Fad and fashion? The relevance of subjective performance measures

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Abstract

Purpose – The purpose of this paper is to investigate the effect of the use of subjective (objective) performance measures on relevant organisational outcomes, namely perceived managerial discretion (PMD) and manager’s satisfaction with the performance measurement system (PMS). Furthermore, the paper analyses the indirect link between subjective vs objective measures and managers’ satisfaction through PMD.

Design/methodology/approach – To test the research hypotheses, a paper-based questionnaire was sent to Italian health care managers in Lombardy. Thus, a PLS-SEM analysis was performed on a data set of 97 Italian health care managers.

Findings – Empirical findings showed that objective measures are more capable of supporting the managerial perception of discretion when compared to more subjective ones such as “fads” and “fashions”, and that managers are more satisfied with the PMS when it is grounded on objective measures rather than subjective ones.

Originality/value – The paper operationalizes and empirically tests the measure of PMD, linking this to antecedents and consequences. It also extends the literature on subjectivity in the PMS, since it develops new knowledge on the choice between subjective and objective measures by applying this choice to a variety of PMS, whereas prior literature on objective vs subjective measures has mainly focussed on performance evaluation.

Keywords Performance measurement systems, Performance evaluation, Budget, Non-financial performance, Objectivity vs subjectivity, Perceived managerial discretion

Paper type Research paper

Introduction

Prior research identified subjectivity in performance measurement as a “challenge”, since its use is promising and problematic at the same time (McCracken et al., 2001). It could be argued that organisations adopt more (fewer) subjective measures in their PMS due to a “fad” or a “fashion” (Abrahamson and Fairchild, 1999), since several scholars have investigated the benefits and detrimental effects of both objective and subjective measures in the private and public sectors, with results that are still open to debate (Bol, 2008; Bol and Smith, 2011). Thus, more opportunities to investigate the role of subjective measures in specific contexts have emerged. In fact, to the best of our knowledge, no studies have been carried out to analyse the effect of subjectivity on one of the determinants of decision-making activity, namely perceived managerial discretion (PMD). This choice is motivated by the assumption that managers will be able to deliver higher organisational performance if supported by a set

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of performances which are relevant to them (Pizzini, 2006). PMD can be defined as “the actual influence that managers perceive themselves to have regarding the firm's decision-making process” (Zhao et al., 2010, p. 148). A recent review on this topic has called for more research on the antecedents of managerial discretion (Wangrow et al., 2015). This paper aims at replying to this call by testing the effect of the nature (subjective vs objective) of performance measures on PMD. Moreover, the effect of subjectivity is also analysed with regards to the manager’s satisfaction with the PMS. Furthermore, the paper analyses the indirect link between objective vs subjective measures and managers’ satisfaction through PMD. Finally, a large part of the literature on subjectivity in the PMS is focussed only on performance evaluation systems (e.g. Ahn et al., 2010; Bol, 2008; Bol and Smith, 2011; Kunz, 2015). Therefore, there is also a gap in investigating the effect of subjective measures in a plurality of PMSs.

Our research question is, thus, as follows:

RQ1. Do subjective performance measures affect managers’ satisfaction and the perception of managerial discretion?

More specifically, since objective data are lacking, aggregated and competition-sensitive (Walker and Jones, 2003), more and more scholars are relying on subjective performance measures. However, issues of measurement validity and reliability inhibit the use of subjective measures, especially in the public sector (Wang and Gianakis, 1999). Thus, this study seeks to analyse whether the use of PMS relying more on subjective measures can be conceived of as a “fad” and “fashion”, and, thus, expected to be used by managers to support managerial decision making. To answer the research question, a paper-based questionnaire was sent to Italian health care managers operating in Lombardy.

Empirical findings will contribute to the management literature on subjectivity in PMSs (Bol and Smith, 2011). The paper also extends the literature on PMS design, specifically that part which is focussed on “measuring and managing organisations in delivering value-in-use to its customers” or stakeholders, as in the present study (Nudurupati et al., 2011, p. 10). This study also extends managerial discretion theory by replying to the call for “examining the antecedents and measurement of the managerial discretion construct” (Wangrow et al., 2015, p. 106) and PMS users’ satisfaction (Malmmose, 2015). The managerial implications can be summarised as follows: this study addresses the need to deal with subjectivity when developing a PMS in order to enhance managers’ satisfaction and decision-making effectiveness. This study also leads PMS developers to take into account users’ psychological characteristics in designing and diagnosing PMSs (Kunz, 2015). It also addresses how middle managers can improve internal organisational outcomes via increased managerial discretion (Wangrow et al., 2015). Moreover, since users’ satisfaction is linked to PMS subjectivity, findings from this paper can be aimed at engaging users in the design of the PMS.

