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# Effect size odds ratio on management control system and organizational performance

**Aida Nahar<sup>1</sup>**

<sup>1</sup>Universitas Islam Nahdlatul Ulama, Jepara Indonesia  
[aida@unisnu.ac.id](mailto:aida@unisnu.ac.id)

**Anis Chariri<sup>2</sup>**

<sup>2</sup>Faculty of Economics and Business, Diponegoro University,  
Semarang Indonesia  
[Anis\\_chariri@live.undip.ac.id](mailto:Anis_chariri@live.undip.ac.id)

**Tri Jatmiko Wahyu Prabowo<sup>3</sup>**

<sup>3</sup>Faculty of Economics and Business, Diponegoro University,  
Semarang Indonesia  
[Jatmiko26@undip.ac.ir](mailto:Jatmiko26@undip.ac.ir)

## Abstract

This study is a meta-analysis study, which has been conducted using the effect size odds ratio method that examines the effect of management control systems (MCS) on organizational performance. The data were analyzed using a random effect model with the Review Manager 5.3 (RevMan 5.3) software. This study found that management control systems positively and significantly influence organizational performance. In conclusion, a company must pay attention to the management control system in managing the company so that the company's ideal performance can be successfully achieved.

**Keywords:** Management, control, system, organizational, performance.

# Proporción de probabilidades de tamaño del efecto en el sistema de control de gestión y el rendimiento de la organización

## Resumen

Este estudio de metanálisis, que se ha realizado utilizando el método de odds ratio de tamaño del efecto que examina el efecto de los sistemas de control de gestión (MCS) en el desempeño organizacional. Los datos se analizaron utilizando un modelo de efectos aleatorios con el software Review Manager 5.3 (RevMan 5.3). Este estudio encontró que los sistemas de control de gestión influyen de manera positiva y significativa en el desempeño de la organización. En conclusión, una empresa debe prestar atención al sistema de control de gestión en la gestión de la empresa para que el desempeño ideal de la empresa se pueda lograr con éxito.

**Palabras clave:** gestión, control, sistema, organización, desempeño.

## 1. INTRODUCTION

An organization should have a clear vision and mission that is easy to understand and manage. To achieve the vision and mission, the organization requires a management control system that can control the organizational activities. According to Hongren et al. (2014), management control systems can be utilized as tools to achieve organizational goals by coordinating and controlling the members' behavior to fit the vision and mission of the organization. Thus, in order for the organization to survive, the management control system plays an extremely important role in the business organization. Management control system (MCS) is a process that ensures resources

are allocated in a controlled direction with a defined purpose so as to achieve company goals (Anthony & Govindarajan, 2007).

MCS will bring uniformity of goals and objectives between the various sub-unit businesses within the organization and its managers. If there is no control in the organization, every member of the organization will work for his/her own interests and ignore the organization interests as a whole. As the control of each action will be evaluated, the outcome of the action must be aligned with the organizational plan.

MCS has been claimed as essential informal controls and feedback systems and is used to monitor organizational outcomes and correct standard deviations from the predetermined performance. The organization controls its activities to achieve its goals. This control is done when the company implements a plan which is then measured, evaluated between actual results and planning and takes corrective action if deemed necessary. MCS involves the entire organizational rules and actions, which are designed to achieve the goal of improving performance with little risk involved (Ansari, 1977). It becomes a control for the achievement of organizational goals. The MCS is used by organizations to avoid failures and losses.

Therefore, MCS has a very important role in the performance of an organization. Some previous research results on MCS contribute to the development of science (Anthony & Govindarajan, 2007). The development of economic studies both directly and indirectly is

influenced by these developments. These studies can use one of the research methods with a quantitative approach. More research using the quantitative approach on a certain topic increases the likelihood of variations in results or conclusions on the concerned topic. Even when several types of research are conducted on the same topic, they have contradictory results.

