International Entrepreneurship and Management Journal (2022) 18:1141–1172
https://doi.org/10.1007/s11365-020-00715-5

Board of director attributes: effects on financial performance in SMEs

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Accepted: 16 December 2020 / Published online: 28 January 2021

Abstract

This paper analyses the relationship between board of director (BoD) attributes and financial performance in small and medium-sized enterprises (SMEs). Although SMEs are the backbone of world economies, most studies on this relationship focused on large companies and did not consider many typical or recommended processes and activities carried out by SME BoDs. We monitored a set of variables related to BoD attributes such as composition, characteristics, structure and processes for 184 Italian SMEs along with their financials over a 4-year period (2014–2017). We controlled for enterprise-specific characteristics such as annual sales growth, assets value, sales turnover, leverage, company size (employees), firm age, generational changes, director ownership and familiness. Using an ordinary least squares (OLS) regression model with time-period and industry-fixed effects on financial performance data, we found a significant correlation between certain BoD attributes and financial performance. In particular, in our model, BoD members' adequate competences and skills, presence of committees or individual delegates within the BoD, adequate and timely-furnished documentation before BoD meetings, monitoring of conflicts of interest of BoD members, BoD risk analysis and management, BoD member performance-based remuneration, and disclosure to stakeholders influenced the ROA ratio, used as a proxy for financial performance. Our findings support the importance of the BoD and its attributes in influencing the financial performance of SMEs. BoDs are proven unique resources for companies.

Keywords Board of Directors · BoD attributes · Financial performance · ROA ratio · SMEs · Family firm · Agency theory · Resource based view

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Introduction

Over the past 40 years, several studies have focused on boards of directors (BoDs) and some of their attributes in relation to company financial performance and enhancement of shareholder capital (Alimehmeti and Paletta 2014; Bhagat and Bolton 2008; Coles et al. 2008; Fama and Jensen 1983; Gompers et al. 2003; La porta et al. 1998). In their seminal work on the BoD and company financial performance, Zahra and Pearce (1989) argued that the BoD fulfils multiple roles, such as control, service and strategy. In large corporations, the control role of the BoD is particularly important for mitigating the well-known agency problem. According to the agency theory (Jensen and Meckling 1976), managers tend to pursue their personal interests to the detriment of shareholders (Hermalin and Weisbach 2003). Agency problems may arise in the presence of concentrated ownership (La Porta et al. 1998; Mayer 1997) and even when ownership, board and top management roles tend to overlap, typical of SMEs (Brunninge et al. 2007; Jaskiewicz and Klein 2007). Neither do family firms completely solve these problems, because despite the fact that the role of owner and manager tends to be filled by the same family member, they could suffer an 'entrenchment' phenomenon (Oswald et al. 2009; Bozec and Laurin 2008), which happens when management acquires greater power due to family status rather than knowledge or expertise. The autonomy of the board suffers negative consequences; its overseeing role is compromised, thus 'agency costs will be reborn' (Charbel et al. 2013).

Several studies have focused on BoD issues related to demographic characteristics (such as BoD size or composition), particularly in large firms, because they were directly observable and replicable (Coles et al. 2001; Jensen 1993). However, findings were not conclusive and did not reach unanimous consensus in Anglo-American and European contexts (Daily et al. 2003; Hermalin and Weisbach 2003). This also holds true in Italy, where the corporate governance model has certain distinctive characteristics compared to Anglo-Saxon and German-Japanese archetypes (Merendino and Melville 2019). More recently, some authors have pointed out the necessity to move on the agency theory and its associated prescriptions in search of new variables on the BoD that may better interpret the relationship between the board and firm-level outcomes (Roberts et al. 2005). As reported by Minichilli et al. (2009), limiting the analysis of BoD influence on financial performance and considering only demographic variables, the complex group dynamics inside the BoD 'black box', an important driver of board effectiveness, are not considered. To advance research in this field, a deeper analysis of BoD processes and activities is required.

In OECD countries, excluding the non-financial sector, SMEs account for more than 50% of total employment, generating between 50% and 60% of the value added (OECD 2017) and at least one-third of exports in the main developed economies (WTO 2016) which makes them important. In recent years, a growing stream in the literature (Abor and Biekpe 2007; Arosa et al. 2013; Bennedsen et al. 2008; Eisenberg et al. 1998) has directed its attention towards an analysis of the role of the BoD in smaller firms.

In SMEs, a well-functioning board of directors is seen as a critical 'resource' for the business (Corbetta and Tomaselli 1996; Van den Heuvel et al. 2006). Therefore, BoD attributes that deal with its composition and characteristics (e.g., the number of BoD members, presence of independent directors, variety of profiles and competences) as

well as its structure and processes (e.g., adequate documentation for BoD meetings, enterprise risk management [ERM] processes, disclosure to stakeholders) could lead to better financial results.

Prior studies have not thoroughly investigated the relationship between BoD attributes and financial performance in SMEs. Indeed, some BoD attributes recommended by the main Corporate Governance (CG) codes, associations of SMEs or professionals remain unexplored, either singularly or jointly considered, particularly in relation to other contextual forces such as company size, age or familiness (Bammens et al. 2011). Practically speaking, SME BoD members need more support in identifying which attributes would have more effect on company performance, singularly or in combination with each other. In our view, clearer answers should be given to the recurrent question that SME entrepreneurs ask corporate governance researchers: 'Why should we sustain the costs to establish a 'good' BoD'? We would be glad to tell them 'Because a "good" BoD is not a cost but an investment, which could enhance a company's financial performance'.

This paper intends to contribute to this ongoing debate in three ways: first, by extending the analysis of the influence of a wide set of BoD attributes to SMEs (considering both structural elements and processes and activities (Wan and Ong 2005)) on financial performance; second, by considering the BoD attributes and contextual forces together in one single model; and lastly by measuring the influence of BoD attributes in conjunction with the main recommendations of CG codes, associations of SMEs or professionals on financial performance. We hypothesise that BoD attributes may contribute to better results by offering the BoD precious 'resources' and good practices, thus supporting the value creation process of SMEs. It has been observed that CG models and BoD practices are influenced by national laws and tend to incorporate cross-national differences (Lane et al. 2006; Aguilera and Jackson 2010; Mallin 2011). This is the case in Italy, where there is high ownership concentration, limited role of financial markets and dominance of family-owned companies (Merendino and Melville 2019). This could limit generalization of studies across different countries. Nonetheless, we believe that some interesting findings outlined in this study could be extended beyond the Italian context. To address our research questions, we collected data on BoD attributes and financial performance over a four-year period (2014–2017) from a sample of 184 SMEs based in the Verona and Vicenza provinces (northern Italy), most of which were family firms according to Corbetta's definition (1995). In our analysis, we used an ordinary least squares (OLS) regression model, in which the BoD attributes and other control variables acted as regressors, whilst the financial ratios for the subsequent years acted as dependent variables. In this way, we tried to reduce potential endogeneity problems of simultaneity or bias selection (Afrifa and Tauringana 2015). The article is structured as follows. "Theoretical framework and literature review" section presents a review of the literature and the research hypotheses. "Empirical research: model, data and analysis " section describes the methodology of our research, including the sample and variables considered, and the results with some robustness checks. Finally, "Conclusion, limitations and future research" section contains conclusions and limitations, and outlines some implications of the present study.

Theoretical framework and literature review

Board of directors and financial performance: theories and roles

In recent years many contributions of the literature have addressed topics concerning the board of directors. Among them and mostly concerning large companies, a relevant group of studies focused on the supposed influence of BoD demographic attributes – such as BoD size, board meetings, and CEO tenure, which are directly observable, thus more reliable and replicable (Iturralde 2016 et al.) – on financial performance, identifying in the agency theory the main support for their argumentations (Zahra and Pearce 1989; Johnson et al. 1996). Stemming from the separation of ownership from control (Jensen and Meckling 1976), the BoD has the formal and legal responsibility to control and maintain organisational operation and effectiveness (Zald 1969). Therefore, the BoD has an important controlling role, being responsible for hiring, firing, monitoring and remunerating managers. Checks and balance mechanisms, composition rules such as the number of BoD members (Muth and Donaldson 1998) or presence of non-executive directors (NEIDs) (Daily and Dalton 1993), BoD practices, like board remuneration according to results (Main et al. 1996), should be appointed by the BoD to reduce agency costs, thus safeguarding shareholders' interests (Jensen 1993).

