The Role of the Management Accounting System and Decision-Making Style on Managerial performance

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Abstract
This study aimed to provide empirical evidence on the relationship between the management accounting system (MAS) and decision-making style on cooperatives' managerial performance in Ponorogo. Data were collected from 119 questionnaires, while 60 questionnaires could be analyzed. Then, SPSS was applied to test non-response bias and descriptive statistics. SmartPLS was used for hypothesis testing. Research findings indicated that MAS did not affect managerial performance, and the decision-making style affected managerial performance.

Keywords : Decision Making Style, Managerial Performance, Management Accounting System

JEL Classification : G30, G34, G41

1. INTRODUCTION

Managerial performance is essential in all organizations (Mihaela-Lavinia & Luciana, 2011). It has been an exciting topic since Fayol published his study in 2016. Managerial performance is impressive due to some reasons. First, managerial performance is an indicator of a manager's success in achieving goals (Zenita, Sari, Anugerah, & Said, 2015). It also reflects economic performance and profitability (Arcelus, Melgarejo, & Simón, 2014). Managerial performance designates individuals' level of success (Mahoney, Jerdee, & Carroll, 1965). Moreover, good managerial performance will achieve business success (Dafna, 2008) through a decision-making process that utilizes information (Zenita et al., 2015). Indeed, decision making is part of the management task (Cosgrave, 1996). Baba and HakemZadeh (2012) argue that decision making is the essence of management duties; so it is necessary to make the right decisions. Decision-making is more contented and effective by utilizing knowledge as a part of the accounting system (Zimmerman, 2009) and information (Zenita et al., 2015) by providing accounting information within the organization (Siyanbola, 2012).

The management accounting system (MAS) is an accounting information system that provides managers information (Alikhani, Ahmadi, & Mehrava, 2013). MAS is essential in the decision-making process (S.O. Ajibolade, Arowomole, & Ojikutu, 2010) since MAS produces information (Solabomi O. Ajibolade, 2013). MAS in the organization assists
decision-makers in carrying out management tasks (Indriani & Nadirsyah, 2015). Instead, MAS has a relationship with managerial performance (Tsui, 2001) to improves managerial quality (Vincent K Chong & Eggleton, 2003) and as a source of organizational competitive advantage (Atkinson, Kaplan, Matsumura, & Young, 2010). However, MAS has been debated by practitioners and academics (Zoni, Dossi, & Morelli, 2012) that lead to MAS research among accounting academics (Seaman & Williams, 2006).

MAS is vital for organizations for some reasons. First, the system responds to manager requests for information needs (Lääts & Haldma, 2012). MAS also converts a reference in changing the external environment (Waweru, 2008). Third, the interaction between MAS and budgetary participation affects managerial performance (Tsui, 2001). Fourth, all the characteristics possessed by MAS are positively related to managerial performance (Sohrabi, Talebnia, & Nikjoo, 2014; Soobroyen & Poorundersing, 2008). Fifth, MAS provides planning and control information needs (Sohrabi et al., 2014). Sixth, the system safeguards organizational rules, procedures, and employees (Sisaye & Birnberg, 2014). Seventh, MAS has principles following stakeholder theory and relates to manager behavior in rational decision making (Rausch, 2011). Last, MAS supports managerial decision making and controls (Abernethy & Bouwens, 2005).

MAS’s prominence makes it the object of research worldwide. Studies investigating the relationship between MAS and managerial performance were conducted by Gul (1991), Gul and Chia (1994), Chia (1995), Vincent K Chong (1996), Vincent K. Chong (1998), Vincent K Chong and Eggleton (2003), Soobroyen and Poorundersing (2008), Agbejule (2005), Hammad, Jusoh, and Oon (2010), Hammad, Jusoh, and Ghozali (2013), Chung, Su, and Yu-Ju (2012), Sohrabi et al. (2014), and others. Although MAS research has not been a new issue, there is a contradiction to the previous studies. Therefore, the researcher intended to test and re-analyze the relationship between MAS and managerial performance in the cooperatives with the mediation of decision-making style (DMS) to analyze the relationship between MAS and managerial performance.

