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Fad or fashion? The relevance of subjective performance measures

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Fad or fashion? The relevance of subjective performance measures

Abstract

Purpose: This study aims at investigating the effect of the use of objective (subjective) performance measures on some organizational outcomes, namely Perceived Managerial Discretion (PMD) and user's satisfaction with the Performance Measurement System (PMS). Furthermore, the paper analyzes the indirect link between objective vs subjective measures and managers' satisfaction through PMD.

Design/methodology/approach: To test research hypotheses, a PLS-SEM analysis was performed on a dataset 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 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 perceived managerial discretion and links it 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 focused on performance evaluation.

Keywords: objectivity vs subjectivity, perceived managerial discretion, performance measurement systems, budget, non-financial performance, performance evaluation

Introduction

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3 Prior research identified subjectivity in performance measurement as a ‘challenge’ (McCracken et
4 al., 2001). Since objective data is lacking, aggregated and competition-sensitive (Walker and Jones,
5 2003), more and more scholars are relying on performance measures as perceived by managers.
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7 However, issues of measurement validity and reliability inhibit the use of subjective measures,
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9 especially in the public sector (Wang and Gianakis, 1999). Several scholars have investigated the
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11 benefits and detrimental effects of both objective and subjective measures in the private and public
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13 sectors (Bol, 2008; Bol and Smith, 2011); however, to the best of our knowledge, no studies have
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15 been carried out to analyze the effect of subjectivity on the managerial perception of discretion.
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19 Based on the upper echelon theory (Hambrick and Mason, 1984), this paper aims at investigating
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21 the effect of the use of objective (subjective) performance measures on some organizational
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23 outcomes, namely Perceived Managerial Discretion (PMD) and user’s satisfaction with the
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25 Performance Measurement System (PMS). Furthermore, the paper analyzes the indirect link
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27 between objective vs subjective measures and managers’ satisfaction through PMD. Moreover, a
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29 large part of the literature on subjectivity in the PMS is focused only on performance evaluation
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31 systems (e.g., Ahn et al., 2010; Bol, 2008; Bol and Smith, 2011; Kunz, 2015). Therefore, there is
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33 also a gap in investigating the effect of subjective measures in a plurality of PMSs.
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37 Our research question is thus: “Do subjective performance measures affect managers’ satisfaction
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39 and the perception of managerial discretion?”. More specifically, the study wants to analyze
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41 whether the use of more subjective measures can be conceived of as a ‘fad’, and thus not expected
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43 to be used by managers, or a ‘fashion’ which will be adopted within a variety of PMSs to support
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45 managerial decision-making. To answer the research question, data from 97 Italian health care
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47 managers operating in Lombardy was used.
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51 Empirical findings will contribute to the management literature on subjectivity in PMSs (Bol and
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53 Smith, 2011). The paper also extends the literature on PMS design, specifically that part which is
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55 focused on “measuring and managing organisations in delivering value-in-use to its customers” or
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57 stakeholders, as in the present study (Nudurupati et al., 2011, p. 10). This study also extends the
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3 literature on the PMD (Wangrow et al., 2015) by replying to the call for “examining the antecedents
4 and measurement of the managerial discretion construct” (Wangrow et al., 2015, p. 106) and PMS
5 users’ satisfaction (Malmlose, 2015). The managerial implications can be summarized as follows:
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7 this study addresses the need to deal with subjectivity when developing a PMS in order to enhance
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9 users’ satisfaction and decision-making effectiveness by avoiding ‘fads’ and pursuing ‘fashion’ in
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11 the PMS. This study also leads PMS developers to take into account users’ psychological
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13 characteristics in designing and diagnosing PMSs (Kunz, 2015). It also addresses how middle
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15 managers can improve internal organizational outcomes via increased managerial discretion
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17 (Wangrow et al., 2015). Moreover, since users’ satisfaction is linked to PMS subjectivity, findings
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19 from this paper can be aimed at engaging users in the design of the PMS.
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24 The remainder of the paper is organized as follows. The next section will provide a review of the
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26 literature and the theoretical development of the conceptual framework. The third section will
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28 present the research methodology, sample selection and constructs included in this study. The
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30 fourth section will analyze results from the surveyed sample. A discussion of the empirical findings
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32 and concluding remarks are outlined in the final section.
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37 **Background**

