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SPECIAL ISSUE: LOCALITY AND INTERNATIONALIZATION OF FAMILY FIRMS

Family involvement in governance and firm performance in industrial districts. The moderating role of the industry's technological paradigm

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ABSTRACT

Studies on industrial districts tend to highlight the advantages for companies arising from the network of relationships among actors based on the sharing of a common history, culture and norms of behaviour. It has been recently shown that family businesses succeed in leveraging on the district effect only under certain size conditions. In this work, we further advance the study of the 'district' effect on family businesses with the analysis of further key contingencies in addition to size, namely the actual level of family involvement and the technological sector. It has been recently shown that family businesses succeed in leveraging on the district effect only under certain size conditions: for example, according to Cucculelli and Storai's (2015) results, medium-sized family businesses companies enjoy the advantages of operating in a district more than larger and smaller companies and than non-family businesses of similar size. In this work, we further advance the study of the 'district' effect on family businesses with the analysis of further key contingencies in addition to size, namely the actual level of family involvement and the technological sector. We argue that an intense involvement of family members in the governance of companies operating within districts, negatively impacts on companies' performance due to the emergence of a phenomenon of overembeddedness. Further, we also show an industry technological paradigm, characterized by radical breakthroughs, combines with family involvement and location in a district to negatively influence a company's performance. The study is conducted on the Bocconi Italian Observatory of Family Business and includes a final usable panel of 55,489 company/year observations.

Introduction

The spatial agglomeration of economic activities in local systems has been shown to offer important advantages to companies, thanks to the relationships that develop among actors and institutions, and the specialization of activities in a delimited area (e.g. Boschma 2005; Cooke 2002; De Marchi, Di Maria, and Gereffi 2017). Among the various forms of local systems, industrial districts have received a substantial amount of attention for their role in the competitiveness and development of firms (especially small and medium enterprises) and regions (e.g. Becattini, Bellandi, and De Propris 2014).

An Industrial District (ID) is 'a socioterritorial entity characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area. In the district, unlike in other environments, such as manufacturing towns, community and firms tend to merge' (Becattini 1990, 38).

The interactions between the local community's norms and institutions and the business activity at the local level create a 'relationally dense' environment (Johannisson et al. 2007) which fosters partnerships, trust, cooperation, mutual loyalty and enhances both efficiency and innovation capabilities (e.g. Becattini and Dei Ottati 2006; Harrison 2007). This strong embeddedness of business activities would create 'a district effect' leading to a performance advantage for firms located in IDs (e.g. Signorini 1994; Cucculelli and Storai 2015).

Notably, the features characterizing industrial districts strongly resemble the distinctive traits of family firms. Family firms are organizations in which ownership and management are held by one or more families, with several family members striving to maintain intra-organizational family-based relatedness (Arregle et al. 2007). The paramount role of the family creates a unique organizational setting to develop strong social relationships, which span also across the boundaries of the firm (Chirico and Salvato 2008; Salvato and Melin 2008; Zahra, Neubaum, and Larrañeta 2007).

Despite these commonalities, few studies so far have considered the interplay between industrial districts and family firms (e.g. Cucculelli and Storai 2015; Naldi et al. 2013). This is surprising given the economic importance worldwide of both local clustering phenomena (e.g. Porter 1998; Porter and Ketels 2009) and family businesses as organizational forms (e.g. Astrachan and Shanker 2003; Memili et al. 2015). A stream of literature at the intersection between regional studies and family business literature is indeed emerging (e.g. Backman and Palmberg 2015; Baù et al. 2019; Stough et al. 2015), and we believe that a more extensive and deep exploration of the interplay between local systems and family business is required to get a more nuanced and realistic picture of both family firms' behaviours and local systems' traits and development paths, which would ultimately benefit researchers as well as practitioners and policy makers.

More specifically, to enrich the current line of research dealing with the contextual impact of various factors on the existence and magnitude of a 'district effect' on firms' behaviours and outcomes (e.g. Cucculelli and Storai 2015), in this study we embrace a configurational perspective, and integrate in our hypotheses the technological sector of companies' operations. As put forward by the extant literature on sectoral systems of innovation and business systems (See Tylecote and Conesa 1999; Liu and Tylecote 2016; Rana and Morgan 2019), firm governance, inter-firm relationships and industry's technology need to form a coherent bundle to generate positive effects on companies' performance as innovation in different sectors leverage on different types of knowledge (more or less tacit), relationships (more or less long-term oriented) and opportunities for reconfiguration (Geels 2002; Perez 2004). The focus on the technological dimension is therefore needed to avoid significant misinterpretations of the interaction between localization effects and family firms.

Hence, drawing from the local embeddedness perspective as our baseline theoretical framework, in the present study we aim at: (1) assessing the magnitude of the 'district effect' on family firms' performance under different conditions of family involvement in company governance; (2) exploring the combination between district-level effects and industry-level effects, with special emphasis on the differences in industry's technological paradigm.

Our empirical research is carried out on the entire population of family firms with turnover exceeding 20 million of Euros and located in Italy. Italy is an especially relevant context for this type of investigation as industrial districts have supported the industrial development of the country after World War II and, notwithstanding the recent crisis, still account for a large part of the country's foreign account positive balance (70%) of the manufacturing sector (Istat 2005).

The results of our study suggest that, controlling for firms' size, whose impact was previously investigated by Cucculelli and Storai (2015), the district effect is increasingly negative at higher levels of family involvement in companies' governance and justify also the adoption of a contextual approach based on the industry's technological paradigm as we find significant

differences in the sign and magnitude of the district effect between family firms operating in different industries.

