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Family involvement in business and financial performance: A set-theoretic cross-national inquiry

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ABSTRACT

Prior empirical research finds positive, negative and neutral relationships between family involvement in business and firm performance. We argue that some of the challenges that have plagued empirical research in this field are related to the measurement of family involvement in business. Real-world family firms are not binary entities. Rather, they can be better characterized by heterogeneous configurations formed by different components of family involvement in the enterprise. These alternative configurations can be systematically captured using set-theoretic methods. Applying this methodology to a cross-national sample of 6592 companies, we identify which particular configurations are associated with superior financial performance. Our results lend support to the configurational hypothesis, which posits that the impact of family involvement in business is not the product of the components of family involvement in isolation but that it is subject to substantial complementarity and substitution effects.

1. Introduction

What is the relationship between family involvement in business (FIB) and a firm's financial performance (FP)?[1] Over the last three decades, family business researchers have tried to provide an answer to this recurrent question. The results of previous studies on the relationship between FIB and either market- or accounting-based measures of FP have been mixed, with researchers finding positive, negative and neutral relationships (Dyer, 2006; Mazzi, 2011; Rutherford, Kuratko, & Holt, 2008; Schulze, Lubatkin, & Dino, 2003; Schulze, Lubatkin, Dino, & Buchholz, 2001).

These contradictory empirical findings may be related to methodological issues. While previous research typically includes four common FIB components related to *ownership, governance, management* and *succession* (Astrachan, Klein, & Smyrnios, 2002; Klein, Astrachan, & Smyrnios, 2005; Villalonga & Amit, 2006; Westhead & Cowling, 1998),[2] scholars have frequently used quite different operational measures of FIB to characterize family firms, creating a gap in the literature regarding the ways in which the different components of family involvement are connected to FP. In most of these empirical studies, researchers rely on simple dichotomous categorisations of FIB – e.g., whether family ownership in a firm exceeds the 5% threshold – which may overlook more complex categorisations of FIB; see Aguilera and Crespi-Cladera (2012) for a discussion of the current challenges in the conceptualisation of family business. While there is vast empirical literature comparing the performance of family vs. non-family firms (Rutherford et al., 2008), the question of the specific impact that different levels of family involvement exerts on the performance of family firms has been relatively less researched in a systematic way. There are, however, some notable exceptions (e.g., Braun & Sharma, 2007; Chrisman, Chua, & Litz, 2004; Gomez-Mejia, Nuñez-Nickel, & Gutierrez, 2001; Minichilli, Corbetta, & MacMillan, 2010; Sciascia & Mazzola, 2008; Schulze et al., 2001; Villalonga & Amit, 2006). For instance, Villalonga and Amit (2006: 413) uncover that whether family firms are more or less valuable than non-family firms critically depends on how ownership, control and management enter the definition of a family firm.

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[1] While recent theorizing on family business strategy argues that family firms may pursue financial as well as non-financial goals (see, for example, Astrachan, 2010; Basco & Perez-Rodriguez, 2011; Berrone, Cruz, & Gomez Mejia, 2012; Chrisman, Chua, Pearson, & Barnett, 2012; Zellweger et al., 2013), in this article, we investigate the relationship between FIB and financial performance exclusively.

[2] In addition to these four common FIB components, some researchers include other dimensions of family involvement – see Chua, Chrisman, and Sharma (1999) and Basco (2013a). For instance, the F-PEC (Astrachan et al., 2002; Klein et al., 2005) is one of the few empirically validated approaches to assess family influence along several dimensions including power, experience and culture, thereby allowing for more fine-grained distinctions and analyses of family businesses.

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The challenges derived from the multidimensional nature of FIB are arguably aggravated by the research methods used. Previous research has relied to a large extent on regression analysis (Rutherford et al., 2008), which presents some well-known limitations when dealing with complex configurations – e.g., heterogeneous combinations of FIB components – and does not fully allow the systematic exploration of conditions of complementarity and substitutability (Fiss, 2007; Ragin, 2008). In this empirical study, we seek to advance the FIB empirical research by investigating the FIB–FP relationship in a novel manner. First, we argue that the presence or absence of different FIB components leads to several types of family firms characterized by different combinations of these components, each of which is likely to have an impact on FP. Thus, our study addresses recent calls to take the heterogeneity of family firms more fully into account (Chrisman & Patel, 2012). Second, we use set-theoretic rather than correlational methods. Set-theoretic methods have been applied in mainstream management research for quite a while (e.g., Fiss, 2011; Kogut, Macduffie, & Ragin, 2004) and are starting to be used in family business research as well (Garcia-Castro & Casasola, 2011). These methods allow researchers to determine how the presence or absence of FIB components influences firm performance, identifying the main complementarities and substitution effects among them. By doing so, we empirically determine some bounds to the levels of FIB most likely to lead to superior performance among family firms. Lastly, we use a cross-national sample of 6592 large international family and non-family firms to empirically identify the different levels of FIB in each company and to investigate the relationship between these levels and FP.

2. Research on the link between family involvement and firm performance

A review of the past research on the FIB–FP link reveals heterogeneous findings, with authors reporting positive, negative and neutral relationships (Rutherford et al., 2008). In Table 1, we provide a summary of 59 empirical works on the FIB–FP relationship published over the last three decades. While Table 1 is not intended to be exhaustive, it illustrates that previous studies have reported quite different results, although most of them use the same four basic FIB components: ownership, governance, management and succession. These studies predominantly use regression and other econometric techniques (Dyer, 2006; Rutherford et al., 2008). In terms of sampling methodology, researchers typically compare family to non-family firms or compare firms according to their degrees of FIB. Family involvement in the business is defined in these studies in terms of ownership (e.g., percentage of family stock), governance (e.g., family members on the board of directors), management (e.g., a CEO that is a family member), and succession (e.g., how many generations of family members are involved in the firm). In recent years, there has been an increasing number of studies using the F-PEC instrument developed by Astrachan et al. (2002) – see also Klein et al. (2005) – to measure FIB, as well as self-perception questionnaires and other ad-hoc questionnaires (Rutherford et al., 2008).

There are several theoretical arguments supporting the various empirical findings. Advocates of a *positive link* state that family firms generally outperform non-family firms because ownership concentration alleviates the conflicts of interest between owners and managers (Berle & Means, 1932), reducing agency costs (Jensen & Meckling, 1976). This positive link is also associated with potential competitive advantages gained through family-based management (Burkart, Panunzi, & Shleifer, 2003), a family firm's socio-emotional wealth (Berrone, Cruz, Gomez-Mejia, & Larraza-Kintana, 2010) and the long-term perspective that family involvement encourages (Anderson & Reeb, 2003).

