AN EXPLORATION OF BOARD EFFECTIVENESS IN FAMILY BUSINESSES USING A SCALING APPROACH

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Abstract

This study addresses the call for the development of team effectiveness scales that take team context into account. It develops and validates a measurement scale for effectiveness in the specific context of boards of directors in family firms.
Results from a validation study based on 90 family businesses indicate that even if board task performance is associated with activities and roles that appear to represent differing views of effectiveness, they share a single, common line of inquiry. Moreover the study confirms that boards can be distinguished according to the degree to which they perceive themselves as more or less effective in performing certain roles. The scale demonstrates diagnostic properties that make it useful for practitioners as well as researchers.

Keywords: Board of Directors, Family Business, Role, Effectiveness

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INTRODUCTION

In 2003 a review of team effectiveness literature reveals that: "we are now at a key juncture in theory development. To truly push the field forward, (...) a more explicit consideration of team context is critical" (Gibson *et al.*, 2003:446). Additionally, the authors claim that, in order to develop empirical research, the development of measures of team effectiveness have become "essential" (Gibson *et al.*, 2003).

The focus of this article is on the measurement of team effectiveness in a particular context such as that of Family Businesses, i.e., business whose ownership is controlled by a family and where two or more family members work in the company or in some way have a significant influence on the business (Gersick *et al.*, 1997).

Recent reviews of family business literature (Gibb Dyer, 2006; Jaskiewicz and Klein, 2007) indicate that, although much has been investigated, the time is ripe to explore new paths in team research such as those related to boards of directors. As Uhlaner *et al.* (2007:232) indicate, only limited research to date considers the "differences between governance in family-held firms and non family privately held companies."

Corporate governance issues have received attention in international research over the past decade (Gabrielsson and Huse, 2004; Hart, 1995). The board of directors is one of the most important corporate governance tools influencing a firm's behavior (Forbes and Milliken, 1999; Johnson *et al.*, 1996; Pearce *et al.*, 1992). As a consequence, boards are the focus of many efforts to improve corporate governance, including, for example, recommendations issued by organizations such as the Business Roundtable (1997), the National Association of Corporate Directors (1996), and the Institutional Shareholder Services, Inc. (2005). This issue is significant particularly because companies owned or managed by a family are the predominant form of organization worldwide (Faccio and Lang, 2002; Holderness, 2009; La Porta *et al.*, 1999). Family businesses make important contributions to gross national products, job generation and wealth creation (Beckhard, 1983; Feltham *et al.*, 2005; Kelly *et al.*, 2000; Shanker and Astrachan, 1996).

Scholars claim that the role of the board of directors is even more decisive for family businesses

(Castaldi and Wortman, 1984; Corbetta and Tomaselli, 1996; Nash, 1988; Ward, 1991). In other words, the role of the board of directors in a family business is vital, as one of the most pivotal mechanisms of any corporate governance (Beiner *et al.*, 2004; Blair, 1995) and at the same time peculiarly problematic, given the special conditions of ownership and management in such businesses (Gersick *et al.*, 1997).

This study contributes to the literature by exploring board effectiveness in family firms. It specifically addresses the following research questions**: "How can board effectiveness be**

measured in a family business?" and **"How can family business boards be classified according to the level of perceived effectiveness?"** In addition, it addresses some methodological issues and applies Rasch analysis to validate the instrument proposed.

Rasch analysis is based on an Item Response Theory (IRT) model which is distinguished from other IRT models by one central characteristic: its fundamental statistical character (Andersen, 1973; Fischer, 1973; Rasch, 1960, 1980; Wright, 1977). The unique statistical characteristic of the Rasch model is that person and item parameters are algebraically separable and produce sufficient statistics (Masters and Wright, 1984; Rasch, 1980). Additionally, the Rasch model has been one of the most widely accessible and well-articulated of the item response models (Rasch, 1960, 1980; Wright and Masters, 1982; Wright and Stone, 1979).

HYPOTHESES

Extensive literature exists on the concept of effectiveness of workgroups in organizations (for reviews, see Bettenhausen, 1991; Cohen and Bailey, 1997; Gist *et al.*, 1987).

Boards qualify as groups and, in most cases, board effectiveness is defined as "a board's ability to perform its control and service tasks effectively" (Forbes and Milliken, 1999:492).

However, conceptual confusion has resulted when defining board effectiveness and roles (for a review see Gabrielsson and Winlund, 2000) and research uses different constructs to measure it. For example Minichilli *et al.* (2009) consider board effectiveness as a construct that describes at least six tasks related both to services (advice, networking and strategic participation) and control (behavioral, output and strategic control). Brundin and Nordqvist (2008) measure board effectiveness as the ability to solve moments of conflict, frustration, and distrust with moments of collaboration, harmony, and trust among the interacting board members (Brundin and Nordqvist, 2008). Other works consider effectiveness as the ability of the board to perform three key tasks: the service task, the monitoring task, and the networking task (Zona and Zattoni, 2007).

In addition, it has been claimed that family business boards are unique in their nature and perform some additional activities that are not performed in non-family boards (Lansberg, 1999). In this study we will examine how, and if, the various tasks of the boards that have been used in the literature can be used to describe board effectiveness and to differentiate among boards. In particular we review the literature and develop and validate a measurement scale that aims at being a valid and inclusive tool to measure board effectiveness in family firms.

Given the previous discussion, the following hypotheses were developed:

> Hypothesis 1: Even if board task performance is associated with activities and roles that appear to represent differing views of effectiveness, they share a single, common line of inquiry. That is, all of the various approaches to the definition of board effectiveness are related and share a common dimension that represents different aspects of a more general outcome that can be referred to as board effectiveness.
>
> Hypothesis 2: Boards can be distinguished based on the degree to which they perceive themselves as more or less effective in performing certain roles.