The remainder of the paper is organised as follows. The next section provides a review of the literature and the theoretical development of the conceptual framework. The third section presents the research methodology, sample selection and constructs included in this study. The fourth section analyses results from the questionnaire sample. A discussion of the empirical findings and concluding remarks are outlined in the final section.

**Background and hypothesis development**

**Subjective vs objective measures**

Subjective performance measures (e.g. customer satisfaction) are based on opinions or perceptions, which cannot be assessed or audited by an independent party but are collected through surveys and interviews (Singh et al., 2016). Objective measures (e.g. productivity) are instead grounded on more verifiable facts. The literature has found that the informational power of objective measures is somehow limited by different factors. Bevan and Hood (2006) put forward that it is difficult to capture all the relevant dimensions that should be covered by
the objective measure. Furthermore, the validity of objective measures can be flawed due to unintended behaviour (Bevan and Hood, 2006). Given these pitfalls, there is a call to move beyond activity performance and to adopt subjective measures to achieve accountability and support operational managers (McKernan and McPhail, 2012). According to Gibbs et al. (2004), subjective measures can be used to reduce biases and mitigate risk. Their results show that subjective measures positively affect managers’ satisfaction with the pay scheme. Du et al. (2017) provided evidence that the replacement of an old performance measure with a new one introduces subjective adjustments in the decision-making process. Moreover, subjective measures are useful in aligning individuals’ objectives to those of the firm (Hayes et al., 2005). However, although subjective measures can be more informative compared with objective ones, they are often affected by common-method bias (Wall et al., 2004). Therefore, a strand of the literature has also addressed some concerns about the use of subjective measures (Bol, 2008; Stede et al., 2006). In particular, Ahn et al. (2010) have argued that subjective measures do not provide discriminability in performance evaluation.

Subjective vs objective measures in supporting managerial discretion

At this stage, with contrasting results Abrahamson (1991) argues that firms can adopt a managerial tool – in this case, a subjective PMS – due to imitation strategies rather than a rational choice. In this case, scholars define a “fad”, or “fashion”, as a situation where there is an influencer supporting the imitation strategy to adopt the tool. In this context, there is growing interest in an understanding of the managerial relevance of adopting and using subjective measures, but also in the managerial satisfaction with this kind of measure. If managers perceive subjective measures as more supportive than objective ones, they will more likely use those subjective measures more often and in a more effective way in their decision making. Otherwise, managers will not use the PMS to make decisions, since it primarily contains (subjective) information, which is not relevant to them.

By taking a more comprehensive approach, Dess and Robinson advocate assessing the value in linking the two typologies of performance together (Dess and Robinson, 1984). In this line of enquiry, there is a call to further investigate whether objective and subjective measures can address different effects and or outcomes (Singh et al., 2016). For instance, Van Iddekinge et al. (2018) argued that subjective measures are linked to motivation, whereas objective measures are linked to ability. However, most scholars agree that subjective measures are often less accurate, reliable and more open to rater bias than are objective ones (Stede et al., 2006), but that they can reduce distortions in managerial effort created by objective measures (Singh et al., 2016). To this end, Bol and Smith (2011) reported spillover effects between objective evaluation applied to one task and subjective evaluation applied to another. They also pointed out that controllability plays a significant role in the choice of objective vs subjective measures. Prior literature on subjective vs objective measures has focused on performance evaluation (see, e.g. Ittner et al., 2003; Kampkötter and Sliwka, 2017), whereas few scholars have emphasised the effect of these measures on budgeting and non-financial performance. In this regard, Hansen et al. (2003) argued that ex-post budgets require subjective assessments and Ittner et al. (2003) stated that both objective and subjective measures need to be taken into account in the budgeting process. Furthermore, regarding non-financial performance, Stede et al. (2006) found that firms show higher performance when the performance measures are especially of the subjective type. Therefore, to shed more light on this topic, this paper aims at understanding the role of subjective measures in supporting managerial decision making. From this perspective, this study will adopt the PMD construct to analyse the effectiveness of the subjective measures in decision making. PMD is a concept grounded on the managerial discretion theory (Hambrick and Finkelstein, 1987), which in turn extends the upper echelon theory (Hambrick and Mason, 1984). Managerial discretion can be defined as “whether an organisation’s form and fate sit totally outside the control of its top managers, completely
within their control, or, more typically, somewhere in between” (Finkelstein and Boyd, 1998, p. 180). Managerial discretion has one main assumption, which regards the balance between the effect of the characteristics of executives and the external environment on organisational performance. Following studies at the individual level of managerial discretion, which focused on the top management characteristics and the executive perception of discretion in their decision-making activity (Hutzschenreuter and Kleindienst, 2013), the perception of managerial discretion has been adopted to test the cognitive base of managers. Motivated by Wangrow et al.’s (2015) review on the studies on managerial discretion, which found that there is a lack of investigation of the antecedents of managerial discretion, especially with regard to the perceptual construct, this paper aims at analysing the use of subjective measures to improve decision making and enhance managerial controllability, by testing the following:

