for path-dependence of R&D investments (Sydow et al. 2009), and the variable *financial support for R&D*, calculated as the total amount of financial resources expressed in thousands of Euros a firm received from public institutions intended to be spent for R&D activities. Fifth, we include the variable *product diversification*, measured as the number of sectors in which a firm has diversified its activities, and *international operations*, measured as the ratio of purchases made from foreign countries divided by sales at time t_{-1} , to control for possible economies of scope associated with R&D investments (Baysinger and Hoskisson 1989). Sixth, we include the variable *change in market dynamism* to control for shifts in a firm's focal market that may affect its attitude toward risk (Shinkle 2012). In particular, for each year the ESEE database reports whether a firm's focal market has expanded (1), remained stable (2), or has recessed. Based on this information, we build the variable as the difference of market dynamism between the period t_{-1} and t_{-2} . Finally, we control for potential exogenous, industry-level influences on firms' strategic risk-taking decisions. Since managers are found to use industry averages as an overall reference for making strategic decisions (Finkelstein and Hambrick 1996), we include the variable *industry performance*, measured as the average ROA in each industry by year, as a further control in our analysis.

4.3.7 Endogeneity

To control for the possible endogeneity of risk taking due to unobservable organizational or environmental characteristics that are not captured in the control variables, we implement the Heckman's (1979) two-stage technique (e.g., see Gómez-Mejía et al. 2007). Using Heckman's two-stage procedure, we first estimate a probit model for each period, in which family (=1) versus non-family firm (=0) is the endogenous variable, and estimate the inverse Mills ratio. We then estimate the change in R&D investments model using the inverse Mills ratio from the first stage as a control variable. Incorporating this correction term into the second-stage model yields unbiased estimates of the predictors of change in R&D investments (Greene 1997). In the first-stage model, we use three variables

Table 2 Results of panel regression analysis

Variables	Change in R&D investments	
	B	SE
<i>Direct effects</i>		
H1: Family management	-0.131*	0.055
H2a: Unabsorbed slack	-0.768***	0.176
H3a: Internal performance hazard	0.613 [†]	0.339
H4a: External performance hazard	0.258***	0.074
H4b: Competitors' market power	-0.401*	0.205
H5a: Change in buyers' bargaining power	-0.004*	0.002
H6a: Change in suppliers' bargaining power	-0.016	0.016
<i>Interaction effects</i>		
H2b: Family management × Unabsorbed slack	0.528***	0.117
H3b: Family management × Internal performance hazard	0.264 [†]	0.137
H4c: Family management × External performance hazard	-0.137*	0.063
H4d: Family management × Competitors' market power	0.320 [†]	0.173
H5b: Family management × Change in buyers' bargaining power	0.048*	0.019
H6b: Family management × Change in suppliers' bargaining power	0.160***	0.029
<i>Controls</i>		
Firm age	-0.001	0.001
Firm size	0.375***	0.114
Positive internal performance gap	-0.134	0.107
Positive external performance gap	-0.173 [†]	0.076
ROA	0.002 [†]	0.001
Absorbed resources	0.762	1.015
Previous R&D investments	-0.416*	0.169
Financial support for R&D	0.023	0.045
Product diversification	0.001	0.003
Market trend change	0.252*	0.098
Import intensity	-3.032*	1.230
Performance average by year	-0.212*	0.088
Miller's inverse ratio	-0.141	0.110
Constant	-5.918**	2.263
Within R ²	0.17	
F	1.46***	
Wu-Hausman χ^2	122.07***	

[†] $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

that may affect the likelihood of family control, but are not correlated with change in R&D investments. The first variable is the number of family members working as employees in the firm, because having family members as employees increases the benefits a family may derive from controlling a company. The second variable is the firm's legal form because families are more likely to control private limited companies. The ESEE database reports six possible legal forms: public limited company (=1), private limited company (=2),

labor limited company (=3), public labor limited company (=4), partnership (=5), and other (=6). Finally, we include the share of foreign equity because families and foreign investors are likely to have typically divergent interests (Kim et al. 2008) and family control is thus less likely when foreign investors own significant shares of the firm's equity. There is no theoretical basis to link either of these variables directly with change in R&D investments. Other variables from our work were also included in the first-stage model.