THEORETICAL BACKGROUND

In order to measure board effectiveness in family firms we developed a measurement scale. This scale is composed of a set of activities that boards generally perform in family businesses and is the result of research conducted at different stages. Stage 1 was the development of the items based on a review of literature that allowed us to gain inputs from previous studies in different though related domains (Churchill Jr, 1979). In stage 2, we examined content validity by asking a pool of 30 experts whether the items reflected the construct domain, the ease of understanding, and whether or not the behaviors described actually reflected roles and activities of the boards. In this way, the usefulness of the survey was also pilot-tested. In stage 3, we focused on the psychometric properties of the scale by assessing its reliability and the distinctness of its dimensions by using the Rasch analysis (testing Hypothesis 1). Finally, in stage 4, we examined how boards can be distinguished based on the degree to which they perceive themselves as more or less effective in performing certain roles (testing Hypothesis 2). In this section we present the results of stages 1 and 2.

The role and activities of the board of directors has been long debated (Andrews, 1981a, 1981b; Judge Jr and Zeithaml, 1992; McNulty and Pettigrew, 1999; Pugliese, *et al.*, 2009).

The most common distinction is between the board's *control roles* and *service roles* (Bammens *et al.*, 2011). In the existent literature however different positions exist with regard to boards' roles. A good way to present them is to consider the following distinction between the "passive" and the "active" school of though.

According to Pugliese *et al.* (2009) the potential contributions of boards to strategy have been considered over the past as rather limited because of their distance from day-to-day

operations, the presence of information asymmetries, and the need to remain independent (Charan, 1998; Conger *et al.*, 1998; Hendry and Kiel, 2004; Mace, 1971; Stiles, 2001). As a result, the board is seen as a controller while strategy is part of management activity. This is defined by Castro *et al.* (2009) as the "*passive school of thought* regarding the board's involvement in strategy" (Castro *et al.*, 2009:745). Moreover, in family businesses the CEO is typically a family-owner-manager. This implies that the power to propose career advancements, to choose directors and to take critical executive decisions is concentrated in the CEO's hands. In these cases the board might risk being no more than a legal structure dominated by the CEO (Mace, 1971) who might inhibit criticism from directors and hamper their involvement in the decision-making process (Stiles, 2001).

In contrast to the passive one, the *active school* of thought regarding the board's involvement in strategy sees directors as actors able to shape the strategic direction of the business and to generate and analyze strategic alternatives (G. F. Davis and Thompson, 1994; Demb and Neubauer, 1992; Finkelstein and Hambrick, 1996; Lorsch and MacIver, 1989; Roberts *et al.*, 2006). This can happen only when strategy is seen as the responsibility of both the management and the board. The board should act as a strategic partner with management (Anderson *et al.*, 2007) where *control* behavior is combined with collaborative behavior regarding questions of strategy (i.e., the *service* role) (Castro *et al.*, 2009). In this paper we espouse a view consistent with the results of an extensive review of literature concerning boards of directors in family businesses that shows that it was mainly those studies with a focus on both the control and service tasks that advanced the understanding of family business boards' effectiveness (Bammens *et al.*, 2011). This viewpoint relies on a mix of different perspectives such as agency, stewardship, resource dependence and stakeholder theories; each of which is referred to the main roles of the board (Bammens *et al.*, 2011).

Agency theory regards the activities of monitoring the behavior and performance of managers, with directors acting as fiduciaries of stockholders (Letza *et al.*, 2004). Agency theory addresses the relationship between a principal such as an owner, an agent, and the contract that binds them (Jensen and Meckling, 1976) . A problem that results from asymmetric information and divergences of interest between the two parties is a limited ability to select a reliable agent and to monitor his or her performance (Fama and Jensen, 1983). In family businesses, Agency problems emerge not only from "principal–agent conflict," but also from "owner–owner conflict" stemming from the divergent interests of majority and minority shareholders (La Porta *et al*., 1999; Le Breton Miller and Miller, 2009). For this reason in the list of activities that the board should perform we included protecting the interests of *all* owners (Fama and Jensen, 1983; Jensen and Meckling, 1976) *and* the company (Dossena, 2008). The associated board's **control** task refers to providing fiduciary oversight (Forbes and Milliken, 1999; Monks and Minow, 1995) and ensuring that the company complies with legal requirements.

Typical control activities are related to selecting, appraising and (in some situations) firing senior

managers and the CEO, and to providing feed-back to the CEO on senior management (J. A. Davis, 2006a). Considering the complexity of companies, in some cases the board can simply restrict itself to ratifying decisions based on information provided by managers and internal members (Daily and Dalton, 1994; Fama and Jensen, 1983; Mizruchi, 1983).

Stewardship theory regards stewards' pro-organizational, collectivistic behaviors and activities aimed at supporting and counseling management (J. H. Davis *et al.*, 1997). With regard to the associable board's **service** task, it refers to providing advice and counsel to the CEO and other top managers, and to participating actively in the formulation of strategy (Forbes and Milliken, 1999:492). Activities related to the service task are: helping management make decisions in the best interests of the business (Dossena, 2008; Ocasio, 1994; Pearce *et al.*, 1992; Zahra and Pearce, 1989); focusing the board and management on "the big picture" for business (J. A. Davis, 2006a; J. A. Davis, 2006c); contributing to the decision-making process and generating and analysing strategic alternatives (G. F. Davis and Thompson, 1994; Demb and Neubauer, 1992; Finkelstein and Hambrick, 1996; Lorsch and MacIver, 1989; Roberts *et al.*, 2005); helping management develop needed policies for the company (Anderson *et al.*, 2007; J. A. Davis, 2006a; J. A. Davis, 2006c; Johnson *et al.*, 1996); and providing expert and detailed insight during major events such as mergers and acquisitions (J. A. Davis, 2006a; J. A. Davis, 2006b).

Resource dependence theory (Hendry and Kiel, 2004) defines the board as a co-optative mechanism that extracts vital resources for company success by linking the firm to its environment and with other organizations thanks to its directors' connections. The board activity related to this involves accessing external resources such as knowledge and professional skills (Hillman *et al.*, 2000; Korac-Kakabadse *et al.*, 2001; Pearce *et al.*, 1992; Pfeffer, 1972; Pfeffer and Salancik, 1978).

Finally, **Stakeholder theory** claims that companies should balance the conflicting claims of

multiple stakeholders in order to achieve a coordinated solution which is satisfactory for all stakeholders (Donaldson and Preston, 1995; Hill and Jones, 1992). As Bammens *et al.* (2011) explain, this concept of balancing conflicting claims is also useful in order to address conflicts among owner coalitions, with the board of directors seen as an appropriate ground for goal negotiations and coordination (Freeman and Reed, 1983). The board role related to this can therefore be defined as the activity of coordinating corporate governance actions between the family, the business, and the owners.