On the other hand, advocates of a *negative link* between FIB and FP posit that because these firms are unprofessionally managed, practice nepotism, and are vulnerable to entrenchment, family firms will underperform on average relative to non-family firms (Lansberg, Perrow, & Rogolsky, 1988). In addition, Villalonga and Amit (2006: 387) suggest that a second type of agency conflict (referred to as type II agency conflict) appears in family-owned firms: large family shareholders may use their controlling position in the firm to extract private benefits at the expense of the small shareholders. This agency conflict II, if severe, may negatively affect the capacity of family firms to deliver high performance.

Between these two extremes, we find a group of scholars who argue that the effect of FIB on FP may follow non-linear – e.g., inverted U-shaped – relationships, or that this effect is contingent upon a number of factors, such as governance structures, firm strategy, industry, size, and other firm-specific features (Anderson & Reeb, 2003; Dyer, 2006; Mazzi, 2011; Sciascia & Mazzola, 2008). For example, Braun and Sharma (2007) demonstrate that the relationship between CEO duality – CEO and chairperson positions being held by the same person – and performance is contingent on the family's ownership stake in the firm. The authors uncover that performance is inversely related to family ownership level in non-dual firms, while dual firms did not exhibit any changes in performance dependent on family ownership levels. Other authors report that the relationship between FIB and FP is contingent on other factors such as ownership, control features and other firm-specific characteristics (Randøy, Dibrell, & Craig, 2009; Silva & Majluf, 2008; Westhead & Howorth, 2006). Finally, within the group of mixed results, there are a set of studies more recently exploring more directly the effect of type of family firm (e.g., family vs. founder-owned firms) as the core driver of firm performance (Block, Jaskiewicz, & Miller, 2011; Le Breton-Miller, Miller, & Lester, 2011; Miller, Minichilli, & Corbetta, 2013).

In light of all of this empirical evidence, the question arises: How is it possible to reconcile the mixed empirical findings on the relationship between FIB and FP? One possibility is that these inconsistent results are driven by methodological problems that often arise in this research stream, such as measurement issues, sampling issues, the lack of relevant control variables, reverse causality problems or endogeneity (Miller, Le Breton-Miller, Lester, & Cannella, 2007). However, these methodological challenges are not unique to family business research; they plague most research in the management field (Hamilton & Nickerson, 2003).

The problems associated with measurement incongruity (construct validity) and the ill-defined concept of "FIB" are, however, specific to family business research (Basco, 2013b; Lansberg et al., 1988; Litz, 1997; Rutherford et al., 2008). While the measurement of FP is reasonably developed in these studies – see, however, Carsrud (1994: 40) – the measurement of FIB is not (Chrisman, Chua, & Sharma, 2005; Chua, Chrisman, & Sharma, 1999; Westhead & Cowling, 1998). In general, researchers tend to use binary categorisations of FIB – e.g., whether family ownership in a firm exceeds a certain threshold – with the empirical results being sensitive to such categorisations (Villalonga & Amit, 2006). If different researchers use different definitions of FIB based on ownership, governance, management or succession criteria, then it is not surprising that empirical studies end up demonstrating, in turn, contradictory results.

One first step to overcome some of the aforementioned limitations, we argue, is to systematically identify the different types or degrees of FIB and then empirically explore the relationship between each type and FP, taking into account some main contingencies that may arise. We posit in the next section that set-theoretic methods have the potential to better identify

Table 1
FIB and financial performance in 59 studies.[a]

Study	Components	FIB measures	Performance measures
Positive relationship			
Daily and Dollinger (1992)	O, M	Key managers related to the owner	Size, revenue growth, profit margin, perceived performance
Beehr et al. (1997)	O, G, M	Equity ownership, board seats, family CEO	ROA, ROE, Tobin's Q
McConaughy et al. (1998)	M, S	Run by founder or descendent of founder	ROA, ROE, sales growth, R&D/sales, PE ratio
McConaughy and Phillips (1999)	O, M	CEO answered that the firm was a family firm	ROA, ROE, profit margin
McConaughy, Matthews, and Fialko (2001)	O	Percentage of ownership	Tobin's Q, sales growth, sales/employee, cash flow per employee, pay-out ratio
Chrisman, Chua, and Steier (2002)	O, M, S	Percentage of ownership, family involvement and succession intention	First-year revenues
Anderson and Reeb (2003)	O, G	Fractional equity ownership of founding family and/or the presence of family members on the Board	ROA, ROE, Tobin's Q, net income
Zahra (2003)	O, M	Percentage of shares, family involvement in operations	Percentage of sales generated from international markets
Lee (2004)	O, M, S, G	Single family controlled, family members active in top management, family involved (2 generations)	ROA, ROE ROI, gross profit margin, net profit margin
Barontini and Caprio (2006)	O, G	Direct voting rights, cash flow rights	ROA, Tobin's Q
Favero, Giglio, Honorati, and Panunzi (2006)	O	The family is the largest shareholder	ROA, market data
Maury (2006)	O, M, G	Voting rights (>10%)	ROA, ROE, Tobin's Q
Lee (2006)	O, M, S, G	Founding family members or descendants hold shares in the firm or are present on the board of directors	Employment growth, revenue growth, gross income growth, net profit margin
Chrisman, Chua, Kellermanns, Chang (2007)	O, M, S, G	Percentage of the business owned by family members, number of family managers, expectation that president successor will be a family member	ROS
Martínez, Stöhr, and Quiroga (2007)	O	Family ownership (>50% family members in the board of Directors)	ROA, ROE, Tobin's Q
Sraer and Thesmar (2007)	O, G	Founder or a family member is a blockholder of the company when block represents more than 20% of the voting rights	ROA, ROE, Tobin's Q, pay-out ratio
Allouche et al. (2008)	O, M	Percentage of family ownership, family members in top management positions	ROA, ROE, ROIC
Andrés (2008)	O, G	Family members hold more than 25% of the voting shares and/or are represented on the executive or supervisory board	ROA, Tobin's Q
Bjuggren and Palmberg (2010)	O, G	Control rights (>20% of the total voting rights), and the family is the largest owner	Profit margin
Negative relationship			
Holderness and Sheehan (1998)	O	Percentage of stock	ROE, Tobin's Q, investment policies, frequency of corporate-control transactions
Lauterbach and Vaninsky (1999)	O	Ownership structure	Ratio of actual output to ideal output
Smith and Amoako-Adu (1999)	M, S	Run by founder or descendant	ROA, Abnormal monthly stock return,
Faccio, Lang, and Young (2001)	O, G	Amount of votes and capital controlled by the largest family	Dividends
Cronqvist and Nilsson (2003)	O, G	Control rights (% of the total voting rights)	ROA, Tobin's Q
Chua, Chrisman, and Chang (2004)	O, M, S, G	Percentage owned by family members, number of family managers, expectation that future president will be family member	Size, age
Filatochev, Lien, and Piesse (2005)	O, M, G	Percentage of family ownership, family members on the board	ROA, ROE, Tobin's Q, sales revenue, earning per share
Pérez-González (2006)	M, S	Family CEO, new CEO was related by blood or marriage to: (a) the departing CEO, (b) the founder, or (c) a large shareholder	ROA, ROE, Tobin's Q, R&D over assets
Bennedsen et al. (2007)	M, S	Family CEO, family succession	ROA, ROE
Naldi, Nordqvist, and Wiklund (2007)	O, M	Percentage of family ownership and family members in top management, self-perception measures of FIB	Profit, sales growth, cash flow, growth of net worth
Chang et al. (2008)	O, M, G, S	Percentage of the business owned by members of the family, number of family members involved in management, intention that future president is a family member	Gross state product (GSP) per capita
Sciascia and Mazzola (2008)	O, M	Percentage of family ownership and percentage of family members in top management	ROE
Oswald, Muse, and Rutherford (2009)	O, M	Percentage of family ownership, family members in top management	Sales growth, revenues, capital structure
Ibrahim and Samad (2011)	O	Fraction of equity stake held by all family members including blood relationship and family-in-law (>20%)	ROA, ROE, Tobin's Q
Mixed relationship/neutral			
Jacquemin and De Ghellinck (1980)	O	Majority shareholders	Net cash flow over book value