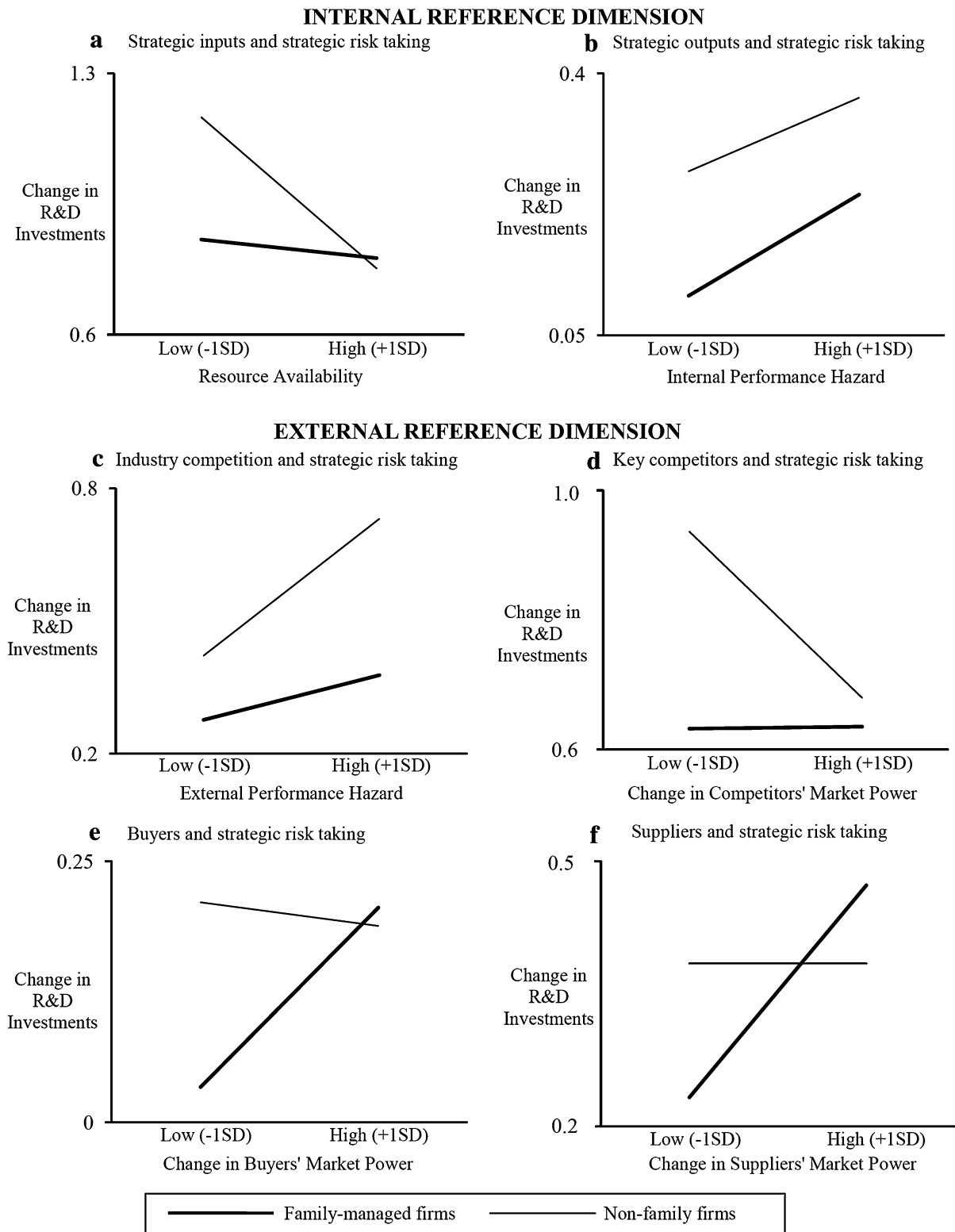


Fig. 2 Interaction between strategic reference points and family management in predicting variations in R&D intensity

4.4 Data analysis

The descriptive statistics and correlations for the variables are reported in Table 1. As the assumption for normal distribution could not be met in the ordinary least squares (OLS) regression model, a longitudinal regression was conducted. We calculated the variance inflation factors after each regression to see whether results were subject to the threat of multicollinearity. Values were lower than 2.50, indicating that estimations were free of any significant multicollinearity bias. The Wu-Hausman test suggests that the fixed effect GLS panel model is more appropriate than the random effect ($\chi^2 = 131.75$, $p < 0.001$). As such, we use the fixed effect panel regression as the tool of our primary analysis. Huber-White sandwich estimator cross-sectional correction of covariance is used to control for heteroscedasticity and serial correlation.