We believe that our findings allow us to make two main contributions. First, by considering the local embeddedness combined with the technological features of the industry as crucial contingencies that impact on the diversity in family firms' behaviour and performance, we extend the knowledge on the implications of family firms' heterogeneity, which so far has been mainly studied with respect to internal variables (e.g. governance, management, actors and culture) (Chua et al. 2012; Daspit et al. 2018; Dibrell and Memili 2019).

Second, by analysing the interplay between localization, company governance, and technological paradigms, we add to the literature on the diversity and evolution of local systems of firms, and industrial districts in particular (e.g. Dei Ottati 2017; Grandinetti 2019; Johannisson et al. 2007). Theoretical arguments and anecdotal evidence identify in the change of local embeddedness conditions and in the technological dynamics the main drivers of change within local systems of firms (Dei Ottati 2017). Our research provides a more systematic understanding of these developmental patterns, with specific reference to family firms, which are the archetypal organizational form in industrial districts (Cucculelli and Storai 2015).

The work is structured as follows. In the first section, we briefly discuss our background literature and formulate the hypothesis of our study based on the embeddedness perspective; in the second section, we present the method; the third section describes the results, which are discussed in the fourth section along with theoretical and practical implications. The fifth section concludes.

Theoretical background and hypotheses

Embeddedness and the district effect

Previous studies have extensively documented the crucial role of local embeddedness with respect both to firm outcomes at the local and regional/domestic levels (e.g., Cooke, Clifton, and Oleaga 2005; Cooke 2007) and competitiveness at the international scale (e.g., Al-Laham and Souitaris 2008; Schmitz and Nadvi 1999), suggesting that firms embedded in local system might enjoy performance advantages over firms operating outside such systems (e.g. Delgado, Porter, and Stern 2014). Local embeddedness is defined as the involvement of economic actors in a geographically delimited network and/or institutional setting (Granovetter 1973; Hess 2004). As such, local embeddedness favours contacts with customers and suppliers in a geographic area (e.g., Belussi 2006; Cooke 2007) and facilitates access to tangible assets, such as technology and skilled labour force (e.g. Eriksson and Lindgren 2008), and intangible assets, especially in the form of localized knowledge (e.g. Camuffo and Grandinetti 2011; Coenen, Moodysson, and Asheim 2004). Localized knowledge is characterized by its tacit character, which makes it difficult to codify, transfer and replicate. Therefore, such knowledge can have a pivotal role in the creation of firms' competitive advantages (Grant 1991; Nonaka 2008; Spender 1993). The local context may also favour the pursuit of expansion strategies in international markets as local institutions and linkages often help to develop legitimacy and capabilities that can sustain firms' international competitiveness (e.g., Al-Laham and Souitaris 2008; Laursen, Masciarelli, and Prencipe 2012a, 2012b; Peng, Lee, and Wang 2005).

Industrial districts are contexts where local embeddedness of economic activities is particularly visible and pronounced (e.g. Zucchella 2006). Districts can be described as local clusters of firms where the geographical concentration and the complementary specialization of firms are combined with the pervasive influence of the social/cultural dimension and a shared system of values and beliefs, rooted in a common tradition and history (Becattini 1990). This creates the conditions for a profound social embeddedness of economic action, whereby economic and social behaviours are intertwined and affected by the dyadic relations among actors and by the structure of the overall network (Granovetter 1992). In industrial districts both dyadic relationships and network structures are 'a product of space (geography) and time (history), which transform a geographically bounded

territory into a social space and socio-economic community, with its own shared values, identity, and institutions' (Zucchella 2006, 25). These features further strengthen the effect of local embeddedness on firms' conducts and outcomes, and in this respect family firms might deserve special attention.

Family firms' features and family business-specific advantages, such as long-term orientation (Miller and Le Breton-Miller 2005), commitment to long-term relationships with stakeholders (Miller, Le Breton-Miller, and Scholnick 2008; Sirmon and Hitt 2003), family social capital (Arregle et al. 2007), cumulativeness and path dependency in knowledge creation (Chirico and Salvato 2016; Sirmon and Hitt 2003), seem to fit particularly well with the ID model. Family firms should be, therefore, particularly able to leverage on district-level local embeddedness to achieve superior levels of performance in comparison to non-family firms (e.g. Backman and Palmberg 2015; Baù et al. 2019). However, existing evidence seems to indicate that this is not always the case. For example, Cucculelli and Storai (2015) have highlighted that family firms enjoy a specific advantage over firms outside districts only within certain size classes. This suggests further reflections that we will elaborate in greater detail below, starting with the development of our baseline hypothesis.

The embeddedness of economic action is a central feature of family firms as organizational forms (e.g. Aldrich and Cliff 2003; Arregle et al. 2007; Cruz, Justo, and De Castro 2012). In family firms, social relationships are indeed the building blocks of the family organizational structure and are character-ized by long-term generalized reciprocity and trust among firm members (Long and Mathews 2011; Pearson and Marler 2010). The family context where business activity is embedded represents a source of competitive advantage because of the uniqueness that it offers to the firm in terms of interactions between individual family members and the business (e.g. Craig, Dibrell, and Davis 2008; Gedajlovic et al. 2012; Habbershon, Williams, and MacMillan 2003). These features tend to be replicated outside of the firm, thus creating an environment that facilitates the use and exchange of knowledge and resources with the external network of local stakeholders (e.g. local suppliers and customers, actors in the labour market) on the basis of informal and trust-based interactions (Miller et al. 2009; Lester and Cannella 2006; Peake, Cooper, Fitzgerald and Muske 2016), sustained by family members' personal commitment and personalized business relationships (Carney 2005; Gedajlovic and Carney 2010) and through the dissemination of the family business' values and norms in the local community (Arregle et al. 2007; Benavides-Velasco, Quintana-García, and Guzmán-Parra 2013; Danes et al. 2009), which also favour the emergence of business alliances (Basco 2013; Cucculelli and Storai 2015; Gedajlovic et al. 2012).