Furthermore, cooperatives rapidly change the economic environment structure due to globalization and agricultural industrialization (Royer, 1999). They are an economic alternative and feasible in the form of powerlessness (Bello & Zaria, 2005). Cooperatives are generated as institutions that fully defend themselves by seeking profit, as theoretically cooperatives are business organizations (Robotka, 1947). In Indonesia, cooperatives were known in colonial times as economic institutions with limited roles in assisting their members (Subandi, 2008).

This study applied a decision-making style (DMS). The style is an individual characteristic in perceiving and responding to decision-making behavior (Spicer & Sadler-Smith, 2005). The variable is crucial for managerial performance (Ali, 1993) and affects individuals’ decision-making tasks (Scott & Bruce, 1995). The style also contributes to understanding the decision-making process (Reyna, Ortiz, & Revilla, 2014) and reflects individual characteristics in observing and responding to the decision-making process (Harren, 1979).

Based on the previous descriptions, this study investigated how the management accounting system (MAS) increased managerial performance and how a decision-making style improved managerial performance. The research problems can then be formulated: (1) Does the management accounting system (MAS) positively affect managerial performance? And (2) Does the decision-making style affect managerial performance?
Moreover, this study aimed to analyze and determine the effect of the management accounting system (MAS) on managerial performance empirically and the effect of decision-making styles on managerial performance empirically.

2. HYPOTHESES DEVELOPMENT

Effect of Management Accounting System on Managerial Performance

Information is an essential element in human activities. Individuals and organizations have developed information need with advanced technology (Alikhani et al., 2013). Accounting is one of the information systems information that integrates and connects the environment and technical elements of human potential into a follow-up unit (Tokic, Spanja, Tokic, & Blazevic, 2011). An organization's accounting information system involves two systems: financial accounting system and management accounting system (Alikhani et al., 2013).

The management accounting system (MAS) provides internal information to management decision-making (Watts, Yapa, & Dellaportas, 2014). The management relies on MAS in a tactical position instead of its change determination. MAS guarantees utility as a service tool for managers as the formal information subsystem within organizations (Moliner & Ruiz, 2004). It develops a combination of multidimensional planning and control subsystems (Williams & Seaman, 2002) and delivers managers with the required information to make decisions (Jerman, Kavčič, & Korošec, 2012). A company's system aims to provide timely and relevant information to facilitate decision-making and motivate employees to achieve organizational goals (Zimmerman, 2001).

Managerial performance has been an exciting research topic since Fayol published his work in 1916 (Borman & Brush, 1993). The managerial performance can influence organizational culture and productivity (Young, Winfred Arthur, & Finch, 2000) and the behavioral consequences (Staw & Barsade, 1993). The performance has important domains: knowledge, leadership, communication, and interpersonal behavior (Young et al., 2000). The domains are identified as part of managerial work: leadership, communication, and interpersonal behavior (Borman & Brush, 1993).

Previous studies contributed to improving understanding of managerial performance's nature. Two dimensions relevant to managerial performance are managerial functions and managerial competence (Mahoney et al., 1965). They provide a framework for analyzing a manager's work. Many researchers use even the instrument of managerial functions dimensions. Meanwhile, managerial competence focuses on technical competence or knowledge areas, which include employees, finance, material and goods, purchases and sales, methods and procedures, facilities, and equipment.

Managerial performance is an indicator of a manager's success in realizing goals that must be improved from time to time through improved decision-making processes (Zenita et al., 2015). Furthermore, Zenita et al. (2015) added that managers use information in the decision-making process and make effective decisions. One significant source of information is the Management Accounting System (MAS), which can be conceptualized as an essential part of an organization's formal planning process and assists managers in the decision-making process (Rinsum, 2006). Besides, MAS has a primary goal: achieving organizational goals (Rasid, Isa, & Ismail, 2014) through providing information and techniques to managers and employees to control, coordinate and facilitate decision making (Rausch, 2011). In other words, MAS is a type of system that helps managers
access and use management accounting information to achieve goals and improve managerial performance (Chung et al., 2012). All will improve the existing performance in the organization (Robert H. Chenhall, 2003; Ismail & Isa, 2011).