Studies on CG indexes considered BoD attributes among the variables used to determine corporate governance ranking across companies and to evaluate its effects on financial performance (Bhagat and Bolton 2008; Renders et al. 2010).

According to Zahra and Pearce (1989), a BoD has three specific roles: control, service and strategy. The control role is strictly supported by the agency theory framework and is empirically carried out through a set of activities, such as monitoring of the chief executive officer (CEO), CEO duality (CEO and president must be different people), and presence of internal committees, etc. The service role is related to supporting activity of the BoD to the company structure, which includes shaping corporate identity, managing stakeholder relations, supporting managers' activity, 'wide spreading' information, and enforcing codes of conduct. Finally, the strategic role deals with its actual involvement in strategic planning and support to other strategic issues. Each of these three roles of the BoD entail board attributes with different emphasis and influence on company financial performance.

BoD attributes can be grouped into four categories: composition, characteristics, structure and processes (Zahra and Pearce 1989). Composition denotes the size of the board and the presence of non-executive independent directors (outsider directors). Characteristics is related to the profile and experience of directors. BoD composition tends to influence BoD characteristics which can have an effect on the next two categories of attributes – structure and processes. Structure deals with structural elements such as the presence of committees and other related issues, whereas the processes category deals with how the BoD works (such as decision-making process, risk analysis and management, policy rewards, and external disclosure). Other theories have been used to interpret the relationship between BoD attributes and financial performance, particularly the resource based view and the stewardship theory (Hung, H. 1998). The resource based view is based on the idea that a firm can gain a sustainable competitive advantage by exploiting the resources and capabilities under its control when these resources are valuable, imperfectly imitable and irreplaceable

(Barney 1991; Barney et al. 2001). Under this view, the BoD is seen in terms of experience and knowledge which would make any board distinct and inimitable (Madhani 2017). The BoD can be a source of competitive advantage in SMEs (Carney 2005) and, in turn, it can enhance the performance of the firm (Hillman and Dalziel 2003). The stewardship theory states that managers should operate in the interest of shareholders and act as 'good stewards' (Donaldson and Davis 1991). According to this view, the BoD could strive less for the control role, as it is motivated towards organisational goals rather than personal interests because of trust and respect for authority (Davis et al. 1997), or because of parental altruism in cases of family firms (Samara and Berbegal-Mirabent 2018). Consequently, small boards are preferred to large ones, NEIDs are recommended for better understanding the business (Madhani 2017), and the focus is on strategies. This appears to be a proper description for the typical unlisted SME context (Jaskiewicz and Klein 2007).

The board of directors in the context of small and medium enterprises

The agency theory assigns a primary control role to the BoD. Service and strategy play secondary roles. This is particularly true in large firms, whereas in SMEs the situation is partially different. As outlined by Jensen and Meckling, if ownership and management tend to overlap, the need for balancing and controlling the two opposite positions is consequentially reduced (Jensen and Meckling 1976). They posit that the sole proprietorship company should be without 'agency problems', as principal and agent are the same person. Conversely, ownership concentration in the form of large-block shareholders (La Porta et al. 1999) – which is typical for SMEs – can generate inefficiencies in corporate control, low transparency and opportunistic behaviour (Schillaci and Faraci 2002). Indeed, SMEs could suffer from other forms of agency problems like minority shareholder expropriation, inefficient risk-bearing, and underinvestment (Fama and Jensen 1983). These drawbacks could be exacerbated in family firms, where those benefits remain with the controlling family (Villalonga and Amit 2006). Notably, family SMEs may be affected by the "entrenchment "effect which happens at high levels of family control, when family member directors remain "entrenched "in their positions pursuing their own interests rather than that of the other shareholders (Oswald et al. 2009; Carney 2005; Aguilera and Crespi-Cladera 2012). Similarly, the long tenure of the founder or other family members in company top positions could be detrimental for the company's financial performance (Schulze et al. 2001). Studies on family firms reported mixed interpretations of the relationship between the role of the family and financial performance (Villalonga and Amit 2006), particularly in SMEs that have been less investigated (Cabrera-Suárez et al. 2001; Habbershon and Williams 1999; Habbershon et al. 2003; Sharma et al. 1997). Director or managerial ownership, which are quite common in SMEs, could be another solution by aligning the two interests, but the literature remains divided and both outside and inside managers were found to bring benefits to company profitability (Ang et al. 2000; Roffia 2019). SMEs cannot be considered as 'large companies on a small scale'. Their BoDs are the head of the company, often directly responsible for planning, implementing and controlling strategies (Pugliese and Wenstøp 2007), oversight of risks and the business in general, being even more important than in large companies (Gillan 2006) for influencing financial performance (Van den Heuvel et al. 2006). With their limited size (few

employees, managers and directors), SME governance mechanisms typically receive little attention and few resources (Huse 1990). Indeed, many good BoD practices recommended for large companies might be too expensive or difficult to implement, and might have to be adapted to a smaller context. Only recently, scholars have focused on some BoD attributes in SMEs and analysed their potential influence on a company's financial performance.

For example, Eisenberg et al. (1998) identified a negative correlation between board size and profitability in a sample of small and medium-size Finnish firms and hypothesized problems in communication and coordination. Bennett and Robson (2004), in a large sample of UK SMEs, found little evidence of a strong association of board size, board qualifications or board structure with firm performance. Abor and Biekpe (2007), referring to SMEs in Ghana, reported positive associations between several independent variables (board size, board composition, skill level of the management, CEO duality, inside ownership, family ownership and foreign ownership) and firm performance (ROA ratio). Bennedsen et al. (2008), analysing the causal effect of board size for almost 7000 SMEs in Denmark, found negative effects on financial performance for board size when it exceeded six or more members. Lappalainen and Niskanen (2012), in Finnish SMEs, identified a positive influence on financial performance (ROA) with managerial ownership, whereas outside board members led to both lower growth rates and profitability. Arosa et al. (2013) investigated the effect of board composition, size, activity, leadership structure and CEO tenure on firm performance (ROA ratio) and reported negative relationships between outsiders and board size. Afrifa and Tauringana (2015) analysed the effect of board size, CEO age and tenure, NEIDs and directors' remuneration on the performance (Tobin's Q) of listed SMEs in the UK and found that board size and directors' remuneration had negative effects, whereas CEO age and tenure had positive ones. Al-Najjar (2015), in UK SMEs' cash holding context, reported limited relevance of the agency theory and weak CG mechanisms.

Still considering SMEs, Iturralde et al. (2016) tested the relationship between board characteristics and company performance (ROA), reporting a negative impact of outside directors and board size.

The above-mentioned literature is rather limited and does not offer a convincing and clear-cut interpretation of the contribution of BoD attributes, singularly and in combination, to SME financial performance. It has been observed that it is not always necessary to conclusively choose one theoretical perspective over another, as each may be partly suitable in any given situation (Lewis and Kelemen 2002). Indeed, a sort of theoretical pluralism rather than just a substitution of one dominant theory by another is necessary to increase the number of studies on CG (Roberts et al. 2005). Additional perspectives to overcome the partiality of the agency theory were recommended by Donaldson and Davis (1991), whereas other scholars have proposed a multi-theory approach to analyse both corporate governance and BoD issues, particularly in smaller firms (Daily et al. 2003; Bammens et al. 2011). Further research is required, particularly to analyse the inner workings of the BoD (Hermalin and Weisbach 2003). Empirical data suggests that boards have a broader role than just that of control (Roberts et al. 2005) and that other board characteristics (in addition to demographic ones) should be taken into consideration in relation to company financial performance (Johnson et al. 1996; Minichilli et al. 2009). Indeed, in SMEs, a better understanding of BoD contribution to financial performance could be reached by using

a combination of models, rather than choosing one among them (Corbetta and Salvato 2004).

As a matter of fact, the agency approach to BoD, which supports the controlling role of the board and related attributes, such as board size, presence of NEIDs, monitoring of conflicts of interest, and BoD member remuneration according to financial results (Morck and Yeung 2003), does not adequately consider the other two roles, service and strategy, which are particularly relevant in SMEs (Minichilli et al. 2009).

On the other hand, the resource based view emphasizes the importance of the BoD's service and strategy roles, which shapes specific BoD attributes like the profiles and competencies of BoD members, participation in strategic and control processes, decisions supported by adequate documentation or risk analysis. Therefore, to achieve our research purposes, we decided to refer to more than one theory, namely the agency theory and the resource based view (Hillman and Dalziel 2003; Van den Heuvel et al. 2006).