There is a significant overlap between the above-mentioned factors and the external economies and distinctive resources that are accessible to firms operating in industrial districts (e.g. De Marchi, Di Maria, and Gereffi 2017; Molina-Morales 2002; Pyke, Becattini, and Sengenberger 1991). This, on the one side, would suggest that family firms have higher capacity, in comparison to their family counterparts, to access the potential benefits arising from the localization in an industrial district. However, the redundant combination between the conditions fostering district-level advantages and the advantages specific to family firms, rather than producing positive synergies, may result in substitution or even detrimental effects on performance (Cucculelli and Storai 2015; Grabher 1993; Uzzi 1997). On the other hand, it may be that non-family firms, which have lower capacity to generate competitive advantages based on socially embedded relationships, benefit more from the favourable conditions created by the relationally dense environment within an industrial district.

These potentially contrasting impacts of the 'district effect' are empirically explored by Cucculelli and Storai (2015) who indeed find that (1) the influence of the 'district effect' on performance is overall more pronounced among non-family firms and (2) among family firms the 'district effect' is contingent to firm size. In particular, the 'family effect' and the 'district effect' operate synergistically in medium-sized firms, whereas in smaller firms they act as substitutes. The authors argue, in particular, that 'when firm size is larger, the involvement of the family in the business allows firms to exploit the family stewardship ability and the capacity to forge relationship with suppliers and buyers through family social capital' (Cucculelli and Storai 2015, 244).

These findings, emphasizing the contingent effect of size among family firms, call for a more fine grained exploration of how family firms' heterogeneous features influence the ability to capture the localization advantages as size is only one among others feature that differentiate family businesses and companies more in general.

Local embeddedness and family involvement in governance

In the previous section, we have emphasized the overlap between family business features and district level conditions, in particular, regarding the role of social relationships. This overlap can be assessed through the lenses of varying degrees of family involvement in company governance, and in particular, in terms of family representation on the board of directors.

Corporate governance can be interpreted as a system of bodies and institutions that influence managerial discretion and thus govern CEO's and top executives' decisions (Charreaux 1997, 2008). In this way, the corporate governance system acts as a cognitive mechanism by 'driving' top management's behaviour in terms of strategy selection and implementation, resource acquisition and learning processes (Wirtz 2011; Zahra and E Filatotchev 2004).

Family representation in the board of directors is therefore likely to orient the conduct of family business decision makers, by establishing a common cognitive background, which is based on the network of family ties. Family ties are characterized by both cognitive and physical proximity (Boschma 2005; Granovetter 2005) and are supported by high levels of trust, which favours knowledge exchange and learning (Adjei, Eriksson, and Lindgren 2016). This is further strengthened by the tendency of family members to preserve ties over time and by the propensity to extend the norms and values of the family group in a long-term system of relationships with external stakeholders (e.g. Arregle et al. 2007), establishing a continuum between the cognitive bases of external actors' and internal decision makers.

In family firms, the board is also often seen as a way to build community-level social capital, which represents a resource capable to preserve the long-term viability of the organization, by reducing uncertainty and creating valuable links with key actors in the surrounding environment (Lester and Cannella 2006). Particularly, in the context of industrial districts, family-based governance is embedded in higher-order systems, which involve local communities and institutions (e.g. Johannisson, Ramírez-Pasillas, and Karlsson 2002; Johannisson et al. 2007), and are usually characterized by the same variables that are found at the underlying level, namely interpersonal trust, loyalty and reciprocity, long-term orientation and preservation of ties over time (e.g. Maskell and Malmberg 1999; Mistri and Solari 2003). Even in the cases when the formal governance mechanisms such as the board are not very active, a strong family representation in terms of appointed members can have a signalling effect (e.g. Certo 2003) towards the external community, that the family prioritizes the continuity of values and beliefs (Lester and Cannella 2006)

High levels of family representation in the board of directors combined with the location in an industrial district (and the associate local embeddedness conditions) amplify the effects of the informal norms and institutions on family business behaviours and outcomes (e.g. Soleimanof, Rutherford, and Webb 2018) and increase the likelihood of over-embeddedness to occur (Boschma 2005; Grabher 1993; Soda and Usai 1999; Uzzi 1997), with possible detrimental effects on performance. According to the over-embeddedness argument, long-term relationships, strong commitment and very cohesive networks encouraged by family members and further legitimated and secured by the local community norms may lock companies into rigid routines and established behaviours, thus diminishing the capacity of innovation and learning (Uzzi 1997). In addition, family members' strong ties within and across levels favour the accumulation of redundant cognitive resources, which orient top executives' decision-making in a way that may enhance the lock-in effects (Adjei, Eriksson, and Lindgren 2016; Grabher 1993; Jensen et al. 2007). The combined effects of local norms of behaviour and concerns with family business reputation in the local community (Zahra et al. 2013) may also further enhance the family business risk aversion (Berrone, Cruz, and

Gomez-Mejia 2012) and prevent the reconfiguration of business ties and the resource shedding processes (Sirmon and Hitt 2003) thus promoting conservative strategies and discouraging innovation.

These arguments suggest that for family firms, the district effect is positive in situations where the family involvement in governance is relatively low, and thus the benefits from knowledge spillovers and external economies are less redundant and less subject to risks of lock in. On the contrary, the district effect will turn to negative when it is combined with situations of high family embeddedness.

Formally stated:

Hypothesis 1. Among family firms, the level of family involvement in the board of directors interacts with the district localization effect on performance, such that the effect of district localization becomes increasingly negative as the number of family members in the board of directors increases.