38 *Subjective vs objective measures in supporting managerial discretion*

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40 Subjective performance measures (e.g., customer satisfaction) are based on opinions or perceptions,
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42 which cannot be assessed or audited by an independent party but are collected through surveys and
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44 interviews (Singh et al, 2016). Objective measures (e.g., productivity) are instead grounded on more
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46 verifiable facts.
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50 The literature has found that the informational power of objective measures is somehow limited by
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52 different factors. Bevan and Hood (2006) put forward that it is difficult to capture all the relevant
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54 dimensions that should be covered by the objective measure. Furthermore, the validity of objective
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3 measures can be flawed by unintended behaviours (Bevan and Hood, 2006). Given these pitfalls,
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5 there is a call to move beyond activity performance and to adopt subjective measures in order to
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7 achieve accountability and support operational managers (McKernan and McPhail, 2012).
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9 According to Gibbs et al. (2004), subjective measures can be used to reduce biases and mitigate
10
11 risk. Their results show that subjective measures positively affect managers' satisfaction with pay
12
13 scheme. Moreover, subjective measures are useful in aligning individuals' objectives to the firm's
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15 PMS (Hayes et al., 2005). However, although subjective measures can be more informative
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17 compared with objective ones, they are often affected by common-method bias (Wall et al., 2004).
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19 Therefore, a strand of literature has also addressed some concerns on the use of subjective measures
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21 (Bol, 2008; Stede et al., 2006). In particular, Ahn et al. have argued that subjective measures do not
22
23 provide discriminability in performance evaluation (Ahn et al., 2010).
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27 By taking a more comprehensive approach, Dess and Robinson advocate assessing the value in
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29 linking the two typologies of performance together (Dess and Robinson, 1984). In this line of
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31 inquiry, there is a call to further investigate whether objective and subjective measures can address
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33 different effects and or outcomes (Singh et al., 2016). However, most scholars agree that subjective
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35 measures are often less accurate, reliable and more open to raters' biases than are objective ones
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37 (Stede et al., 2006), but that they can reduce distortions in managerial effort created by objective
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39 measures (Singh et al., 2016). To this end, Bol and Smith (2011) reported spillover effects between
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41 objective evaluation applied to one task and subjective evaluation applied to another. They also
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43 pointed out that controllability plays a significant role in the choice of objective vs subjective
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45 measures. Prior literature on subjective vs objective measures has focused on performance
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47 evaluation, whereas few scholars have emphasized the effect of these measures on budgeting and
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49 non-financial performance. In this regard, Hansen et al. (2003) argued that ex-post budgets require
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51 subjective assessments and Ittner et al. (2003) stated that both objective and subjective measures
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53 need to be taken into account in the budgeting process. Furthermore, regarding non-financial
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55 performance, van der Stede (2006) found that firms show higher performance when the
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3 performance measures are especially of the subjective type. Therefore, to shed more light on this
4 topic, this paper aims at understanding the role of subjective and objective measures in supporting
5 managerial decision-making.
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9 For this purpose, this study investigates managerial discretion that can be defined as “whether an
10 organisation’s form and fate sit totally outside the control of its top managers, completely within
11 their control, or, more typically, somewhere in between” (Finkelstein and Boyd, 1998, p. 180).
12
13 Managerial discretion has one main assumption, which pertains to the domain of the upper echelon
14 theory: senior managers’ characteristics, especially CEOs, are ‘reflected’ in organisational
15 outcomes (Hambrick and Mason, 1984). From the initial definition of managerial discretion, which
16 focused on executives’ demographic characteristics, the concept has evolved into a more
17 comprehensive one. Studies at the individual level of managerial discretion have focused on the top
18 management characteristics and the executive *perception* of discretion in their decision-making
19 activity (Hutzschenreuter and Kleindienst, 2013). From this perspective, Zhao and his colleagues
20 stressed the relevance of the perception of managerial discretion, which can be defined as “the
21 actual influence that managers perceive themselves to have regarding the firm’s decision-making
22 process” (Zhao et al., 2010, p. 148). In 2015, Wangrow et al. reviewed the studies on managerial
23 discretion and found that there is a lack of investigation of the antecedents of managerial discretion,
24 especially with regard to the perceptual construct. Since the literature addresses the use of
25 subjective measures to improve decision-making and to enhance managerial controllability, this
26 paper aims at testing the following:
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46 H1. Subjectivity in budgeting, performance evaluation and non-financial performance measures
47 positively affects the PMD.
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55 *Performance measurement subjectivity and user’s satisfaction with the PMS*
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3 Managers rely on those PMSs they perceive as more effective in both providing accurate and
4 reliable information and supporting them in extending the boundaries of their managerial options
5 (Stede et al., 2006). Prior studies have found that it is more straightforward to find benchmarks and
6 collect performance for objective compared to subjective performance measures (Nudurupati et al.,
7 2011). Therefore, when multiple performance measures are available, there will be a preference to
8 assign higher values to objective rather than subjective measures, thereby reducing the balancing
9 effect of subjectivity (Ittner et al., 2003). From a different perspective, prior research has found
10 supportive evidence of the use of both objective and subjective performance measures in enhancing
11 user's perception of usefulness and satisfaction with the PMS (Singh et al., 2016). Subjective
12 measures are perceived as useful by top management teams when there is a need to operationalize
13 multidimensional and broad scope performance measures, such as overall performance (McCracken
14 et al., 2001). Moreover, the literature on performance evaluation found that subjective measures are
15 perceived as useful by superiors in the appraisal of their subordinates (Bicudo de Castro, 2017). In
16 the public sector, the use of subjective performance measures has been found to be useful by the
17 user, especially when controlled against external verification (Andersen et al., 2016). The
18 management literature is rather lacking in evidence regarding the user's satisfaction with subjective
19 (objective) performance measures in budgeting and non-financial PMSs (Demartini and Mella,
20 2014). Since there are contradictory findings, this study cannot predict the sign of the relationship,
21 and therefore the paper tests the following:

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46 H2. Subjectivity in budgeting, employee evaluation and non-financial performance measures affect
47 the user's satisfaction with the PMS.
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52 *Consequences of the PMD on satisfaction with the PMS*

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54 According to Wangrow et al. (2015) "there is tremendous opportunity to better understand the
55 consequences from discretionary forces within an organization and from an executive's
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3 psychological attributes” (Wangrow et al., 2015, p. 100). In this context, PMD can affect
4 organizational outcomes other than firm performance. More specifically, when performance
5 measurement supports performance management, the PMD increases and the satisfaction or
6 willingness to use it for decision-making and accountability purposes is positively affected as well
7 (Maas and Torres-González, 2011). Prior studies have pointed out that several factors enhance the
8 satisfaction with the PMS, such as the instrumental use and usefulness of organizational
9 performance and the relevance of implemented measures with specific reference to the context in
10 which managers operate (Walker et al., 2011). All of these dimensions are captured by the PMD
11 construct. In this regard, it is argued here that the analysis of managers’ satisfaction with the PMS is
12 linked to the degree of PMD. Satisfaction with the PMS is relevant in that managers will be more
13 (less) likely to use the PMS in an effective way when they experience higher (lower) levels of
14 satisfaction.

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

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

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40 Moreover, it is argued here that performance subjectivity is assumed to impact managers’
41 satisfaction with the PMS according to the manager’s perception of discretion. More objective
42 (subjective) performance measures will enhance managers’ satisfaction with the PMS in a context
43 of high (low) perceived discretion. In line with prior research, which treats managerial discretion as
44 a mediator factor (Wu et al., 2015), this study contends that PMD provides an indirect effect on the
45 relationship between performance subjectivity and manager satisfaction:
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55 H4. Performance subjectivity is indirectly linked to managers’ satisfaction with the PMS through
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3 the PMD.
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7 **Methodology**

8 *Sample selection and data collection*

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11 This study investigates a sample of Italian managers in hospital structures in Lombardy. This sector
12 can be effectively adopted to test our research hypotheses due to the dual role of managers in this
13 sector and their resistance to using performance in their activities (Bevan and Hood, 2006).
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16 Therefore, managers will be satisfied if they perceive the PMS as an enabling factor for their PMD.
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19 This region was chosen for the unique features that make it a best practice in terms of efficiency
20 and PMS (Demartini and Mella, 2014).
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23 The responsibility center was selected as the organizational unit of analysis. A responsibility center
24 is the organizational unit, however named, that makes the decisions regarding the use of resources
25 (Demartini and Mella, 2014). As a preliminary step, the total population of organizational units was
26 identified. It can be assumed they are around 2,000, determined by multiplying 200 structures in
27 Lombardy (SISTAN, 2010) by the amount of responsibility centers per structure in the Lombardy
28 region (10 on average). Demographic statistics of the study sample are shown in Table 1.
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46 Following Wangrow's et al. (Wangrow et al., 2015) suggestion for the development of
47 the measure of managerial discretion, the present study performed a survey to help in identifying
48 psychological, environmental and organizational features related to managerial discretion. A paper-
49 based questionnaire was sent to 125 responsibility centers, whose manager has got both clinical and
50 administrative responsibility as budget holder. A random sampling selection method was performed
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3 to identify 125 units of analysis among the universe of units; in this way, all participants have an
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5 equal chance of selection (Messiah et al., 2014).