**H1.** A high degree of subjectivity in budgeting, performance evaluation and non-financial performance measures positively affects the PMD.

Performance measurement subjectivity and manager satisfaction with the PMS
Managers rely on those PMSs they perceive as more effective in both providing accurate and reliable information and supporting them in extending the boundaries of their managerial options (Stede et al., 2006). Prior studies have found that it is more straightforward to find benchmarks and collect performance for objective compared to subjective performance measures (Nudurupati et al., 2011). Therefore, when multiple performance measures are available, there will be a preference to assign higher values to objective rather than subjective measures, thereby reducing the balancing effect of subjectivity (Ittner et al., 2003). From a different perspective, prior research has found supportive evidence of the use of both objective and subjective performance measures in enhancing user’s perception of usefulness and satisfaction with the PMS (Singh et al., 2016). Subjective measures are perceived as useful by top management teams when there is a need to operationalise multidimensional and broad scope performance measures, such as overall performance (McCracken et al., 2001). Moreover, the literature on performance evaluation found that subjective measures are perceived as useful by superiors in the appraisal of their subordinates (Bicudo de Castro, 2017). In the public sector, the use of subjective performance measures has been found to be useful by the user, especially when controlled against external verification (Andersen et al., 2016). The management literature is rather lacking in evidence regarding manager satisfaction with subjective (objective) performance measures in budgeting and non-financial PMSs (Demartini and Mella, 2014). Since there are contradictory findings, this study cannot predict the sign of the relationship, and, therefore, the paper tests the following:

**H2.** The degree of subjectivity in budgeting, employee evaluation and non-financial performance measures affect manager satisfaction with the PMS.

Consequences of the PMD on satisfaction with the PMS
According to Wangrow et al. (2015) “there is tremendous opportunity to better understand the consequences […] from an executive’s psychological attributes” (Wangrow et al., 2015, p. 100). In this context, PMD as a psychological attribute can affect organisational outcomes other than firm performance, such as manager satisfaction. More specifically, when the PMS supports the managerial activity, the PMD increases and the satisfaction or willingness to use it for decision-making and accountability purposes is positively affected as well (Maas and Torres-González, 2011). Prior studies have pointed out that several factors enhance the satisfaction with the PMS, such as the instrumental use and usefulness of organisational performance and the relevance of implemented measures with specific reference to the context in which managers operate (Walker et al., 2011). All of these
dimensions are captured by the PMD construct. In this regard, it is argued here that the analysis of managers’ satisfaction with the PMS is linked to the degree of PMD. Satisfaction with the PMS is relevant in that managers will be more (less) likely to use the PMS in an effective way when they experience higher (lower) levels of satisfaction.

To shed some light on the consequences at the individual level of PMD, this paper will address the following:

H3. Higher levels of PMD will positively affect managers’ satisfaction with the PMS.

PMD as mediator of the relationship between PMS subjectivity and satisfaction with PMS

It is argued here that performance subjectivity is assumed to impact managers’ satisfaction with the PMS through the PMD. More subjective performance measures will enhance managers’ satisfaction with the PMS in a context of low perceived discretion. In such a context of low PMD, managers are not able to control the activities they have to supervise (Bresciani and Ferraris, 2015) and find a satisfactory support in the subjective PMS, since subjective measures are suitable for reducing biases and mitigating risk (Gibbs et al., 2004). In line with prior research, which treats managerial discretion as a mediator factor (Wu et al., 2015), this study contends that PMD provides an indirect effect on the relationship between performance subjectivity and manager satisfaction:

H4. The degree of subjectivity in budgeting, employee evaluation and non-financial performance measures is indirectly linked to managers’ satisfaction with the PMS through the PMD.