MAS is required to achieve the desired performance (Ismail & Isa, 2011). It is a formal system designed to provide managers information (Bouwens & Abernethy, 2000) and influences the manager's decision making (Rausch, 2011). Besides, MAS is also related to managerial performance (Tsui, 2001) and even improves managerial performance (Chung et al., 2012). In brief, MAS aims to provide management information for business planning and control (Wessels & Vermaas, 1998).

Chia (1995) found that MAS contributes to managerial performance. Chang, Chang, and Paper (2003) also found that performance can be improved with MAS availability. Other findings showed that all characteristics are positively related to managerial performance (Robert H Chenhall & Morris, 1986; Soobaroyen & Poorundersing, 2008). The MAS-broad scope also affects managerial performance (Chia, 1995; Mia & Chenhall, 1994). These are corroborated by Sohrabi et al. (2014) that MAS-broad scope is positively related to non-financial managers' performance. Soobaroyen and Poorundersing (2008) also argue that all MAS dimensions are positively related to managerial performance. The information will have an impact on performance. MAS is one of the information in an organization that can improve managerial performance. Consequently, the hypothesis is developed below:

H1. Management Accounting System positively affected managerial performance.

Decision-Making Style and Managerial Performance

Various understandings have been discussed about the style of decision making. Taylor discussed the decision-making style in a book entitled "The Principles of Scientific Management" in 1947 (Rowe & Boulgarides, 1983). Scott and Bruce (1995) define it as learning response patterns when individuals face with decision-making situations. The decision-making style symbolizes "the habit-based response to learning habits to react in a certain way to a decision" (Verma & rangnekar, 2015). Two fundamental questions may distinguish decision-making style: how information is used and how to make choices; these are derived into four styles: decisive, flexible, hierarchic, and integrative (Brouseeau, Driver, Hourihan, & Larsson, 2006). In contrast, Conteh (2005) divides decision-making styles into Analytic Autocratic, Heuristic Autocraticm Analytic Consultative, and Heuristic Consultative.

Scott and Bruce (1995) developed a decision-making style from the model proposed by Harren (1979), i.e., rational, intuitive, and dependent. They also add from Phillips, Pazienza, and Ferrin (1984) findings with the emergence of a decision style, namely avoidant style. Scott and Bruce (1995) divide decision-making style into five: (1) rational style, (2) intuitive style, (3) dependent style, (4) avoidant style, and (5) spontaneous style. The development is the most widely used instrument for measuring decision-making styles (Curseu & Schruijer, 2012).

Amazt and Idris (2011) state that the literature shows a positive correlation between participation in decision making and staff productivity. Individual decision making will have an impact on productivity. Others find that the decision-making style affects lecturers' job satisfaction at the University (Amazt and Idris, 2011). While Moghadam,
Tehrani, and Amin (2011) argue that emotional intelligence is negatively related to rational style, and dependent style and spontaneous is not related to emotional intelligence.

Kao, Kao, Chen, and Chiu (2012) initiate that rational style has a positive relationship with management knowledge, and avoidant style has a negative relationship with executive management knowledge. The rational style is the dominant style of decision making. Verma, Bhat, Rangnekar, and Barua (2015) support the findings that the central decision-making styles are rational and avoidant. Baiocco, Laghi, and D’Alessio (2009) demonstrate that rational style has a positive relationship with school achievement. Thus the decision-making style taken by individuals will result in the achievement of goals. So, the hypothesis is developed below:

**H2.** Decision-making style affected managerial performance

### 3. METHOD, DATA, AND ANALYSIS

#### Types and Sources of Data

This study applied primary data for analysis. The data were obtained by distributing questionnaires to cooperative managers in Ponorogo Regency. Cooperatives were considered the objects of this study due to Hammad et al. (2013), who use attractive industrial services. According to Nilsson (1996), a stimulating business is a business with business principles and community principles. Both principles are owned by cooperatives (Nilsson, 1996). Cooperatives can survive and do business in an economy full of uncertainty (Birchall & Ketilson, 2009).