There are some differences in the results of the researches conducted on MCS with organizational performance. Some studies such as Acquah (2013) and Su et al. (2015) have found that a relationship exists between the management control system and organizational performance. However, Bisbe and Otley (2004) found that there is no direct relationship between them. This creates problems especially in constructing a comprehensive theory or making it the basis for decision making. To overcome the problems in quantitative research, meta-analysis appears to integrate studies that initially seem to be contradictory and difficult to accumulate. Thus, the integration of research findings becomes a solid foundation for theory development as well as decision making and policy-making.

The objective of this study is to determine whether there is a positive relationship between MCS and organizational performance and to know the effect of MCS's relationship with organizational performance. Meta-analysis is an analysis of data derived from primary studies (Borenstein et al., 2009). The results of the primary study are used as a basis for accepting or rejecting the hypothesis proposed by researchers. Meta-analysis is a technique used to

quantitatively summarise the various research results by finding the effect size. Furthermore, it allows for the combination of mixed results and takes into account sample size and effect size.

The main objective of meta-analysis is to find the effect size (Borenstein et al., 2009). Effect size is a measure of the magnitude of the effect, the difference or the relationship of a variable on other variables. There are several types of effect size on the dichotomous, continuous or ordinal data. In dichotomy data, the effect size is in the form of relative risk, odds ratio, and risk difference. The approach used to calculate the effect size is an inverse-variance method, the Mantel-Haenszel method, the Peto method for the fixed effects model and the DerSimonian Laird method for random effect model. In the meta-analysis of this article, the odds ratio is considered as the effect size, and the models used are the random-effects model and the inverse variance approach method. Currently, meta-analysis is being used in the world of economy.

## **2. THEORETICAL FRAMEWORK AND EXTANT RESEARCH**

### *2.1. Management Control System*

Within each organization, control is one of the key tools to help ensure that employees do what is best for the organization so that predetermined goals can be achieved and run according to plan. However, we often find that there is a lack of objectives between the

various parties in the organization. Each party usually tends to have its own goals or self-interest. This is in line with Anthony and Govindarajan (2007), who stated that every individual involved in the company's operations has a different purpose for the attainment of the company's goals because each individual has personal wants and goals. Therefore, to maintain the ideal behavior among employees, the company must have a system that ensures the implementation of the company's objectives.

MCS is defined as a set of interconnected communication structures, and it provides information processing facilities to assist managers in coordinating and achieving organizational goals on an ongoing basis. On the other hand, Anthony & Govindarajan (2007) view the management control system in terms of the success of strategy achievement. Thus, it is defined as a process whereby managers influence other organization members to implement the organizational strategy.

The organizational control system, which is commonly referred to as an administrative or bureaucratic control system, is designed to direct or organize the activities of organizational members to conform to the desired organization leader (Anthony & Govindarajan, 2007).

Within the organization, the MCS is used for a number of purposes. MCSs provide incentives through performance measurement and evaluation and through a system of reward and punishment. Performance measurement is one form of control used by the

management. With the performance measurement, the management will provide incentives in the form of reward and punishment (Anthony & Govindarajan, 2007).

## *2.2. Organizational Performance*

Performance is the achievement or final result of a process and management system. A performance measurement system can be defined as something formal, with its procedures and routines based on information that managers use to maintain or alter patterns within a company's activities. The first element of an effective performance measurement system, which can improve the company's goals, must be linked to the company's goals and strategies as well as the company's character. A performance measurement system should provide a comprehensive and practical measurement, which should be linked to organizational goals and strategies; additionally, the performance measurement should be effective. The second element is that performance measurement should show management efforts, targeted, and related to appropriate rewards.

Performance measures are generally dominated by budget, profit or other accounting measures. Performance measures are used to measure the expected long-term performance of the company (Bozec et al., 2010). By the end of this decade, accounting-based performance measurement will be unable to meet the needs of an effective performance measurement system. The inability of accounting-based



performance measurement has motivated some academics and practitioners to advocate several performance measurement innovations, which have started from modified financial metrics such as economic value added (Stern et al., 1995), to the Balanced Scorecard, which combines financial and non-financial measurements (Bento et al., 2013), and personal or subjective measurements.