Methodology

Sample selection and data collection

This study investigates a sample of Italian managers in hospital structures (private and public) in Lombardy. The sample is composed of research and teaching hospitals with a different level of complexity. This sector can be effectively adopted to test our research hypotheses due to the dual role of managers and their resistance to using performance in their activities (Bevan and Hood, 2006). The dual role of managers consists in having both a clinical and an organisational responsibility. The former has much to do with effectiveness and quality, whereas the latter with efficiency issues. Therefore, managers will be satisfied if they perceive the PMS as an enabling factor for their PMD. This region was chosen for the unique features that make it a best practice in terms of efficiency and PMS (Demartini and Mella, 2014).

The responsibility centre was selected as the organisational unit of analysis. A responsibility centre is the organisational unit, however named, that makes the decisions regarding the use of resources (Demartini and Mella, 2014). As a preliminary step, the total population of organisational units was identified. It can be assumed that they are around 2,000, determined by multiplying 200 structures in Lombardy (SISTAN, 2010) by the amount of responsibility centres per structure in the Lombardy region (ten on average). Demographic statistics of the study sample are shown in Table I.

Following Wangrow’s et al. (2015) suggestion for the development of the measure of managerial discretion, the present study administered a paper-based questionnaire to help in identifying psychological, environmental and organisational features related to managerial discretion. A paper-based questionnaire was sent to 125 responsibility centres, whose manager has got both clinical and administrative responsibility as budget holder. A random sampling selection method was performed to identify 125 units of analysis among the universe of units; in this way, all participants have an equal chance of selection (Messiah et al., 2014).

Two weeks after the submission of the paper questionnaire, a follow-up was performed. The response rate was 77.6 per cent (97 questionnaires were returned), which can be
considered in line with similar studies in this sector (Messiah et al., 2014) and with the significant sample size (Barclay et al., 1995). To determine the significant sample size \( n = 97 \), the following formula was applied (Sapsford, 2006, pp. 22, 90-3):

\[
 n = \left( \frac{F^2 \times N \times (P \times (1-P))}{(DS^2 \times (N-1)) + (P^2 \times P \times (1-P))} \right),
\]

where \( n \) is the significant sample size, \( DS \) is the desired precision (\( DS = 2 \) per cent), \( P \) is the probability of positive results (\( P = 99 \) per cent), \( F \) is the confidence level, which equals 95 per cent (\( F = 2 \)), and \( N \) is the population of managers.

To check for early and late respondent bias, a \( t \)-test analysis was performed which led to the rejection of bias between early and late respondents in the study sample.

**Measurement of variables**

Based on the data collected and the research hypotheses of this study, the following variables were developed: PMD, Degree of Subjectivity in the PMS, and Satisfaction with Performance Measurement System (PMS). Following the managerial discretion theory, the control variables are Environmental Uncertainty, Gender and Tenure (Hambrick and Finkelstein, 1987). The paper focusses on three performance measurement mechanisms: budgeting, non-financial PMSs and performance evaluation systems, since these can be based on both subjective and objective measures (Arnaboldi et al., 2015). Moreover, budgeting and non-financial PMSs have been under-investigated in the performance subjectivity literature (Hansen et al., 2003; Ittner et al., 2003).

With reference to the PMD variable, the study tried to overcome the limitations of prior studies by using a measure, which directly assesses perception and is not a proxy for it. PMD is a latent variable composed of the following two items with regard to the three PMSs (Anessi-Pessina et al., 2016): decision-making and flexibility. In the questionnaire, decision making regards the managers’ perception of the effectiveness of the three PMSs used in providing information with reference to supporting the operational decisions of the managers’ units (Key, 2002), whereas flexibility regards the respondents’ perceptions of the