The moderating role of technological intensity

The extent to which overembeddedness hampers the competitiveness of family firms operating in industrial districts is likely to be heterogeneous across different contexts. In particular, the technological paradigm of the industry where the firm operates may represent an important factor that affects the relationship between local and family embeddedness and performance.

Since the emergence of the socio-technical approach to organizations (Emery and Trist 1965; Trist and Bamforth 1951) studies addressing the connection between firm's organization, technology and performance have highlighted that the conditions of success in different sectors are more easily pursued by different governance and organizational configurations ranging from arm's length, market-based types of relationships with stakeholders on one side, to strongly embedded and long-term ones on the other (e.g. Blair 1995; Dore, Lazonick, and O'Sullivan 1999; Tylecote and Conesa 1999; Tylecote and Visintin 2007; Tylecote, Cai, and Liu 2010; Hirsch-Kreinsen 2011; Mazzucato 2013). A mismatch between the challenges posed by the technology on the one side and the governance and organizational features on the other can severely limit the performance of the company, not only in terms of the ability to generate innovative products, which is *per se* one of the central determinants of performance (e.g. Garud, Tuertscher, and Van De Ven 2013) but also for the successful management of any of the components of the business model (e.g. Tylecote and Ramirez 2008; Hirsch-Kreinsen 2011).

The challenges posed to companies' strategic management by a technological paradigm can be classified according to some key dimensions corresponding to distinctive features at the industry level (e.g. Dore, Lazonick, and O'Sullivan 1999; Asheim and Coenen 2006; Tylecote and Visintin 2007), which are:

(1) *The visibility and degree of codification of knowledge.* Low- and medium-low-technology sectors (e.g. artisan activities, wood crafting, furniture, textile manufacturing) present generally lower degrees of codification as they are characterized by more frequent incremental and component innovations (Tushman and Anderson 1986; Henderson and Clark 1990) based on the core capabilities of a firm, which are in large part tacit types of knowledge. On the contrary, medium-high- and high-technology sectors, such as pharmaceuticals and biotechnologies, but also (and increasingly) industrial machinery and automation exhibit higher degrees of visibility and codification. For example, firms in these industries regularly display their expenditures on capital, R&D and marketing; the research and specially the development processes are extremely regulated and generally very centralized in R&D laboratories, and the final product embodies high degrees of codified knowledge (Tylecote and Conesa 1999)

(2) *The degree of novelty.* High- and medium-high-technology sectors are characterized by high degrees of novelty, which means that the technological progress in these contexts is often

competence-
destroying as it does not build on previously accumulated capabilities at the firm level (Tushman and Anderson 1986) and requires important modifications in the learning process of firms, as well as in their organizational architecture. Information technology, biotechnology and industrial automation are experiencing since the last 30 years important competence destroying waves of innovation (Miller and Atkinson 2014; Della Malva et al. 2015). Considerably lower degrees of novelty characterize the low- and medium-low-technology sectors, where the cumulativeness of knowledge and the importance of competence enhancing innovations are more pronounced.

(3) *The importance of knowledge spillovers*. In low- and medium-low-technology sectors, it is more likely that the technological knowledge that is crucial for the competitive advantage is distributed among stakeholders (e.g. suppliers, customers and employees) and, as a consequence, the returns from innovation are less appropriable for the firm. Low- and medium-low-technology industries are mainly based on object-oriented technologies, with a heavy demand of accumulation of skills on the shop floor and importance of core competence, and privilege close long-term inter-firm relationships due to the use of components and other sub-systems supplied by other firms. On the contrary, in high- and medium-high-technology sectors, knowledge spillovers are less important, and firms have higher capacity to control the relevant knowledge by means of property right on the knowledge itself. Means of appropriation, such as patenting and other forms of protection of intellectual property, are more effective in comparison to low- and medium-low-technology settings.

In synthesis, the low-technology sectors, such as wood-furniture, textiles, food, present low-visibility, low novelty, low need for reconfiguration, and high knowledge spillovers. In these sectors, the strategic, firm-specific knowledge has been accumulated and typically co-produced over time by company managers, employees, customers and suppliers. Innovation proceeds along well-known and predictable trajectories and strong, embedded relationships among the various stakeholders nurtured by trust, shared values and a common history represent some of the most strategic assets of the company. On the other hand, the high- and medium-high-technology sectors are characterized by high visibility, high novelty with frequent need for reconfiguration, and low spill-overs. The social and institutional systems most effective in generating innovation with these kinds of technologies need to be characterized by high flexibility to easily reconfigure, both in terms of workforce and social capital; insider shareholders, socially embedded resources and relationships are therefore redundant and often represent a rigidity rather than an asset.

If we combine these arguments with those we previously developed in support to our Hypothesis 1, we may argue that family firms located in industrial districts and operating in high- and medium-high-technology sectors will suffer more from increasing levels of family embeddedness, as this will heighten the possibility of lock-in and rigidity, which are especially negative for industries characterized by high levels of visibility and novelty and low intensity of knowledge spillovers. Being located in a district may generate conditions of overembeddedness that prevent companies from activating the radical breaks needed to be competitive in the high-technology sectors. When family influence at the ownership, governance and management level is pervasive, the risk of overembeddedness is higher. In particular, we argue that the strong family influence combined with the close ties with the local community increase the importance of the so-called 'bonding ties' (within social groups) over 'bridging ties' (between social groups). According to Portes (1998) strong bonding ties may diminish the ability to form connections with the outside system. This may produce negative consequences at the firm level by fostering conformist behaviour (Westlund and Bolton 2003) and leading to group-think (Janis 1982). Lower levels of family influence in an industrial district would instead favour the integration of knowledge (e.g. Asheim and Isaksen 2002; Guerrieri and Pietrobelli 2004) and the interaction with global value chains (e.g. De Marchi and Grandinetti 2016; Laursen, Masciarelli, and Prencipe 2012a, 2012b).