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7 Two weeks after the survey submission, a follow-up was performed. The response rate was 77.6 %
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9 (97 questionnaires were returned), which can be considered in line with similar studies in this sector
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11 (Messiah et al., 2014) and with the significant sample size (Barclay et al., 1995). To determine the
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13 significant sample size ($n = 97$), the following formula was applied (Sapsford, 2006, pp. 22, 90–3):
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$$15$$
$$16$$
$$17$$
$$18 n = (F^2 \times N \times (P \times (1 - P))) / ((DS^2 \times (N - 1)) + (F^2 \times P \times (1 - P)))$$
$$19$$
$$20$$
$$21$$

22 where n is the significant sample size, DS is the desired precision (DS)= 2%, P is the probability of
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24 positive results (P= 99%), F is the confidence level, which equals 95% (F=2), and N is the
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26 population of managers.
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28 To check for early and late respondent bias, a t-test analysis was performed which led to the
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30 rejection of bias between early and late respondents in the study sample.
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35 *Measurement of variables*

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37 Based on the data collected and the research hypotheses of this study, the following variables were
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39 computed: PMD, Degree of Subjectivity in the PMS, and Satisfaction with Performance
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41 Measurement System. Following upper echelon theory, the control variables are Environmental
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43 Uncertainty, Gender and Tenure (Hambrick and Mason, 1984). The paper focuses on three
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45 performance measurement mechanisms: budgeting, non-financial PMSs and performance
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47 evaluation systems, since these can be based on both subjective and objective measures. Moreover,
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49 budgeting and non-financial PMSs have been under-investigated in the performance subjectivity
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51 literature (Hansen et al., 2003; Ittner et al., 2003).
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3 With reference to the PMD variable, the study tried to overcome the limitations of prior studies by
4 using a measure, which directly assesses perception and is not a proxy for it. PMD is a latent
5 variable composed of the following two items with regard to the three PMSs (Eugenio Anessi-
6
7 Pessina et al., 2016): Decision-Making and Flexibility. In the questionnaire, Decision-Making
8
9 regards the managers' perception of the effectiveness of the three PMSs used in providing
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11 information with reference to supporting the operational decisions of the managers' units, whereas
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13 Flexibility regards the respondents' perceptions of the effectiveness of the afore-mentioned PMSs
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15 in providing information to enable the flexibility/adaptability of the organizational unit.
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19 Degree of Subjectivity in the Performance System is a latent variable composed of three items:
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21 Degree of Subjectivity in Non-Financial Performance System, Degree of Subjectivity in the Budget
22
23 and Degree of Subjectivity in the Employee Performance Evaluation System. Respondents were
24
25 specifically asked to highlight if the three PMSs are based, or focused, entirely on either subjective
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27 or objective performance measures.
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31 Satisfaction with Performance Measurement System is a latent variable composed of three items
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33 represented by a score assigned by respondents to Satisfaction with the three PMSs.
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36 Environmental Uncertainty is a latent variable composed of Complexity, Risk and Uncertainty,
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38 based on other studies (Govindarajan, 1984). Managers were specifically asked to evaluate the
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40 relevance of the degree of Uncertainty, the level of Complexity and the level of Risk faced in their
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42 unit compared to the average of the sector to which they belong.
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45 The tenure variable is composed of the manager's tenure in the same company (how long the
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47 manager has been with the company, namely, Time) and in his or her current position (how long the
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49 manager has been in his or her current job, namely, Time Actual).
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52 As suggested by Jacoby and Matell (1971), for each question respondents could choose a score
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54 from 1 to 7 on a Likert scale.
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57 *Research method*

To test the research hypotheses, a PLS-SEM for the whole dataset 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: (a) the internal consistency reliability, (b) the convergent and discriminant validity for the latent variables, (c) the factor loading for each indicator included in the latent variable, and (d) 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: (a) R^2 of endogenous latent variables, (b) estimates for path coefficients, and (c) 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 2). 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

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3 with decision-making in non-financial PMS, whereas the item providing the least among PMD is
4 flexibility in budgeting. The highest mean value of satisfaction with the PMS was assigned to
5 budgeting, even though the mean differences with the other two mechanisms was rather low.
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7 Environment was perceived as highly uncertain on average. Even if this mean value does not seem
8
9 to be very high, the standard deviation is quite high, reflecting quite different situations among
10
11 respondents. Table 3 presents the correlation matrix, Pearson index, reliability and validity of
12
13 constructs and the goodness-of-fit of the structural model. All the tested correlations are positive
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15 and significant at the 0.01 level, with Pearson's coefficient values higher than 0.47 in all cases.
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26 *Measurement model*