Hypotheses formulation

As previously observed, service and strategy roles of SME BoDs are probably even more important than in large companies. This holds particularly true in family firms, where the advice role of the family is prevalent (Bammens et al. 2008). The BoD is a precious 'resource' for the company, which is able to create and sustain competitive advantages, thus supporting financial performance (Carney 2005; Madhani 2017; Hillman and Dalziel 2003). BoDs are common to the vast majority of companies; but their attributes, downsized from large companies, vary greatly due to other contextual factors (e.g. company size, growing trend, corporate governance structure). Previous studies, have found certain associations between some BoD attributes and company financial performance. In this study, we considered many other BoD attributes, alone and in combination, that have often been recommended by scholars, by corporate governance codes and professional associations of companies in their principles and best practices for BoDs. Following the previous considerations, we propose the following hypotheses:

Hypothesis 1 (Hp1): BoD attributes influence an SME's financial performance.
Hypothesis 2 (Hp2): The four categories of BoD attributes, (composition, characteristics, structure and processes) singularly or in combination, influence a SME's financial performance.
Hypothesis 3 (Hp3): Adopting the best or recommended practices from corporate governance codes or associations of companies, SMEs could enhance their financial performance.

Empirical research: model, data and analysis

Model and variables specification

Previous studies on both large companies and SMEs have found associations between BoD attributes and financial performance, particularly when adequately controlling for endogeneity and bias selection (Bhagat and Bolton 2008; Renders et al. 2010). For our

purposes, we defined a model to interpret a supposed relationship between a set of independent variables related to BoD attributes plus a few control variables and SME financial performance. As one of the purposes of our study was to investigate BoD attributes from an 'operational approach,' we considered the above-reported literature, suggestions from studies on CG indexes (G-index by Gompers et al. 2003 and other papers like Cuomo et al. 2016; Bhagat and Bolton 2008) plus recommendations from professional sources, such as the Italian Corporate Governance Code (Comitato per la Corporate Governance 2018) and the Principles for the Corporate Governance in non-listed family companies (Marchetti et al. 2017). We began in Italy, because CG is connected to the political and cultural contexts in which companies operate. Secondly, we looked at documents issued specifically for SMEs by stock exchange authorities, such as the Code de Gouvernement d'Entreprise (Middlenext 2016), the Buysse Code III (CCGEM 2017) and the Corporate Governance Code for Small and Medium Enterprises (Dubai SME 2012) or by professionals, including the document 'Corporate Governance Guidance and Principles for Unlisted Companies in Europe' issued by the European Confederation of Directors' Associations, which is a non-profit association and which represents ten national institutes of directors (ecoDa 2010). Other corporate governance codes considered for their worldwide importance were the UK Corporate Governance Code (Financial Reporting Council 2016) and the King Code of Governance Principles for South Africa (IoD Southern Africa 2016). Thirdly, we examined the most recognised document on CG issued by the OECD, namely "Principles of Corporate Governance "(OECD/G20 2015). All these documents contain interesting recommendations and suggestions for 'good' BoD attributes which we considered for selecting our variables even for SMEs.

In our model, we limited the number of BoD attributes to twelve (for simplification purposes) following Zahra and Pearce's taxonomy (1989), and chose at least one variable for each category.

Regarding the first category A) Composition, we selected two variables: 1) BoD size in terms of members (B_SIZE); and 2) presence of non-executive independent directors (NEIDs). Various scholars considered these demographic characteristics in their studies and found, for board size, positive (Eisenberg et al. 1998; Mak and Kusnadi 2005; Arosa et al. 2013; Lee and Filbeck 2006; Bennedsen et al. 2008), negative (Hamad and Karoui 2011) or even non-linear shapes, particularly in large or listed companies (Cheng 2008; Coles et al. 2008; Conyon and Peck 1998; Dalton et al. 1999; Guest 2009; Mak and Kusnadi 2005; O'Connell and Cramer 2010; Yermack 1996; Coles et al. 2008; Robinson and Schumacker 2009). Similarly, for NEIDs presence findings were contrasting both for large companies and SMEs [Daily and Dalton 1993; Duchin et al. 2010; O'Connell and Cramer 2010; Perry and Shivdasani 2005; Wagner et al. 1998, Abor and Biekpe 2007; Hamad and Karoui 2011 Arosa et al. 2013; Basco and Voordeckers (2015); Samara and Berbegal-Mirabent 2018].

Regarding the second category, we chose one variable, 3) the adequacy of BoD competences and skills (B_PROF), which was recommended by professional bodies [King IV Report on Corporate Governance for South Africa (IoD Southern Africa 2016); Corporate Governance Guidance and Principles for Unlisted Companies in Europe issued by the European Confederation of Directors' Associations (ecoDa) (2010)] and was investigated by a few scholars (Daily and Dalton 2004; Adams et al. 2017; Norburn 1986) also in SMEs (Abor and Biekpe 2007). Considering the

C) structure category, we selected two variables, namely 4) the presence of committees or individual delegates for internal controls, evaluation of BoD member profiles and remuneration (COMM) and 5) the adequate and timely documentation provided to BoD members (A_DOC). The first has been recommended by professional bodies in many countries, particularly in large listed firms (Comitato per la Corporate Governance 2018) and by Klein (1998). The second was supported by Arosa et al. (2013); Iturralde et al. (2016) and by FRC (2016) and ecoDa (2010).

Finally, regarding the D) Processes category, we identified seven other BoD-related variables. The first is 6) frequency of BoD meetings (M_FREQ), which was considered by both professional bodies and scholars (Lipton and Lorsch 1992; Gabrielsson and Winlund 2000; Vafeas 1999; Adams 2003; Brick and Chidambaran 2010; Arosa et al. 2013; Iturralde et al. 2016). Other variables we selected were 7) monitoring of conflict of interest (C_INT), which was recommended for both large firms and SMEs (ecoDa 2010; O'Reilly and Chatman 1996), 8) frequency of the BoD plan-do-check-act cycle (B_PDCA) (Pietrzak and Paliszkiewicz 2015; Committee on the Financial Aspects of Corporate Governance 1992; FRC 2016) and 9) BoD use of reports from independent auditors (A_USE) (FRC 2016; Watts and Zimmerman 1983).

The next variables considered were: 10) BoD risk analysis and management (B_RA), recommended by both professional bodies (Comitato per la Corporate Governance 2018; CoSO 2013; CoSO 2017) and scholars (Sobel and Reding 2004; Hoyt and Liebenberg 2011; McShane et al. 2011; Baxter et al. 2013; Farrell and Gallagher 2014; Gordon et al. 2009; Florio and Leoni 2017), 11) BoD remuneration based on financial performance (B_REM), which has wide consensus in both large companies (Jensen and Murphy 1990; Murphy 1999; Abowd 1990; Core et al. 1999; Gerety et al. 2001; Gregg et al. 1993; Fernandes 2005; Coles et al. 2001; Main et al. 1996) and SMEs (Wang et al. 2016; Aaron et al. 2013), and 12) communication of financials and other relevant information to stakeholders (E_DIS), which has been addressed by the literature mainly in reference to large firms (Farvaque et al. 2011; Healy and Palepu 2001; Jiao 2011; Lee and Yeo 2016).

We also considered in our model some control variables that previous studies found to influence firm performance (Coles et al. 2008). This allowed us to better control for potential bias due to omitted variables. A first group of control variables considers company financials, such as total assets (T_ASS), as larger firms have been found to be more profitable (Barontini and Caprio 2006; Arosa et al. 2013), sales variation (S_VAR), because growing firms revealed higher profitability (Arosa et al. 2013) and leverage (LEV), which negatively influences financial performance (Gompers et al. 2003; Alimehmeti and Paletta 2014). A second group deals with contextual factors, such as firm age (F_AGE) since profitability has been inversely correlated with it (Aldrich and Auster 1986; Arosa et al. 2013; Iturralde et al. 2016) and medium size (M_SIZE), because larger firms are supposed to be more profitable (Aldrich and Auster 1986; Iturralde et al. 2016). Two other variables considered were generational changes (G_CH) for which the literature reports with both positive and negative effects (Bennedsen et al. 2007; McConaughy and Phillips 1999) and family firm (F_FIRM), which in some studies were better performers (Miller et al. 2007). This depended also on family firm definition (Mazzi 2011; Miller et al. 2007; Shanker and Astrachan 1996). Family members were identified by their surnames (Arosa et al.; De Massis et al. 2015), using the definition proposed by Corbetta (1995), who identified a family

firm when two or more members of the same family (or two or more families) own enough shares to control the company. Lastly we considered director ownership which could be beneficial to financial performance in SMEs (Roffia 2019).

