

The influence of performance measurement systems and supervisor trustworthiness on knowledge sharing

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ABSTRACT

The objective of our study is to examine the influence of combined performance measurement systems (PMS), which include both subjective evaluation and objective measures, on the willingness of employees to share knowledge. Additionally, our study investigates another variable which may influence subjective judgments of employee performance, namely supervisor trustworthiness. We argue that incorporating subjective evaluations into a performance measurement system will have little effect on knowledge-sharing behavior unless the supervisor is considered trustworthy enough to evaluate such behavior. Using a 2x2 between-subjects experiment design with 73 undergraduate students who act as employees as subjects, the result of this study shows that including subjective evaluation in a PMS encourages the willingness to share knowledge more than only using objective measures. This study also shows that supervisor trustworthiness alone can encourage a willingness to share knowledge. Furthermore, the combination of PMS which include subjective and objective measures and high supervisor trustworthiness has a significant impact on increasing the willingness to share knowledge.

Introduction

According to Merchant and Van der Stede (2012, pp. 368-369), the incentive system in management control has three benefits: 1) it is useful for attracting employees' attention and informing them of the importance of competing for results; 2) employees exert more effort to perform their duties well; and 3) it increases recruitment and retention by offering compensation packages comparable or superior to their competitors. The benefits of the incentive system can be obtained through the performance measurement system (PMS) design because employees who expect incentives will direct their attention directly to the aspects of the work being measured.

According to agency theory, implementing PMS using objective performance measures guarantees that the incentives agents will obtain are in a predictable direction, as these measures can be assessed by third parties (because of their objectivity) and these measures are not influenced by noise (because of its precision) (Kunz, 2015). Objective performance measures have the advantage of setting clear criteria that provide information to employees regarding specific actions that can lead to increased compensation. However, PMS with objective measurements is also deficient. Objective measures are sometimes considered to fail to measure employee contributions to organizational goals and the long-term growth of company value. Therefore, many companies attempt to mitigate the distorting effects of objective performance measures by allowing evaluators to include their subjective assessments.

Various empirical evidence shows that subjective performance measures are applied to compensate for deficiencies in objective performance measurements (see, Cheng & Coyte, 2014; Kunz, 2015; Voußem et al., 2016). Subjectivity in performance appraisal evaluations can be used when evaluators find it challenging to use objective measures alone when measuring performance when the measure does not fully reflect employee performance (Wick, 2021). Events that subordinates cannot control can influence their outcomes. Thus, these outcomes do not reflect the actual efforts of subordinates, whether the outcome is above the target or below the target, and as a result, will affect the quality of performance assessment decisions.

One of the practical activities or behaviors carried out by subordinates, which is beneficial for company value but is difficult to measure with objective measures, is sharing knowledge with colleagues. Knowledge sharing is a form of behavior that is difficult to describe explicitly in performance measurement, although it is behavior that benefits individuals, teams, and organizations (Ahmad & Karim, 2019; Haesebrouck et al., 2021). Ahmad and

Karim (2019), in their literature review, conclude that the impact of knowledge-sharing behavior on individuals, teams, and organizations varies. At the individual level, sharing knowledge impacts individual performance, learning, and creativity and has psychological effects. At the team level, it impacts performance, creativity, and team climate. At the organizational level, it impacts performance, innovation and learning, and organizational business process efficiency. With its many benefits, Haesebrouck et al. (2021) emphasize that knowledge is crucial for organizations. Therefore, a reward system and appropriate PMS design are needed to encourage this behavior.