Summarizing, we propose our:

Hypothesis 2. The negative interaction between family involvement in the board of directors and the district localization is more pronounced among family firms operating in high- and medium-high-technology industries.

Sample and method

Our sample is drawn from Bocconi University's Italian Observatory of Family Firms. The Observatory monitors the entire population of Italian family-controlled and non-family-controlled firms with turnover of over €20 million as identified from public sources such as AIDA (Italian Digital Database of Companies) – a branch of the Bureau van Dijk group.

The population comprises 15,495 companies (5,427 non-family companies; 10,068 family companies). For the purpose of the analysis, we restricted our focus on family firms.

We defined as family controlled those private firms in which a family owned an absolute majority (i.e., 50%) of shares. Due to the large blockholdings characterizing Italian privately controlled firms, 50% of ownership (25% for listed companies) is required to achieve control (Bennedsen and Wolfenzon 2000). The resulting dataset is a panel with 171,156 company/year observations over the period 2000–2016. Given the strong characterization of industrial districts in terms of manufacturing specialization (Becattini 2002; Harrison 2007), we restricted our focus to manufacturing firms. After further deleting cases with missing or incomplete information, we arrived at a final usable panel of 55,489 company/year observations.

Variables

Independent variable
Financial performance. Our performance variable is an industry-adjusted measure of *return on sales* (ROS). ROS was selected to ensure comparability with previous studies assessing the district effect on family and non-family business performance (e.g. Cucculelli and Storai 2015) and is calculated as net operating income before extraordinary items divided by annual total value of sales. The industry-adjusted measure is computed as the difference between the firm's ROS and the median ROS of the firms in the same two-digit SIC code industry in the same year.

Dependent and moderating variables
Family business status. Family business status is a dichotomous variable assuming value 1 if the firm is defined as a family firm and 0 otherwise. As explained above, we classified as family controlled those private firms in which a family owns an absolute majority (i.e., 50%) of shares. This is due to the large blockholdings characterizing Italian privately controlled firms, where 50% of ownership is required to achieve control (Bennedsen and Wolfenzon 2000).

Location within an industrial district. Location within an industrial district is a dichotomous variable assuming value 1 if the firm has its headquarter in a municipality that is located within an industrial district and 0 otherwise. Industrial districts have been identified following the classification operated by the Italian Central Institute of Statistics (ISTAT) which is based on census information and combines data on industrial specialization with data on the local movements of employees (Istat 2005).

Family involvement in the board of directors. Following previous studies, the family involvement at the board level was measured by the number of family directors, both in executive and non-executive positions (e.g. Yoshikawa and Rasheed 2010; Miller, Le Breton-Miller, and Lester 2011). By considering this variable, rather than the percentage of family directors, we are able to assess the extent of family ties overlapping with business level ties and also the number of potential 'nodes' for

Table 1. Descriptives and correlations (N = 55,489).

		Mean	SD	1	2	3	4	5	6	7	8	9
1	Performance (ind. adj. ROS)	0.30	5.6	1.00								
2	Size (N of employees)	99.8	88.6	0.04	1.00							
3	Age	25.4	22.7	0.06	0.11	1.00						
4	Debt/Equity Ratio	1.75	2.9	−0.01	−0.01	−0.01	1.00					
5	Industrial District	0.07	-	0.00	0.03	0.05	0.00	1.00				
6	High and Medium-High Tech	0.16	-	0.01	0.11	0.05	−0.01	−0.03	1.00			
7	Family Directors	2.86	1.45	0.03	0.04	0.13	−0.02	0.06	0.00	1.00		
8	First Generation	0.39	-	0.01	−0.09	−0.34	0.01	−0.02	−0.02	0.00	1.00	
9	Family CEO	0.83	-	0.03	−0.03	0.14	0.00	0.06	−0.04	0.32	0.16	1.00

Correlations higher than 0.01 and lower than −0.01 are significant at the 0.05 level

the creation of external ties. As a robustness check, we also performed an analysis using the percentage of family directors instead of the number, and the results remain substantially unchanged in terms of the signs of the key effects.

The familial nature of the directors was determined by surname affinity with that of the controlling family (Amore, Minichilli, and Corbetta 2011; Miller, Minichilli, and Corbetta 2013; Wilson, Wright, and Scholes 2013) as recorded in Chamber of Commerce filings (Miller, Minichilli, and Corbetta 2013). Although this may miss some family companies in the (rare) cases in which the only major owner is an in-law with a different name from the founding family and although the term 'family firm' includes any firm in which there are multiple major owners or CEOs with the same name as the founder, given our very large sample of private firms, these inaccuracies are not likely to distort our results to any significant extent. Moreover, we cross-referenced national fiscal code numbers with personal data on our owners and executives (such as residence, change in address, etc.) and this helped us to identify marriage relationships and spousal branch involvement, further decreasing the likelihood of significant inaccuracies in our classifications.

Industry. With the aim to capture the effect of technological intensity at the industry level, we adopted the ISIC technology intensity classification of sectors elaborated by the OECD (OECD 2016).

Control variables

We also employed a number of control variables accounting both for structural factors that might affect company performance and, among family firms, for additional dimensions of family business heterogeneity, potentially impacting also on the degree of family embeddedness. Our control variables at the company level are: the *age of the company* (natural logarithm of the years since the year of foundation), the *size of the company* (natural logarithm of number of employees) to control for the size effect identified by Cucculelli and Storai (2015) and the *Debt/equity ratio* (book value of long and short-term debts divided by shareholders' equity); the *family generation in charge of the company* (dichotomous variable assuming value 1 if the company is a first-generation family firm and 0 otherwise); the presence of a *family CEO* (dichotomous variable assuming the value 1 when the CEO is a member of the controlling family, 0 otherwise).