<table>
<thead>
<tr>
<th>Demographic statistics of the sample being analysed</th>
<th>Hospitals</th>
<th>Sample managers</th>
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</thead>
<tbody>
<tr>
<td><strong>Type of hospitals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>Public</td>
<td>5</td>
<td>102</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>125</td>
</tr>
<tr>
<td><strong>Complexity of hospitals</strong></td>
<td></td>
<td></td>
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<tr>
<td>Research</td>
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<td>38</td>
</tr>
<tr>
<td>Teaching</td>
<td>4</td>
<td>87</td>
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<tr>
<td>Total</td>
<td>7</td>
<td>125</td>
</tr>
<tr>
<td><strong>Total (average) number of beds</strong></td>
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<td>(23)</td>
</tr>
<tr>
<td><strong>Total (average) catchment area</strong></td>
<td>502,352</td>
<td>(27,840)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>101</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td></td>
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<tr>
<td>Total</td>
<td>125</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Demographic statistics of the sample being analysed are provided for surveyed hospitals and units of analysis (sample of managers of the responsibility centre). Type of hospitals entails the amount of hospitals (managers working) for private and public hospitals included in the study. Complexity of hospitals identifies the degree of complexity by splitting the surveyed hospitals (managers) into research (more complex) and teaching (less complex) hospitals. Total (average) number of beds provides the total amount of beds per hospital and the average number of beds per unit of analysis. Total (average) catchment area reports the number of people in the catchment area per hospital and the average catchment area per unit of analysis. Gender addresses the number of questionnaires sent to male or female managers per unit of analysis.
effectiveness of the aforementioned PMSs in providing information to enable the flexibility/adaptability of the organisational unit (Kogut and Kulatilaka, 1994).

Degree of Subjectivity in the performance system is a latent variable composed of three items: degree of subjectivity in non-financial performance system, degree of subjectivity in the budget and degree of subjectivity in the employee performance evaluation system. Respondents were specifically asked to highlight if the three PMSs are based, or focussed, entirely on either subjective or objective performance measures.

Satisfaction with PMS is a latent variable composed of three items represented by a score assigned by respondents to Satisfaction with the three PMSs (Lau and Sholihin, 2005; McGowan and Klammer, 1997).

Environmental Uncertainty is a latent variable composed of complexity, risk and uncertainty, based on other studies (Govindarajan, 1984). Managers were specifically asked to evaluate the relevance of the degree of uncertainty, the level of complexity and the level of risk faced in their unit compared to the average of the sector to which they belong.

The tenure variable is composed of the manager’s tenure in the same company (how long the manager has been with the company, namely, time) and in his or her current position (how long the manager has been in his or her current job, namely, time actual; Finkelstein and Hambrick, 1990).

As suggested by Jacoby and Matell (1971), for each question respondents could choose a score from 1 to 7 on a Likert scale.

Research method
To test the research hypotheses, a PLS-SEM for the whole data set was performed. PLS-SEM is a casual modelling approach aimed at maximising the explained variance of the endogenous latent variables widely used across disciplines such as marketing (Henseler et al., 2009) and the public sector (Kim, 2012). Prior studies that have used PLS-SEM have shown its advantages, which are mainly related to its possible use for small sample sizes, non-normal data and the formative measures of latent variables (e.g. Ringle et al., 2012). All PLS-SEM analyses were performed using SmartPLS 3.0 (Ringle et al., 2012).

This study assessed both the outer and the inner model (Chin, 1998). In order to assess the outer model, the following tests were performed: the internal consistency reliability; the convergent and discriminant validity for the latent variables; the factor loading for each indicator included in the latent variable; and the cross-validated redundancy (Henseler et al., 2009). Convergent validity was assessed using the average variance extracted (AVE; Chin, 1998). Discriminant validity was checked by running a heterotrait-monotrait ratio of correlations (HTMT). To assess the significance of each indicator’s weights, a bootstrapping test was performed (Chin, 1998).

To assess the inner model, the following tests were performed: $R^2$ of endogenous latent variables; estimates for path coefficients; and cross-validated redundancy ($f^2$, Henseler et al., 2009).

Empirical findings
Descriptive statistics and correlation analysis
Descriptive statistics report minimum, maximum and mean values, as well as the standard deviation, for all the observed variables included in this study (Table II). Regarding the Degree of Subjectivity, the highest mean value is associated with budgeting, followed by non-financial PMS and performance evaluation system. As for the PMD, the highest item-mean value is associated with decision-making in non-financial PMS, whereas the item providing the least among PMD is flexibility in budgeting. The highest mean value of satisfaction with the PMS was assigned to budgeting, even though the mean differences with the other two mechanisms was rather low. Environment was perceived as highly
uncertain on average. Even if this mean value does not seem to be very high, the standard deviation is quite high, reflecting quite different situations among respondents. Table III presents the correlation matrix, Pearson index, reliability and validity of constructs and the goodness-of-fit of the structural model. All the tested correlations are positive and significant at the 0.01 level, with Pearson's coefficient values higher than 0.47 in all cases.