Based on the explanation above, this study aims to investigate the effect of a combined PMS design—meaning the application of objective and subjective measures simultaneously—by extending the study of Cheng and Coyte (2014). Experiments by Cheng and Coyte (2014) produced empirical evidence showing that employees are more willing to share knowledge in incentive schemes with subjective weighting¹ compared to a formula-based incentive scheme with predetermined weighting. In contrast to Cheng and Coyte (2014) study, this study examines the application of a combined PMS as an antecedent factor of knowledge-sharing behavior. One of the antecedents of knowledge sharing in the form of incentive expectations has so far been found to have different directions of influence, some are positive, others are negative, and some studies even show no effect (Wang & Noe, 2010). These different findings are not only due to problems with the internal validity of some studies, such as the assumptions of Wang and Noe (2010), but also because knowledge-sharing behaviors depend on the situation and conditions in which the behavior occurs (see Sergeeva & Andreeva, 2016). Therefore, this study adds supervisor trustworthiness as an explanatory variable for the PMS relationship and knowledge-sharing context, which has never been tested along with PMS. This variable is important because the supervisor's position is considered to be more involved in subordinates' work and daily activities and significantly influences subordinates' promotions, assignments, and layoffs. When PMS includes subjective assessments as performance indicators, supervisors can assess employee behavior in the company that cannot be assessed using only objective measures (Voußem et al., 2016). However, when implementing this system, trust between subordinates and supervisors is essential if subjective PMS is to be successful (Haesebrouck et al., 2021; Hayat Bhatti et al., 2021).

Literature Review

Subjectivity in Performance Measurement Systems

Subjectivity in performance measurement has a vital role because these measures allow supervisors to use non-contractible information to account for the contribution of subordinates to company value that is difficult to capture with objective measures (Voußem et al., 2016). Long et al. (2015) conclude that subjectivity can be used in performance evaluation systems through (1) the inclusion of subjective performance measures, (2) the subjective weighting of diagnostic measures, or (3) the discretionary adjustment of measures.

Wick (2021) concludes that the benefits obtained when applying subjectivity in performance measurement include reduced compensation risks arising from events beyond the control of the ex-ante contract design so that they cannot be explicitly contracted out. This risk can be handled with ex-post discretion of subjectivity, which reduces perceptions of unfairness, especially if performance is aggregated so that individual assessments can be ignored. Using subjective assessments can restore the perception of fairness to individuals, and this can be significant if there are team members who do not contribute at all; it can encourage adaptive behavior such as extra-role behavior and knowledge sharing; it can also mitigate incentive distortion because not all job dimensions are observable and measurable.

Apart from that, Wick (2021) also concludes that the costs of subjectivity, including inaccurate evaluation, refer to divergence from 'real' performance. Such inaccuracies may be intentional or unintentional; subjectivity will open up opportunities for activities to influence managers to provide higher value for employees' performance or compensation. Subjectivity can lead to uncertainty about measurement criteria, thereby incurring the cost that employees do not have complete control over how managers can subjectively evaluate their efforts. Subjectivity also has the risk of not being fair because it depends on the likeability of the assessor (Bauch et al., 2021).

Knowledge Sharing

One way to shape values and build the competitive advantage of employees is to encourage them to share and apply their knowledge (Ahmad & Karim, 2019; Li et al., 2017; Obrenovic et al., 2020). The knowledge possessed by individuals can be categorized into explicit knowledge and tacit knowledge. Tacit knowledge can be defined as knowledge that is difficult to codify or articulate because it is embedded in an individual's experience and thoughts, such as skills or know-how. Meanwhile, explicit knowledge can be easily expressed and communicated in the form of written documents. Sharing tacit knowledge is necessary to create added value for innovation-oriented businesses. In contrast, explicit knowledge is more in line with the characteristics of manufacturing companies (Obrenovic et al., 2020). In the end, knowledge-sharing behavior has its costs because the knowledge giver will

¹ Knowledge-sharing behavior here is defined as sharing knowledge in informal interactions (Bartol, 2002).

lose their advantages in the interests of the common good (Ayodele et al., 2016). That is why a perception of fairness must be presented to encourage knowledge-sharing behavior, especially for knowledge providers with more significant costs (Li et al., 2017). Therefore, several researchers have concluded that there needs to be benefits obtained for knowledge providers to reduce the burden they have (Cheng & Coyte, 2014; Haesebrouck et al., 2021; Perotti et al., 2022).

Supervisor Trustworthiness

The supervisor (or direct leader) is the primary reference for the level of trust in subordinates, which is very important. Because the supervisor's position is more involved in outcomes related to work and daily activities than subordinates, this study focuses on the definition of subordinate trust related to the characteristics of trustworthiness that their supervisors possess. The supervisory position can guarantee success in achieving management goals by motivating subordinates to make efforts or contributions that exceed formal role expectations (Lapierre, 2007). On the other hand, subordinates will consider making more contributions to the company that their supervisors trust them to do. This trust is essential because supervisors can make decisions that significantly impact their followers (for example, promotions, pay, assignments, and layoffs). A previous study by Kim and Kuo (2015) shows that managers' trustworthiness positively relates to organizational citizenship behavior.