Descriptive statistics and correlations for the variables considered are reported in Table 1.

Estimation procedure

To test our hypotheses, we used panel regression estimations with random effects. We chose between fixed and random company-level effects by looking at the structure of our data (most of the variables are time invariant within cases) and also after performing Hausman specification tests for each model (Hausman 1978). The chi-square values of the Hausman test are reported in the summary statistics of our estimations and are always not significant, indicating that there is no

systematic difference between the coefficients of the random effects and fixed effects models and, therefore, that the random effects estimation is appropriate
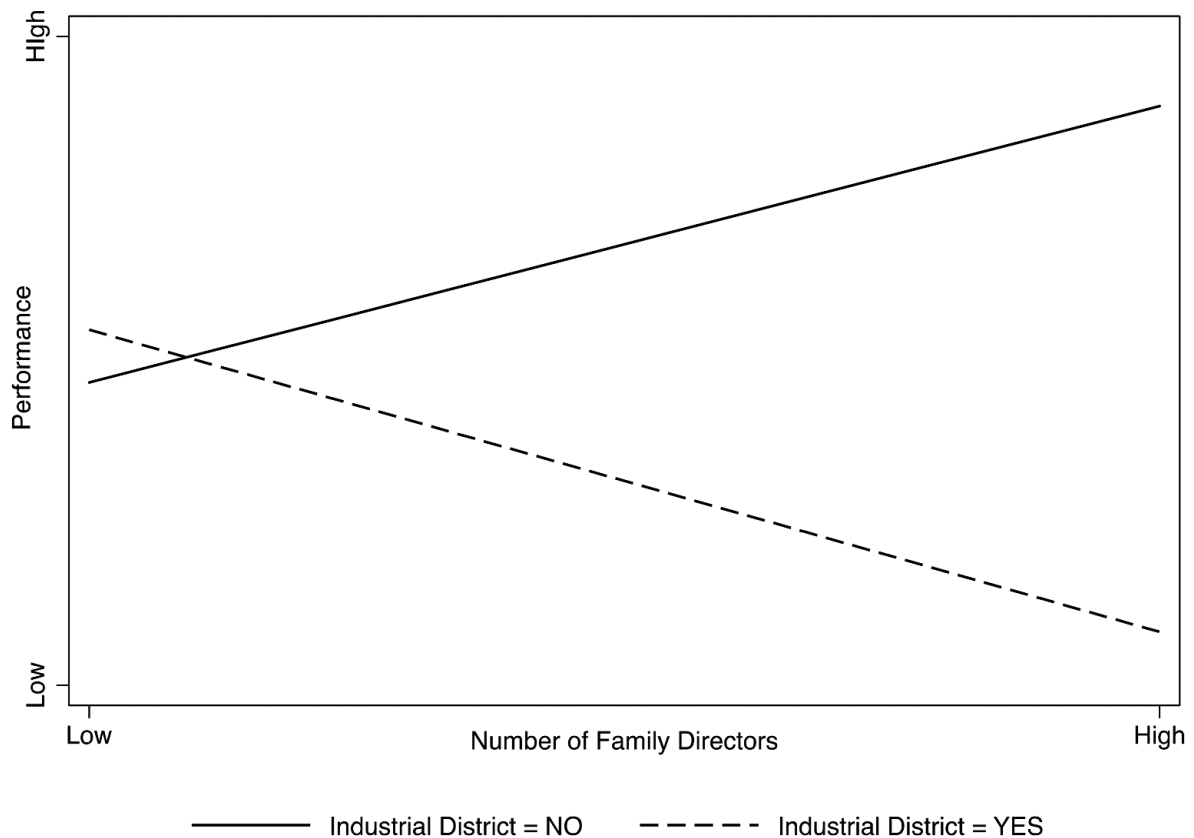
Results

In Table 2 we report the estimations of the direct effects and control variables coefficients only (Column 1), the estimation of the interaction between the district effect and the number of family directors (Column 2); and finally the estimation of the interaction between number of family director and district effect under different industry's technological paradigms (Column 3). Regarding the estimates in column 1, the overall negative (although not significant) effect of the localization in the district for family firms resonates the finding by Cucculelli and Storai (2015) on a comparable large sample of Italian companies. The number of family directors has a positive effect, confirming also the existence of a favourable impact of family involvement on performance.

Moving to column 2, Hypothesis 1 is supported by the analysis concerning the effect of the number of family directors (Table 2, column 2). The coefficient of the interaction term Industrial District × Number of Family Directors is negative and significant (Beta = −0.25; p < 0.001). This indicates that when the number of family directors is higher, the district effect becomes increasingly

Table 2. Difference in the District effects between manufacturing family and non-family firms (1); among family firms with different degrees of family embeddedness (2); among family firms with different degrees of family embeddedness in different conditions of industry's technological intensity (3).

	(1) Direct effects and controls	(2) Family firms' family involvement in governance (family embeddedness)	(3) Family embeddedness and technology intensity
Firm Size	0.20***	0.20***	0.27***
	(0.04)	(0.04)	(0.08)
Firm Age	0.27***	0.27***	0.31***
	(0.05)	(0.05)	(0.09)
Debt/Equity Ratio	−0.00	−0.02***	−0.02***
	(0.00)	(0.00)	(0.00)
Industrial District	−0.29	0.45	0.05
	(0.23)	(0.36)	(0.38)
Medium high and high technology	0.21	0.21	1.31***
	(0.16)	(0.17)	(0.30)
Number of family directors	0.09***	0.12***	0.09**1
	(0.02)	(0.03)	(0.03)
First Generation Family Firm	0.18	0.18**	0.18**
	(0.08)	(0.08)	(0.09)
Family CEO	0.00	−0.00	−0.00
	(0.00)	(0.00)	(0.00)
Industrial District × Number of Family Directors		−0.25***	−0.14
		(0.09)	(0.09)
Industrial District × Medium High and High Technology			4.72***
			(1.34)
Number of Family Directors × Medium High and High Technology			0.10
			0.08
Industrial District × Number of Family Directors × Medium High and High Technology			−1.29***
			(0.35)
Constant	−1.72***	−1.77***	−1.72***
	(0.26)	(0.26)	(0.26)
N − obs	55,489	55,489	55,489
Wald chi-square	93.63***	100.40***	115.37***
R-square (between)	0.01	0.01	0.01
Random Effects	YES	YES	YES
Average Obs per group	8.6	8.6	8.6
Hausmann test p-values	0.36	0.41	0.43