Because correcting for self-selection of family control is important in theory (Chrisman and Patel 2012), we include the inverse Mills ratio from this model into the second-stage models (see Table 2). The Mills ratio's non-significance in the second stage indicates that the potential endogeneity of family control was not adversely affecting our estimated results about change in R&D investments. The hypothesized results are similar with and without the inclusion of the inverse Mills ratio.

5 Results and discussion

Table 2 presents the results using change in R&D investments as the dependent variable. To facilitate understanding of the complex interactions and further elaborate upon the unexpected results observed in some of the variable coefficients, we present the results visually in Fig. 2, setting high and low (plus and minus one standard deviation from the mean, respectively) conditions for the moderating variable (Cohen et al. 2003).

H1 predicts a negative relationship between the involvement of the controlling family members in top management and strategic risk taking. We found that family management decreases the likelihood that a firm changes the level of R&D investments across periods ($B = -0.13$, $p < 0.05$). Hypothesis 1 was thus supported. The negative relationship in our results

suggests—as expected and in line with the literature—that family management exerts a direct negative effect on strategic risk taking (e.g., Chrisman and Patel 2012; Chen and Hsu 2009). More specifically, our results suggest that R&D investments are, in the eyes of family managers, particularly risky because they involve potential losses in terms of both economic and non-economic, family-centered goal.

H2a through H3b concern the relationship between internal reference points and strategic risk taking, and the effect of family management on these relationships. H2a predicts a negative relationship between unabsorbed slack and strategic risk taking. H3a predicts that firms will increase strategic risk when their performance falls below the historical level (i.e., when internal performance hazard is higher). The results show that the change in R&D investments is significantly lower in the presence of slack resources ($B = -0.77$, $p < 0.001$) and higher when performance falls below the historical level ($B = 0.61$, $p < 0.10$). Thus, H2a and H3a are supported. H2b predicts that the negative effect of unabsorbed slack on strategic risk taking is lower in family-managed firms. H3b predicts that family management strengthens the positive relationship between internal performance hazard and strategic risk taking. The interaction between family management and unabsorbed slack is positive and significant ($B = 0.53$, $p < 0.001$). Figure 2a graphically shows this interaction effect. In non-family firms a strongly negative relationship (simple slope = -0.59 , $p < 0.05$) was found between unabsorbed slack and the change in R&D intensity, as predicted. In addition, we observed the highest change in R&D investments when unabsorbed slack was low and when there was no controlling family actively involved in the firm's top management. In family-managed firms, the relationship between unabsorbed slack and change in R&D investments was weaker (simple slope = -0.04 , $p < 0.05$). Thus, H2a and H2b were supported. The interaction between family management and internal performance hazard is positive and significant ($B = 0.26$, $p < 0.10$). Figure 2b graphically shows that the positive effect of internal performance hazard on the change in R&D intensity was stronger in family-managed firms (simple slope = 1.84 , $p < 0.05$) than in non-family firms. Thus, H3a and H3b were supported.

This evidence is consistent with prior literature that emphasizes that family firms face greater resource