#### Population and Samples

In Ponorogo Regency, there are 972 active cooperatives (BPS, 2019). However, not all cooperatives have managers; only 119 cooperatives have managers. In this study, the unit of analysis was the cooperative manager. Following the formula from Rao (1996), its sample size was considered 54 respondents of managers.

#### Operational Development and Variable Measurement

This study involved three variables: management accounting system, decision-making style, and managerial performance. The operational and measurement definitions are labeled as follows:

| Construct                     | Operational Definitions                                                                                     | Instrument Sources                                      | Scales     |
|-------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
| Management Accounting system  | Information that is used to make managerial decisions (Vincent K Chong, 1996)                            | Robert H Chenhall and Morris (1986)                     | Likert, 1-7|
| Decision-Making Style         | Individual's habit patterns in making decisions (Scott & Bruce, 1995)                                     | Scott and Bruce (1995)                                  | Likert, 1-7|
| Managerial Performance        | Individual's quality and quantity of work achieved by a person in carrying out his duties by his/her responsibilities | Mahoney et al. (1965)                                   | Likert, 1-7|
Data Analysis Technique
Testing Non-Response Bias and Descriptive Statistics
In doing research, bias may exist due to the respondents' differences in responding and refusing to participate in filling out the questionnaire (Malhotra & Birks, 2007). It is necessary to do a non-response bias test using the independent samples t-test. The data findings were analyzed using descriptive statistics. Moreover, this study utilized a Partial Least Square (PLS) approach to analyze field data findings. PLS is a variant-based structural equation analysis (SEM) that can simultaneously perform measurement testing and structural model testing (Abdillah & Jogiyanto, 2015). PLS is also a variant-based SEM method designed to solve multiple regression when a specific problem occurs, including a small research sample (Jogiyanto, 2011).

Measurement Model (Outer Model)
The measurement model (outer model) is generated as the first stage in the PLS method. The outer model is to test validity and instrument reliability (Abdillah & Jogiyanto, 2015). With the outer model, the loading factor value and AVE value will be known. The indicator is valid if it has a loading factor value > 0.70, and an AVE value above > 0.50, fulfilling the convergent validity requirements (Latan and Ghozali, 2012). Furthermore, the reliability test was carried out to measure the instrument's internal consistency, with two methods: Cronbach alpha and composite reliability (Jogiyanto, 2011). Cronbach alpha value and composite reliability produce suitable constructs if each has a value above > 0.70 (Latan & Ghozali, 2012).

Structural Model (Inner Model)
This structural model (inner model) is evaluated using $R^2$ for the dependent construct, the path coefficient value, or t-value for each path to test the significance between constructs in the structural model (Abdillah & Jogiyanto, 2015).

4. RESULTS
Testing Non-Response Bias and Descriptive Statistics
In this study, the primary data were obtained from respondents who returned 63 questionnaires via post, from 119 questionnaires sent to respondents. However, the data that could be analyzed was only 60 questionnaires. Moreover, the respondent participation was tested with non-response bias in table 2 and descriptive statistics in table 3 below.

Table 2. Testing Non-Response Bias
| Constructs                  | Mean Awal (n=44) | Mean Akhir (n = 16) | t-stat | p-value |
|-----------------------------|------------------|---------------------|--------|---------|
| Management acc. system      | 79,9545          | 83,9375             | -1.575 | 0.121   |
| Decision Making Style       | 130,1136         | 134,5000            | -0.495 | 0.622   |
| Managerial performance      | 54,7273          | 54,6250             | 0.51   | 0.959   |