Measurement model

As shown in Table III, the indicators included in the latent variables present a satisfactory level of statistical significance. Cronbach’s α and composite reliability values for all the latent constructs achieve satisfactory levels for early stage research studies (Nunnally and Bernstein, 1978). Each construct achieved a level of validity well above the satisfactory 0.5 threshold (Chin, 1998, Table III). Cross-validated communality values are positive for all latent variables included in the model, and HTMT values are all below the 0.9 threshold level (Table III), thereby it can be assured that the quality of the measurement model is good (Henseler et al., 2009).

Procedural and statistical remedies were adopted to minimise the effect of common-method bias (Podsakoff et al., 2003). Procedural remedies deal with the design of the questionnaire. To begin with, this study used the same source (respondent) to collect data for all the constructs included in the study, since the paper aimed at analysing the effect of perceptions (of subjectivity) on other perceptual variables (PMD and managerial satisfaction). Following Conway and Lance (2010), self-reporting is the best way to collect data when perceptual variables are being analysed. Second, respondents’ anonymity and reduced evaluation apprehension are protected by explicitly stating in the questionnaire that there are no right or wrong answers and that respondents should answer questions as honestly as possible (Podsakoff et al., 2003). Therefore, to assure respondents’ anonymity, the temporal, proximal, psychological or methodological separation of measurement cannot be used (Podsakoff et al., 2003). Furthermore, the questionnaire was also pilot tested by experts and practitioners in the field, in order to avoid ambiguous or unfamiliar terms and vague concepts; keep questions simple, specific and concise; avoid double-barrelled questions; decompose

<table>
<thead>
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<th>Research variable</th>
<th>Items</th>
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<th>Max.</th>
<th>Mean</th>
<th>SD</th>
<th>Obs.</th>
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<td>1.273</td>
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<td>0.411</td>
<td>94</td>
</tr>
</tbody>
</table>

Table II. Descriptive statistics of the research variables
### Table III.
Reliability and validity of constructs, discriminant validity, goodness-of-fit indices of the structural model, and correlation matrix of the structural model

<table>
<thead>
<tr>
<th>Research variable</th>
<th>AVE (average variance extracted)</th>
<th>Composite reliability</th>
<th>Cronbach’s α</th>
<th>CVR (cross-validated redundancy)</th>
<th>Effect size ($f^2$)</th>
<th>Degree of subjectivity in the performance system</th>
<th>Perceived managerial discretion</th>
<th>Satisfaction with performance system</th>
<th>Environmental uncertainty</th>
<th>Gender</th>
<th>Tenure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of subjectivity in the performance system</td>
<td>0.629</td>
<td>0.835</td>
<td>0.704</td>
<td>0.285</td>
<td>[0.576]</td>
<td>0.475** (0.000)</td>
<td>0.623** (0.000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived managerial discretion</td>
<td>0.715</td>
<td>0.938</td>
<td>0.920</td>
<td>0.150</td>
<td>0.315</td>
<td>[0.757]</td>
<td>[0.709]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction with performance measurement system</td>
<td>0.739</td>
<td>0.895</td>
<td>0.822</td>
<td>0.361</td>
<td>0.216</td>
<td>[0.190]</td>
<td>[0.189]</td>
<td>[0.112]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental uncertainty</td>
<td>0.414</td>
<td>0.595</td>
<td>0.702</td>
<td>0.014</td>
<td>[0.123]</td>
<td>[0.068]</td>
<td>[0.099]</td>
<td>[0.156]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.000</td>
<td>[0.207]</td>
<td>[0.179]</td>
<td>[0.270]</td>
<td>[0.318]</td>
<td>[0.304]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure</td>
<td>0.785</td>
<td>0.880</td>
<td>0.727</td>
<td>0.012</td>
<td>[0.207]</td>
<td>[0.179]</td>
<td>[0.270]</td>
<td>[0.318]</td>
<td>[0.304]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Pearson coefficients are in italics. In brackets are significance levels for Pearson coefficients. Within square brackets are Heterotrait-Monotrait Ratios. **Correlation is significant at 0.01 level (two-tails)**
questions relating to more than one possibility into simpler, more focussed questions; and avoid complicated syntax. Moreover, the questionnaire provides a detailed description and definition of each term and concept it contains. The method biases were minimised by using different scale endpoints and formats for the predictor and criterion measures (Podsakoff et al., 2003). Furthermore, the acquiescence bias was reduced by avoiding the use of bipolar numerical scale values and providing verbal labels for the midpoints of scales. Regarding the statistical procedures, Harman’s single factor test and partial correlation procedures were applied, the results of which exclude the presence of common-method bias (Podsakoff et al., 2003).