constraints due to their willingness to keep firm control in the family's hands (e.g., Schulze et al. 2001) and that family involvement consequently creates great incentives toward effectively employing their internal resources (e.g., Carney 2005). These findings also provide overall support to the idea that family-managers supervise more closely their performance along the internal reference dimension than non-family firms, and that they are thus likely to change their firms' strategy in a more muscular way in reaction to negative strategic inputs or outputs. In our view, these results suggest that negative feedback along the internal dimension of reference points generate preference reversals in family firms' organizational goals, eventually engendering highly heterogeneous behavior within the population of family firms (Chrisman and Patel 2012; Patel and Chrisman, 2013). Our analysis extends this idea and specifically identifies two conditions that lead family goals or business goals to prevail over each other. In the presence of slack resources, the economic goals of a firm should lead managers to maximize exploitation of existing advantages and use extra resources to remunerate shareholders. On the contrary, our analysis suggests that this logic is weakened in family firms by the family's goals to remain independent from external capital providers. For this reason, family managers have the incentive to use unabsorbed slack resources to explore new business opportunities or generate new occasions for business from internal sources. Similarly, we found family managers to react very strongly to declining performance relative to the firm's past results. This finding again supports the importance of family-centered goals in family firms' decision making: declining performance may be seen by family managers not only as a threat to the firm's ability to produce economic returns, but primarily as a threat to their socio-emotional endowment (Gomez-Mejia et al. 2010).

H4a through H4d regard the role of competitors-related reference points in family and non-family firms. H4a predicts a positive relationship between external performance hazard and strategic risk taking. H4b predicts that firms will undertake strategic risks when their key competitors increase their market power. The results show that the change in R&D investments is significantly higher when a firm's performance falls below the average industry performance ($B = 0.26, p < 0.001$). However, unexpectedly,

the change in R&D investments was negative in response to a gain in market power by the main competitors ($B = -0.40, p < 0.05$). Thus, H4a is supported but H4b is not supported. H4c predicts that the positive effect of external performance hazard on strategic risk taking is lower in family-managed firms. The interaction between family management and external performance hazard is negative and significant ($B = -0.14, p < 0.05$). Figure 2c graphically shows this interaction effect. Without family management a positive relationship (simple slope = 0.30, $p < 0.10$) was found between external performance hazard and the change in R&D intensity, as predicted. However, when a controlling family was actively involved in top management, the relationship between external performance hazard and variation in R&D investments was lower (simple slope = 0.14, $p < 0.10$). Thus, H4c was supported. H4d predicts that family management also weakens the relationship between the competitors' market power and strategic risk taking. The interaction between family management and the competitors' market power is positive and slightly significant ($B = 0.32, p < 0.10$). Figure 2d graphically shows that competitors' market power has a strongly negative effect on non-family firms (simple slope = $-0.50, p < 0.05$) and a slightly positive effect in family-managed firms (simple slope = 0.04, $p < 0.05$). Also, Fig. 2d indicates that the change in R&D investments was lower in family-managed firms, regardless of the competitors' market power. This ordinal figure shows that, although an interaction effect does exist, the total effect of competitors' market power is likely to be dominated by the effect of family management (Cohen et al. 2003). Thus, H4d was partially supported.

Overall, these results suggest that family-managed firms tend to give less emphasis than non-family firms to the external reference points relative to competitors, and that family firms are thus less subject to social comparison processes than non-family firms. Indeed the reaction of family-managed firms to internal performance hazards is superior to that of non-family firms, whereas family-managed firms are less sensitive to external performance hazards. This finding confirms that negative performance discrepancies relative to social aspirations (that are modeled as the average industry performance in our analysis) engender some goal reversals in family firms (e.g., Chrisman and Patel 2012), because these firms tend to take strategic risks

in the form of increasing R&D investments when their performance falls below the aspiration level. However, the fact that their reaction is weaker compared to their reaction to internal performance gaps suggests that self-reflection and social comparison processes are not consistent in family-firms as normally assumed in prior studies (e.g., Gómez-Mejía et al. 2007; Chrisman and Patel 2012). This represents a promising avenue for future research aimed at exploring differences between family and non-family firms in their decision-making processes. In addition, we unexpectedly found that firms generally decrease strategic risk rather than increasing it when their major competitors' market share grows. Nevertheless, family firms appear to be rather indifferent to variations in their competitor's market share, which is consistent with our hypothesized effect. One possible reason is that owing to their strong and long-term relationships with commercial partners, family firms are little concerned with the competitors' moves, and are thus more inward oriented than non-family firms (e.g., Dunn 1996). Alternatively, it may be the case that family firms face their competitors through idiosyncratic strategies that do not involve R&D investments. So far, very little research has examined the direct interaction of family firms with their key competitors (De Massis et al. 2012), and our results suggest that this represents an area ripe for further research.