### *2.3. Management Control System and Organizational Performance*

Management control system is essential in the formal control and feedback systems to monitor organizational outcomes and correct standard deviations from predetermined performance (Anthony & Govindarajan, 2007). The management control system is used to plan the various activities of the organisation vision through its chosen mission and to implement and monitor the plan implementation. Further, Anthony & Govindarajan (2007) stated that the management control system is a system used by management to influence their organisation members in order to execute organizational strategy and policy efficiently and effectively to achieve organizational goals. Management control system consists of two important elements. They are structure and process control. Structure and process of control are two things that build management control system (Anthony & Govindarajan, 2007). The management control system provides a structure that enables the process and implementation of the planning. Thus, it can be said that as systems, structures and management

processes interact with each other that will impact on the organizational goals achievement. One of the organizational goals is to improve organizational performance. Based on the description above, the hypothesis in this research is: There is a positive relationship between management control systems on organizational performance.

### **3. RESEARCH METHODS**

#### *3.1. The Strategy of Search Research and the selection criteria of research*

Research on the effect of management control system on organizational performance was conducted by referring to database EBSCO, ProQuest, Elsevier and Google Scholar, from 2010-2018. The research results included in this study meet the criteria of inclusion and exclusion as follows inclusion criteria and exclusion criteria. The inclusion criteria in this study are (1) researches on the effect of management control system on organizational performance, (2) written in English and Indonesian Language, (3) researches published in database EBSCO, ProQuest, Elsevier and Google Scholar. While exclusion Criteria in this study are researches that have full text and output calculations used in the meta-analysis, and quantitative researches. Some studies were excluded from the sample because of the following arguments: 1). having variables and operational definitions which are different from the desired criteria; 2). Having

insufficient data, and 3). Having no full-text version. Data were analysed using a random effect model

### *3.2. Analysis Data*

The method used in this research is a meta-analysis. This method is one of the ways to summarise the results of quantitative research on the same topic (Borenstein et al., 2009). The purpose of meta-analysis calculations is to analyze the data from the primary study results. The results of the analysis are then used as a basis for accepting (supporting) or rejecting (cancelling) hypotheses and serve as specific guidelines for further research (Borenstein et al., 2009).

## **4. RESEARCH RESULT AND DISCUSSION**

### *4.1. Characteristics Research*

Based on a systematic review on previous review studies regarding the relationship of management control system and organizational performance available on database of EBSCO, ProQuest, Elsevier, and Google Scholar, we found 13 relevant studies for meta-analysis performed in this study, i.e. Bisbe & Otley (2004), Acquaah (2013), Bedford et al. (2016) and others.