Considering the importance of the board's assessments in determining board effectiveness (Conger *et al.*, 1998), we added the following item to the list of activities that an effective board should perform: "assessing board performance" which can be viewed as a board task itself.

The functions enumerated above are those that distinguish effective from ineffective boards. In general, they could apply equally both to family and to non-family businesses. However, in **family** businesses, the board of directors must have a particular knowledge of, and sensitivity to, the family side of the business. For this reason we will also include among the list of effective boards activities those that, according to the literature, apply only in the special context of a family business, since these are the areas in which the board can contribute effectively and bring an added value to the company. Examples of these activities are: Foreseeing and responding to "unthinkable" scenarios that involve the family and the business (Gersick, 1997); Acting as an emotional buffer to avoid conflicts between family members, (Lansberg, 1999; Tagiuri and Davis, 1982); Coordinating the governance of the family and of the businesses; Consulting, approving and supporting the succession plan (Tagiuri and Davis, 1982); Encouraging the definition of a shared Family Dream; and Consulting with regard to the leader's retirement plan and the extent to which it affects the business (Lansberg, 1999).

This review of literature (Stage 1) presented how the items of the scale (a list of board activities) were developed; the items are listed in Table 1. In Stage 2 we submitted this list to a pool of experts (individually). Thanks to the experts we were able to refine the wording of some items in order to increase the ease of understanding, and verified that the items actually reflected roles and activities of the boards in family firms. The discussions with experts confirmed that the items were properly formulated to measure the construct domain (board effectiveness in family firms). The next sections will regard Stages 3 and 4.

Table 1. Board Tasks in Family Businesses

Code	Item Description
BE1	Helping management make decisions in the best interest of the business
BE2	Focusing the board and the management on the "big picture" for business
BE3	Consulting with regard to the leader's retirement plan and the extent to which it affects that the business
BE4	Consulting, approving and supporting the succession plan
BE5	Contributing to the decision-making process
BE6	Coordinating corporate governance actions (between the family, the business, the owners)
BE7	Deciding about hiring, compensating and replacing the firm's most senior managers
BE8	Helping management develop needed policies for the company
BE9	Providing feedback to the CEO on senior management
BE10	Accessing external resources (knowledge, professional skills etc.)
BE11	Providing expert and detailed insight during major events such as an acquisition or restructuring
BE12	Serving as an emotional buffer between the generations and, also, between family members
BE13	Generating and analyzing strategic alternatives during board meetings
BE14	Encouraging the belief in, and pursuit of, a shared dream for the family
BE15	Due Diligence Regarding Family and Ownership Policies
BE16	Interacting in a productive way with the CEO
BE17	Predicting and responding to 'worst-case' scenarios for the family business
BE18	Ratifying decisions based on information provided by internal members
BE19	Selecting, appraising and (in some cases) removing the CEO
BE20	Providing fiduciary oversight and ensuring that the company complies with legal requirements
BE21	Assessing the board's performance
BE22	Protecting the interests of all owners (both minority and majority shareholders) and the company

DATA

In order to test the psychometric properties of the scale we submitted the list of items to 90 family business board members asking them to assess how well their board performed the indicated activities. Rasch analysis was then applied, which, by considering how people value a set of items, helps researchers by indicating how (and if) these items are able to represent a general latent trait (in this case, board effectiveness). Respondents had to state the level of agreement / disagreement regarding whether the company board is effective in the above-mentioned series of ways. A 4-point Likert scale ("1" means "strongly disagree", 4 means "strongly agree") was used. The sample is referred to Italian family businesses.

The data used in this study were collected though a snowball sampling technique, coherently with previous works on boards of directors carried out by other scholars (Pettigrew and McNulty, 1995). These authors recognized that access to managerial élites might be easier if connections are made through high status members of such élites. The advantage of this method is that it seems to be the "only possibility" (Saunders *et al.*, 2009) when populations are difficult to identify. The disadvantages are that it is very unlikely that the sample will be representative, although this requirement is not essential in estimations carried out by means of Rasch analysis (Rasch, 1960, 1980).

The task was to identify a number of family business directors able to evaluate the (active) boards they were working for. An initial small group of family business directors was selected. These agreed to help and supplied contacts for further cases. After two months, one of the authors attended an international three-day meeting on the topic of "family businesses". The participants were entrepreneurs, directors, managers, consultants and professors. In this context, these contacts led to introductions to a number of individuals with the required characteristics (directors of family business active boards) from all over Italy.

A questionnaire was distributed and gathered personally by one of the authors who assisted respondents in case of need. The sample was composed of 90 respondents. Among these 90 respondents considered, 72 were male, and 18 female. The average respondents' age was 48.8. On average, the companies were 50 years old and had 143 employees (i.e. small-to-medium size companies). They represented various industries related to manufacturing (60%) and services (40%). Since a well-defined population does not exist, we could not explore the potential for nonresponse bias. To ensure that each respondent accurately represented the entirety and reality of the board to which he or she belonged, data from the fellow board members of a subset of family businesses were gathered. This allowed us to assess the reliability and validity of respondents' assessments (Blum *et al.*, 1994; Forbes *et al.*, 2009; Simsek *et al.*, 2005). 20 responses from identifiable board members at every family business board for which we had already received a questionnaire were gathered providing a set of secondary respondents for 22% of the firms in the final sample.

To assess the reliability of the primary respondents, Intraclass Correlation Coefficients (ICCs) of their responses with those of the secondary respondents were calculated. ICC checks the extent to which one rather is as reliable as any other from the same board. An ICC(1) greater than .12 indicates acceptable reliability (Bliese, 2000). ICC for the measure of board effectiveness (considered as the sum of the assessments given to each item) exceeded this criterion effectiveness = .61 $p < .01$.