This study uses the characteristics of trustworthiness as per Lapierre (2007), namely ability, benevolence toward the subordinate, and benevolence toward the subordinate's peers, which are proxies for integrity. According to Lapierre (2007), benevolence toward subordinate peers influences subordinates' perceptions regarding supervisor integrity. This construct suggests that supervisors behave positively towards all people without excluding others. This leader's behavior is considered to demonstrate his or her integrity in behaving the same way towards all employees.

Hypothesis Development

This study emphasizes that participants will be more willing to engage in knowledge-sharing behavior if their performance is measured using a combined PMS (that uses both objective and subjective measures) compared to objective measures alone. This prediction is based on economic exchange theory which posits that individuals will act based on their rational calculations related to an analysis of benefits and costs. Therefore, knowledge sharing will occur when the incentives obtained exceed the costs.

Knowledge-sharing behavior has more significant costs for the knowledge giver; for example, the superiority afforded by having the knowledge will be lost, and effort and time will be diverted to the interests of others (Ayodele et al., 2016). The experiments of Haesebrouck et al. (2021) and Cheng and Coyte (2014) have proven that knowledge-sharing behavior requires more significant incentives than just engaging in extra-role behavior that does not involve the transfer of knowledge. Therefore, many studies emphasize the influence of incentive systems to encourage knowledge-sharing behavior.

Supervisors can assess work dimensions that are difficult to capture with objective measures by including subjective measures in the PMS. For example, if a subordinate shares knowledge with his or her colleagues, this results in a lack of achievement of targets from objective measures due to diverted time and effort. Supervisors can provide higher ratings through subjective assessments, reducing the costs subordinates bear from knowledge-sharing behavior. Therefore, subordinates can expect the incentives they receive from the supervisor's subjective assessment.

It is different if PMS only uses objective measures, even though it directs various behaviors to obtain incentives, but limits employee behaviors that have aggregate benefits for the company. On the other hand, supervisors cannot provide incentives or reduce costs borne by subordinates because this behavior is an informal activity that escapes the dimensions of objective measurement. Thus, researchers assume that implementing a combined PMS will encourage more knowledge-sharing behavior than simply applying objective measures. Therefore, this study proposes the following hypothesis:

H1: Employee willingness to share knowledge is higher under combined PMS compared to PMS which uses only objective measures.

Even though it has many benefits, using subjective measures in a PMS cannot ensure that incentives from knowledge-sharing behavior will be obtained. Merchant and Van der Stede (2012, pp. 377-378) argue that applying subjective measures in a PMS can affect employee risk. These risks can be reduced when subjective measures are used in the interests of employees. However, on the other hand, employee risk can increase if employees do not trust their evaluators, resulting in bias in the assessment of their performance. Results of performance appraisals that do not match employee expectations can cause frustration, demotivation, and friction (disunity occurs).

Trustworthiness possessed by superiors will influence the level of trust in subordinates. It will motivate behavior that is beneficial to company value. Therefore, when applying subjectivity in a PMS, trust in the supervisor will be the primary consideration for subordinates when engaging in knowledge-sharing behavior. Thus, this study

also tests whether high levels of supervisor trust can be one of the factors driving the effectiveness of implementing a PMS that incorporates subjective measures and also be one of the drivers of knowledge-sharing behavior, even though only implementing a PMS with objective measures. So, the following hypothesis is proposed:

H2: High supervisor trustworthiness will encourage knowledge-sharing behavior in a combined PMS or a PMS that only uses objective measures.

H3: Combining PMS and high supervisor trust will encourage more knowledge-sharing behavior.

Research Methods

This study uses a laboratory experiment with a 2x2 between-subjects factorial design, namely the PMS scheme with only objective measures or a combination of both objective and subjective assessments along with supervisor trustworthiness (high and low). A genuine experimental design is applied because the researcher and manipulation can manipulate the independent variables in this study, which can be applied randomly to groups of subjects to increase homogeneity between groups (Nahartyo, 2013, p. 80). The experimental procedure was modified from previous experiments by Haesebrouck et al. (2021)² plus a scenario related to supervisor trustworthiness adapted from Lapiere (2007). Experimental procedures and modules were subjected to pilot testing before being executed.