Table 1 (*Continued*)

Study	Components	FIB measures	Performance measures
Chaganti and Damanpour (1991)	O	Percentage of stock held	ROA, ROE, price earnings ratio, per cent of total stock return
Galve and Salas (1996)	O	Majority shareholders	ROE, value added per worker
Chua et al. (1999)	O, M, S, G	Percentage of the business owned by family members, number of family managers, expectation that future successor as president will be a family member	ROA
Daily and Near (2000)	O, M, G	Major operating decisions, plans for leadership succession influenced by family members	Age, percentage of gross revenues from new car sales, gross revenues/sales
Gomez-Mejia et al. (2001)	O	Last name of owner and editor	Volume of newspaper circulation
Schulze et al. (2001)	O	Two or more family members with same last name	Sales growth (5-year average)
Chrisman et al. (2004)	O, M, S	Percentage owned by family, number of family members involved in management, family member as successor	First-year sales growth
Villalonga and Amit (2006)	O, G, M, S	Founder or a member of his family by either blood or marriage is an officer, a director, or a stockholder	ROA, Tobin's Q
Yammeesri and Lodh (2004)	O	Largest shareholders	ROS
Jaskiewicz, González, Menéndez, and Schiereck (2005)	O, G	Ownership percentage, board participation and family influence on power, experience, and culture (F-PEC)	Abnormal returns
Ng (2005)	O, M	Percentage of managerial ownership	ROE
Dyer (2006)	O, M, G	Percentage of family ownership or the number of family members occupying management or board positions	-
Miller and LeBreton-Miller (2006)	O, M, S, G	Family ownership (>30%), vote control (>20%), family CEO, multiple generations in business	ROA, ROE
Rutherford, Muse, and Oswald (2006)	O	Two or more family members with same last name	Size (sales and full-time employees), age, sales growth
Westhead and Howorth (2006)	O	50% of shares owned by single family, perceived by CEO to be a family business	Gross sales revenue growth, employees growth, exports, profitability
Braun and Sharma (2007)	O	Percentage of family ownership	Abnormal stock returns
López-Gracia and Sánchez-Andújar (2007)	O	50% of shares owned by single family	Sales growth, age
Miller et al. (2007)	O, M, S, G	Family members are involved as major owners or managers (level of ownership and voting control, managerial roles, and family generation of key family members)	Tobin's Q
Silva and Majluf (2008)	O, G	Ownership concentration, family members in the board of directors	ROA, Tobin's Q
Randøy et al. (2009)	O, G, M	Founding family leadership and founding family ownership	ROA, Tobin's Q
Chiung-Wen, Shyh-Jer, Chiou-Shiu and Hyde (2009)	O, G	Fractional equity ownership of founding family and/or the presence of family members on the board of directors	ROA, ROE
Kowalewski, Talavera, and Stetsyuk (2010)	O, M, G	Share of family voting rights, CEO from the family and the family chairman	ROA, ROE
Minichilli et al. (2010)	O, M	Family ownership, family CEO	ROA
Sacristán-Navarro, Gómez-Ansón, and Cabeza-García (2011)	O, G	The larger owner is a family or an individual who held more than 10% of the voting rights	ROA

[a] O, ownership; G, governance; M, management; S, succession.

alternative types of family firms in terms of the presence or absence of FIB components.[3]

3. A set-theoretic analysis of components of family involvement

3.1. Components of family involvement in business

Family firms vary significantly according to the extent and mode of family involvement in the business (Sharma & Nordqvist, 2008: 72). Since the inception of scientific research on family enterprises, scholars have used Venn diagrams and other pictorial depictions to describe and understand the nature of family and business overlaps in these hybrid-identity firms (Davis, 1982; Lansberg et al., 1988; Sharma & Nordqvist, 2008).

However, although theoretical developments elaborate rich categories of family firms, researchers tend to use dichotomous measures of family firms in practice. This practice is arguably due to the availability of adequate data and a lack of a proper methodology to deal with each category of family firms individually. While statistical techniques such as cluster analysis have been recently used to distinguish family firms from non-family firms (Chang, Chrisman, Chua, & Kellermanns, 2008; Chrisman et al., 2004), these methods implicitly assume that the components of FIB are correlated, bringing together firms that may be very heterogeneous in nature, attending to the components individually. For example, studies that use cluster analysis tend to assume that family ownership and family management are correlated components when this is not necessarily the case, as we show later in this article. Other problems associated with the use of cluster analysis include issues related to the selection of the sample, the scaling of the variables and the extensive reliance on researchers' judgment to determine a stopping rule to create the clusters (Fiss, 2007).

Using set-theoretic methods, we can take into account all of the configurations that emerge when combining the different

[3] As we explain in the next section, *fuzzy* set methods (Ragin, 2000, 2008) partly overcome some of the limitations of binary definitions (e.g., family vs. non-family) by establishing a continuous degree of membership in a set.

components of FIB. This is a critical issue for several reasons. First, there is strong empirical evidence that the particular components of FIB chosen and how they are defined – e.g., a 5% or 10% cutoff for family ownership – can change and even reverse the empirical findings (Villalonga & Amit, 2006). Set-theoretic methods may contribute to alleviating these issues by systematically covering all possible FIB combinations and by using *fuzzy* definitions for the FIB components so that being a *family firm* is not a binary (0/1) condition, but there is a continuum degree of membership in the set of family firms. We will provide more information on fuzzy sets later in the article.