METHOD

Rasch model (Rasch, 1960, 1980) is a probabilistic mathematical model. In traditional measurement literature, we refer to more or less skilled subjects with more or less difficult exercises (i.e., items) to endorse; for this reason we speak about *person's ability* and *item's difficulty*. In this case study, by *item's difficulty* we mean the related measures of board effectiveness. By *person's ability* we refer to the level of effectiveness that each respondent conferred on his/her board.

Under Rasch model expectations, a person with higher ability always has a higher probability of endorsement or success concerning any item than a person with lower ability. Likewise, a more difficult item always has a lower probability of endorsement or success than a less difficult item, regardless of individual ability.

The classic Rasch model is characterized by unidimensionality and additivity. Uni-dimensionality means that a single construct is being measured. The Rasch model produces measurement on the interval scale. This implies additivity on the scale that is invariant over the entire continuum, if the data fit the model. These units are expressed in logits (logarithm of odds) and are a linear function of the difference between the person parameter and the item parameter. These interval measures may be used for subsequent parametric statistical analysis that assumes an interval level scale. The placement of items according to their difficulty, and of persons according to their ability, is carried out on a common logit scale on the real continuum.

The use of a Rasch model enables predictions of how persons at each level of ability are expected to perform regarding each item. This capability of having estimates for item hierarchy and a person's ability levels enables us to detect "aberrant patterns", such as someone failing to endorse the least severe (or easiest) items while endorsing the most severe (hardest) items.

The model is able to compare respondents and items directly. This means that we have created respondent-free measures and item-free calibrations - abstract measures that transcend specific respondent abilities and specific item difficulties -. This characteristic is sometimes called *specific objectivity*. Thus, the measures represent a respondent's ability as independent of the specific tested items, and item difficulty as independent of a specific sample.

Once the parameters model are estimated, it is interesting to deal with issues of unusual patterns or "misfitting" cases, and thus to compute expected

(predicted) response patterns for each person on each item. "Fit statistics" are then derived from a comparison of the expected patterns and the observed patterns. These "fit statistics" are used as a measure of the validity of the data-model fit. The "fit statistics" measure how the observed situation differs from the situation proposed by the theoretical model. In the Rasch model two groups of "fit statistics" can be considered: one related to the subjects and one related to the items.

"Person fit" statistics measure the extent to which a person's pattern of responses to the items corresponds to that predicted by the model. A valid response requires that a person of a given ability should have a greater probability of providing a higher rating on easier items than on more difficult items. Therefore if a respondent is more skilled (i.e. he/she places in a higher value of the latent trait) it is expected that he/she will endorse a greater number of items than a subject less skilled.

"Item fit" statistics are used to identify items that may not contribute to a unitary scale or whose response depends on a response to other items. The model requires that an item should have a greater probability of yielding a higher rating for persons with higher ability than for persons with lower ability. Those items identified as not fitting the Rasch model need to be examined and revised, eliminated, or possibly calibrated with other misfitting items to determine if a second coherent dimension may exist. There are many potential reasons why an item may misfit. For example, an item may not be related to the rest of the scale or may simply be statistically redundant with reference to the information provided by other items.

Several reasons explain the usefulness of Rasch models. To summarize, the advantages of Rasch models include the characteristic of equating responses from different sets of items intended to measure the same construct; the development of equal interval units of measurement when the data fit the model; and the possibility of conducting validity and reliability assessments in one analysis for both item calibration and person measures. Rasch models are particularly useful and appreciated for the assessment of psychometric and perceptual scales referred to teams (Lange and Houran, 2009) and are gaining attention from scholars exploring organizational issues (Drehmer *et al.*, 2000). Some of the reasons are that they allow for the estimation of person ability (in this study: respondent's evaluations of their boards) freed from the sampling distribution of the items attempted; for the estimation of item difficulty freed from the sampling distribution of the sample employed; and for the expression of item calibration and person measures on a common linear scale (Zhu *et al.*, 2001).

The Model

Georg Rasch (Rasch, 1960) developed a mathematical model for constructing measures based on the probabilistic relationship between any item's difficulty and any person's ability. According to the Rasch model, the probability of having a certain respondent's assessment of each item can be calculated as a function of the difference between these two parameters.

In this study, by *item's difficulty* (δ_i) we mean the related measures of board effectiveness. Indeed, these parameters allow for the measurement and ordering of items, from the one characterized by the greatest effectiveness to the one with least effectiveness. By *person's ability* (ϑ_v) we refer to the level of effectiveness that each respondent conferred on his/her board. So a high value for a person parameter means a high judgment of effectiveness, while low values mean the reverse. Note that in this measure ϑ_v measures effectiveness including all the personal elements conditioning the response pattern.

In our case study we consider the Partial Credit Model (PCM) (Masters, 1982) in which the probability that person *v* responds to item *i* in category *h* is given by:

$$P(h|\vartheta_v,\delta_{ih}) = \frac{\exp\left\{h\vartheta_v - \sum_{j=0}^{h}\delta_{ij}\right\}}{1+\sum_{t=1}^{m}\exp\left\{t\vartheta_v - \sum_{j=0}^{t}\delta_{ij}\right\}} \quad where \quad h = 0,1,...,m$$

where ϑ_v *(v = 1, 2, ..., n)* is the respondent parameter (respondent's evaluation), δ_i *(i = 1, 2, ..., k)* is the item parameter and τ_{ij} is the *j-th* threshold of item *i* (for convenience $\tau_{i0} = 0$). This formula indicates the probability of a response involving all thresholds of an item. Therefore if a respondent gives a score of 0 (first response category), no threshold is crossed and no threshold appears in the numerator. If the person gives a score of 1 (second response category), only the first threshold is crossed and only the first threshold appears in the numerator. The denominator is the sum of all possible numerators for an item.

In logit form (i.e. the ratio between the probability that the subject responds with category

h respect to the probability that the subject responds to the same item with category *h – 1*) we have:

$$\ln\left(\frac{P(h)}{P(h-1)}\right) = \vartheta_v - \delta_{ih}$$

.

In other terms, the logit is a linear function of the person parameter ϑ_v and an item x category parameter δ_{ih}.

RESULTS

Estimation

Item responses were gathered on a 4–point Likert scale: strongly disagree, disagree, agree, strongly agree. Rasch model parameters were estimated for each subject and each item. To analyse the data we used an interactive Rasch software package RUMM (Rasch Unidimensional Measurement Models) 2020 (Andrich *et al.*, 2004). The bank is formed of 22 items describing various aspects of board effectiveness (see Table 1).