5. RESULT META-ANALYSIS AND DISCUSSION

Table 1: Output Meta-Analysis

Study or Subgroup	log(Odds Ratio)	SE	Weight	Odds Ratio	
				IV, Random, 95% CI	IV, Random, 95% CI
Acquaah (Family), 2013.2	-0.02	0.86	0.2%	0.98	[0.18, 5.20]
Acquaah (Non family), 2013.2	0.03	0.75	0.3%	1.03	[0.24, 4.48]
Su, et al, 2014.2	0.061	0.377	1.0%	1.06	[0.51, 2.23]
Su, et al, 2014.1	0.078	0.375	1.0%	1.08	[0.52, 2.26]
Astini, et al, 2014	0.065	0.033	9.3%	1.08	[1.02, 1.16]
Anjumi and Yahya, 2016	0.066	0.063	8.0%	1.09	[0.96, 1.23]
Acquaah (Family), 2013.1	0.11	1.97	0.0%	1.12	[0.02, 53.04]
Bisbe and Odey, 2004	0.137	0.148	4.3%	1.15	[0.86, 1.53]
Sari and Saragih, 2009.1	0.164	0.077	7.3%	1.18	[1.01, 1.37]
Purnama, et al, 2012.1	0.202	0.093	6.5%	1.22	[1.02, 1.47]
Acquaah (non Family), 2013.1	0.22	2	0.0%	1.25	[0.02, 62.80]
Pratipta, 2016.2	0.282	0.114	5.6%	1.33	[1.06, 1.68]
Dewantoro, 2012	0.294	0.149	4.3%	1.33	[0.99, 1.78]
Sari and Saragih, 2009.2	0.313	0.095	6.9%	1.37	[1.16, 1.62]
Bedford, 2015.1	0.314	0.1414	4.5%	1.37	[1.04, 1.81]
Manurung, 2012	0.316	0.142	4.5%	1.37	[1.04, 1.81]
Bedford, 2015.2	0.317	0.156	4.0%	1.37	[1.01, 1.86]
Purnama, et al, 2012.2	0.338	0.02	9.7%	1.40	[1.35, 1.46]
Restini, et al, 2016	0.379	0.096	6.4%	1.46	[1.21, 1.76]
Pratipta, 2016.1	0.466	0.147	4.3%	1.59	[1.19, 2.13]
Yusufan, 2012.1	0.497	0.114	5.6%	1.64	[1.31, 2.08]
Yusufan, 2012.2	0.621	0.103	6.1%	1.66	[1.52, 2.28]
<b>Total (95% CI)</b>			<b>100.0%</b>	<b>1.32</b>	<b>[1.22, 1.43]</b>

Heterogeneity: Tau<sup>2</sup> = 0.02, Chi<sup>2</sup> = 74.09, df = 21 (P < 0.00001); I<sup>2</sup> = 72%  
 Test for overall effect: Z = 6.92 (P < 0.00001)

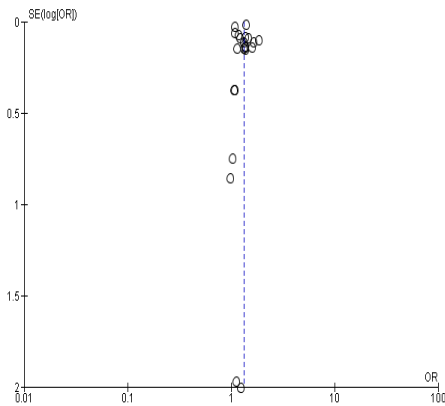


Figure 1: Funnel Plot Meta-Analysis te effect of MCS on organisation performance

Table 1 shows that the random-effect model produces a value of pooled odds ratio of 1.32 (95% CI 1.22-1.43), with the p-value for the test for overall effect less than 0.05, i.e.  $p < 0.00001$ . This implies that MCS has a significant positive effect on organization performance. The p-value of the heterogeneity test showed a value less than 0.05, i.e.  $p < 0.00001$ , which means that the variation between studies about the effect of the management control system on organizational performance is heterogeneous. The results of the meta-analysis of the total sample in Table 3 indicated that the management control system has a positive effect on organization performance. Each study showed that the odds ratio was greater than 1. The odds ratio ranged from 1.22 to 1.43. The combined odds ratio of some research was 1.32, which is shown as a diamond image. This means that the variables of management control system affect performance 1.32 times more than other variables.

The hypothesis testing of this research is evident from the Z and P value. It is clear from Table 3 that the Z value is 6.92 with the P-value = 0.00001. It shows that the hypothesis is accepted, and it indicates that there is a positive and significant influence between management control systems on organizational performance. Therefore, it can be concluded that MCSs influence organizations' performance. Moreover, the study of variation in the graph funnel plot is indicated in Fig. 2. The figure showed that all variables have a variety of heterogeneous, which means that if the analysis is conducted using population with different times, places and conditions, then the findings will be different from the current ones.