Standard errors in parentheses. *** p < 0.001, ** p < 0.01, * p < 0.05, † p < 0.1.

Figure 1. Plot of the interaction effect between the localization in an industrial district and the number of family directors.

negative for family firms. The result provides support to our Hypothesis 1 and is also visualized in Figure 1.

In line with our Hypothesis 2, the analysis also reveals (Table 2, column 3) that the negative interaction between the number of family directors and the localization in an industrial district is more pronounced in firms belonging to high-technology and medium-high-technology sectors. The inspection of Figure 2, where we plot the effects of the three-way interaction Industrial District × Number of Family Directors × Medium-High and High Technology (Beta = −1.29; p < 0.001) reveals, in fact, that in low- and medium-low-technology the divergence between performance levels of firms located inside and outside the district is less clear as the number of family directors increases. Instead, at increasing levels of family presence in the board, the gap in performance between firms located inside and outside industrial districts (i.e. a district effect turning from positive to increasingly negative) is definitely more pronounced among high- and medium-high-technology sectors.

Discussion

Leveraging on the results we just described, we believe that our study adds to the knowledge on the interplay between localization and family business, by first allowing us to extend the knowledge on family firms' heterogeneity effects on performance. So far, family business heterogeneity has been mainly studied with respect to internal variables (e.g. governance, management, actors and culture) (Dibrell and Memili 2019). We demonstrate that if we consider the localization as a further contextual variable we can actually obtain very different implications for the relationship between family business heterogeneous features and performance. As it is clear from Figure 2, the number of family directors, which is a typical measure of the heterogeneity at the governance level, can be either beneficial or detrimental for performance, depending on the local context where the firm operates. This finding also complements the results reported by Cucculelli and
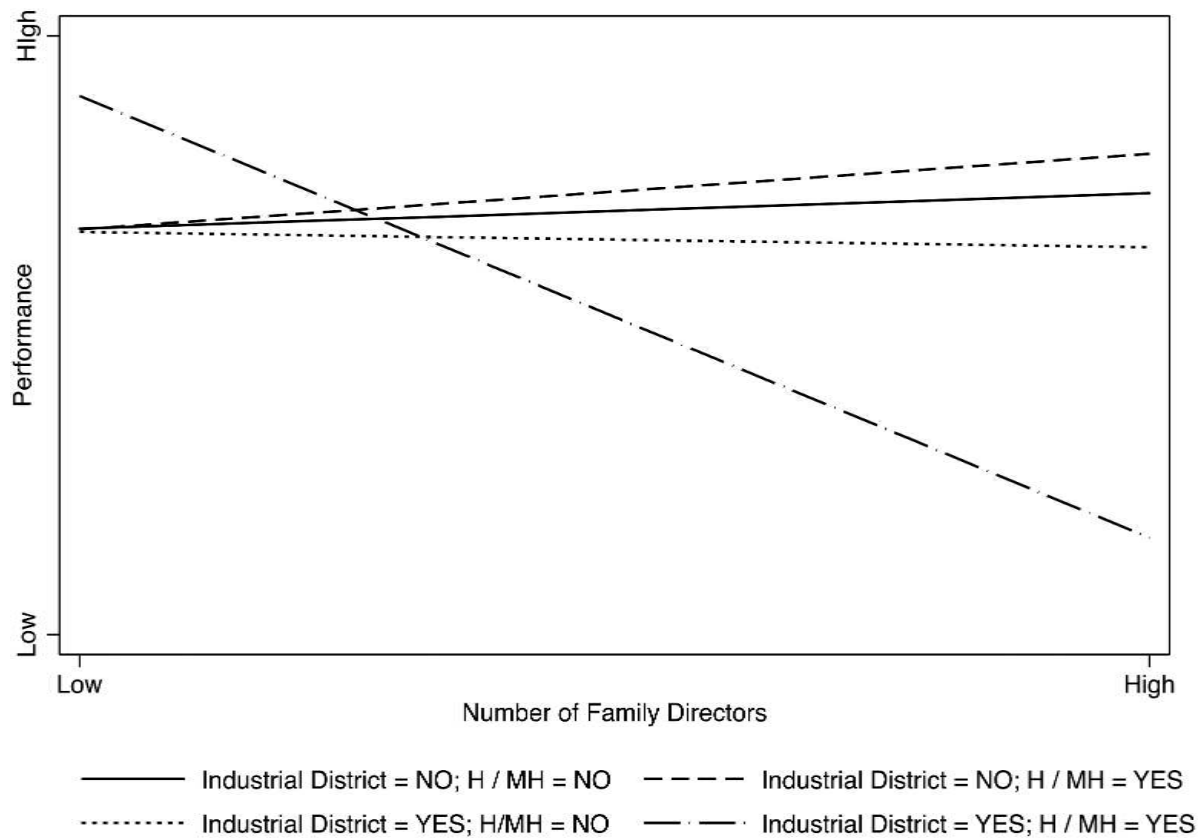
Figure 2. Plot of the interaction effect between the localization in an industrial district, the number of family directors and the companies' activity in medium-high- or high-technology industry (H/MH tech).