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28 As shown in Table 3, the indicators included in the latent variables present a satisfactory level of
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30 statistical significance. Cronbach's alpha and composite reliability values for all the latent
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32 constructs achieve satisfactory levels for early stage research studies (Nunnally and Bernstein,
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34 1978). Each construct achieved a level of validity well above the satisfactory 0.5 threshold (Chin
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36 1998; Table 3). Cross-validated communality values are positive for all latent variables included in
37
38 the model, and HTMT values are all below the 0.9 threshold level (Table 3), thereby it can be
39
40 assured that the quality of the measurement model is good (Henseler et al., 2009).
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44 Procedural and statistical remedies were adopted to minimize the effect of common method bias
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46 (Podsakoff et al., 2003). Procedural remedies deal with the design of the questionnaire. To begin
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48 with, this study used the same source (survey respondent) to collect data for all the constructs
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50 included in the study, since the paper aimed at analyzing the effect of perceptions (of subjectivity)
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52 on other perceptual variables (PMD and managerial satisfaction). Following Conway and Lance
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54 (Conway and Lance, 2010), self-reporting is the best way to collect data when perceptual variables
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56 are being analyzed. Secondly, respondents' anonymity and reduced evaluation apprehension are
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3 protected by explicitly stating in the questionnaire that there are no right or wrong answers and that
4 respondents should answer questions as honestly as possible (Podsakoff et. al 2003). Therefore, to
5 assure respondents' anonymity, the temporal, proximal, psychological, or methodological
6 separation of measurement cannot be used (Podsakoff et. al 2003). Furthermore, the questionnaire
7 was also pilot tested by experts and practitioners in the field, in order to avoid ambiguous or
8 unfamiliar terms and vague concepts; keep questions simple, specific, and concise; avoid double-
9 barreled questions; decompose questions relating to more than one possibility into simpler, more
10 focused questions; and avoid complicated syntax. Moreover, the questionnaire provides a detailed
11 description and definition of each term and concept it contains. The method biases were minimized
12 by using different scale endpoints and formats for the predictor and criterion measures (Podsakoff
13 et. al 2003). Furthermore, the acquiescence bias was reduced by avoiding the use of bipolar
14 numerical scale values and providing verbal labels for the midpoints of scales. Regarding the
15 statistical procedures, Harman's single factor test and partial correlation procedures were applied,
16 the results of which exclude the presence of common method bias (Podsakoff et. al 2003).
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39 *Structural model*

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41 Results from the SEM-PLS analysis of the study sample are summarized in Table 3 and Figure 1.
42 The magnitude and significance of the path coefficients achieve satisfactory levels (p -value < 0.01 ;
43 Figure 1) and cross-validated redundancy values for all exogenous variables are positive (CVR,
44 Table 3). Thus, the structural model shows a satisfactory level of quality (Henseler et al., 2009).
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3 Results from the general model do not support hypothesis H1 (at $p < 0.000$) (*Subjectivity in*
4 *budgeting, performance evaluation and non-financial performance measures positively affects*
5 *PMD*). Empirical results show that the degree of subjectivity in performance measures can affect
6
7 PMD. In particular, the sign of the relationship is positive and statistically significant, which means
8
9 that objective measures enhance PMD more than do subjective ones. Thus, the results contradict
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11 our H1.
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15 Furthermore, the results highlighted that hypothesis H2 (*Subjectivity in budgeting, employee*
16 *evaluation and non-financial performance measures affect the user's satisfaction with PMS*) is
17 supported (at $p < 0.000$). Results show that the degree of subjectivity in the performance measures
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19 can affect the user's satisfaction with the PMS. The results specifically show that the sign of this
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21 relationship is positive and statistically significant; therefore, if objective performance measures are
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23 used more, the user's satisfaction with the PMS is high.
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28 The results demonstrate that hypothesis H3 (*Higher levels of PMD will positively affect managers'*
29 *satisfaction with PMS*) is supported (at $p < 0.000$). Therefore, if PMD increases, the managers'
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31 satisfaction also increases.
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35 Moreover, the indirect effect between Degree of Subjectivity in the PMS and Satisfaction with
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37 Performance System is positive and statistically significant ($p < 0.000$). Thus, H4 (*The performance*
38 *subjectivity is indirectly linked to managers' satisfaction with the PMS, through the PMD*) is
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40 supported.
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44 The explanatory power of the SEM-PLS general model is moderate ($R^2 = 22.2\%$) for PMD,
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46 whereas it is quite high regarding satisfaction with PMS ($R^2 = 51.5\%$).
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50 **Discussion and conclusions**