Interpretation

The overall adequacy of the model can be described by two reliability indices: the person separation index (PSI) and Cronbach's Alpha (Zhu *et al.*, 1997). PSI is a measure used to describe how well the scale identifies individual differences. It depends in part on the actual variance of the persons and it has a very important role in understanding the fit statistics in the Rasch model. If the PSI is low (close to zero), then all the persons tend to be in a similar location and therefore they do not spread out across the continuum. In this analysis, PSI = 0.903, this means that the respondents tend to be in different locations (i.e., they gave quite different answers). Cronbach's Alpha is a measure of the internal consistency of a scale, and is a direct function of both the number of items in the scale and their magnitude of intercorrelation. In our case Cronbach's Alpha is 0.935, meaning that test reliability is very high.

Table 2 provides the Rasch estimates of the item's location with respect to the underlying board effectiveness variable. The "location" column describes (in logit values) "item difficulty". In our case item difficulty measures the difficulty of the item in measuring board effectiveness. 10 items have negative logit values (i.e., these items are "easy": the probability that respondents positively evaluate these items is high), while 12 have positive difficulty (i.e., the probability that respondents negatively evaluate these items is high). The items with a negative location are easier that the items with a positive location.

Two features assess the quality of the measure: "FitResid" and "Prob". The Fit Residual is a statistic that provides information on the fit of the data to the model from the perspective of the items. For each item, this statistic is based on the standardized residuals of the responses of all persons to the item. When FitResid lies in the range from -2.5 to +2.5 (critical values proposed by the software used for these analyses), then the items fit the model; this means that it is helpful in explaining the latent trait. As shown in Table 2, almost all items lie in this range. Only BE21 ("Assessing board performance") and BE22 ("Protecting owner and company interests") lie outside the range, meaning that they are not helpful in explaining the latent trait (i.e. board effectiveness).

The central concept in item response theory is that of the Item Characteristic Curve; the Item Characteristic Curve is the expected score on the item for each possible location of a person on the continuum. To evaluate if an item is coherent with the model we can perform a chi-squared fit test. To do this test we have to divide the sample into a convenient number of class intervals (CI) based on person ability estimates, i.e. the board effectiveness, so that all subjects with the same ability fall within the same CI and all CIs contain more or less the same number of subjects. If the data fit the model, then the means of persons in each CI should be close to the theoretical curve. "Prob" refers to the p-value of an approximation chi-square fit test. This statistic is employed to evaluate the discrepancies between the observed scores of all persons in the CI and their expected values according to the model. According to the null hypothesis of this test the item is coherent with the model (i.e. the observed value is very close to the theoretical value proposed by the model), while the alternative hypothesis says that the item fit is bad (i.e. the difference between the observed value and the one proposed by the model is high). As shown in Table 2 the null hypothesis (that the item is coherent with the model) is accepted for all the items (α=0.05).

In Figure 1 the Item Characteristic Curve for items BE20 and BE11 are displayed. Item BE20 is an example of a very good fit to the Item Characteristic Curve, while item BE11 represents a less good fit.

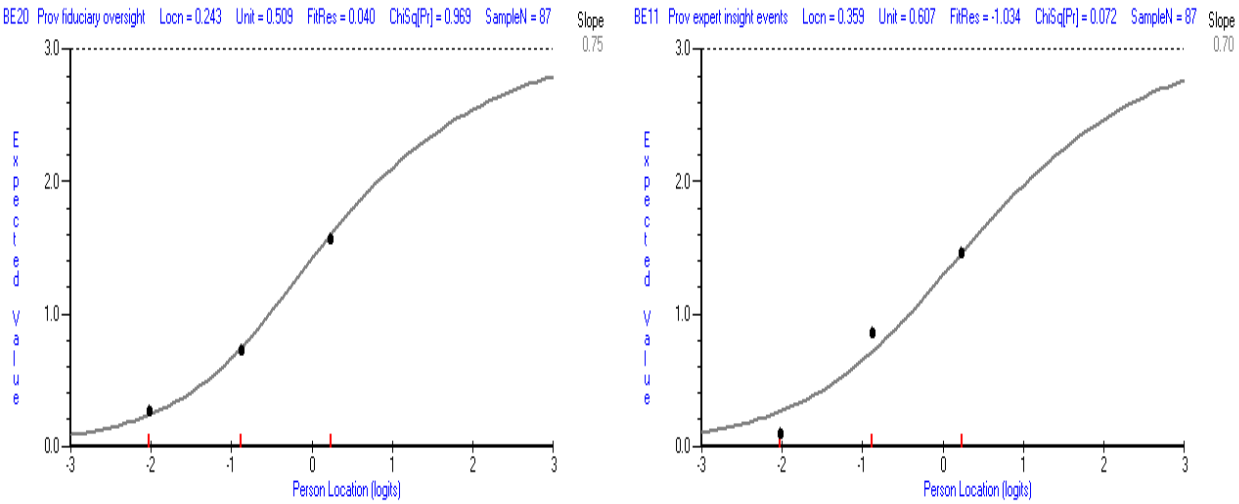
Table 2. Initial Estimation of 22 Item Parameters by Location Order (with 3 CI)

Code	Item Description	Location	FitResid	Prob
BE3	Consulting leader retirement	-0.63	0.528	0.483
BE18	Ratifying decisions	-0.493	0.752	0.755
BE9	Providing feedback CEO	-0.413	0.578	0.101
BE7	Deciding hiring replacing	-0.412	-1.167	0.332
BE4	Consulting succession plan	-0.388	-0.815	0.417
BE12	Serving emotional buffer	-0.278	0.017	0.318
BE21	Assess board performance	-0.261	**3.213**	0.181
BE10	Accessing ext resources	-0.198	0.451	0.774
BE19	Selecting appraising CEO	-0.166	-0.787	0.948
BE6	Coordinating gov actions	-0.029	-0.666	0.203
BE13	Strategic alternatives	0.045	-0.659	0.212
BE16	Interacting with CEO	0.082	-1.487	0.406
BE1	Helping make decisions	0.154	-0.147	0.709
BE17	Predicting worst cases	0.161	-0.962	0.219
BE15	Informing general situation	0.167	-0.47	0.847
BE14	Encouraging pursuit dream	0.171	-0.311	0.882
BE20	Prov fiduciary oversight	0.243	0.04	0.969
BE8	Help develop needed policies	0.286	-0.125	0.608
BE11	Prov expert insight events	0.359	-1.034	0.072
BE22	Protect interests company	0.497	**2.701**	0.479
BE2	Focusing on big picture	0.544	-0.249	0.966
BE5	Contributing decision making	0.559	0.453	0.746