Storai (2015), by highlighting that, other than the smaller size, what also might impede family firms to benefit from the district performance effect, is the high presence of the family in the governance of the firm.

The most interesting results in light of both the research on family firms' heterogeneity and the research on family firms' district localization are however those concerning the family and local embeddedness combined with the technological features of the industry (Hypothesis 2). The family embeddedness' negative moderation on the district effect is more pronounced in high- and medium-high-technology sectors. As shown in Figure 2, the performance of family firms operating within districts in high- and medium high-tech sectors decreases significantly with the increase in the number of family members involved in the board of directors. The same does not occur for companies not operating in districts and, only to a very limited extent, for companies operating in medium- to low-technology sectors, where the effects are basically absent (partially contradicting Hypothesis 2). The phenomenon, which is in partial contrast with our Hypothesis 2, can, in our view, be explained as follows.

The empirical evidence shows that family firms tend to limit their investments in R&D and privilege incremental innovations rather than radical, architectural ones (Chrisman and Patel 2012; De Massis et al. 2015). This is mainly because of the perceived loss of control which negatively impacts on the socio-emotional wealth of the family (Gomez-Mejia et al. 2011). To achieve a high innovation intensity which translates in superior performance, companies need to collaborate with actors outside the family circle as only a small fraction of the breakthrough innovations are produced within the company's borders (Grimpe and Sofka 2009; Nooteboom 2000). Managers with high levels of technological expertise may have to be hired from the market, capitals raised from venture capitals and institutional investors and suppliers searched and chosen on uncertain markets, often governed by price and opportunistic behaviours (Boschma 2005).

However, empirical evidence shows also that family firms are able to achieve a good performance despite the limited investments in innovation inputs. In particular, Duran et al. (2016) show that family firms have a high conversion rate of innovation input in innovation output, thanks to the capability of the family members to orchestrate resources and monitor their allocation and to operate as 'sophisticated investors'. The number of family members involved in the company, therefore, can, on the one side, reduce the number of innovation inputs and create a lock-in effect, and on the other, increase the availability of capabilities to optimize the conversion rate, in particular, by strengthening the monitoring process and reducing inefficiencies.

When the company is located in an industrial district (as well explained in the development of Hypothesis 2), the combination of the familial governance and the local embeddedness of knowledge and relationships, blend in a way that it is difficult to overcome, causing an overall lower conversion rate of innovation of inputs in outputs and thus overall performance. Within districts, families are subject to the norms of behaviour governing the dynamics of the local actors which influence not only the absorptive capacity towards new ideas, technologies or resources deriving from unconnected networks but also the extent of success in opportunity recognition. Available specialized, knowledge is district specific, connections are developed by proximity and relationships are close, long term and limited in number.

All of these conditions represent significant obstacles to performance in high- and medium-high-tech sectors, particularly as they prevent the achievement of the high levels of novelty characterizing these sectors, while they are redundant as far as visibility and appropriability are concerned. On the other hand, in the medium- to low-technology sectors, the negative impact is lower or null, as innovation and performance are mainly based on those same components of embeddedness and proceed along predefined and controllable trajectories. Even though in the past decade, the importance of codified knowledge has increased significantly also within districts and in the so-called 'made in Italy' sectors (Dei Ottati 2017), the traditional embedded knowledge base still plays a crucial role. However, this progressive transformation is probably the reason why in the medium-low-technology sectors the results are in partial contrast with Hypothesis 2 as we were expecting a positive impact of the district effect. Also, in these sectors, the features of the technological paradigms are being influenced by the digitally driven transformations and the extent of novelty is progressively increasing (Dei Ottati 2017; Grandinetti 2019). Companies also in these sectors are called to address the need to combine more intensely than in the past tacit with codified knowledge and to undergo evolutionary processes along difficult to predict trajectories, which is slowly lowering the extent of embeddedness that operates as a liability rather than an asset.

Outside of the districts, the conversion rate is positive and the higher the number of family members involved, the larger the capabilities the company might employ in the process of conversion.

Conclusions, limitations and future research directions

In the present research, using the lenses of the embeddedness perspective, we assessed the magnitude of the 'district effect' on performance for family firms in comparison to their non-family counterparts and we also explored the combination between district-level effects, family governance effect and industry-level effects, with special emphasis on the differences in industry's technological paradigm. Our results supplement and further develop the findings by Cucculelli and Storai (2015), which indicate in firm size an important contingent factor, and support the idea that, by controlling for firm size, the interplay between family business status, actual family involvement, and the conditions in terms of localization and industry is a relevant predictor of business performance and offer new insights in studies on the viability (Johannisson et al. 2007) and evolution (Dei Ottati 2017; Grandinetti 2019) of the district model.

Of course, our study is not free from limitations, which also suggest avenues for future research. First, our dataset does not allow for a more fine-grained assessment of family business features in terms of actual preferences and behaviours of actors involved. Furthermore, in this research, we adopted a definition of technological paradigm based only on one of the possible conceptual and empirical perspectives that could be embraced when we consider the environment at the industry level. Third, it must be recognized that our study lacks a processual perspective, in the sense that family firms could be themselves the actors that have historically promoted and established the norms at the district level, and this would introduce a sort of 'endogeneity' at the conceptual level, that could be addressed effectively with extensive longitudinal studies on an historical basis and with a qualitative approach. The same type of phenomena could be grasped through qualitative analyses on local clusters which are in their early stages of formation and institutionalization.

Finally, our dataset does not allow us to use the innovation output as a dependent (or mediation) measure that would certainly add more detailed insights into the role of technological intensity on performance.

Disclosure statement

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