Finally, H5a through H6b concern the influence of buyers and suppliers on a firm's strategic risk taking. H5a predicts a positive relationship between the buyers' bargaining power and strategic risk taking. H6a predicts a similar effect associated with the bargaining power of suppliers. The results show that the change in R&D investments is significantly lower when the buyers gain bargaining power ($B = -0.004$, $p < 0.05$), but the relationship between the suppliers' bargaining power and change in R&D investments was not significant. Thus, H5a and H6a are not supported. Further, H5b predicts that the effect of the buyers' bargaining power on strategic risk taking is greater in family-managed firms. Similarly, H6b predicts that family management strengthens the impact of the suppliers' bargaining power. The interaction between family management and the buyers' bargaining power is positive and significant ($B = 0.05$, $p < 0.05$). Figure 2e graphically shows this interaction effect. In non-family firms a weak negative relationship (simple slope = -0.003 , $p < 0.05$) was found between the buyers' bargaining

power and the change in R&D intensity, which represents an unexpected result. The relationship between the buyers' bargaining power and change in R&D investments became positive when a controlling family was actively involved in top management (simple slope = 0.06 , $p < 0.05$). Thus, H5b was supported. The interaction between family management and the suppliers' bargaining power is positive and significant ($B = 0.16$, $p < 0.001$). Figure 2f graphically shows that an increase in the suppliers' bargaining power is not significantly related to changes in R&D investments in non-family firms (simple slope = -0.02 , n.s.), whereas the relationship was positive and significant in family-managed firms (simple slope = 0.09 , $p < 0.01$). Thus, H6b also received overall support.

These results not only propose new reference points that add to those found in prior research (e.g., Fiegenbaum et al. 1996) and thereby offer a promising perspective for future research aimed at exploring organizational actions in response to changes in the firms' vertical relationships, they also further extend our understanding of the strategic behavior of family firms, especially in relation to how family-centered goals interact with the firm's economic goals in producing heterogeneous behaviors among family firms. From our analysis and from Fig. 2e, f family firms appear to be more reluctant than non-family firms to change their level of strategic risk. However, when either their buyers or suppliers acquire bargaining power family firms become very aggressive and increase their investments in R&D substantially. In our view, this trend reflects the high emphasis family managers give to the goal of maintaining high discretionary power within their firms (e.g., Kotlar and De Massis 2013). When suppliers or buyers increase their bargaining power relative to a family firm, family managers become more dependent on them, and are consequently forced to respond timely to their claims (Kotter 1979; Pfeffer 1972). This could significantly hamper family managers' control of and discretion over decision making, thereby jeopardizing the non-economic benefits they derive from being in control (Gomez-Mejia et al. 2010). In this regard, our analysis adds to prior research by identifying a specific set of reference points that are particularly relevant to family firms' decision making. Future research is thus encouraged to further explore how family firms and variations thereof respond to threats