Participants

The participants in this study were 105 undergraduate students from the Faculty of Economics and Business at Universitas Gadjah Mada. Previous experimental studies testing incentive systems and PMS have generally used students as participants, including undergraduate students (Haesebrouck et al., 2021; Kunz, 2015), graduate students (Cheng & Coyte, 2014), and MBA students (Long et al., 2015). The selection of undergraduate students as participants in this study took into account several factors. First, because undergraduate students have limited experience related to PMS in both theory and practice; they have not yet developed an understanding of the "ideal design" of the system. Based on this, undergraduate students can provide conclusions regarding the behavioral consequences of PMS without any confounding problems from the effects of participants who have experience related to poor PMS implementation (Kunz, 2015). Second, the decision-making task in this experiment did not require specific skills that exceeded the expected abilities of undergraduate students. The study sample was taken using a purposive sampling technique and involved students who had taken the Management Control Systems course. The selection of these criteria ensures that participants understand the assessment process in PMS based on objective measures and subjective assessments.

Experimental Procedures

The experimental study procedure of Haesebrouck et al. (2021) applies the treatment of the presence and absence of incentives originating from co-workers as a construct of reciprocation. This study modifies this procedure by using incentives and applying only combined PMS or objective measures. In addition, this study adds information related to supervisor characteristics before continuing to the second session to decide the willingness to share knowledge.

Participants were randomly assigned to one of four experimental conditions created from two between-subjects factorials: objective or combined PMS and supervisor trustworthiness (high or low). Afterward, participants received treatment in two stages, as explained below.

Table 1. Experimental design 2 x 2 between subjects

		Supervisor trustworthiness	
		High	Low
Performance Measurement System	Combination	Cell 1	Cell 2
	Objective Measure	Cell 3	Cell 4

The First Stage

In the first stage, after the participants had read a scenario related to the company and their role in the company, all participants were assigned to complete seven sets of arithmetic sequence problems. The participants read instructions explaining the number series and the purpose of their task in this stage. Number series were available in the form of a sequence of numbers that follow a specific pattern or a particular algorithm. The participants had to answer each question correctly and work on the description/solution of the algorithm before continuing with the next question.

² This study modifies Haesebrouck et al's 2015 experimental procedures which can be accessed via paper.ssrn.com before being published in a journal in 2021.

There were seven sets of questions; each set consisted of two numbers with the same pattern, which were answered within 25 minutes³. Depending on the PMS, each participant's correct answer would receive a different treatment. For PMS with only objective measurements, each correct answer was given an incentive of IDR 10,000, a total of IDR 70,000⁴ (7 questions x IDR 10,000). Meanwhile, the ratio of subjective and objective measures was 50:50 for combined PMS⁵. So, each correct answer was worth IDR 5,000, the total incentive if all answers were correct was IDR 35,000 (7 questions x IDR 5,000), and the remaining IDR 35,000 was a subjective assessment by the supervisor.

Before continuing with the next stage, participants were given the facilities to complete all seven questions. First, they received two problems that followed identical algorithms, providing more information to identify the algorithm used to create the two problems. Second, participants could access up to two hints per question on envelopes marked "Hint 1" and "Hint 2". Access to these instructions was assumed to be an advantage built by participants during their careers at the company. Participants were asked to open the hint envelope when they could not determine the solution on their own.

Second Stage

At this stage, all the participants first read different instructions in each cell. The information provided by the scenario was related to supervisor trust (high or low) adapted from Lapierre (2007). In the second stage of instruction, the participants learned that colleagues in the same company could not complete all of the tasks, indicating that they would not receive any incentives. The participants were also informed that their co-workers did not have the advantages that the participants currently have, namely access to two instructions and getting two questions with the same pattern.

The participants were then given the opportunity to help their colleagues by sharing information from descriptions of algorithms they had worked on previously. Participants determined the number of solution descriptions of the problem (between 0 and 7) they were willing to share. However, for each assistance provided, participants would be charged a fee of IDR 10,000 (for objective measurement treatment only) or IDR 5,000 (for combined performance assessment treatment) as a potential cost of effort diverted to helping colleagues⁶. This assistance was a measure of knowledge-sharing behavior, taking into account participants' willingness to allow the description of the algorithm they previously worked on to be studied by their colleagues.