Secondly, it is possible that the components of family involvement work not in isolation but in a complementary manner, and therefore, the relationship between the components of FIB and FP to be critically affected by these complementarities. For example, Villalonga and Amit (2006: 413) find that family ownership creates value *only* when the founder serves as CEO of the family firm or he/she is a chairman with a hired CEO; when descendants serve as CEOs, firm value is diminished. Other authors discovered other complementarities between family ownership and firm size, the legal system, board composition, and dual boards (e.g., Braun & Sharma, 2007). Finally, in a thorough analysis of the performance of U.S. firms, Miller et al. (2007) conclude that it is difficult to attribute superior performance to a single governance variable in isolation, providing further support to the complementarity hypothesis.

Building on the previous discussion, we draw upon contingency theory to propose a *configurational* hypothesis that argues that the effect of FIB on performance takes place in a causally complex way involving more than one component of family involvement (see also Basco & Perez-Rodriguez, 2009, 2011; Lindow, Stubner, & Wulf, 2010). We use the basic components of FIB as the key characteristics distinguishing family firms. In addition to *ownership* and *management*, we include family involvement in *governance* and its plans for trans-generational continuity or *succession*, which are often added as two other integral components that are likely to influence FP (Brockhaus, 2004; Chua et al., 1999; Handler, 1990).

Hypothesis 1a. Particular combinations of FIB components (ownership, governance, management and succession) and firm-specific features are associated with superior firm financial performance.

Thus stated, Hypothesis 1a is eminently exploratory given the lack of more specific theory-driven propositions linking the presence or absence of the different FIB components and firm financial performance within a configurational framework. The configurational hypothesis (H1a) suggests that FIB components cannot lead to performance in isolation but *only* when combined with other components. This hypothesized complementarity effect, if supported by the data, offers a potential explanation of why previous research has failed to find consistent independent effects between single FIB components and performance.

However, from a theoretical point of view, it is also possible to find an isolated, independent effect of any single component of FIB on FP (Anderson & Reeb, 2003; Dyer, 2006; Habbershon & Williams, 1999). Although previous empirical research casts some doubt on this last possibility (Rutherford et al., 2008), we cannot exclude it a priori. Therefore, we propose an alternative *universalistic* hypothesis that argues that single components of family involvement independently lead to superior FP after controlling for other variables:

Hypothesis 1b. Single FIB components are independently associated with superior firm financial performance.

4. Study design and methods

4.1. Set-theoretic methods and fuzzy sets

We rely on set-theoretic methods (Ragin, 2000, 2008) to test our hypotheses. Standard methods such as regression analysis and multivariate techniques such as cluster and factor analysis, while allowing for the analysis of interaction effects, present key limitations when dealing with complex configurations (Fiss, 2007, 2011; Grandori and Furnari, 2008). The advantages and disadvantages of using set-theoretic methods and the main differences between other econometric techniques have been extensively discussed elsewhere (Fiss, 2007, 2011; Garcia-Castro, Aguilera, & Ariño, 2013; Ragin, 2008), and thus, we will not discuss these issues again here.[4] For the purpose of this article, it suffices to say that set-theoretic methods have been increasingly adopted in the strategic management research in the last few years partly because of some recent methodological improvements such as the possibility to use fuzzy sets where a continuous degree of membership to a set can be established (Ragin, 2008) and the newer possibilities to apply statistical tests to the empirical results obtained using programs such as R or STATA (Longest & Vaisey, 2008). We use the truth table algorithm recently implemented in STATA through the command named *fuzzy* (Longest & Vaisey, 2008).

Set-theoretic methods are based on Boolean algebra language, which allows for a formalization of the configurational hypotheses advanced earlier. Set theory uses set-subset connections rather than correlations between the variables in order to establish empirical links between the conditions. In terms of set theory, a causal condition is necessary when the outcome is a subset of the causal condition, and a causal condition is sufficient when this condition is a subset of the outcome (Ragin, 2008: 44–68). Expressed this way, as pointed out by Grandori and Furnari (2008: 475), the notions of sufficiency and necessity are deterministic and thus not very compatible with the complexity of social sciences. However, it is possible to express these notions in a probabilistic way that is more suitable to empirical testing (Ragin, 2000: 108–112). Because in the social sciences, it is unusual to find perfect set-subset connections that can apply to 100% of the observed cases, a threshold lower than 100% can be used, giving way to a notion of "statistically necessary" and "statistically sufficient" conditions.

To compute the empirical strength of statistically necessary and sufficient conditions, researchers rely on consistency and coverage measures ranging from 0 to 1 (Ragin, 2008). Informally, the consistency can be roughly thought of as the proportion of cases that satisfy the condition and the coverage as a measure of the empirical relevance of the set-subset connection found. Formally, they are computed as follows:

[4] Set-theoretic methods differ in several respects from conventional statistical methods. Being a non-correlational approach, set-theoretic methods need not make any a priori assumption about the underlying distribution of the variables (i.e., normality). In addition, set-theoretic methods allow the researcher to address both quantitative as well as qualitative aspects of the phenomena being researched. Unlike correlational linear approaches that disaggregate cases into independent, separate aspects, set-theoretic analysis uncovers configurations of qualitative and quantitative attributes that lead to a given outcome and establishes relationships between the different configurations as a whole. Furthermore, rather than assuming linear causation and estimating the average effect of a given variable net of all other variables, set-theoretic analysis assumes that a given causal condition may be necessary or sufficient for an outcome, together with combinations of jointly sufficient causal conditions (Ragin, 2008). This last point implies that a causal condition found to be related in one configuration may even have an inverse relation in some other combination – i.e., the effect of causal conditions is not necessarily symmetric (causal asymmetry).

Table 2a
Descriptive statistics and set calibration.

	Descriptive statistics		Membership criteria		
	Mean	St. dev.	Full membership	Crossover point	Full non-membership
Ownership					
Family Ownership	8.86%	17.4	25%	5%	1%
Governance					
Family Board	6.30%	13.17	10%	5%	1%
Family Chairman[a]	16.02%	–	*Crisp set (1,0)*		
Management					
Family CEO[a]	16.44%	–	*Crisp set (1,0)*		
Succession					
Succession[a]	11.25%	–	*Crisp set (1,0)*		
Anglo-Saxon[a]	42.23%	–	*Crisp set (1,0)*		
Size (Log assets)	12.94	2.03	14.71	12.76	11.17
ROE-adjusted	0.02	0.21	0.09	0.01	−0.07

[a] These are dummy variables, and thus, the mean refers to the percentage of cases where Chairman, CEO, Succession or Anglo-Saxon take the value of 1.

Table 2b
Correlation matrix.