Note: in bold the item fit > 2.5

Figure 1. Example of Items that are Very Good According (a) and Good According (b) to the Model

(a) **(b)**



In Table 3 the threshold parameters of the 22 items are shown. These threshold-parameters give a measure of the difficulty of endorsing each response category over the previous one. Through these thresholds it is possible to measure distances between categories. In this case study with 4 categories (strongly disagree, disagree, agree, strongly agree) we have 3 thresholds. With polytomous data, it is important to check if the thresholds are ordered in accordance with scoring function specifications. For items BE4, BE5, BE16, BE19, BE21 and BE22 the thresholds are disordered; in these cases, category 2 is never more probable than categories 0, 1 and 3. Therefore these categorizations are not optimal.

An example of ordered and disordered thresholds is shown in Figure 2.

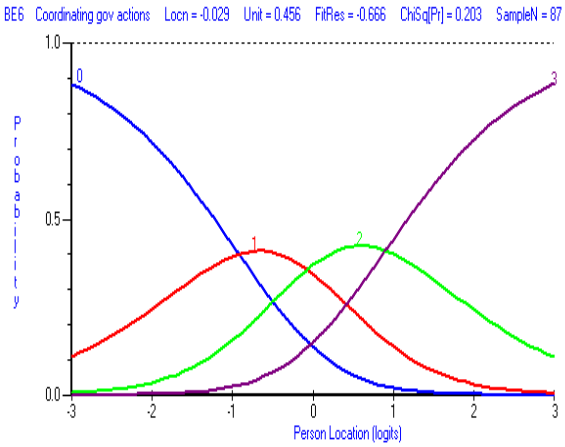
Table 3. Ordered and Disordered Threshold Parameters of the 22 Items

Code	Item Description	Location	Threshold 1	Threshold 2	Threshold 3
BE3	Consulting leader retirement	-0.630	-1.612	-0.364	0.086
BE18	Ratifying decisions	-0.493	-1.679	-0.314	0.516
BE9	Providing feedback CEO	-0.413	-0.983	-0.653	0.396
BE7	Deciding hiring replacing	-0.412	-1.371	-0.196	0.33
BE4	Consulting succession plan	-0.388	**-1.529**	**0.439**	**-0.075**
BE12	Serving emotional buffer	-0.278	-1.185	0.133	0.219
BE21	Assess board performance	-0.261	-1.152	0.227	0.141
BE10	Accessing ext resources	-0.198	-1.438	-0.416	1.261
BE19	Selecting appraising CEO	-0.166	**-1.077**	**0.336**	**0.243**
BE6	Coordinating gov actions	-0.029	-0.919	-0.072	0.904
BE13	Strategic alternatives	0.045	-1.384	0.601	0.919
BE16	Interacting with CEO	0.082	**-0.567**	**0.578**	**0.234**
BE1	Helping make decisions	0.154	-0.611	0.376	0.697
BE17	Predicting worst cases	0.161	-0.788	0.543	0.728
BE15	Informing general situation	0.167	-0.291	0.035	0.756
BE14	Encouraging pursuit dream	0.171	-1.053	0.676	0.89
BE20	Prov fiduciary oversight	0.243	-0.476	-0.354	1.559
BE8	Help develop needed policies	0.286	-0.575	0.597	0.836
BE11	Prov expert insight events	0.359	-0.733	0.116	1.693
BE22	Protect interests company	0.497	**0.177**	**-0.06**	**1.375**
BE2	Focusing on big picture	0.544	0.025	0.671	0.936
BE5	Contributing decision making	0.559	**0.13**	**0.876**	**0.671**

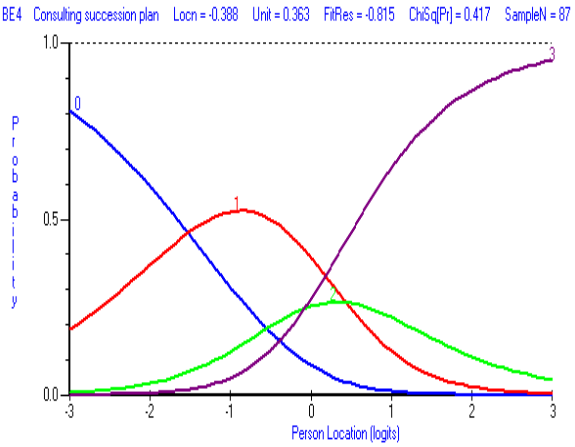
Note: in bold the disordered thresholds

Figure 2. Example of Ordered (a) and Disordered (b) Thresholds

(a)



(b)



Another useful task is to examine the degree to which the person response patterns conform to the expected Guttman pattern (Guttman, 1950) and the relationship between these patterns and the residuals. The higher the value of this statistic, the more pronounced the deviation from the Guttman situation. The range normally set for the residuals is from -2.5 to 2.5. Under this condition we found 3 respondents characterized by a residual outside the provided range.

Up to now we have illustrated the most important results of the estimations, highlighting the problems that arose. In the next session we propose a discussion of results and we indicate how we solved the mentioned issues to achieve a good model.

DISCUSSION

Because it is important that the data fit the chosen model, we decided first to remove the 3 respondents with a response pattern not conformed to the expected one, together with item BE21 ("Assessing the board performance") which has a residual fit greater than 2.5 (FitResid = 3.313). At this point, item BE22 remains in the bank because its FitResid (= 2.701) is not far from the expected range.