Source: Processed Primary Data

Table 2 presented that the p-value of each construct had a value of > 0.05. In other words, there was no significant difference between the two groups that gave the initial response and the final response. So, there was no response bias problem.
### Table 3. Descriptive Statistics

| Variables                | N   | Theory Frames | Mean | Actual Rate | Actual Mean | Dev. Standard |
|--------------------------|-----|---------------|------|-------------|-------------|---------------|
| Management acc. system   | 60  | 14-98         | 56   | 62-96       | 81,0167     | 8,76915       |
| Decision Making Style    | 60  | 25-175        | 100  | 70-167      | 131,2833    | 30,14546      |
| Managerial performance   | 60  | 9-63          | 36   | 35-63       | 54,7000     | 6,76557       |

Source: Processed Primary Data

Table 3 indicated that all the constructs had an actual mean value higher than the theoretical mean, and the standard deviation value was smaller than the actual mean. So, the management accounting system constructs in cooperatives were widely used in decision making. Cooperative managers often carried out the construct of decision-making style in cooperatives. Meanwhile, the managerial performance construct showed that the manager's performance was good. The data for all constructs did not vary.

**PLS Analysis**

The outer model was conducted to measure the validity and reliability of research indicators. The second-order outer model resulted from the multidimensional management accounting system (MAS) and decision-making style. The path diagram and construct reliability and validity table after dropping the items were presented as follows:

![Path diagram of management accounting system](image)

*Figure 1. Path diagram of management accounting system*
Table 4. Composite Reliability and AVE Construct of MAS and DMS

| Management Accounting System (MAS) | Decision Making Style (DMS) |
|-----------------------------------|------------------------------|
|                                  | Composite Reliability | AVE | Composite Reliability | AVE |
| Aggregated                        | 0,848                  | 0,657 | Avoidant              | 0,974 | 0,883 |
| Broadscope                        | 0,864                  | 0,614 | Dependant             | 0,884 | 0,612 |
| Integreated                       | 0,827                  | 0,616 | D.M. Style            | 0,859 | 0,380 |
| MAS                               | 0,923                  | 0,469 | Intuition             | 0,804 | 0,460 |
| timeliness                        | 0,815                  | 0,525 | Rational              | 0,767 | 0,444 |
|                                  |                          |      | Spontaneous           | 0,668 | 0,442 |

Source: Processed Primary Data

Table 4 demonstrated that the MAS construct's dimensions had a Composite Reliability value > 0.70, and the AVE value was <0.50. In contrast, the decision-making style construct's dimensions involved a Composite Reliability value of <0.70 and an AVE value with a value < 0.50. Thus, the indicators were less than the provisions. After removing indicators that did not comply with the provisions, the path diagram and composite reliability and AVE table are presented below:
Figure 3. Path diagram of MAS after Issuing Invalid Indicator

Figure 4. Path diagram of DMS after Issuing Invalid Indicator
Table 5. Composite Reliability and AVE Construct of MAS and DMS after Issuing Invalid Indicator

| Management Accounting System (MAS) | Composite Reliability | AVE  | Decision-Making Style (DMS) | Composite Reliability | AVE  |
|------------------------------------|-----------------------|------|----------------------------|-----------------------|------|
| Aggregated                         | 0.915                 | 0.843| Avoidant                   | 0.974                 | 0.883|
| Broadscope                         | 0.864                 | 0.614| Dependant                  | 0.907                 | 0.710|
| Integreated                        | 0.827                 | 0.616| Decision Making Style      | 0.920                 | 0.524|
| MAS                                | 0.929                 | 0.523| Intuition                  | 0.886                 | 0.796|
| timeliness                         | 0.802                 | 0.575| Rational                   | 0.971                 | 0.944|
|                                    |                       |      | Spontaneous               | 0.792                 | 0.541|