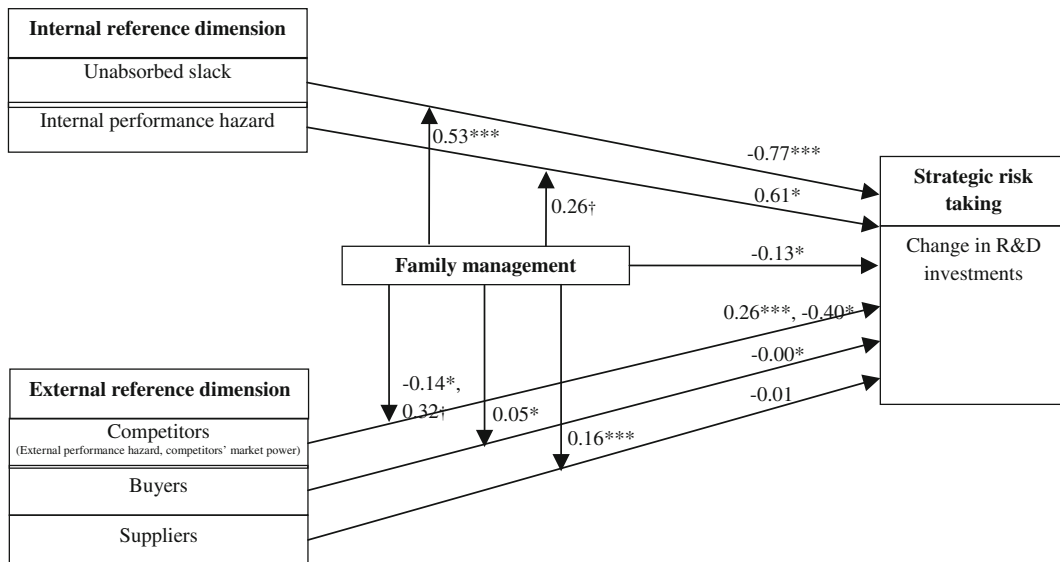


Fig. 3 The empirical results

to managerial discretion such as those represented by increases in the their vertical partners' bargaining power.

In sum, the results discussed above provide support for the conditions that underlie strategic risk taking decisions in family-managed and non-family firms. The results are summarized in Fig. 3. In the first part of the model (i.e., the relationships among internal reference points, family involvement, and strategic risk taking in the form of change in R&D investments), our results show that (a) unabsorbed slack resources exert a negative influence on strategic risk taking and internal performance hazard positively affects strategic risk taking, while (b) family management positively moderates both these relationships (see Table 2; Figs. 2, 3). For the second part of the model (i.e., the relationships among external reference points, family involvement, and strategic risk taking in the form of change in R&D investments), our results show that (a) external performance hazard positively influences strategic risk taking, whereas competitors' market power, buyers' and suppliers' bargaining power negatively influence strategic risk taking, while (b) family management negatively moderates the effect of external performance hazard and positively moderates the impact of competitors' market power, buyers' and suppliers' bargaining power (see Table 2; Figs. 2, 3).

6 Conclusions

Overall, our findings provide support for a model of strategic risk taking based on reference points that lay on both internal and external reference dimensions. The significant results from the regression analysis indicate that strategic inputs, strategic outputs, competition, and feedback information about other stakeholders are important factors driving strategic risk in organizations, and the choice of these reference points for adjusting a firm's level of strategic risk is different between family-managed firms and non-family firms.

In view of these results, this study's main contribution lies in using the strategic reference point theory to enrich the behavioral theory predictions of differences between family-managed and non-family firms in their strategic risk taking behavior. This theory allowed us to uncover the multidimensional and multivariate nature of reference points used by family firms, and to identify some key contingencies under which family goals and the economic goals of the firm converge or diverge. As such, this study responded to recent calls for exploring how family goals affect strategic and innovation processes (Lumpkin et al. 2011), as well as the factors driving the heterogeneity of strategic behaviors in family firms (Chrisman and Patel 2012; De Massis et al. 2014). It did so by extending the narrow focus of previous studies on

economic reference points (Chrisman and Patel 2012; Gómez-Mejía et al. 2007) by considering a broader set of dimensions along which family firms set aspiration levels that may generate socioemotional benefits for the controlling family.

This study also contributed to theory in the broader area of the determinants of strategic risk taking, by enriching the strategic reference point theory in several ways. By uncovering the content of some key reference points used by organizations to make strategic decisions and by showing that different types of firms give different weights to different sets of reference points, this study developed a practical framework to identify the multidimensional nature of reference points used for making strategic decisions. Furthermore, it provided support to the theory proposed by Fiegenbaum et al. (1996) and enhanced our understanding of which reference points are used by organizations to decide about strategic actions (Holmes et al. 2011). Our findings also supported the notion that the value function implicit in behavioral theory varies across firms such that losses that appear immense for some firms may appear unimportant for others, thus addressing boundary conditions to behavioral theories of the firm (Holmes et al. 2011).

Finally, our study contributed to the scholarly debate about innovation in family firms (De Massis et al. 2013). In this literature scholars have typically focused on the level of R&D, and concluded that family firms have on average lower R&D intensity than non-family firms (e.g., Chrisman and Patel 2012; Munari et al. 2010). Our analysis adds to these findings by showing that family firms are also less likely to change their level of R&D investments across periods, and this general tendency is moderated by the influence of reference points distributed along internal and external reference dimensions.