Figure 1 presents an overview of the model, whereas Table 1 contains a summary of all the variables considered.

We kept those variables separate and did not group them into one single factor to appreciate their individual contribution to financial performance. In the economic literature, various studies on CG and BoD attributes have used this approach both for one or two variables (Daily and Dalton 1993; Yermack 1996; Eisenberg et al. 1998; Vafeas 1999; Mak and Kusnadi 2005; Bennedsen et al. 2008) and for larger sets of variables (Coles et al. 2001; Abor and Biekpe 2007; Arosa et al. 2013; Afrifa and Tauringana 2015). In particular, in model [1] the dependent variable ROA_{it} measures the financial performance of SMEs for each company i and year t (where t = 2014, …, 2017).

We are aware that our analysis may be affected by a potential endogeneity problem (Hermalin and Weisbach 2003; Wintoki et al. 2012). Possible methods to address this concern are the two-stage least-square (2SLS) analysis (Weir et al. 2002) and the Generalised Method of Moments (GMM) designed by Arellano and Bond (1991). However, *given* the high number of variables jointly considered in our model, we were unable to find adequate instrumental variables to perform a 2SLS regression or to apply the GMM method (Chenhall and Moers 2007*;* Wintoki et al. 2012). For this reason, we decided to control for possible endogeneity with a time lag, particularly by investigating the association between the 2014 BoD attributes of a firm and its financial performance in the following years (at the end of 2014, 2015, 2016 and 2017), assuring that the 2014 data remained unchanged over the subsequent period (Afrifa and Tauringana 2015; Al-Najjar 2015; Mina et al. 2013). Indeed our data collection from late 2016, 2017 and 2018 gave us precious information on changes in BoD attributes that occurred in our reference period. The presence of this lag allows the former to have an effect over the latter (Zahra and Pearce 1989; Klein 1998; Ling and Kellermanns

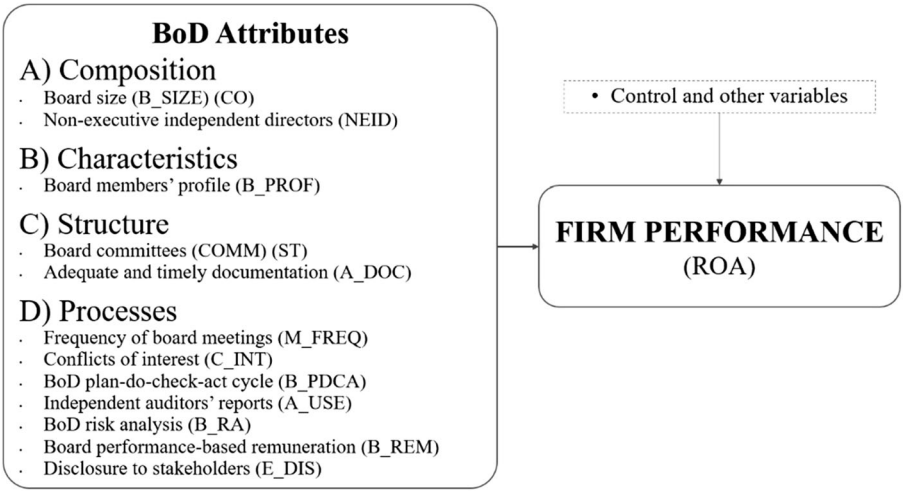

Fig. 1 Overview of the model

Table 1 Definition of variables

Variable name	Description
B_SIZE [a]	A variable that accounted for the total number of BoD components (1: BoD composed of two members; 2: BoD ranging from three to five members; 3: BoD ranging from six to seven members; 4: BoD ranging from eight to 10 members; 5: BoD composed of more than 10 members)
NEID [a]	A variable that measured the proportion of NEIDs to BoD members (1: absent [0%]; 2: 10%; 3: from 10% to 20%; 4: from 20% to 40%; 5: more than 50%)
B_PROF [a]	A variable that evaluated the variety of competences and adequate skills of BoD members (1: absolutely not; 2: a little; 3: more yes than not; 4: almost always; 5: very much)
COMM [a]	A variable to assess the presence of nomination, remuneration and audit committees (or individual delegates) (1: none of the three present; 2: at least one present; 3: at least two out of three present; 4: all three committees active; 5: great emphasis on the activity of the committees)
A_DOC [a]	A variable based on the degree of adequacy and timeliness of the documentation given to BoD members (1: absolutely not; 2: a little; 3: more yes than not; 4: almost always; 5: very much)
M_FREQ [a]	A variable accounting for the frequency of BoD meetings per year (1: one or two; 2: three or four; 3: five or six; 4: one per month; 5: more than 12)
C_INT [a]	A variable that considered the level of detection, communication and management of conflicts of interest (1: absolutely not; 2: a little; 3: more yes than not; 4: almost always; 5: very much)
B_PDCA [a]	A variable measuring the frequency of the PDCA cycle conducted by the BoD in 1 year (1: never; 2: once a year; 3: every three months; 4: every month; 5: several times a month)
A_USE [a]	A variable that monitored the BoD attention to the independent auditors' reports (e.g., from statutory auditors) (1: absolutely not; 2: a little; 3: more yes than not; 4: almost always; 5: very much)
B_RA [a]	A variable that accounted for the BoD risk analysis during the year (1: never; 2: once a year; 3: between two and three times per year; 4: between four and six times; 5: more than six times)
B_REM [a]	A variable measuring how much the remuneration of the BoD was performance based (1: absolutely not; 2: a little; 3: more yes than not; 4: almost always; 5: very much)
E_DIS [a]	A variable that recorded the degree of disclosure of relevant information to stakeholders (1: absolutely not; 2: a little; 3: more yes than not; 4: almost always; 5: very much)
T_ASS	Logarithm of total assets, proxy for company size
S_VAR	Sales revenues variation (in %), proxy for company growth
LEV	Total debts over total assets
F_AGE	Logarithm of number of years of activity from establishment
M_SIZE	A dummy taking the value 1 for a medium-sized company and 0 otherwise
F_FIRM	A dummy has the value of 1 if it is a family firm according to Corbetta's definition (1995) and 0 otherwise
G_CH	A variable measuring the number of generational changes from founding
D_OWN	A variable that measured in which percentage (over total equity) shareholders have an active role in the BoD (1: none or very little 0-5%, 2: very little 6-20%; 3: a little 21-30%; 4: enough 31-49%; 5: very much more than 50%)
Y2015	A dummy taking the value 1 if financial data were for 2015 and 0 otherwise
Y2016	A dummy has the value of 1 if financial data were for 2016 and 0 otherwise
Y2017	A dummy taking the value 1 if financial data were for 2017 and 0 otherwise

Table 1 (continued)

Variable name	Description
INDUSTRY dummy n	Dummies (from 1 to n) taking the value 1 when the company belonged to a certain INDUSTRY and 0 otherwise as done by Gompers et al. 2003
ROA	Earnings before interests and taxes divided by total assets
ROA^	Net income divided by total assets
ROS	Earnings before interests and taxes divided by sales revenues
EVA	Net operative profit after taxes (NOPAT) minus weighed average cost of capital (WACC). See robustness test paragraph for more details.