**Structural model**

Results from the SEM-PLS analysis of the study sample are summarised in Table III and Figure 1. The magnitude and significance of the path coefficients achieve satisfactory levels ($p$-value < 0.01; Figure 1) and cross-validated redundancy values for all exogenous variables are positive (CVR, Table III). Thus, the structural model shows a satisfactory level of quality (Henseler et al., 2009).

Results from the general model do not support $H1$ (at $p < 0.000$) (a high degree of subjectivity in budgeting, performance evaluation and non-financial performance measures positively affects the PMD). Empirical results show that the degree of subjectivity in performance measures can affect PMD. In particular, the sign of the relationship is positive and statistically significant, which means that objective measures enhance PMD more than do subjective ones. Thus, the results contradict our $H1$.

Furthermore, the results highlighted that $H2$ (the degree of subjectivity in budgeting, employee evaluation and non-financial performance measures affect manager satisfaction with the PMS) is supported (at $p < 0.000$). Results show that the degree of subjectivity in the performance measures can affect the user’s satisfaction with the PMS. The results

![Diagram of Structural Model](image-url)

**Notes:** Significant at **0.05, ***0.01 level
specifically show that the sign of this relationship is positive and statistically significant; therefore, if objective performance measures are used more, manager satisfaction with the PMS is high.

The results demonstrate that $H3$ (higher levels of PMD will positively affect managers’ satisfaction with PMS) is supported (at $p < 0.000$). Therefore, if PMD increases, manager satisfaction also increases.

Moreover, the indirect effect between Degree of Subjectivity in the PMS and Satisfaction with Performance System is positive and statistically significant ($p < 0.000$). Thus, $H4$ (the degree of subjectivity in budgeting, employee evaluation and non-financial performance measures is indirectly linked to manager satisfaction with the PMS through the PMD) is supported.

The explanatory power of the SEM-PLS general model is moderate ($R^2 = 22.2$ per cent) for PMD, whereas it is quite high regarding satisfaction with PMS ($R^2 = 51.5$ per cent).

**Discussion and conclusions**

*Discussion of results and comparison with the existing literature*

This study analysed the effect of subjective (objective) performance measures on PMD and on manager satisfaction with PMSs. Although the relevance of this topic has been addressed by other scholars, previous studies on this topic did not lead to a general consensus (McCracken *et al.*, 2001). Furthermore, there are very few studies that focus on a variety of PMS, since most previous ones analyse the effect of subjective vs objective measures on employee evaluation (Bicudo de Castro, 2017). Contrary to our expectations, empirical findings from this study show that managers are more inclined towards objective measures than towards subjective ones; indeed, the results highlight that more objective measures can enhance manager satisfaction with PMSs and their perception of managerial discretion, thereby answering the research question:

*RQ1. Do subjective performance measures affect manager satisfaction and the perception of managerial discretion?*

Thus, the study has demonstrated that the subjective measures in the PMS do not seem to have been used as a “fad and fashion” at the time this study was carried out. This result can be due to the adoption of a multitude of PMSs and contributes new knowledge to the lean-as-a-system-fit model literature (Kristensen and Israelsen, 2014).

This study investigated managers with a dual role. In order to deal with this multi-faceted responsibility, managers prefer to rely more on objective rather than subjective measures, since they are more reliable and comparable (McCracken *et al.*, 2001). This result seems to show that subjective measures produce a negative effect, especially in highly uncertain and complex contexts, such as the one investigated in this paper and, more specifically, in R&D settings, where the outcome is difficult to measure (see also Chiesa and Masella, 1996), and performance evaluation contexts, where the perception of justice can be lower due to the lack of trust in the supervisor (Ittner *et al.*, 2003). Moreover, the use of subjective PMSs in the health care sector is rather recent compared to other industries; therefore, as in the case of the introduction of a new PMS (Tuomela, 2005), managers can be more reluctant to use it, and issues of measurement validity and reliability inhibit the use of subjective measures (Wang and Gianakis, 1999). To be effective, subjective measures need fair and unbiased judgements and require that employees accept them unconditionally. Thus, subjectivity may reduce employees motivation (Bol and Smith, 2011).