In sum, the analysis presented in this paper advanced our understanding of the factors driving heterogeneity in family firms' strategic behavior (Chrisman and Patel 2012; Kotlar and De Massis 2013), contributed to extend knowledge about organizational behavior directed by goals that go beyond profitability (Greve 2008), and added important insights to our understanding of factors driving innovation in family firms (De Massis et al. 2013). In doing so, our study also informs managerial and consulting practice, as well as teaching. For family business practitioners, our study suggests a variety of

factors that should be contemplated as predictors of their strategic behavior. While our results are descriptive of family firms' strategic behavior rather than normative, they inform family business managers and consultants that family firms' strategic decisions carry implications for both the economic goals of the firm and the non-economic goals of the family and members thereof. Thus, practitioners dealing with family firms should think about whether the adoption of risk-taking strategies is appropriate not only in relation to the organization's economic objectives, but also in relation to the expectations of the controlling family. In this regard, relaxing the trade-offs between economic and non-economic goals, that is, pursuing risky strategies that could eventually sustain firm growth in the long term while also ensuring the preservation of control, discretion, and identity of family members, emerges as a key challenge for all family firms. Moreover, we also offer insights to the ongoing conversation on the content of family business education programs (e.g., Sharma et al. 2007). In particular, our study suggests that students interested in family business management issues will benefit from extending their knowledge to include a number of organizational theories in addition to the central theoretical paradigms typically taught in family business courses (e.g., agency theory, resource-based view). Our study borrowed ideas from motivation theory, resource dependency, and institutional theory perspectives, and the findings reported in this article suggest that all these theoretical paradigms can add significantly to our understanding of family firms' behavior. If family business educational programs are to inform students about the unique logics and challenges faced by family firms, educators may use our findings to explain how these multiple theories apply to the family firm, thereby fostering a critical understanding of family firms in their classes.

6.1 Limitations

Although this study contributed with a fresh and compelling view of the controlling family's influence on strategic risk taking in organizations, it has some limitations, which provide opportunities for future research. First, this study follows others (Berrone et al. 2010; Chrisman and Patel 2012; Gómez-Mejía et al. 2007) in using an objective proxy of the pursuit of family goals to preserve socioemotional wealth.

Empirical results indicate that family involvement is a reliable predictor of the pursuit of family goals (Chrisman et al. 2012; Chua et al. 1999), and our choice of focusing on family involvement in management rather than, e.g., ownership, appears consistent with other research that has focused on CEOs or other top managers (e.g., Hambrick 1994), because top managers are those with the best access to information as well as immediate power over organizational actions. Nevertheless, measuring directly the multiple effects on firm behavior resulting from the presence of a controlling family can be helpful in future studies. It would allow indeed to reinforce our findings as well as to offer a more nuanced view of strategic risk taking by distinguishing the behavior of firms that are similar in terms of family involvement but are guided by different goals. Second, while we applied a classical assumption of additive effects of reference points on strategic risk, managers may use alternative logics in dealing with organizational goals. For example, Greve (2008) proposed that organizational goals may have joint effects such that the success/failure to achieve one goal may affect the salience of another. Thus, understanding whether variegated reference points are evaluated independently or jointly represents a promising avenue for future research that may further reveal which types of goals are subject to managerial prioritization, and which goals are instead considered simultaneously in strategic decision making in both family and non-family firms. Finally, we focused on the change of R&D investments across periods to proxy strategic risk taking. Although R&D investments have been used in other studies looking at risk taking (Latham and Braun 2009) and they represent a very convenient dimension for investigating the interactions between family goals and the economic goals of organizations (Chrisman and Patel 2012), other scholars have noted unexpected relationships between R&D and other risk dimensions such as capital investments (Miller and Bromiley 1990) or diversification (Palmer and Wiseman 1999). Thus, future research is encouraged to extend our arguments using variegated firm behavior to proxy strategic risk taking, particularly emphasizing the different implications of alternative dimensions of strategic risk taking on both the economic and non-economic goals of firms. In this regard, it would also be useful for future research to examine the R&D behavior of family and non-family firms in more detail. Patel and

Chrisman (2013), for example, distinguish variance-reducing exploitative investments to mean-enhancing exploratory investments; Ben-Oz and Greve (2012) examine search behavior with shorter or longer time horizons. We hope that our study will inspire other scholars to continue this line of inquiry and conduct future work that extends and complements the findings reported in this article.

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