Manipulation Check

Manipulation checks for independent and moderating variables were carried out by asking the participants questions. Two questions were used to determine whether the participants understood the manipulation given. The manipulation check asked the participants (a) whether the company implemented subjective assessments by supervisors in the performance measurement system, and (b) what level of trust the participants had in their supervisors at the company.

This check tests whether the participants have adequate understanding or internalization (appreciation) of the manipulation (Nahartyo, 2013, p. 156). The follow-up to the manipulation check is to carry out an analysis of participants' responses. If the participants did not meet the criteria or did not answer the questions asked correctly. In that case, they would be removed from the study sample.

Analysis Techniques

Testing of hypothesis 1 and hypothesis 2 was analyzed using the independent t-test. This test was conducted to test the main effect of implementing a combined PMS and supervisor trustworthiness on knowledge sharing. Hypothesis 3 testing used the Test of Two-Way ANOVA to test the interaction effect. The hypothesis would be supported if the significance value was less than 0.05. Analysis and explanation of results based on the review of the previous literature.

Results and Discussion

Manipulation Check

The experiment was carried out on November 21 and 27, 2017, in the regular class of the Accounting Study Program at Universitas Gadjah Mada. The total number of subjects who participated in the experiment was 105.

³ The assignment time is 25 minutes taking into account that each set of questions can be answered along with how to do it within 3 minutes per set of questions (including when participants access a maximum of 2 instructions provided). Next, a pilot test will be carried out to avoid threats to external validity in the form of maturity effects.

⁴ The total incentive refers to Nahartyo's (2013:200) explanation that incentives for experimental method study in Indonesia range from IDR 20 thousand to IDR 100 thousand for one experimental session. However, what is most important is how the provision of incentives can influence the subject's sensitivity in providing an assessment of the treatment. Therefore, to test the amount of incentives provided, a pilot test will be carried out.

⁵ This distribution percentage follows and takes into account the study of Bailey et al. (2011) which shows that limiting discretion in partial rather than full discretion can increase managers' consideration in including relevant noncontractible information in bonus allocation.

⁶ This study uses decision-making that has consequences from real incentive payments, not from hypothetical questions as in Cheng and Coyte (2014).

Assignment and division into treatment groups were carried out randomly without considering participant characteristics. The researchers carried out manipulation checks on the PMS instrument and supervisor trust. Two questions in the manipulation check aimed to determine whether the manipulation given could be internalized well. The criteria for passing the manipulation check was whether the participant correctly answered the two questions.

Table 2 shows that, of the 105 participants, 77 (73.3%) successfully passed the manipulation check. However, four participants (3.8%) did not provide complete demographic data due to not writing down their GPA scores. So the overall amount of data that could be processed further was 73 participants (69.5%).

Table 2. Manipulation Check

Information	Group				Total (%)
	1	2	3	4	
Number of initial participant data	30	25	24	26	105 (100%)
The number of participant data that did not pass the manipulation check	12	6	3	7	28 (26.7%)
Number of participant data whose demographic data is incomplete	2	2	0	0	4 (3.8%)
The final amount of participant data that can be processed for subsequent analysis	16	17	21	19	73 (69.5%)

Descriptive demographic statistics show the age, gender, and overall GPA of all the participants and each participant within the group. Overall, participants in this experiment had a minimum age of 19 years to 22 years, with an average participant age of 20.58 years. There were 26 male participants (35.62%) and 47 female participants (64.38%). The lowest participant GPA was 2.72, and the highest was 3.93. Table 3 shows detailed statistical data on the demographics of the participants in the experiment.

Table 3. Demographic Characteristics of Experimental Participants

Demographic Characteristics		Number of Participants	%
Gender	Male	26	35.62
	Female	47	64.38
Age	19-20 years old	31	42.47
	21-22 years old	42	57.53
GPA	2.5-2.99	1	1.37
	3.00-3.5	27	36.99
	>3.5	45	61.64

Source: SPSS Output Version 26

Demographic Characteristics Testing

This test was carried out to provide confidence that differences did not influence the dependent variable in the subject's demographic characteristics, namely age, gender, and GPA (see Table 4). The results of ANOVA testing with the dependent variable knowledge-sharing behavior on demographic characteristics showed no significant relationship. So, it was concluded that knowledge-sharing behavior was not influenced by differences in the subject's demographic characteristics based on age, gender, and GPA.