Source: Processed Primary Data

Table 5 indicated that the MAS and DMS constructs' dimensions had a composite reliability value of >0.70 and an AVE value of >0.50. Thus, the management accounting system (MAS) construct indicators and decision-making style (DMS) were valid and reliable. So it is necessary to continue at the next stage, namely the outer model of research with the SmartPLS program that can help to create the following figures and tables:
Table 6. Composite Reliability and AVE Construct on MAS and DMS

| Construct                  | Composite Reliability | AVE   | Composite Reliability | AVE   |
|----------------------------|-----------------------|-------|-----------------------|-------|
| Aggregated                 | 0.915                 | 0.843 | Intuition             | 0.886 | 0.796 |
| Avoidant                   | 0.974                 | 0.883 | Managerial Performance| 0.942 | 0.648 |
| Broadscope                 | 0.864                 | 0.614 | MAS                   | 0.929 | 0.523 |
| Dependant                  | 0.907                 | 0.710 | Rational              | 0.971 | 0.944 |
| Decision-Making Style      | 0.920                 | 0.524 | Spontaneous           | 0.792 | 0.541 |
| Integreated                | 0.827                 | 0.616 | timeliness            | 0.802 | 0.575 |

Source: Processed Primary Data

Table 6 showed the Management accounting system (MAS) construct, decision-making style, and the managerial performance had a composite reliability value of > 0.70 and an AVE value of > 0.50. The constructs were invalid and reliable. Thus, the analysis was continued to the structural model or inner model. Figure 6 and Table 7 showed the inner model below.

![Figure 6. Inner Model](image-url)
Table 7. Path Coefficient of Management Accounting System (MAS), Decision-Making Style (DMS), and Managerial Performance

| Path | Coefficient | Sample Mean | Standard Deviation | t-stat | p-value |
|------|-------------|-------------|--------------------|--------|---------|
| MAS → Managerial Performance | 0.097 | 0.122 | 0.168 | 0.579 | 0.563 |
| DMS → Managerial Performance | 0.497 | 0.530 | 0.124 | 4.023 | 0.000 |

Source: Processed Primary Data

Table 7 presented the results of the hypothesis testing. MAS had no positive effect on managerial performance, as evidenced by the p-value > 0.05 and t-stat < 1.96. Meanwhile, the decision-making style affected managerial performance, evidenced by the t statistical value >1.96 and the p-value < 0.05.

5. DISCUSSION

The Effect of Management Accounting System (MAS) on Managerial Performance

Hypothesis one (H1) tested that the management accounting system (MAS) did not affect managerial performance. MAS's dimensions (e.g., broad-scope, timeliness, increased, and aggregated) did not affect managerial performance. The results of this study did not support the findings of Agbejule (2005), Agbejule (2011), S.O. Ajibolade et al. (2010), Bhimani (2012), and Solabomi O. Ajibolade (2013). This study concluded that MAS was related to performance, both managerial performance, and organizational performance.

The Effect of Decision-Making Styles on Managerial Performance

Hypothesis two (H2) tested that the decision-making style positively affected managerial performance. The increasing decision-making styles by cooperative managers would advance their performance. The finding supported the study of Rehman, Khalid, and Khan (2012) that employee decision-making styles affected organizational performance. Riaz, Riaz, and Batool (2014) concluded that avoidance style, as one of the dimensions of decision-making style, was predicted to influence organizational performance.

6. CONCLUSION, IMPLICATIONS, AND LIMITATIONS

This study concluded that the management accounting system (MAS) did not affect managerial performance, and the decision-making style had a positive effect on managerial performance. This study was implicated to cooperative managers. The managerial performance in the organization cannot be separated from the existing system in the institution. An essential system is information; in this case, it is MAS. Although the findings rejected the hypothesis, this study implies that MAS should be used as a basis by managers in their decision style to influence their performance. Otherwise, this study involved three limitations. The small samples of this study could not provide maximum results. The finding also did not differentiate between cooperative managers since the cooperatives had several types. Last, this study only used a management accounting system and decision-making styles as constructs that affected managerial performance. For further research, suggestions are delivered to increase the number of samples so that generalization can be appropriately done, to group the types of cooperatives so that a homogeneous manager can be selected as respondents, and to include the constructs of organizational culture and organizational commitment.
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