In detail, the results show that objective measures are more capable of supporting the managerial perception of discretion than are more subjective measures by contributing to that stream of studies which addressed the preference for objective rather than subjective measures by managers when making strategic decisions (Heneman, 1986). This study
supports the prior research that stresses the low capability of subjective PMSs in explaining the delivery of high quality service (Manary et al., 2013).

Moreover, managers perceiving a higher discretion in their decision-making activity have been found to have a higher satisfaction with the PMS as well, and are therefore keener to use it in a strategic way (McCracken et al., 2001). The paper also extends the literature on the performance information use in the public sector (Bevan and Hood, 2006) in that it identifies the nature of the measures (i.e. objective) that seem to significantly affect leaders’ perception of discretion. Therefore, the need to design (or redesign) PMSs accordingly might enhance the quality of managerial decision-making activity (Taylor, 2009).

Finally, the paper contributes to the PMD literature by identifying the antecedents (the use of objective measures) and consequences (satisfaction with the performance measurement) of PMD, especially in the public sector (Hutzschenreuter and Kleindienst, 2013; Wangrow et al., 2015).

Contributions to theory
Findings from this research are consistent with managerial discretion theory by replying to the call for “examining the antecedents and measurement of the managerial discretion construct” (Wangrow et al., 2015, p. 106). On the one hand, this study tested the degree of subjectivity in the PMS as an antecedent of the PMD and found that managers rely more on the objective measures to improve their decision making. On the other hand, it tested the satisfaction with PMS as a consequence of PMD and found that PMD as a psychological attribute can affect manager satisfaction.

Furthermore, based on the managerial discretion theory, the study also extends the upper echelon theory (Cho and Hambrick, 2006), in which scholars demonstrated that managers – whose time is a scarce resource – may effectively benefit from the use of objective performance to effectively allocate their time.

From a methodological standpoint, this study contributes to the development and test of the PMD construct through a paper questionnaire, as previously suggested by Wangrow et al. (2015).

Practical implications
This study has several practical implications. First, it explores some of the drivers to enhance satisfaction regarding the use of a variety of PMSs (Malmmose, 2015). In particular, objective measures should be used to enhance manager satisfaction with the use of PMSs. In fact, managers are more satisfied with the PMS when it is grounded on objective measures as opposed to subjective ones, since the former provide them with more reliable and supportive information to make decisions on multiple objectives. Results suggest that subjective measures have detrimental effects, since these measures may be unduly influenced by an individual’s knowledge of other, unrelated information (see among others: Bol, 2008; Bol and Smith, 2011; Wall et al., 2004), whereas objective measures bring benefits to the organisation (see also Ahn et al., 2010). Furthermore, this study suggests that leaders have to simultaneously deal with a multitude of objectives to be effective (see also McCracken et al., 2001). Managers with a dual-role can exploit this study by relying on objective measures when making decisions. The results also demonstrate that the relationship between performance measure subjectivity and manager satisfaction with the PMS is both directly and indirectly statistically significant. In the latter case, the relationship can be realized through the indirect effect of managerial discretion. PMS developers may take advantage from this study by considering users’ psychological characteristics in designing and diagnosing PMSs (Kunz, 2015). Furthermore, this study may help middle managers in improve internal organisational outcomes via increased managerial discretion (Wangrow et al., 2015).
Limitations and future studies
This study has some limitations, which can be overcome by addressing future research. The results reported in the study refer to a sample of managers in Lombardy. Thus, future research could extend the sample to managers from other Italian regions and other countries in order to facilitate comparisons among different systems by also taking into account different cultural settings. This study focusses on managers from the health care sector (both private and public hospitals are taken into account), which is interesting for its peculiarities and features, such as the high degree of uncertainty and complexity. However, future research can address the same issue in the industrial sector to highlight similarities and differences among different analytical contexts. Moreover, some measures used in this study are based on managerial perceptions. However, the literature has identified this approach as effective and widespread in management and accounting studies (Otley, 2016; Singh et al., 2016). Furthermore, future research could analyse the moderating and or mediating role of managerial discretion in the relationship between subjective vs objective measures and manager satisfaction with the PMS. Other lines of future research could be an analysis of the conditions under which objectivity is better perceived than subjectivity and which is the best combination of objective vs subjective performance measures to reinforce their effectiveness in the PMS, taking account of the complexity of human factors that should be considered when dealing with a PMS (Kunz, 2015).

References


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