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52 This study analyzed the effect of subjective (objective) performance measures on PMD and on
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54 managers' satisfaction with PMS. Although the relevance of this topic has been addressed by other
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3 scholars, previous studies on this topic did not lead to a consensus (McCracken et al., 2001).
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5 Furthermore, there are very few studies that focus on a variety of PMS, since most previous ones
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7 analyze the effect of subjective vs objective measures on employee evaluation (Bicudo de Castro,
8
9 2017). Contrary to our expectations, empirical findings from this study show that managers are
10
11 more inclined toward objective measures than toward subjective ones; as a matter of fact, the results
12
13 highlight that more objective measures can enhance managers' satisfaction with PMSs and their
14
15 perception of managerial discretion, thereby answering the research question: "Do subjective
16
17 performance measures affect managers' satisfaction and the perception of managerial discretion".
18
19 Thus, the emphasis on subjective measures would seem to be a 'fad' rather than a support to
20
21 managerial action. This result can be due to the adoption of a multitude of PMSs and contributes
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23 new knowledge to the lean as a system fit model literature (Kristensen and Israelsen, 2014).
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25 This study investigated managers with a dual role. In fact, managers have both a clinical and an
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27 organizational responsibility. The former has much to do with effectiveness and quality, whereas
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29 the latter with efficiency issues. In order to deal with this multi-faceted responsibility, managers
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31 prefer to rely more on objective rather than subjective measures, since they are more reliable and
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33 comparable (McCracken et al., 2001). This result is in line with that part of the literature
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35 highlighting the negative effect of subjective measures in highly uncertain and complex contexts,
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37 such as the one investigated in this paper and, more specifically, in R&D settings, where the
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39 outcome is difficult to measure (Chiesa and Masella, 1996), and in performance evaluation
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41 contexts, where the perception of justice can be reduced due to the lack of trust in the supervisor
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43 (Ittner et al., 2003). Moreover, the use of subjective PMSs in the health care sector is rather new
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45 compared to other industries; therefore, as in the case of the introduction of a new PMS (Tuomela,
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47 2005), managers can be more reluctant to use it. Therefore, the results are in line with those
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49 scholars who argue that issues of measurement validity and reliability inhibit the use of subjective
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51 measures, especially in the public sector (Wang and Gianakis, 1999). To be effective, subjective
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3 measures need fair and unbiased judgements, and require that the employees accept them
4 unconditionally. Thus subjectivity may reduce employees' motivation (Bol and Smith, 2011).
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7 This study has several practical and theoretical implications. First, it explores some of the drivers to
8 enhance satisfaction regarding the use of a variety of PMSs (Malmrose, 2015). In particular,
9 objective measures should be used to enhance managers' satisfaction with the use of PMSs. As a
10 matter of fact, managers are more satisfied with the PMS when it is grounded on objective measures
11 as opposed to subjective ones, since the former provide them with more reliable and supportive
12 information to make decisions on multiple objectives. These results are in line with that part of the
13 literature which found detrimental effects in the use of subjective measures (Wall et al., 2004),
14 those studies that highlight benefits in having objective measures (Ahn et al. 2010), those that take
15 into account that leaders have to simultaneously deal with a multitude of objectives (McCracken et
16 al., 2001), and those theories from psychology and organizational behavior which suggest that
17 subjective measures may be unduly influenced by an individual's knowledge of other, unrelated
18 information (Bol, 2008; Bol and Smith, 2011). Thus, this study questions the introduction of
19 subjective measures in supporting decision-making activity. Furthermore, the paper extends the
20 literature on PMS, since it deals with a variety of PMSs (budgeting, non-financial and employee
21 evaluation systems), whereas the prior literature on objective vs subjective measures mainly
22 focused on performance evaluation (Bol and Smith 2011). The results also demonstrate that the
23 relationship between performance measure subjectivity and managers' satisfaction with the PMS is
24 both directly and indirectly statistically significant. In the latter case, the relationship can be
25 realized through the indirect effect of managerial discretion.
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48 Secondly, objective measures are more capable of supporting the managerial perception of
49 discretion than are more subjective measures. On the one hand, this result is in line with some
50 earlier studies, which addressed the preference for objective rather than subjective measures by
51 managers when making strategic decisions (Heneman, 1986). In particular, our study supports prior
52 research that stresses the low capability of subjective PMSs in explaining the delivery of high
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3 quality service (Manary et al., 2013). On the other hand, findings from this analysis are in contrast
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5 with the stream of literature questioning the use of objective measures (Bevan and Hood, 2006).