Table 4. Testing Demographic Characteristics

		Sum of Squares	df	Mean Square	F	Sig.
Gender	Between Groups	0.305192	1	0.30519247	0.14	0.7143
	Within Groups	160.434534	71	2.25964132		
	Total	160.739726	72	2.23249619		
Age	Between Groups	2.945289	3	0.98176289	0.43	0.7326
	Within Groups	157.794437	69	2.28687590		
	Total	160.739726	72	2.23249619		
GPA	Between Groups	100.906393	37	2.72719988	1.60	0.0840
	Within Groups	59.833333	35	1.70952381		
	Total	160.739726	72	2.23249619		

Source: SPSS Output Version 26

Testing the Knowledge-Sharing Behavior Hypothesis

Table 5 shows that the first hypothesis shows a significant result of 0.015 and the second hypothesis has a significant value of 0.044. These results indicate that the combined PMS design and Supervisor Trustworthiness separately influence the knowledge-sharing behavior increase.

Table 5. Independent Samples Test

		Average	F	Sig	Sig (2 tailed)
Hypothesis 1	Objective only	0.98	1.521	0.222	0.015
	Combined	1.82			
Hypothesis 2	Low Supervisor Trustworthiness	1.00	4.885	0.030	0.044
	High Supervisor Trustworthiness	1.70			

Source: SPSS Output Version 26

The results of the interaction hypothesis test in Table 6 show a significant value of 0.106, more than 0.05. These results indicate marginal significance. Furthermore, Figure 1 shows the significant difference between the interaction of combined PMS and supervisor trustworthiness is higher than objective PMS. However, there was no significant difference in PMS when supervisor trustworthiness was lower.

Table 6. Test of Between-Subjects Effects

Dependent Variable: Knowledge Sharing

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	27.933 ^a	3	9.311	4.838	.004
Intercept	142.232	1	142.232	73.897	.000
PMS	13.650	1	13.650	7.092	.010
ST	11.219	1	11.219	5.829	.018
PMS * ST	5.171	1	5.171	2.687	.106
Error	132,806	69	1.925		
Total	295,000	73			
Corrected Total	160,740	72			

a. R-squared = .174 (Adjusted R-squared = .138)

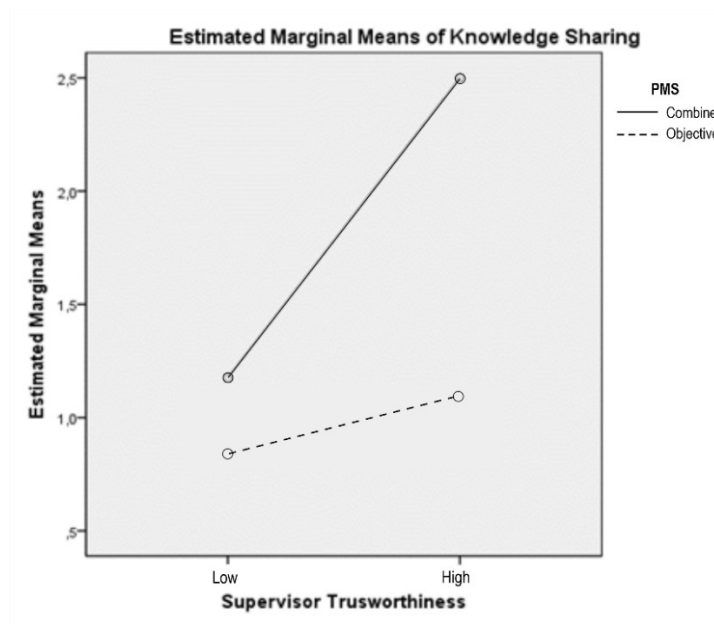


Figure 1. Average knowledge sharing

Discussion

Hypothesis 1 predicted that the combined PMS would encourage a higher willingness to share knowledge than PMS with objective measures alone. The independent sample t-test shown in Table 5 has indicated a significant average difference in the willingness to share knowledge (p=0.015). This result confirms the findings of Cheng and Coyte (2014) that using subjective weighting in PMS can encourage higher knowledge-sharing intentions than