[a] Values in Likert scale (1–5)

2010; Mazzola et al. 2013). To enhance analysis reliability of the model, we decided to control for both industry and time-period fixed effects (Coles et al. 2008). This allowed us to control for unobserved time and industry-invariant fixed effects, thus reducing other potential sources of simultaneity bias that might exist at an industry level (Cornett et al. 2007). Industry adjustments are made by adding dummy variables according to the European NACE code at the two-digit level (our 25 different NACE codes were reduced to 14, in order to have at least 4 SMEs in each group).

$$
\begin{aligned}
ROA_{i,t} = {} & \beta_0 + \beta_1 B\_SIZE_{i,2014} + \beta_2 NEID_{i,2014} + \beta_3 B\_PROF_{i,2014} \\
& + \beta_4 COMM_{i,t} + \beta_5 A\_DOC_{i,2014} + \beta_6 M\_FREQ_{i,2014} \\
& + \beta_7 C\_INT_{i,2014} + \beta_8 B\_PDCA_{i,2014} + \beta_9 A\_USE_{i,2014} \\
& + \beta_{10} B\_RA_{i,2014} + \beta_{11} B\_REM_{i,2014} + \beta_{12} E\_DIS_{i,2014} \\
& + \beta_{13} E\_DIS\text{^}2_{i,2014} + \beta_{14} T\_ASS_{i,t} + \beta_{15} S\_VAR_{i,t} + \beta_{16} LEV_{i,t} \\
& + \beta_{17} F\_AGE_{i,2014} + \beta_{18} M\_SIZE_{i,2014} + \beta_{19} F\_FIRM_{i,2014} \\
& + \beta_{20} G\_CH_{i,2014} + \beta_{21} D\_OWN_{i,2014} + \beta_{22} Y2015 + \beta_{23} Y2016 \\
& + \beta_{24} Y2017 + \beta_n INDUSTRY dummies + \varepsilon_{i,t} \qquad (1)
\end{aligned}
$$

The most common measures for evaluating a firm financial performance are financial ratios (Delen et al. 2013). In accordance with other studies, in our model we selected the ROA ratio as the dependent variable, a proxy for financial performance. Therefore, the impact of the financial, non-current and fiscal positions on each company was not considered (Anderson and Reeb 2003; Abor and Biekpe 2007; O'Connell and Cramer 2010; Arosa et al. 2013). We also used in our robustness checks ROA^ ratio (net income over total assets), ROS ratio (EBIT to Sales Revenues) and economic value added (EVA). Conversely, we did not considered Tobin's Q because it might have been affected by severe accounting practice problems, and by the impossibility of determining its value because SMEs are often unlisted (Demsetz and Villalonga 2001; Coles et al. 2001; Varshney et al. 2012).

Italian SMEs, sample selection and characteristics

As of 2017, approximately 4.4 million firms were operating in Italy (ISTAT 2020), 150,000 of which are small-to-medium firms (CERVED 2018). Similarly to the rest of the world, Italian micro, small-to-medium sized companies account for more than 95% of total firms and employ more than 90% of the workforce. Excluding micro-companies, SMEs account for around 40% of the sales turnover and the value added in the non-financial sector (CERVED 2018). We carried out our analysis by applying our model to a panel data of Italian companies operating in two provinces (Verona and Vicenza) to obtain a homogeneous sample (De Massis et al. 2013) and to ensure the best contacts with companies and their main associations (i.e., Confindustria and API, which are the most representative associations of companies for this company size and area). We considered only companies belonging to the manufacturing (C), construction and buildings (F), and grocery and distribution (G) macro-sectors, which accounted for more than 50% of the overall companies active in the two provinces. In selecting SMEs, we used as a threshold the number of employees (which had to be in the range of 10–249 employees). Micro companies (less than 10 employees) were excluded owing to the lack of structured BoD processes. We also excluded unlimited liability companies, which are typically very small and because Italian legislation does not require them to disclose financial statements. Companies that were insolvent, under liquidation or had no activity (i.e., in special situations that may affect data) were not considered, nor were companies that had some particular legal forms, such as consortiums or cooperatives.

Considering the above-mentioned criteria, we identified around 5000 SMEs active in 2014 that were contacted for our survey (statistics from ISTAT – the Italian Institute of Statistics, indicate 5040 companies, whereas data from the Italian Public Register of Companies identify 4905 active firms with legal entity in the two provinces, excluding consortiums and cooperative organisations). All these firms were unlisted limited liability companies.

Sample data

Companies that met the aforementioned criteria were contacted via email or telephone to stress the purpose and the importance of this study and to provide detailed instructions on how to complete the questionnaire. Because the target sample was composed of small to medium-sized companies, questionnaires were addressed directly to the chairperson, the CEO or the CFO. Company answers referred to their situation in 2014. The questionnaire contained a space where the companies could give further information about potential changes having occurred in the interim. All the questions (reported in Appendix) were formulated regarding the specific context of SMEs. To make it easier to fill in the questionnaire, enhance the response rate and limit response bias, we used a pre-filled Likert scale (1–5) for most of the responses (e.g., for the evaluation of BoD meeting frequency, the scale was: 1 – one or two meetings a year, 2 – three or four, 3 – five or six, 4 – once a month, 5 – two or more a month). A sample of ten companies was used in a pre-test to calibrate the mean of the Likert scale to the possible distribution of answers. In 2016 and early 2017, we collected around 200 questionnaires. In the second semester of 2017 and 2018, we contacted companies again to

encourage non-respondents to comply in order for us to address the non-respondent bias. Eighty more questionnaires were collected. Returned questionnaires (276) were validated by analysing the coherence of answers and excluding companies that, according to Italian civil law, declared that they had no BoD (36 cases). Financial statement data and financial ratios of SMEs were collected in 2017 and 2018 from the AIDA database (Bureau van Dijk). Further, companies that with regard to their financial data surpassed ±100% for sales variation and ± 30% for EBIT/sales, EBITDA/sales, EBIT/total assets or net income/total assets ratios were not considered. SMEs with ROE fluctuations exceeding ±60% were also excluded. In the end, we winsorised data for approximately 10% over the set of the original respondents. In addition, 12 companies had to be eliminated because of missing financial statement data over the four-year period considered (we adopted a balanced panel data). The final number of respondents after the above reported exclusions was 184.

Bias control and representativeness of sample data

The number of comparable SMEs operating in the Verona and Vicenza provinces was 4905 companies (according to the Italian Register of Companies) but applying the same cuts that we used on the sample data in controlling for outliers, we had 3704 companies (3051 when requiring balanced panel data). A further exclusion criterion to align the two groups should have been done for companies that had no BoD. Unfortunately, we had no information about the absence of a BoD in the companies of our study area. In our sample data, 16.7% of companies were excluded because they had no BoD (in Italy in 1996, Corbetta and Tomaselli found 12% of companies with no BoD). Applying this percentage to the 3051 firms, we found 2541 'comparable' companies. The response rate between sample companies (184) and this last comparable set of SMEs (2541 companies) grew to 7.2%, or 6.0% if we did not consider the final cut based on BoD absence. The return rate appears to be low, but it can be considered an appreciable result for the Italian context, where the average rate is typically low. Regarding Italian surveys by post, Corbetta and Tomaselli (1996) indicated a response rate of 2%–6%; Mazzola et al. (2013) and Gnan et al. (2015) in their research on Italian family businesses reported a response rate of 4.1% and 3.2%, respectively.

In order to control bias in respondents, we took four actions. First, to enhance the response rate we re-called companies to stress the importance of the research reassuring them that all the information given would remained anonymous and confidential. Second, we analysed the differences between the first and the last quartiles of respondents (47 responses for the two groups). The last quartile was made up of respondents that finally decided to reply but who without our "push "action in late 2017, probably were not planning to answer. Hasty replies from procrastinators might also have less reliability. The analysis of responses given by the two groups did not reveal substantial differences ($p < 0.05$). Second, in late 2018 and 2019, we interviewed a group of 20 companies to verify the validity of answers collected through the questionnaire to make sure there had been no variation since 2014. Only two respondents mentioned a variation, however these were not pertinent to our survey because they occurred after our study period (2014–2017). Third, due to the use of the Likert scale (1–5), we tested the internal coherence of data collected through the questionnaire by applying Cronbach's Alpha (Gnan et al. 2015). We calculated its values for the full set of 12

variables (the value was 0.6, a moderate internal consistency of data) and also singularly for each variable, analysing the variation in the Cronbach's Alpha value, when excluding the specific one (we found no relevant variations when excluding single variables). A fourth analysis dealt with a comparison of financial data between the population and our sample and this is reported in the next paragraph. In summary, our panel data comprised 736 observations referring to 184 companies, each of which had four financial data records (balanced panel data).

Some of the main concerns about the use of sample data in empirical studies centre on the "effect size "and the power of findings in addition to the statistical relevance of the results (Ellis 2010). We addressed these problems in our robustness paragraph. To consider the issue of the representativeness of our sample in relation to the SMEs of Verona and Vicenza limited liability companies, we considered their similarity in terms of industry, size, and financial results with three analyses.

We compared the proportion of manufacturing companies (C macro-sector) to the other ones and medium-size companies to total number of companies in the two groups. We found some statistically significant differences regarding macro-sectors and company size (C macro-sector companies accounted for 81% in our sample and 70% in Verona and Vicenza provinces; medium-size companies accounted for 35% in the sample and 16% in the others). In short, manufacturing companies were overrepresented in our sample contrary to grocery/distribution companies; medium-size companies were oversized, whereas the smaller companies (between 10 and 19 employees) were undersized. However, we believe that these differences should not affect the validity of our results for three main reasons: 1) our model [1] controls for structural characteristics of companies, such as sales turnover, total assets, company size and NACE code, 2) the average value of the dependent variable ROA has similar values in the sample and in Verona and Vicenza SMEs, and 3) the SME governance framework remains stable in the selected companies. We further address this issue in our robustness checks.