	ROE adjusted	F. ownership[a]	F. Board	F. Chairman	F. CEO	Succession	Anglo-Saxon	Size (log assets)
ROE adjusted	1.00							
F. Ownership	−0.02	1.00						
F. Board	−0.03*	0.92*	1.00					
F. Chairman	−0.03*	0.66*	0.68*	1.00				
F. CEO	−0.04*	0.67*	0.72*	0.59*	1.00			
Succession	−0.02	0.49*	0.46*	0.33*	0.32*	1.00		
Anglo-Saxon	0.11*	−0.02	−0.03*	−0.02	−0.03*	−0.03*	1.00	
Size (log assets)	0.20*	−0.30*	−0.31*	−0.19*	−0.25*	−0.06*	0.10*	1.00

* Significance level: *p*-value 0.05.
[a] F, Family.

$$\text{Consistency}\,(X \subseteq Y) = \frac{\sum \min(x_i, y_i)}{\sum x_i}$$

$$\text{Coverage}\,(X \subseteq Y) = \frac{\sum \min(x_i, y_i)}{\sum y_i}$$

where X_i is the degree of membership of individual i in configuration X, and Y_i is its degree of membership in outcome Y.

A consistency above 0.75 is generally accepted as a valid threshold in empirical studies (Fiss, 2011), and it is the one we use in this article. Because consistency is a proportion, probabilistic tests can be applied to check for statistical significance (Ragin, 2000: 108–112). We use a Wald test (which uses an F distribution) implemented in STATA to find out which observed consistency scores are significantly greater than the benchmark value of 0.75, given the total number of cases included in the sample (Longest & Vaisey, 2008).

4.2. Sample description

The data used in this study come from the OSIRIS database (Bureau Van Dijk).[5] The OSIRIS full database comprises approximately 19,000 publicly listed and major unlisted/delisted companies around the world. All observations used in this study refer to the years 2005 and 2006. The companies in the sample belong to a wide range of industries and are coded following the 1-digit NACE classification. We included only those non-financial firms that had full information on the variables of interest; we excluded financial and insurance entities because critical data on ownership such as family names were not fully available for most of these firms.

In addition, we excluded firms with inconsistencies in their balance sheets. For instance, we ruled out those firms with negative values in positive-defined accounts (e.g., sales, debt, intangibles and so on). In addition, we eliminated from our sample those firms where the total sum of shares exceeded 100%. Finally, we removed those countries with four or fewer companies listed in OSIRIS. As a result, a final sample of 6592 of publicly listed and major unlisted companies from 38 countries was used for the empirical analysis presented here.

The OSIRIS dataset, in addition to accounting and financial information, contains data on firm ownership (shareholders' names and family names, the percentage of shares held by owners, the types of shareholder), the composition of the board of directors (the full names of board members and chairmen), and the top management team, age, size, industry sector, and country of origin of each company that we used in the study.

4.3. Measures and set calibration

Set-theoretic analysis requires a previous transformation of variables into sets that are calibrated regarding *full membership*, the *cross-over point* of maximum ambiguity and *full non-membership* regarding membership in the set of interest (Fiss, 2007; Ragin, 2000, 2008). These values are qualitative anchors that calibrate a measure with regard to substantively meaningful thresholds. This calibration is essential to any set-theoretic analysis because it determines which cases belong to each of the sets analyzed and, therefore, the results obtained are sensitive to such calibration (Ragin, 2008). Only for dummy variables (0/1) can this calibration be performed directly from the original variable into a crisp set, where 1 indicates full membership and 0 indicates full non-membership. Next, we show how the calibration has been done for

[5] http://www.bvdep.com/en/osiris.html.

each variable (see Table 2a). We follow the *direct method* described by Ragin, (2008: 89).

4.4. FIB components

Most definitions of family firms are merely based on ownership characteristics, such as the existence of blood or marriage ties among shareholders or the percentage of shares held by members of a family. Thus, as a first step and in line with earlier empirical works (Anderson & Reeb, 2003; Villalonga & Amit, 2006), we infer the level of family ownership in a firm from the *surname relationships* among the shareholders. The criterion used was the presence of at least two common family names among the shareholders.[6] In addition, we include those firms in which a single person is the largest shareholder, even though he/she does not share a common family name with other shareholders.

Of the 6592 companies in our sample, we identify 2037 firms that meet these two identification criteria. These criteria only identify potential family firms; it is from the combination of the components of FIB that different configurations of family firms emerge. We use five components in this study: two components in the sphere of governance (family board and family chairman) and one component for each of the other domains: ownership (family ownership), management (family CEO) and succession (succession).

Family ownership is computed by adding all shares owned by family members with the same surnames. We used 1% as the threshold for *full non-membership*, 5% is the *crossover point*, and 25% is the threshold we use for *full membership* in the set of firms with family ownership.[7]

Family board captures the family's presence on the board of directors. It is computed as the ratio of family directors to total board directors. In its definition of family firms, the European Group of Owner-Managed and Family Enterprises (GEEF) requires that there be at least one family member on the board. Hence, we use the lowest percentage (1% threshold for full non-membership) in order to leave out of the set those firms with no presence of family members on the board. For the crossover point, we take the same 5% used for family ownership, and a threshold of 10% is used for full membership in the set of firms with family members on the board.

Family Chairman carries the value of 1 when a family member is the chairman of the board of directors. Otherwise, it is set to 0. Similarly, *Family CEO* takes the value of 1 when a family member is the CEO of the company and 0 otherwise. Finally, for *succession*, given the large sample of 6592 firms, a threshold of 30 years is used to create a proxy measure. If a company is younger than 30 years, it is considered to be in the first generation, and the variable takes the value of 0. Firms older than 30 years are assumed to be in the second or later generation, so the variable takes the value of 1. Although this proxy has been used in previous family business studies (Fernández & Nieto, 2005), we discuss this as a limitation in the concluding section. These three final variables are crisp sets, taking binary values.

4.5. Financial performance and control variables

While both accounting- and market-based metrics of FP have been used in family business research, our review of the empirical literature on the FIB–FP relationship shows that accounting-based measures are the ones most often used (see Table 1). Thus, we use ROE to ensure comparability with previous research. We introduce a one-year lag (2006) in order to alleviate reverse causality issues. Following Fiss (2011), we use the 20th, 50th, and 80th percentiles to transform the original ROE variable into a fuzzy set.

We distinguish between small and large family firms and between industry types because firm size and industry are likely to affect FP, and they have been included as control variables in previous studies (Chrisman et al., 2005; Dyer, 2006; McConaughy, Walker, Henderson, & Mishra, 1998; Westhead & Cowling, 1998). Size is measured as the logarithm of total firm assets, and we use the 20th, 50th and 80th percentiles as the anchors to transform the original variable into a fuzzy set. The industry has been operationalized by using the 1-digit NACE codes for industry. We control for industry differences by using industry-adjusted ROE in all the models.