using formulaic weighting in PMS. Implementing subjective assessment in PMS can provide a signal to employees that the activities carried out, outside of objective performance measures, will give them the opportunity to get incentives or at least not reduce their performance assessment due to not meeting work targets. These findings, based on objective measures alone, also reveal disadvantages of PMS that will prevent employees from behaving outside of the established performance standards, despite the fact that these behaviors may be advantageous to the company in the aggregate. The results of this study also support the study of Haesebrouck et al. (2021) which emphasizes the importance of incentive systems as drivers of extrinsic motivation to share knowledge with colleagues. This finding follows the economic exchange theory which posits that people will analyze benefits and costs for themselves (self-interest). This theory suggests that an agent will allocate effort to carry out certain activities if the personal benefits received exceed the costs incurred.

Hypothesis 2 predicted that high supervisor trustworthiness would encourage knowledge-sharing behavior. Statistical test results in Table 5 show that supervisor trustworthiness positively influences willingness to share knowledge ($p=0.044$). This result is consistent with the findings of Kim and Kuo (2015) which demonstrate the significance of a supervisor's trustworthiness with regard to an employee's performance behavior. Moreover, this result is consistent with social exchange theory which posits that employees are more likely to be willing to devote extra effort to leaders they like and trust than to those they do not like without the need for economic motives. This study also supports the argument that supervisor characteristics become essential for subordinates when making sacrifices that impact their performance.

Hypothesis 3, which predicted the interaction between PMS and supervisor trustworthiness in knowledge sharing, is statistically marginally significant ($p=0.106$). Figure 1 also shows that significant differences only occur in combined PMS compared to PMS which is objective only. This finding supports the expectancy-value theory which assumes that someone decides to act according to their tendency to have a good effect and refuses to do something that will tend to have a bad effect (Taylor, 2006). Due to the subjective assessment of PMS and the expectation that supervisors can be trusted to assess knowledge-sharing behavior, the likelihood of adverse effects is less with combined PMS than with PMS which is objective only.

Conclusion

This study aims to provide empirical evidence regarding 1) the influence of combined PMS and supervisor trustworthiness on knowledge-sharing behavior, and 2) the influence of the interaction of the two on knowledge-sharing. This study proved that knowledge-sharing behavior is higher when implementing a combined PMS compared to PMS with only objective measures. This study also found that supervisor trustworthiness influences the willingness to share knowledge. In addition, this study found that supervisor trustworthiness becomes essential when using subjective assessments and has a significant influence on the willingness to share knowledge.

This study has several limitations. First, it uses paper-based instruments, making it quite difficult for participants to complete the tasks in the experiment. Second, this study was also carried out in different classes and times. However, no significant differences were found between experimental groups and time. Further limitations relate to study procedures. The cases presented are illustrative, so they cannot fully represent conditions in the real world. The selection of undergraduate students as employee assistants/consultants is also a limitation; although there have not been any theoretical or empirical differences found regarding the actual differences between student and employee behavior, experienced employees are certainly more able to see the good or bad things in PMS and consider these when engaging in behaviors that are outside of their primary duties. The authors acknowledge that the conclusions reached do not absolutely show a causal relationship because of the possibility of unobservable bias in this study.

The results of this study have theoretical and practical implications. As for theoretical implications, it is hoped that this study can provide knowledge regarding the impact of PMS design on knowledge-sharing behavior. This study is expected to contribute to variables in the management accounting literature that influence extra-role behavior in companies, such as knowledge-sharing behavior. As for a practical implication, it is hoped that this study's results will be a consideration for company leaders in designing their PMS when they want to create a culture of sharing and helping each other within their companies. Bear in mind that knowledge-sharing behavior in this study is a daily activity that is not planned, and this activity is independent of direct direction from the supervisor. Apart from that, it is hoped that this study can provide further insights to academics who want to study this topic.