Third, thanks to the availability of financials data for all the Italian-registered companies in our selected area, we used the Z-test to verify the similarities between our sample companies (184) and the SME comparable population (3051), in relation to financials used in our research. The Z-test found no statistical differences between the two groups over the four years for Sales variation, ROA and ROA* ($p < 0.05$). Lastly, we analysed the appropriateness of the sample size for the data that we collected. Regarding the variables obtained through the questionnaires, because respondents used the 1–5 Likert scale, assuming an alpha level of 0.05 (which corresponds to 1.96 in Z-test values table, two-tailed), the maximum accepted error of 0.035 (that in a five-point scale is five times 0.036 or 0.18), a variance of 1.56, the minimum acceptable size of the sample is 185 units (Bartlett et al. 2001). We obtained similar results by adopting another approach based on the confidence interval ($Z = 1.96$ for $p < 0.05$, population = 4905/3051, variance = 2). Also considering financial data variables, we had a minimum sample size around 185 units ($p < 0.05$). In our regression model we also ensured that the ratio of observations to independent variables was not below the value of 5 (Bartlett et al. 2001). Under these assumptions our sample size of 184 companies could justify an extension of validity of our results to other SMEs.

Table 2 Descriptive statistics of variables

Variable	Sample N. 184				
	N.	Min.	Max	Mean	Std. Dev.
B_SIZE [a]	736	1	4	1.889	0.613
NEID [a]	736	1	5	1.399	0.926
B_PROF [a]	736	1	5	4.034	0.895
COMM [a]	736	1	4	1.225	0.674
A_DOC [a]	736	1	5	3.255	1.169
M_FREQ [a]	736	1	5	2.786	1.294
C_INT [a]	736	1	5	2.216	1.425
B_PDCA [a]	736	1	5	3.114	0.850
A_USE [a]	736	1	5	3.203	1.302
B_RA [a]	736	1	5	3.272	1.163
B_REM [a]	736	1	5	1.620	1.052
E_DIS [a]	736	1	5	3.175	1.287
T_ASS	736	13.291	18.511	15.926	1.173
S_VAR	736	−0.683	0.868	0.048	0.157
LEV	736	0.063	0.920	0.539	0.189
F_AGE	736	0.693	4.898	3.304	0.684
M_SIZE	736	0	1	0.353	0.478
F_FIRM	736	0	1	0.777	0.416
G_CH §	484	0	5	0.946	0.905
D_OWN [a]	736	1	5	4.576	1.051
ROA	736	−0.236	0.288	0.064	0.059
ROA^	736	−0.232	0.187	0.037	0.045
ROS	736	−0.171	0.275	0.056	0.052
EVA	735	−0.263	0.180	−0.005	0.055

([a]) = Values in Likert scale (1–5); § = 83 firms omitted this information

Descriptive statistics

Table 2 contains descriptive statistics for the aforementioned variables, including mean, standard deviation, minimum and maximum. Most of the variables monitored through the questionnaire had means of around a value of three (which is the mean and the median value of the Likert scale) and revealed distributions similar to the normal curve, confirming the validity of our pre-test phase for calibrating the scale. In our sample, the mean value for board size (B_SIZE) was 1.889, which corresponded to a number of BoD members close to three. As expected, boards tended to be small. The presence of NEIDs was very low (1.399), meaning that on average NEIDs were less than 10% of directors. These values were quite far from those for large firms found in other studies. Respondents declared that they paid a lot of attention (the mean was 4 over 5, almost always) to the fact that

their directors had a variety of competences and adequate skills (B_PROF). Firms revealed that they did not consider important (mean equal 1.225) the presence of committees or delegates for internal controls, nomination or remuneration issues (COMM). Companies probably benefited from the close relationships among directors, a typical situation for SMEs. Regarding the provision of adequate and timely documentation to BoD members (A_DOC), firms declared that they tended to provide good support to BoD activities (mean 3.255).

On average, the number of BoD meetings per year (M_FREQ) remained less than six (mean 2.786), indicating that they took place nearly every 2–3 months. In our sample, there were companies that had meetings very frequently or very few times a year, as indicated by the standard deviation (1.294). Boards, on average, did not waste too much time evaluating conflicts of interest of BoD members (C_INT), but a few companies had very different practices (mean 2.216, standard deviation 1.425). In SMEs, managers and shareholders tended to be the same person or social controls were more effective than formal ones. In our sample companies, the PDCA cycle (PDCA) was performed by the board around three times a year (3.114), confirming the strategic role of the BoD with a proactive approach to double-loop strategic learning. Respondents declared that the BoD, in most cases, adequately took into consideration the reports of independent and statutory auditors (A_USE) when they were present (mean 3.203). A standard deviation with a value of 1.302 indicated that some companies had different approaches, either strongly considering or giving no consideration to the prescriptions and suggestions outlined by auditors. The contribution to risk analysis by the BoD was declared to be important (B_RA), as discussions on main risks occurred on average three times a year (Likert value 3.272). In our sample, BoD remuneration (B_REM) was poorly linked to financial results (this happened only in a few cases, mean 1.620). External disclosure to stakeholders (E_DIS) was declared relatively important and frequent, but some companies revealed a notable dispersion from the mean value of 3.175 (standard deviation 1.287). For the 2014–2017 period, the financial data considered revealed a positive sales variation trend (+5%) and positive profitability for ROA (mean 0.064, standard deviation 0.059). Leverage of SMEs (debts to total assets) was slightly overweighed (0.539) compared with recommended values (less than 0.5), but it was expected due to the typical Italian undercapitalisation. Family firms accounted for 77.7% of total SMEs, in line with previous research in Italy by Gnan et al. (2015) which reported 82% family firms among SMEs. In Europe, the USA and other developed economies, family firms account for at least 70% (OECD 2017; Corbetta and Montemerlo 1999). Director ownership exceeded on average 50%.

Before running our model on the panel data, we analysed Pearson's correlation coefficients among explanatory variables and in relation to dependent ones in order to identify potential multicollinearity problems. We analysed the values which were statistically significant. In particular, relevant correlations (more than 0.4, $p < 0.05$) were found for A_USE in relation to T_ASS (0.45) and M_SIZE (0.44), and for B_RA with PDCA (0.48), and M_FREQ (0.39). Financial performance ratios (ROA, ROA^ and ROS) plus economic value added (EVA), which in our model are alternative dependent variables, had strong correlations between them ($p < 0.05$). According to

Field (2005), multicollinearity becomes an issue only when the correlation coefficient exceeds 0.80. All our coefficients among the explanatory variables remained below the indicated threshold, so multicollinearity should not be an issue (the correlation matrix is available upon request).

To test the hypotheses mentioned in "Theoretical framework and literature review" section, we performed OLS regression using Model [1] with ROA ratio as the dependent variable. As one variable (E_DIS) was inserted in a quadratic form, we mean-centred their values before running the regression, to reduce potential collinearity problems (Iacobucci et al. 2016).