Finally, given the cross-national sample used and the many national differences, we further distinguish between Anglo-Saxon and non-Anglo-Saxon firms because the legal system where the firm is embedded may also affect FP. Thus, we create a crisp set that takes the value of 1 when the firm belongs to an Anglo-Saxon country and 0 otherwise.

5. Results

Tables 2a and 2b provide descriptive statistics, set calibration thresholds and correlations for all the measures. Table 2b shows that there are no significant positive pairwise correlations between single FIB components and industry-adjusted ROE.

Table 3 describes all of the possible combinations using the five FIB components. Although there are 32 (2^5) theoretical combinations, we have empirically found only 24 combinations with at least one observation in the sample. The number of combinations found with at least 1% of cases in the sample (66 firms) decreases to only 11. The fact that some combinations do not correspond to any real firm reduces the complexity in the elaboration of a typology of family firms. For example, we did not find any first-generation companies in the sample with family ownership and CEO but no family board and no family chairman, so this combination and others shown in Table 3 with few or no observations can be regarded as rare cases or even non-existent configurations of family firms.

Table 4 shows the results of our fuzzy-set analysis. We follow the notation recently introduced by Ragin and Fiss (2008) and Fiss (2011), where full circles indicate the presence of a condition, while crossed-out circles indicate the absence of a condition. If a condition does not have a full or crossed-out circle, it means that this particular condition is not binding in that particular configuration. This is the case, for example, for size in configuration 1N (Table 4). Consistent with previous works (Ragin, 2008; Fiss, 2011), we set the lowest acceptable consistency for solutions at 0.75, and the minimum acceptable solution frequency was set at three.

The high overall solution consistency of .844 indicates that the set-subset connections found in Table 4 are strong and well supported by the data. The overall solution coverage is, however, low (0.039), suggesting that although the relationships found are consistent, they only apply to a reduced number of firms. This coverage, being lower than perfect coverage, also suggests that there are other causal conditions leading to high industry-adjusted ROE different from the ones studied in this article.

Our analysis uncovers seven different configurations statistically sufficient to cause superior industry-adjusted ROE: four configurations for Anglo-Saxon firms (1A-4A), two for non-Anglo-Saxon firms (1N and 2N) and one configuration compatible with

[6] We looked at the names and surnames of all the shareholders of each firm in the database and looked for possible surname repetitions and surname connections between a husband and wife, descendants, relatives, etc. In some countries, such as Spain and some Latin American countries, some family ties might have been overlooked because in these countries, spouses typically keep their own family names after marriage.

[7] While calibration is an important issue in fuzzy sets, in the next section, we show that our results are robust to small variations of the thresholds used for all the components.

Table 3
Typology of family firms in the sample[a].

Components of family involvement[b]					In the sample	%
Ownership	Governance		Management	Succession	Firms #	
Family Ownership	Family Board	Family Chairman	Family CEO	Succession		
N	N	N	N	N	4555	69.09%
				Y	26	0.39%
			Y	N	–	–
				Y	–	–
		Y	N	N	–	–
				Y	–	–
			Y	N	–	–
				Y	–	–
	Y	N	N	N	5	0.08%
				Y	1	0.02%
			Y	N	1	0.02%
				Y	2	0.03%
		Y	N	N	2	0.03%
				Y	–	–
			Y	N	7	0.11%
				Y	2	0.03%
Y	N	N	N	N	97	1.47%
				Y	70	1.06%
			Y	N	–	–
				Y	1	0.02%
		Y	N	N	14	0.21%
				Y	9	0.14%
			Y	N	4	0.06%
				Y	2	0.03%
	Y	N	N	N	257	3.91%
				Y	147	2.23%
			Y	N	258	3.93%
				Y	116	1.76%
		Y	N	N	214	3.24%
				Y	113	1.71%
			Y	N	439	6.67%
				Y	250	3.81%

[a] For the sake of simplicity, we represent in this table all the sets as "crisp sets" (Y/N). However, only chairman, CEO and succession are truly *crisp* sets while ownership and board are *fuzzy* sets where each firm has a different degree of membership in that set from 0 (fully out) to 1 (fully in).
[b] Y, "Yes": the variable is above the crossover point; N, "No": the variable is below the crossover point.

any legal tradition (1AN). Any of these seven solutions are sufficient by themselves, reinforcing the idea of equifinality: different paths lead to the same outcome (high industry-adjusted ROE).

Configuration 1A (consistency = 0.920; coverage = 0.001) corresponds to large, Anglo-Saxon firms in the first generation. 1A firms are run by a family CEO, their chairmen are not related to the family, less than 5% of the directors belong to the family, and it is not a binding condition that family members hold more than 5% of the company stock. Configurations 2A (consistency = 0.948; coverage = 0.001), 3A (consistency = 0.930; coverage = 0.001) and 4A (consistency = 0.898; coverage = 0.003) also correspond to generally large Anglo-Saxon firms characterized by low family ownership (lower than 5%), due partly to the highly disperse ownership composition characteristic of Anglo-Saxon firms. Although configurations 2A, 3A and 4A are quite heterogeneous, there are some commonalities in addition to the lack of strong family ownership such as the presence of succession and the absence of a family CEO, although this last condition is not necessarily required in 3A.

Configurations 1N (consistency = 0.926; coverage = 0.001) and 2N (consistency = 0.894; coverage = 0.001) correspond to first-generation non-Anglo-Saxon firms of any size with strong family ownership, family CEOs and, in general, low involvement of the family in the governance of the firm.

Finally, configuration 1AN (consistency = 0.838; coverage = 0.035) is a hybrid type with strong family ownership, weak family involvement in the board of directors and no family chairman. Despite being large firms, they are still in their first generation.

Overall, it can be observed in Table 4 that larger firms tend to outperform smaller firms in terms of industry-adjusted ROE; however, the existence of configuration 2A suggests that second-generation small Anglo-Saxon companies with family chairmen are associated with high ROE as well. Further, configuration 1N indicates that small non-Anglo-Saxon firms with strong family ownership and family CEOs can be highly profitable as well. In terms of legal tradition, our analysis proves that there are configurations leading to high performance in both Anglo-Saxon as well as non-Anglo-Saxon countries, yet family ownership is clearly higher among high-performing non-Anglo-Saxon firms.

Beyond the specific configurations, we observe some empirical trends in Table 4. For instance, family CEOs and succession seem to work as substitutes for each other; firms with family CEOs and no succession seem to perform above the median (1A, 1N and 2N), but so do firms with no family CEO that are in the second generation (2A and 4A). This pattern of substitution between family CEOs and generations corroborates previous observations in the field (Pérez-González, 2006; Villalonga & Amit, 2006).