Suggestions for future studies include: 1) research could test the effects of organizational justice if subjectivity in the combined PMS is not used in the interests of employees; 2) researchers could also test changes in the willingness to share knowledge if in the previous period there was injustice in performance appraisal; 3) future research could use computer and internet-based study procedures to make it easier for participants to carry out assignments; and 4) future studies could add qualitative insights obtained from interviews to understand the barriers to knowledge sharing caused by PMS design.

References

- Ahmad, F., & Karim, M. (2019). Impacts of knowledge sharing: a review and directions for future research. *Journal of Workplace Learning*, 31(3), 207-230.
- Ayodele, F. O., Yao, L., Haron, H. B., & Juan, S. H. (2016). Review on knowledge sharing: Barriers and motivations. *The National Conference for Postgraduate Research*, 225-237.
- Bauch, K. A., Kotzian, P., & Weißenberger, B. E. (2021). Likeability in subjective performance evaluations: does it bias managers' weighting of performance measures? *Journal of Business Economics*, 91(1), 35-59.
- Cheng, M. M., & Coyte, R. (2014). The effects of incentive subjectivity and strategy communication on knowledge-sharing and extra-role behaviors. *Management Accounting Research*, 25(2), 119-130. <https://doi.org/10.1016/j.mar.2013.07.003>
- Haesebrouck, K., Van den Abbeele, A., & Williamson, M. G. (2021). Building trust through knowledge sharing: Implications for incentive system design. *Accounting, Organizations and Society*, 92, 1-6.
- Hayat Bhatti, M., Akram, U., Hasnat Bhatti, M., Riaz, T., & Syed, N. (2021). Knowledge has no value until it is shared: an empowering leadership perceptives. *International Journal of Quality and Service Sciences*, 14(1), 133-153.
- Kim, S., & Kuo, M. H. (2015). Examining the relationships among coaching, trustworthiness, and role behaviors: A social exchange perspective. *The Journal of Applied Behavioral Science*, 51(2), 152-176.
- Kunz, J. (2015). Objectivity and subjectivity in performance evaluation and autonomous motivation: An exploratory study. *Management Accounting Research*, 27, 27-46.
- Lapierre, L. M. (2007). Supervisor trustworthiness and subordinates' willingness to provide extra-role efforts. *Journal of Applied Social Psychology*, 37, 272-297.
- Li, X., Zhang, J., Zhang, S., & Zhou, M. (2017). A multilevel analysis of the role of interactional justice in promoting knowledge-sharing behavior: The mediated role of organizational commitment. *Industrial Marketing Management*, 62, 226-233.
- Long, J. H., Mertins, L., & Vansant, B. (2015). The effect of firm-provided measure weightings on evaluators' incorporation of non-contractible information. *Journal of Management Accounting Research*, 27(1), 47-62.
- Merchant, K. A., & Van der Stede, W. A. (2012). *Management control systems: Performance measurement, evaluation and incentives* (3rd ed.). Pearson Education Limited.
- Nahartyo, E. (2013). *Design and implementation of experimental research*. PT Index.
- Obrenovic, B., Jianguo, D., Tsoy, D., Obrenovic, S., Khan, M. A. S., & Anwar, F. (2020). The enjoyment of knowledge sharing: impact of altruism on tacit knowledge-sharing behavior. *Frontiers in Psychology*, 11, 1-16.
- Perotti, F. A., Ferraris, A., Candelo, E., & Busso, D. (2022). The dark side of knowledge sharing: Exploring "knowledge sabotage" and its antecedents. *Journal of Business Research*, 141, 422-432.
- Sergeeva, A., & Andreeva, T. (2016). Knowledge sharing research: Bringing context back in. *Journal of Management Inquiry* 25(3), 240-261.
- Voußem, L., Kramer, S., & Schäffer, U. (2016). Fairness perceptions of annual bonus payments: The effects of subjective performance measures and the achievement of bonus targets. *Management Accounting Research*, 30, 32-46. <https://doi.org/10.1016/j.mar.2015.10.001>
- Voußem, L., Kramer, S., & Schaffer, U. (2016). Fairness perceptions of annual bonus payments: The effects of subjective performance measures and the achievement of bonus targets. *Management Accounting Research*, 30, 32-46.
- Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. *Human Resource Management Review*, 20, 115-131.
- Wick, S. (2021). Subjectivity in performance evaluations: A review of the literature. *Accounting Perspectives*, 20(4), 653-685.