For each regression, we calculated the variance inflation factor (VIF) of the independent variables to test for multicollinearity. Although some of the correlation coefficients showed a statistically significant correlation, VIF values never exceeded 5 (max VIF was 3.5), supporting evidence of no multicollinearity issues (according to Myers (1990), values over 10 suggest multicollinearity problems). In Table 3, column 1 reports the results of the complete model [1], which gives a good interpretation of the relationship between the independent and control variables and financial performance (adjusted $R^2 = 0.377$, $F = 8.509$, $p < 0.001$). Our F-statistic exceeded the critical value ($p < 0.001$) required to reject the null hypothesis, meaning that our model is overall significant. Seven variables related to BoD composition, characteristics, structure, and processes (i.e. B_PROF, COMM, A_DOC, C_INT, B_RA, B_REM and E_DIS) had a statistically significant coefficient and influenced company financial performance (ROA ratio) in our SMEs. Standardized coefficients for independent variables (available upon request) revealed that the most powerful variables were B_PROF (0.190), B_REM (0.198) and A_DOC (0.122) for positive effects, whereas E_DIS (−0.152), C_INT (−0.150/−0.133) and COMM (−0.080) had negative effects. This indicates that BoD attributes affecting characteristic, structure and processes are important for an SME's financial performance and that companies could influence their performance by adequately controlling these variables. In particular, BoD composition (B_SIZE), in terms of BoD size (Coles et al. 2008), had no effects on our sample SMEs, as also found in other studies. Regarding the NEID attribute (NEID), it did not influence financial performance. In line with previous results (Hermalin and Weisbach 1991, 1998), outsiders were not necessarily better than insiders in representing shareholders' interests in the SME context. On the contrary, our results confirmed ($p < 0.05$) that a BoD with adequate skills and competences (B_PROF) is a resource for the firm and can positively influence the ROA ratio. In our study, the presence of committees or individual delegates within the board (COMM variable) was limited to few cases and negatively correlated with performance ($p < 0.10$). In SMEs, this controlling role could be exercised by the shareholders, as it is more informal and efficient. The adequate and timely documentation given to BoD members before BoD meetings (A_DOC) also influences firm performance ($p < 0.01$), therefore well-informed BoD members are important. As regards BoD meetings (M_FREQ), our findings support any influence of their frequency on the ROA ratio. Informal meetings in SMEs could be more effective than formal ones. Monitoring potential conflicts of interest of BoD members (C_INT) negatively influences financial performance ($p < 0.01$). A possible explanation is that SMEs are characterised by high levels of social control and personal trust among BoD members, thus the cost of formal monitoring by the BoD could override benefits. Frequent PDCA cycles during the year (B_PDCA) as well as frequent, useful

discussions on audit reports (A_USE) do not influence financial performance. BoD frequent risk analyses and monitoring (B_RA) are associated with better performance ($p < 0.10$) (Sobel and Reding 2004). Linking BoD remuneration to performance (B_REM) had positive effects on the ROA ratio ($p < 0.01$), confirming the utility of this practice for SME boards as well. Indeed, linking BoD rewards to results may motivate BoD members to act as better stewards. Finally, we found a significant and non-linear association ($p < 0.01$) between E_DIS and the ROA ratio (inverted U-shape). Little or excessive disclosure to stakeholders was not beneficial to financial performance (maximum of 3 value – sufficient disclosure). At high levels of disclosure, costs could override benefits or strategic implications may reduce the opportunity of communication with stakeholders. We analysed this last relationship following the recommendations of Haans et al. (2016) regarding the shape of the curve.

In relation to control variables, the seniority of the company (F_AGE) had negative effects on financial performance, probably because older SMEs operate in a mature industry with less profitability, the entrepreneurial spirit or the willingness to innovate decreases over time, or the company simply tends to become adverse to risk (Aldrich and Auster 1986). Higher leverage (LEV) was associated with lower performance, as found by previous studies. As expected, growing companies (S_VAR) and medium-sized companies (M_SIZE) had better results ($p < 0.01$). Family firms did not reveal significant differences in performance (F_FIRM), at least considering the ROA ratio, whereas generational changes (G_CH) led to worse performance in our sample SMEs ($p < 0.01$). Director ownership had positive effects ($p < 0.01$)

To sum up, seven out of the twelve BoD attributes we selected for our model were statistically relevant in influencing the ROA ratio. Our findings underline the importance of three out of four BoD attribute categories. HP1, which stated a supposed influence of BoD attributes on financial performance, was confirmed. HP2 is only partially confirmed, as composition attributes (such as BoD size and NEID presence) were not relevant, whereas HP3, related to validity of prescription and suggestion by CG codes, associations of companies and professionals, was partially confirmed. In SMEs, BoDs have probably to face less agency problems than in large companies and can be a precious resource for enhancing firm performance.

Robustness tests

To check the robustness of our findings, we performed some additional tests to address possible issues of the reliability of the results to various alternative specifications in the model.

First, we decided to run alternative regressions with a limited dataset. Specifically, we considered observations for the years 2015, 2016 and 2017 singularly and in combination. This way we tested the relationship between independent variables, which referred to 2014, and financial performance of one, two or three years later. We gave time to the explanatory variables to test their influence on the independent one. The adjusted R^2 value and significance of most of the coefficients for the regressions were similar to previous results, confirming that our research design limited the reverse-causality issue.

Table 3 Multiple analysis of BoD variables on financial performance ($N = 736$)

			Alternative dependent variables for Model [1]		
	(1) ROA	(2) ROA	(3) ROA^	(4) ROS	(5) EVA
(Constant)	0.008	0.003	−0.002	−0.104**	−0.031
B_SIZE	−0.005	−0.002	−0.005	−0.002	−0.007
NEID	−0.002	−0.000b	−0.003	−0.002	−0.003
B_PROF	0.012***	0.005*	0.009***	0.012***	0.010***
COMM	−0.006*	0.002	−0.005**	−0.005*	−0.010***
A_DOC	0.006***	0.010***	0.005***	0.003*d	0.007***
M_FREQ	0.000a	0.001	0.001	0.002	0.000e
C_INT	−0.005***	−0.004***	−0.004**	−0.003	−0.002
B_PDCA	−0.002	−0.003	−0.001	−0.003	0.000f
A_USE	0.003	0.001	0.002	0.005**	0.001
B_RA	0.004*	0.006***	0.002c	0.003	0.000
B_REM	0.011***	0.010***	0.007***	0.007***	0.011***
E_DIS	−0.006***	−0.004**	−0.004***	−0.007***	−0.005**
E_DIS^2	−0.006***	−0.002	−0.004***	−0.006***	−0.003**
T_ASS	0.001	–	0.003	0.007***	−0.003
S_VAR	0.076***	–	0.058***	0.053***	0.071***
LEV	−0.069***	–	−0.074***	−0.086***	−0.016
F_AGE	−0.015***	–	−0.009***	−0.011***	−0.005g
M_SIZE	0.018**	–	0.013**	−0.008	0.013*
F_FIRM	−0.003	–	−0.002	−0.017**	0.009
G_CH	−0.010***	–	−0.007***	−0.008***	−0.010***
D_OWN	0.013***	–	0.006**	0.016***	0.007**
N.	736	736	736	736	736
Adjusted R^2	0.377	0.179	0.382	0.381	0.319
F-statistic	8.509***	6.179***	8.662***	8.631***	6.812***
Max VIF	3.494	3.687	3.494	3.494	3.494

***$p < 0.01$ **$p < 0.05$, *$p < 0.10$. Industry NACE and year dummies for fixed effects are omitted. a = 0,00006 b = −0,00007, c = p value equal 0.187; d = p value equal 0.102; e = 0,00003; f = −0,00006; g = p value equal 0.131

Second, we calculated the post-hoc powers of the regression Model [1]. We referred to Cohen's formulas for multiple regression (1988), determining high values both for size ($f^2 > 0.50$) and power analysis (the value we found was around 1), confirming the validity of our model.

A third was to check for sensitivity of the findings using alternative measures of firm size and years from establishment. We ran two separate regressions, considering both

total assets and firm age in absolute terms (our Model [1] considered these two variables in logarithms). The results were similar to the previous regressions.

Fourth, we ran the regression model without including control variables. In Table 3, column 2 shows the results of the OLS regression of Model [1] with time-period and industry-fixed effects, excluding control variables. The adjusted R^2 decreased to 0.179, but most of the variables remained significant (only COMM became insignificant), which provided further support for the hypothesised relationships between our BoD attributes and financial performance.

Fifth, we ran the regression Model [1] for the sub-set of small companies to test the invariance of results when focusing on a more homogeneous company size. The main parameters and significant coefficients remain unchanged.

Last, we performed a sensitivity analysis of our findings, using different measures of performance as the dependent variable in Model [1]. In particular, we considered: the ROA^ ratio, the return on sales (ROS) ratio and EVA (Economic value added). The ROA^ ratio has already been used in previous studies as an alternative measure of performance (Anderson and Reeb 2003). Finally, the EVA expressed the economic value generated in 1 year, as outlined by the Stern Stewart model (Stern Stewart 1996). For each study year, we subtracted the weighted average cost of capital (WACC) from the net operative profit after taxes (NOPAT). Because of the impossibility to acquire internal information, the NOPAT was set to the difference between EBIT and income taxes, minus the net cost for interests. The WACC considered separately the cost for debts and equity, the latter according to the capital asset price model (CAPM) applying the Damodaran tables approach (Damodaran online 2018) adapted to Italy's context. All the alternative measures of financial performance confirmed our previous results (the adjusted R^2 and F-statistics had similar values to the previous ones).