Another noteworthy regularity observed in Table 4 is that firms with family CEOs and non-family chairmen, and vice versa, tend to perform better than firms in which family members occupy both roles. In fact, having a family chairman and family CEO simultaneously seems to be a sure route to low industry-adjusted ROE – see configurations 1A, 1AN and 2AN in Table 5. It is important to note that Table 5 does not indicate that CEO duality by

Table 4
Fuzzy Sets Results, High Industry-Adjusted ROE this table reports the configurations sufficient to cause high industry-adjusted ROE. The causal conditions are shown in rows. The seven resulting configurations are shown in columns. The four first columns (1A–4A) are related to Anglo-Saxon countries; columns 5 and 6 (1N, 2N) are solutions for non-Anglo-Saxon countries, while column 7 (1AN) captures the hybrid solution compatible with any legal tradition. Full circles "●" indicate the presence of a condition, and circles with "⊗" indicate its absence. Blank spaces indicate that the condition is not binding for that particular configuration (i.e., this condition may be present or absent). In crisp sets, the presence (absence) of a condition means that the degree of membership in the set is exactly 1(0), whereas in fuzzy sets, the presence (absence) of a condition means that the degree of membership is over (below) the crossover point (i.e., membership higher than 0.5). More details of the notation used can be found in the studies by Fiss (2011) and Ragin and Fiss (2008).

Solutions (sufficient causal conditions leading to high industry-adjusted ROE)[a]							
	1A	2A	3A	4A	1N	2N	1AN
	1st gen. large firm with fam. CEO	2nd gen. firm with fam. chairman	2nd gen. large firm with fam. chairman	2nd gen. large firm with fam. board	1st gen. fam. owned and managed	1st gen. large fam. owned and managed	1st gen. fam. owned
Ownership							
Family ownership		⊗	⊗	⊗	●	●	●
Governance							
Family Board	⊗	⊗	⊗	●	⊗	⊗	⊗
Family Chairman	⊗	●	●		⊗		⊗
Management							
Family CEO	●	⊗		⊗	●	●	
Succession							
Succession	⊗	●	●	●	⊗	⊗	⊗
Size (log assets)	●		●	●		●	●
Anglo-Saxon	●	●	●	●	⊗	⊗	
Consistency	0.920	0.948	0.930	0.898	0.926	0.894	0.838
Raw Coverage	0.001	0.001	0.001	0.003	0.001	0.001	0.035
Overall solution consistency 0.844							
Overall solution coverage 0.039							

[a] ● Presence of conditions; ⊗ absence of conditions. Blank spaces indicate non-binding conditions.

Table 5
Fuzzy Sets Results, Low Industry-Adjusted ROE Table 5 reports the configurations sufficient to cause low industry-adjusted ROE. The causal conditions are shown in rows. The five resulting configurations are shown in columns. The first column (1A) refers to Anglo-Saxon countries; columns 2 and 3 (1N, 2N) are solutions for non-Anglo-Saxon countries, and columns 4 and 5 (1AN, 2AN) capture hybrid solutions compatible with any legal tradition. Full circles "●" indicate the presence of a condition, and circles with "⊗" indicate its absence. Blank spaces indicate that the condition is not binding for that particular configuration (i.e., this condition may be present or absent). In crisp sets, the presence (absence) of a condition means that the degree of membership in the set is exactly 1(0), whereas in fuzzy sets, the presence (absence) of a condition means that the degree of membership is over (below) the crossover point (i.e., membership higher than 0.5). More details of the notation used can be found in studies by Fiss (2011) and Ragin and Fiss (2008).

Solutions (sufficient causal conditions leading to low industry-adjusted ROE)[a]					
	1A	1N	2N	1AN	2AN
	2nd gen. small fam. owned, governed and managed	1st gen. fam. owned	2nd gen. fam. governed	1st gen. small fam. governed and managed	2nd gen. small fam. governed and managed
Ownership					
Family ownership	●	●	⊗	⊗	⊗
Governance					
Family Board	⊗	⊗	●	⊗	●
Family Chairman	●	⊗	●	●	●
Management					
Family CEO	●	⊗		●	●
Succession					
Succession	●	⊗	●	⊗	●
Size (log assets)	⊗			⊗	⊗
Anglo-Saxon	●	⊗	⊗		
Consistency	0.990	0.787	0.867	0.885	0.893
Raw Coverage	0.001	0.020	0.008	0.001	0.006
Overall solution consistency 0.817					
Overall solution coverage 0.032					

[a] ● Presence of conditions; ⊗ absence of conditions. Blank spaces indicate non-binding conditions.

itself leads to low performance; instead, it indicates that under the constraints imposed by 1A, 1AN and 2AN, duality leads to underperformance. Again, our findings are consistent and refine previous research on the impact of CEO duality on family firms (Braun & Sharma, 2007).

Some of the previous findings are confirmed in Table 5, where we show the causal configurations leading to the opposite outcome, i.e., *low* industry-adjusted ROE. The asymmetric nature of the set-theoretic method implies that the five solutions for low ROE need not be the perfect opposite of the solutions found for high ROE; for a complete discussion of causal asymmetry, see Ragin (2008) and Fiss (2007). Overall solution consistency in this table is 0.817, and the overall coverage is 0.032. Configurations 1A and 2AN in Table 5 show that a family member serving as a CEO after succession has taken place often leads to poor performance, which confirms the substitution patterns between family CEOs and succession found in Table 4. The results in Table 5 also bring more precision to the relationship between family management and

performance. For instance, configuration 1AN in Table 5 shows that under some conditions (no family ownership, no family board, family chairman and small size), firms run by family CEOs can also be poor performers during the first generation. Thus, our results confirm but also extend and qualify some well-known previous findings reported in the family business literature (Pérez-González, 2006; Villalonga & Amit, 2006).

Overall, the results provided in Tables 4 and 5 seem to favor H1a over H1b, given that the different components of family involvement are not related to ROE in isolation; rather, the FIB–FP relationship seems to be better explained in terms of complex configurations which, as a whole, exert an impact on industry-adjusted ROE. In addition to indicating that there are configurations – rather than individual components by themselves – related to FP, the results depicted in Tables 4 and 5 also detail which specific components constitute each configuration.

5.1. Sensitivity analysis and robustness

We conduct several robustness checks to verify if our findings hold under different calibrations of the sets and different performance measures. First, we performed sensitivity analyses to examine whether our findings are robust to the use of alternative specifications of the FIB components, using a different coding for ownership and governance, the only two FIB sets that are not crisp sets. Specifically, we varied the crossover points between 5% and 15% for these two FIB components. For example, we tested if our results were robust if the ownership crossover point of 5% was changed to 10% or 15%. No substantive changes are observed in terms of the relations depicted in Tables 4 and 5. Second, we varied the industry-adjusted ROE crossover points between ±10 percentile points – i.e., the 40th and 60th percentiles. Although the resulting statistical significance scores are higher for the lower crossover threshold, the consistencies and the relationships found were always supportive of the configurational hypotheses under these alternative measures. Finally, in addition to industry-adjusted ROE, we used industry-adjusted ROA (lagged one year), another often-used performance metric in FIB–FP research (see Table 1). The results, albeit with small differences, do not differ much from the configurations and consistency scores shown in Tables 4 and 5, thus confirming the robustness of the results presented.