We decided to recategorize the items with disordered thresholds (BE4, BE5, BE16, BE19 and BE22), into a small number of categories and determine the optimal categorization for each item in these categories. Categorization has always been considered an important element in constructing an ordered-response scale (Zhu *et al.*, 1997). Ordered-response scales include scales possessing ordinal response categories. The categorization of an ordered-response scale has two very important characteristics. First, while all categories of a scale should measure a common trait or property, each of them must also have its own well-defined boundaries, and the elements in a category should also share certain exclusively specific properties. Second, categories must be in an order, and numerical values generated from the categories must reflect the degree or magnitude of the trait. An optimal categorization is the one that best exhibits these characteristics. Moreover, once the optimal categorization has been determined, it is possible to compare the studied situation with similar situations, with those of later years (e.g, one or two years after) or with those of other business families. In this way it is possible to observe whether the optimal categorization is the same or not.

Rasch analysis, technically, starts by combining adjacent categories in a "collapsing" process, in which new categories are constructed. In this case study for the items with disordered categories, we decided to collapse the two central categories.

In the new categorization we have 16 items with the original number of 4 categories and 5 items with only 3 categories: strongly disagree, neither disagree nor agree, strongly agree.

After these adjustments, the recategorization of 5 items into only three categories and the removal of item BE21 and 3 subjects, all items fit the model according to the general criterion of the chi square test, and fit residual and all thresholds are ordered.

In Table 4 the new item locations are shown, with the values of fit residuals and the chi squared test. In this new situation the two reliability indices are invariant: PSI = 0.905 and Cronbach-α = 0.930. We can therefore assert that stage 3 was completed. We indeed were able to assess the psychometric properties of the scale, as well as confirming its reliability and the distinctness of its dimensions.

Table 4. Estimation of the New Bank of 21 Item Parameters by Location Order and Ordered Thresholds

Code	Item Description	Location	FitResid	Prob	Threshold 1	Threshold 2	Threshold 3
BE9	Providing feedback CEO	-0.604	0.830	0.036	-1.119	-0.183	1.301
BE18	Ratifying decisions	-0.558	2.310	0.525	-1.293	0.170	1.123
BE3	Consulting leader retirement	-0.468	0.686	0.327	-1.775	0.142	1.633
BE7	Deciding hiring replacing	-0.301	-0.623	0.171	-1.399	0.185	1.214
BE12	Serving emotional buffer	-0.295	0.150	0.230	-1.030	0.154	0.876
BE4	Consulting succession plan	-0.204	-0.645	0.099	-2.015	2.015	
BE10	Accessing ext resources	-0.200	1.342	0.186	-1.571	-0.194	1.765
BE19	Selecting appraising CEO	-0.176	0.389	0.360	-1.148	0.176	0.972
BE6	Coordinating gov actions	-0.162	-0.593	0.438	-1.077	-0.112	1.189
BE15	Informing general situation	-0.018	-0.548	0.712	-0.856	-0.033	0.889
BE1	Helping make decisions	0.095	-0.722	0.848	-1.221	1.221	
BE13	Strategic alternatives	0.116	0.192	0.158	-1.604	0.502	1.101
BE17	Predicting worst cases	0.161	-0.189	0.402	-1.293	0.311	0.981
BE14	Encouraging pursuit dream	0.168	-0.005	0.380	-1.421	0.499	0.922
BE8	Help develop needed policies	0.172	-0.607	0.742	-0.591	-0.286	0.877
BE2	Focusing on big picture	0.215	-0.326	0.827	-0.626	0.162	0.464
BE11	Prov expert insight events	0.216	-1.701	0.085	-1.394	0.071	1.323
BE16	Interacting with CEO	0.254	-0.865	0.244	-1.495	1.495	
BE5	Contributing decision making	0.492	0.080	0.303	-0.993	0.993	
BE20	Prov fiduciary oversight	0.493	0.349	0.798	-1.384	-0.914	2.298
BE22	Protect interests company	0.604	1.372	0.740	-1.316	1.316	

We now move to stage 4 in order to examine how boards can be distinguished according to the degree to which they perceive themselves as more or less effective. To do so we illustrate the meaning of conjoint ordering among items and respondents. A location map without thresholds (with item locations only) and a location map with thresholds are shown respectively in Figures 3 and 4. The location map uses the measure statistics provided in Table 4 to visually illustrate (a) the histogram of the respondent location on the latent variables and (b) the interrelationships among the items defining board effectiveness. The histogram describes the distribution of the person locations and this is obviously the same in Figures 3 and 4. The position of respondents and items on the measure (vertical axis measured in logits) defines to what extent we can expect the board to perform a particular activity well or not. For example (see Figure 4 with uncentralised thresholds), respondents located at 1.54 logits will have a 50% probability of being *effective* and a 50% probability of being *highly effective* in activities such as *Providing insight during major events* (BE11) and *Providing fiduciary oversight and ensuring that the company complies with legal requirements* (BE20). Figure 4 indicates, next to each item, a number that refers to each threshold. In this case item BE20.3 refers to threshold number 3; in other words, the threshold that lies between category 3 (effective) and 4 (highly effective). These respondents are those that are located in the highest part of the histogram, which indicates that the respondents who perceive their boards as the "most effective ones" are those belonging to boards that perform well in activities BE11 and BE20. Figure 4 shows how boards can be distinguished according to the degree to which they perceive themselves as more or less effective in performing certain roles. As shown, the number of respondents (persons) who perceive their boards as effective (higher part of the histogram) are fewer than those who perceive their boards as less effective (lower part of the histogram). We can therefore confirm both Hypothesis 1 and Hypothesis 2 and need to recognize that there are margins for improvement in this sample in terms of effectiveness.