Conclusions, limitations and future research

BoD attributes in SMEs have received much less research attention compared to large companies. Missing were both a study on their influence (at least for most of them) on SME financial performance and their combined effects in light of the main requirements, and suggestions on CG codes and from associations of companies or professionals. This paper fills that gap. We hypothesised that the four categories of BoD attributes have an influence on company financial performance and that recommendations in the literature and CG codes, guidelines from associations of SMEs or professionals, regarding those attributes lead to better financial performance. To test these hypotheses, we conducted a survey on a sample of SMEs in the Veneto region of northeast Italy, and designed and implemented an OLS regression model with both industry and year fixed effects on a panel data for the 2014–2017 period. Our empirical results found significant associations between many of the BoD attributes that we identified and the ROA ratio, used as a proxy for financial

performance. Regarding the composition and characteristics of the BoD, we focused on three aspects: the number of directors, the presence of NEIDs and the BoD profile, in terms of skill and competences. Studies on large companies have found a relationship with performance for these variables. BoD size had no effect on financial performance of SMEs nor did presence of NEIDs within the BoD. On the contrary, BoD member profiles had a positive influence on the ROA ratio of SMEs.

Regarding the structure and processes carried out by the BoD, several aspects were tested: the presence of BoD committees or individual delegates, adequate and timely documentation for BoD meetings, frequency of BoD meetings, monitoring of conflicts of interest, PDCA cycle frequency, usage of independent or statutory auditor reports, BoD risk analysis and discussion, remuneration of directors and external disclosure of financials and relevant information. Significant and positive influences on the ROA ratio were found for the following BoD attributes: provision of adequate and timely documentation, frequency of meetings devoted to risk analysis and management, and performance-based remuneration of BoD members. A significant but negative relationship was found between both the monitoring activity of conflicts of interest and the presence of committees or delegates within the BoD (for Internal controls, appointing executives or determining their remuneration) and financial performance. Social control among BoD members and lean structures are likely to be better than the use of bureaucratic and costly structures. Communication with stakeholders was statistically significant and had its highest contribution at middle levels, whilst low or high values were detrimental to financial performance. Our study supports both the importance of BoD attributes related to characteristic, structure and processes in influencing SMEs' financial performance and the validity of related prescriptions and suggestions issued by CG codes, associations of companies and professionals.

This research has some limitations. First, although we controlled for reverse causality, this could not be excluded completely. Second, data were collected in a limited geographic area (northern Italy, in particular the provinces of Verona and Vicenza), thereby limiting the possibility of generalising results. Third, we used a 1–5 Likert scale, which may reduce potential insights from our analysis. Fourth, we employed self-answered questionnaires that may introduce a potential bias in the data. Fifth, our sample size remained close to the minimum level acceptable in relation to the population, according to effect size and power analysis.

This paper contributes to the existing literature in three ways. First, it extended to SMEs the analysis of the influence of a broad set of BoD attributes on a firm's financial performance, both structural and related to processes. Some of these attributes have never been explored in the literature. With the insights of this paper, SME directors and managers will be able to identify the most effective BoD variables on financial performance and therefore will be able to concentrate their efforts on those that are more powerful. Second, this analysis is done considering these attributes all together in one single model, including some contextual factors, such as size, leverage, growing trend, age, generational change, familiness and director ownership. Thanks to our research design, it is possible

to analyse their mutual influences on financial performance, whereas previous studies focused mostly on only a few single effects. Third, this analysis was done considering the main recommendations of some relevant CG codes, guidelines from associations of SMEs or professionals who addressed BoD attributes, which have been applied to SMEs. This is particularly relevant for practical issues and to create a bridge between theory and practice in a broader CG framework for both large firms and SMEs.

SMEs are an important part of the economy, both numerically and in terms of generated value added and employment. For this reason, we believe that the literature should continue to investigate SMEs and their BoD attributes. Our findings support the evidence that boards actively contribute to an SME's value creation process, being a rare and unique resource through which to build competitive advantage.

Our research pointed out a set of BoD attributes that in our context had a positive influence on financial performance. In agreement with some studies, we used a multi-theoretical approach (Samara and Berbegal-Mirabent 2018). Indeed, our findings empirically support a joint interpretation of the effects of different BoD configurations on SME financial performance, with both agency theory and resource based view.

Our study started by analysing all three BoD roles (control, service and strategy) hypothesised by Zahra and Pearce (1989) and our results were coherent with their relevance. In spite of the limited organisational structure of SMEs, the BoD with its attributes assumes a central role in driving financial performance. For this purpose, directors, managers and shareholders should rethink BoD attributes in both structures and processes, requiring a structured 'governance function' for any company size. A right decision-making process supported by adequate documentation or an ongoing risk analysis and management should be carried out by any BoD to improve financial performance, regardless of whether the company is mature or newly set up. With the above reported considerations, our paper contributes to answering the question 'Why should we sustain the costs to establish a 'good' BoD?'

We plan to expand the present research by looking at how heterogeneity regarding firm size and family ownership affects the relationships between BoD attributes and financial performance observed at the aggregate level. For example, it might be interesting to explore this topic further by considering separately small and medium-sized firms, as the BoD of these categories could be very different (for instance presence of professional managers, frequency of BoD meetings, structured support for BoD meetings) (Lee and Filbeck 2006). Similarly, it would be stimulating to focus our analysis on a subsample of family and non-family firms, where the goal of profit maximisation is typically combined with the desire to pass the company on to subsequent generations (Anderson and Reeb 2003). Thus, the analysis of the relationship between BoD attributes and financial performance may be of great interest for a deeper comprehension of the mutual and recurring influence of family to business and vice versa, as noted in the family business literature (Habbershon et al. 2003).

Appendix

Structure of the questionnaire
(Answers must refer to the year 2014)

QUESTION			LIKERT SCALE (1–5)				
BOARD_SIZE: members of the BoD:	0 – BoD absent	N. Members	1 – two members	2 – from three to five members	3 – from six to seven members	4 – from eight to ten members	5 – more than ten members
NEID: What is the percentage of independent non-executive Directors in the Board?	0 – BoD absent	%. of Members	1–0%	2–10%	3 – from 10% to 20%	4 – from 20% to 40%	5 – more than 50%
BOARD_PROFILE: is the BoD made up of members with different profiles and skills?	0 – BoD absent	–	1 – Absolutely not	2 – not very	3 – more yes than not	4 – almost always	5 – very much
COMMITTEES: Are inside the BoD present committees or delegates for BoD nomination/ remuneration or for evaluating internal controls?	0 – BoD absent	N.	Committees/ Individual	1 – No	2–1 of 3	3–2 out of 3	4 – All 3
5 – All 3 with great emphasis							
ADEQUATE_DOC: BoD meetings are held delivering adequate and timely documentation:	0 – BoD absent		1 – Absolutely not	2 – not very	3 – more yes than not	4 – almost always	5 – very much
MEETING_FREQ: Are BoD meetings held:	0 – BoD absent	N. Meetings	1 – one or twice a year	2 –three or four times per year	3 – five or six times per year	4 – every month	5 – more than every month
CONFLICT_INT: How often are conflict of interest of BoD	0 – BoD absent		1 – Absolutely not	2 – not very	3 – more yes than not	4 – almost always	5 – very much

(continued)

QUESTION			LIKERT SCALE (1–5)				
members monitored and managed?							
BOD_PDCA: How often is the financial performance monitored in relation to business objectives in one year?	–	N. Meetings	1 – never	2 –once a year	3 – four times per year	4 – every month	5 – more than every month
IND_AUDIT_USE: Are report by independent auditors carefully discussed?	0 – IA absent	–	1 – Absolutely not	2 – not very	3 – more yes than not	4 – almost always	5 – very much
BOD_RA: How many times in one year directors analyse and discuss risks?	–	N. Meetings	1 – one or twice a year	2 –three or four times per year	3 – five or six times per year	4 – every month	5 – more than every month
BOD_REMUN: Are rewards of directors linked to performance?	–	% of Members	1 – Absolutely not	2 – not very	3 – more yes than not	4 – almost always	5 – very much
EXT_DISCLOS: Does the company communicate to its stakeholders (banks, employees, debtors, etc.) its results, financials and strategies?	–		1 – Absolutely not	2 – not very	3 – more yes than not	4 – almost always	5 – very much
D_OWN: In which percentage (over total equity) do shareholders have an active role in the BoD?	0 - BoD absent		1 None or very little (0-5%)	2 Very little (6-20%)	3 A little (21-30%)	4 enough (31-49%)	5 Yes, very much (more than 50%)

Acknowledgement The authors acknowledge Fondazione Studi Universitari of Vicenza for supporting this research.

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