MCS is built by implementing control processes and structures (Anthony & Govindarajan, 2007). The process of management control is a set of actions undertaken to ensure that the organization works according to the goals that involve interaction within an organization. Measured management control processes include strategic planning (programming), budgeting, implementation and performance evaluation (Anthony & Govindarajan, 2007). Strategic planning can be interpreted as the process of organizing the organization program to be implemented and the determination of the number of resources allocated to each program. Thus, proper programming will impact corporate resource management effectively and efficiently.

The second management control process is budget preparation. Anthony & Govindarajan (2007) define it as activities relating to the integration of previously individualized programs into the responsibility centers. The final product is the amount of revenue, cost, profit and income that is expected to be realized within a budget period. Thus, if the budget process goes well, then the expected salary, cost, profit and income can be achieved well. The next stage in the management control process is implementation and measurement. Implementation is the planned execution of activities and costs.

If management wants to ensure that the plan leads to its realization, one of the conditions that need to be met is the consistency between implementation and plan, both in the program and budgeting. It means that both of them can be guides in carrying out activities in order to avoid irregularities. Measurements relate to the assessment

and control of activities based on established programs and budgets. During the fiscal year, the manager implements the program or part of it he/ she is responsible for. The report should provide information about the budget and its realization, whether it is information to measure financial performance or non-financial performance, internal or external information.

The last management control process is performance evaluation in which work performance can be seen from the efficiency or effectiveness of a responsibility center in carrying out its duties. Evaluation can be done by comparing budget realization and predetermined budget. This evaluation is extremely important because it affects the accomplishment of the results of work achievement. Another element of management control is the management control structure. The management control structure is the relationship between the components expressed in the form of organization and the nature of information flowing between the units. These components are interconnected with others, which simultaneously form the system. Each component in the structure has a certain function to facilitate the achievement of the system purpose. The management control structure within an organization is based on the responsibility of the position that is called the responsibility center (Anthony & Govindarajan, 2007). It is a part of an organization headed by a manager who is responsible for the activities in that section. Additionally, it includes elements that are divided into groups of structures, namely organizational structure, information flow and authority delegation (Anthony & Govindarajan, 2007; Escalera Chávez et al., 2019).

The management control structure describes the lines and responsibilities of the company's management. Theoretically, a good management control structure is a control structure that clearly describes the roles and responsibilities of an organization. A good structure is one that illustrates the clarity of functions and the division of tasks. The proper structure of a company's management control system will ultimately contribute to the achievement of performance. The management control system provides a structure that enables the planning process and the implementation of the plan. Through the management control system, the overall main activities that make the company a wealth creation institution can be implemented in a structured, coordinated, scheduled and integrated manner such that it achieves the corporate goals and leads to a significant increase in wealth. Thus, it can be said that when the system, structure, and process of management control system interact, the organizational goals can be achieved. One of the goals of this organization is to improve organizational performance (Tereso et al, 2018).

## **6. CONCLUSION**

The conclusion of the study on the effect of management control systems (MCS) on organizational performance has an effect size odds ratio of 1.32. This shows that the variables of MCS affect performance about 1.32 times more than other variables. The hypothesis testing shows that there is a positive and significant influence of MCS on organizational performance. It indicates that the



MCS is a factor in achieving corporate goals. The management control system consists of control processes and structures. The control process is reflected in strategic planning, budgeting, implementation and measurement, and performance evaluation.

Meanwhile, the control structure describes the lines and responsibilities of company management. A good control structure is exposed to clear roles and responsibilities. Control processes and structures interact with each other to achieve organizational goals. The achievement of organizational goals is reflected in the achievement of organizational performance. All variables in this study have heterogeneous variance. Thus, different results would be obtained if the analysis is conducted on the same population at different times, placed and conditions. As this study employed a limited sample size, future research should conduct a meta-analysis by using larger sample size and may include both published and unpublished studies using primary data from the survey along with questionnaires.

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