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

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

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29 Finally, findings from this research are consistent with two streams of studies based on the upper
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31 echelon theory. The cognitive theory of attention and bounded rationality (Simons, 1994), which
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33 has been integrated with upper echelon theory in Cho and Hambrick's study (Cho and Hambrick,
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35 2006). They demonstrated that managers – whose time is a scarce resource – may effectively
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37 benefit from the use of objective performance to effectively allocate their time.

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40 From a methodological standpoint, this study contributes to the development and test of the
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42 construct of PMD through a survey, as suggested by Wangrow's et al. (2015).

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44 Some limitations arise from this study. The results reported in this study refer to a sample of
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46 managers in Lombardy. Thus, future research could extend the sample to managers of other Italian
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48 regions and other countries in order to facilitate comparisons among different systems by also
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50 taking into account different cultural settings. Moreover, some measures used in this study are
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52 based on managerial perceptions. However, the literature has identified this approach as effective
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54 and widespread in management and accounting studies (Otley, 2016; Singh et al., 2016).

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57 Furthermore, future research could analyze the moderating and or mediating role of managerial
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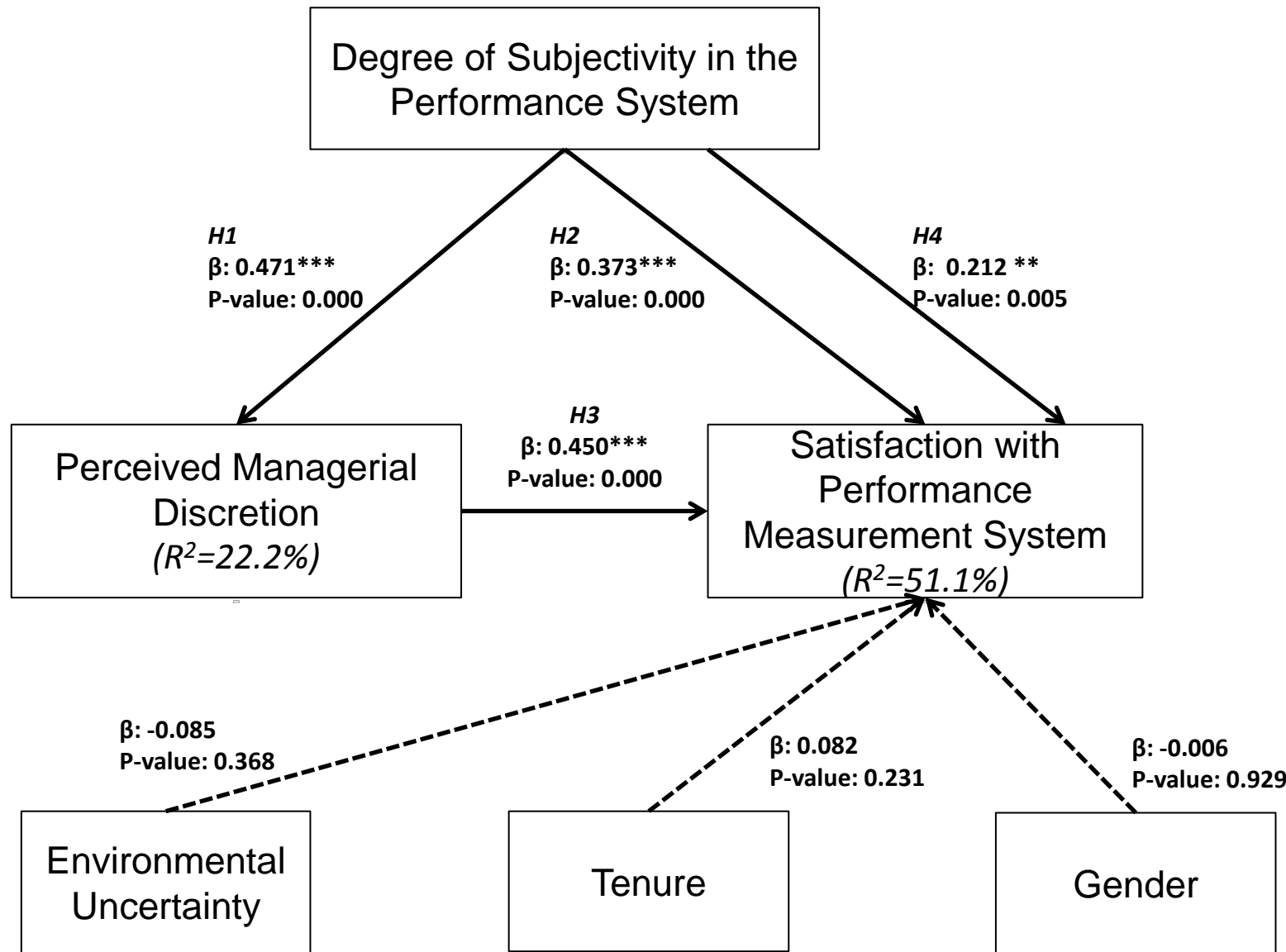
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3 discretion in the relationship between subjective vs objective measures and managers' satisfaction
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5 with the PMS. Other lines of future research could be an analysis of the conditions under which
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7 objectivity is better perceived than subjectivity and which is the best combination of objective vs
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9 subjective performance measures in order to reinforce their effectiveness in the PMS, taking
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11 account of the complexity of human factors that should be considered when dealing with a PMS
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13 (Kunz, 2015).
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Table 1 – Demographic statistics of the sample being analysed