6. Concluding discussion

Does family involvement in the firm foster, hinder, or have no effect at all on firm performance? Our review of 59 previous studies on the FIB–FP link showed that the previous empirical findings in this field are inconclusive. In this article, we seek to advance the FIB–FP empirical literature by suggesting a configurational way of thinking about FIB, using set-theoretic methods.

Although the configurational way of thinking has been present at a theoretical level in family business research since its inception (Davis, 1982; Lansberg et al., 1988; Ward, 1987) and in more recent works (Basco & Perez-Rodriguez, 2009, 2011; Lindow et al., 2010), the lack of a proper research method has prevented further empirical exploration of these configurations, forcing researchers to use binary measures of FIB instead. In the last few years, there have been some recent calls to take the heterogeneity of family firms more fully into account (Chrisman & Patel, 2012). In a recent work, Sharma and Nordqvist (2008: 89) conclude: "without a classification system to sort out different types of family firms, it is difficult to have confidence in our research findings that may be based on samples that are a hodgepodge of different types of firms. Moreover, there is no way to determine the extent of the applicability of the research findings".

Using set-theoretic methods as the main research tool and applying them to a sample of 6592 publicly listed and major unlisted companies from 38 countries, we map the different configurations of family firms attending exclusively to the components of FIB. We find that the components of family involvement in isolation do not exert an impact on industry-adjusted ROE. Instead, these components are related to FP in a complex way where configurations as a whole, and not the individual components, are the causal conditions leading to high industry-adjusted ROE. Although some of these configurations have been found and documented in the current exploratory study (Table 4), additional configurations might be uncovered in subsequent works. In our empirical analysis, we include the five components of family involvement – family ownership, family board, family chairman, family CEO and succession – most often used in the literature (Westhead & Cowling, 1998; Klein et al., 2005) and three important control variables such as industry, firm size and legal system. There are, however, other factors such as the business life cycle, firm strategy, financial structure and other firm-specific features that are likely to affect FP. Although we did not include them in order to give a simple account of FIB complementarities, subsequent research may add these and other control variables in order to generate richer and more comprehensive configurations.

The implications of our findings for family firm owners and managers are twofold. First, by developing a fully articulated empirical typology of family firms based on the components of FIB, managers can easily determine the category in which their firm falls. Is it a family-owned, family-governed or family-managed firm? Making these different types of family firms explicit will make it easier for practitioners to assess their opportunities and challenges. We can decide how the research findings apply to distinct family firms. Secondly, owners and managers can determine the proximity of their firm to the ideal configurations depicted in Table 4 and what can be done to align the organization with the ideal configuration, assuming that improving the financial performance is the purpose of the family firm they run; see Astrachan (2010) for a more complete discussion of family firm goals. For instance, from a financial perspective, having a family CEO running the company in the second or later generation seems to be a practice that leads to lower FP both in Anglo-Saxon as well as non-Anglo-Saxon countries (configuration 1A and 2AN in Table 5). However, our results go beyond this finding and suggest that in the particular case of large Anglo-Saxon firms, second-generation family CEOs add economic value to the firm under some binding ownership and governance conditions (3A in Table 4). The contingent analysis presented in this article illustrates how managers may benefit from more detailed maps and tools to decide when it makes economic sense to transplant "best family practices" from one firm to another and when it does not. The configurations in Tables 4 and 5, although exploratory, provide a first guidance for managers by explicitly articulating the main FIB configurations.

Finally, our study has some limitations. First, fuzzy-set methods are sensitive to set calibration; different crossover points might lead to different results. Given the lack of previous applications of fuzzy sets to the family business literature, it would be desirable to share best practices in set calibration, the most appropriate membership breakpoints, and so on. This would facilitate a comparison between different empirical works. By improving this calibration, researchers may learn more about the object of study because membership and non-membership in a given set has to be guided by some qualitative definition of the set and the conditions for membership in it instead of using just a traditional uncalibrated measure.

Second, given the large cross-national sample, we used a rough proxy based on the generation running the business adopting the threshold of 30 years. This approach may be seen as a limitation

because succession is generally measured in the literature as the "intention for transgenerational succession" (Handler, 1989). Nevertheless, the generation proxy has been used in previous studies (Fernández & Nieto, 2005), and there are some theoretical foundations based on the family business' life cycles (Gersick, Davis, Hampton, & Lansberg, 1997: 192).

Third, although our study covers an international sample of 6592 firms, it contains only publicly listed and major unlisted firms. Thus, the generalization of our results to larger populations of smaller family and non-family firms must be made with this limitation in mind. Furthermore, the cross-sectional nature of the sample used does not allow us to take into account longitudinal dynamic effects, and hence, this limitation may cast some doubt on the direction of the causality – i.e., reverse causality. Garcia-Castro and Ariño (2013) have recently developed a novel approach to apply set-theoretic methods to panel data as well. This method may contribute to address the critical issue of reverse causality in longitudinal family business research in the future.

Finally, our study focuses on accounting measures of performance – i.e., ROE and ROA. Thus, the findings of the present study must be circumscribed to these two performance metrics. Future studies should take into account both financial and non-financial goals (e.g., Astrachan & Jaskiewicz, 2008; Chrisman, Chua, Pearson, & Barnett, 2012; Gomez-Mejia, Haynes, Nuñez-Nickel, Jacobson, & Moyano-Fuentes, 2007; Zellweger, Nason, Nordqvist, & Brush, 2013) and assess them in publicly listed as well as privately owned family firms. In fact, the results of our study could be reinterpreted in the context of goal achievement in that some families may pursue above-average financial performance and configure their firms accordingly, whereas others strive for different (non-financial) goals or for whom financial performance is less of a priority. In light of this alternative interpretation, the suggestions for managers and owners provided above should be considered based on the goals pursued by the owning families.

Beyond the current article, we hope that more empirical research in the family business field can be conducted following set-theoretic principles and methods. We believe that the recent theoretical works in the family business domain using contingency theory and configurational fit analysis (Basco & Perez-Rodriguez, 2009, 2011; Lindow et al., 2010; Sharma & Nordqvist, 2008) might be a good starting place to develop more specific theory-driven hypotheses that can be tested using set-theoretic methods. The recent successful adoption of these methods in other management research areas (Fiss, 2007, 2011; Greckhamer, Misangyi, Elms, & Lacey, 2008) suggests that they may prove to be relevant for family business scholars as well.

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