Figure 3. Item and Person Locations Map without Thresholds

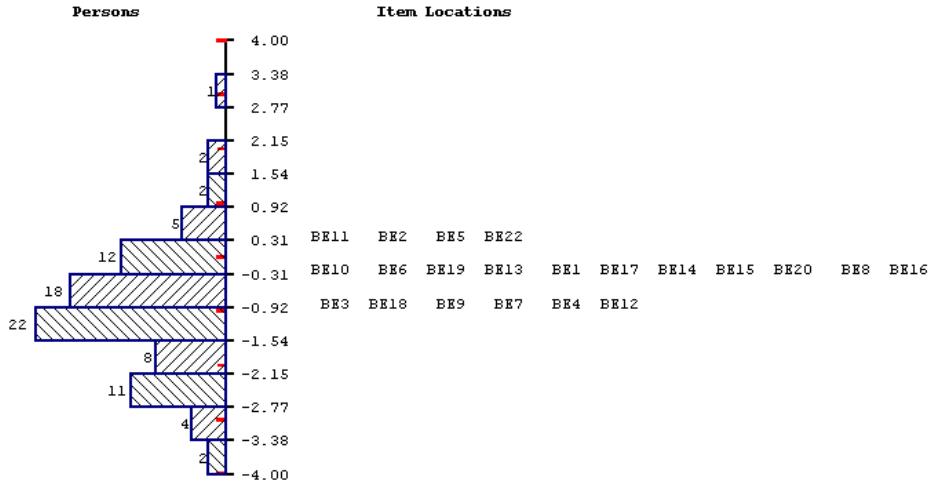
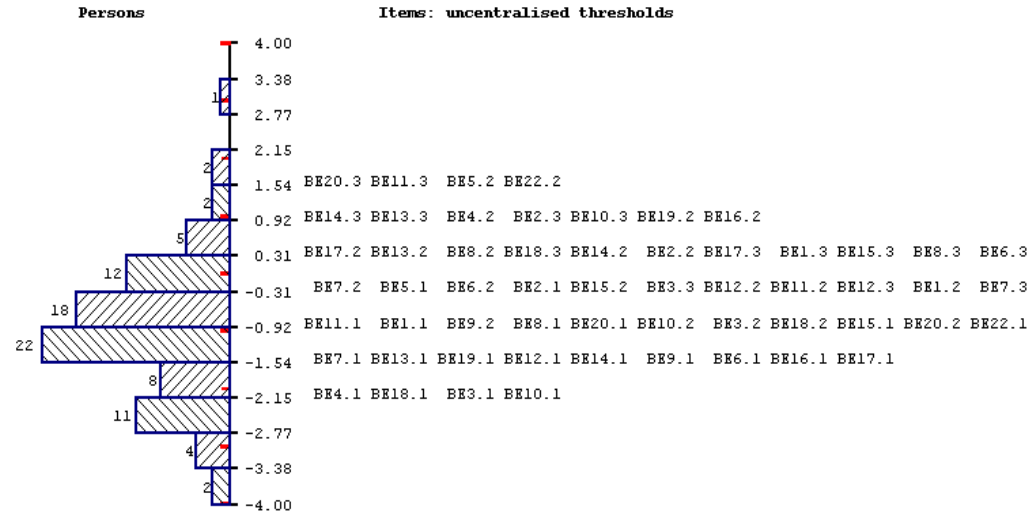


Figure 4. Item and Person Locations Map with Thresholds



CONCLUSION

This paper addressed the call for the development of team effectiveness measures that take team context into account (Gibson *et al.*, 2003) and aimed at defining a tool for measuring board effectiveness in family businesses, as well as classifying boards according to the level of perceived effectiveness. Family businesses play a significant role in the world. However, only limited research to date considers the differences between family and non-family corporate governance systems (Uhlaner *et al.*, 2007). The special conditions of ownership and management in such businesses imply that corporate governance scholars take a number of needs into account that in non-family businesses do not emerge (Chrisman *et al.*, 2010). To do so we integrated different perspectives and developed a measurement scale. From the application of Agency theory, a list of activities related to the board's control task were identified. The Stewardship theory stressed activities related to supporting and advising the management group. The application of Resource Dependence theory lead to the board's activity of accessing external resources. Stakeholder theory allowed us to consider the negotiation and coordination activities of the board. Finally, from the analysis of family business literature, special activities such as consulting, buffering and motivating emerged. All these activities were collected in a list and content validity was tested with a pool of 30 experts. Then, to validate this instrument, a group of 90 family business directors (one from each company) was asked to evaluate their boards through a 4-point Likert scale. Rasch

analysis was performed to consider how, and if, this set of items is able to stand for a general latent trait such as board effectiveness. From the analysis it emerged that the respondents gave diversified answers, meaning that the scale is able to identify differences among individuals. The Fit Residual statistic showed that almost all the items fit the model, which means that they are helpful in explaining board effectiveness. Further analysis and some adjustments were performed that lead to an optimal categorization. Finally, we show that respondents who perceive their boards as more effective are particularly good at some activities. We also show that respondents can actually be classified according to their answers and that boards that perceive themselves as more effective are less than those highly effective.

These results allow us to propose some conclusions. Firstly, the instrument (having excluded item BE21) is composed of activities that are able to embody the latent trait "board effectiveness". This means that it is possible to compare the studied situation with similar situations, with those of later years or with those of other family businesses. Secondly, *board evaluation* is still a new practice, inasmuch as its importance is theoretically acknowledged, although the Italian family business directors who took part in this survey did not recognize its significance (which is why item BE21 was excluded from the list). The fact that only the activity "assessing board performance" does not represent board effectiveness well, indeed indicates that directors do not consider it to be important. Thirdly, Rasch analysis allowed us to confirm both our hypotheses. This has both academic and managerial implications.

From a scientific point of view, the confirmation of Hypothesis 1 allowed us to empirically reconcile different theories and views on boards' roles in family businesses, and to validate a measurement scale that could be used as an instrument in future research. The confirmation of Hypothesis 2 allowed us stress the usefulness of Rasch models for research in the management field and to see how responses to the survey could be interpreted.

From a practical point of view the board evaluation instrument that we propose refers to the most direct way of measuring the result of board actions: board task evaluation. It could be used by family businesses to measure their boards' effectiveness. Regular board evaluations that take these aspects into account could increase board accountability. Moreover, the use of such a scale could improve board effectiveness by identifying board performance gaps and clarifying what is expected from each director and from the board as a working group.

One of the most evident limitations of this research is that it is empirically based on a survey that involved 90 respondents. The sample size is small, and further research will have to explore the functionality of the instrument proposed in the context of bigger samples. In addition, when the usefulness of this instrument is further proven, it would be interesting to see whether board effectiveness self-assessments are related to board composition, board size, board behaviour and company characteristics.

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