		Hospitals	Sample managers
Type of hospitals	Private	2	23
	Public	5	102
	Total	7	125
Complexity of hospitals	Research	3	38
	Teaching	4	87
	Total	7	125
Total (Average) number of beds		852.99	(23)
Total (Average) catchment area		502,352	(27,840)
Gender	Male		101
	Female		24
	Total		125

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.

Table 2 – Descriptive statistics of the research variables

Research variable	Items	Min	Max	Mean	Standard deviation	Obs.
Degree of Subjectivity in the Performance System	Degree of Subjectivity in Non-Financial	2	7	4.75	1.273	96
	Degree of Subjectivity in Budget	2	7	4.97	1.254	97
	Degree of Subjectivity in Employee Performance Evaluation System	1	7	4.19	1.294	97
Perceived Managerial Discretion	Decision-Making in non-financial	1	7	4.99	1.510	97
	Flexibility in non-financial	1	7	4.54	1.479	97
	Decision-Making in budget	1	7	4.77	1.531	97
	Flexibility in budget	1	7	4.36	1.556	97
	Decision-Making in employee performance evaluation system	2	7	4.88	1.371	97
	Flexibility in employee performance evaluation system	1	7	4.58	1.513	97
Satisfaction with Performance Measurement System	Satisfaction with Non-Financial	2	7	4.67	1.305	97
	Satisfaction with budget	2	7	4.74	1.387	97
	Satisfaction with employee performance evaluation system	2	7	4.47	1.251	97
Environmental Uncertainty	Risk	1	7	4.48	1.217	97
	Complexity	3	7	5.20	1.196	97
	Uncertainty	1	7	4.25	1.191	97
Tenure	Time	1	37	13.04	11.222	93
	Time Actual	1	20	4.73	4.658	93
Gender	Gender	0	1	0.21	0.411	94

Table 3 – Reliability and validity of constructs, discriminant validity, goodness-of-fit and correlation matrix of the structural model

Research variable	AVE (Average Variance Extracted)	Composite Reliability	Cronbach's Alpha	CVR (Cross- Validated Redundancy)	Effect size (f ²)	Degree of Subjectivity in the Performanc e System	Perceived Managerial Discretion	Satisfactio n with Performa nce System	Enviro nment al Uncert ainty	Gende r	Tenure
Degree of Subjectivity in the Performance System	0.629	0.835	0.704		0.285		<i>0.475</i> ** (0.000)	<i>0.564</i> ** (0.000)			
Perceived Managerial Discretion	0.715	0.938	0.920	0.150	0.315	[0.576]		<i>0.623</i> ** (0.000)			
Satisfaction with Performance Measurement System	0.739	0.895	0.822	0.361	0.216	[0.757]	[0.709]				
Environmental Uncertainty	0.414	0.595	0.702		0.014	[0.190]	[0.189]	[0.112]			
Gender	1	1	1		0.000	[0.123]	[0.068]	[0.099]	[0.156]		
Tenure	0.785	0.880	0.727		0.012	[0.207]	[0.179]	[0.270]	[0.318]	[0.304]	

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 (2-tails).).

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Management Decision