
The Role of Feedback and Feed Forward Control System to Improve Competitive Advantage of SMEs in Indonesia

Meutia, Tubagus Ismail¹, Ahmad Bukhori²

Abstract:

The purpose of this study is to investigate the influence of feedback and feed forward control as a part of management control system on knowledge and competitive advantage. Unlike previous studies which mostly focused on larger organization, this study focuses on SME which is still limited in developing countries.

There are 157 SME managers in Indonesia that become respondent in this study. AMOS 21 program is used as a tool to solve the problems in SEM. The result of this study state that there is a positive relationship between the use of feedback and feed forward control to the improvement of knowledge and competitive advantage of SME.

Keywords: *Management control system, competitive advantage, SME.*

¹ University of Sultan Ageng Tirtayasa, corresponding author: adeismail73@gmail.com

² University of Sultan Ageng Tirtayasa, tia_almer@yahoo.com

1. Introduction

Management Control System has long been acknowledged as a tool used by managers to reach organizational purpose through strategy implementation tracking, result evaluation performing and capability building (Bisbe *et al.*, 2007). Many previous studies had investigated the influence of MCS on organizational performance (Henri, 2006; De Geuser *et al.*, 2009). Yet, there is a lack of studies that investigate the influence of MCS on competitive advantage in SME especially in developing countries (Horvath *et al.*, 2014; Břečková and Havlíček, 2013; Břečková, 2016; Havlíček *et al.*, 2013; Epifanova *et al.*, 2015; Frank *et al.*, 2016; Kormishkin *et al.*, 2016).

Interactive control system and diagnostic control system are two usages of MCS that have been known for such a long time and it can also improve organizational performance (Henri, 2006; Widener, 2007) unfortunately there are still problems that emerge (Bisbe *et al.*, 2007). The usage of diagnostic and interactive control system, as explained by Henri, refer to the use of performance measurement by senior management that has time limit. The use diagnostic and interactive control system is caused by strategic uncertainty faced by senior managers (Henri, 2006) therefore diagnostic-interactive control system cannot be used at operational level (Grafton *et al.*, 2010). Almost SME managers in Indonesia participate in technical operation which is directly involved with employee (Ismail, 2016). The use of MCS does not only influence performance but also capabilities (Ismail and Ghozali, 2015). Previous authors had acknowledged knowledge as a part of organizational capabilities that can build and create competitive advantage in an organization (Chawla and Joshi, 2010). Many approaches and concept on MCS have been developed, but almost all is developed and tested in larger companies (Henri, 2006; Mari and Bernardini, 2008; Grafton *et al.*, 2010; Henri and Journeault, 2010).

Most industries in Indonesia are small to medium sized enterprises. This paper investigates the influence of MCS usage on competitive advantage of SME. Based resource based view of the firm, capabilities can improve competitive advantage, yet how MCS at operational level can improve capability is still unclear (Horvath, 2014). MCS which is used in this study is feedback and feed forward control system that can exploit capability (Grafton *et al.*, 2010). This paper places capability as mediating variable between MCS and competitive advantage of SME. Capability used in this study is knowledge.

This study contributes on literature to build the view about the relationship between control system and performance, by exploring on how managers use feed forward and feedback control system to mobilize resources and to improve competitive advantage. The article is divided into five parts. Section 2 reviews relevant literature and hypotheses development. Research method is presented in section 3. Descriptive statistic, hypotheses testing and discussion are presented in section 4 and section 5 elaborates conclusion and implication of this study.

2. Literature Review and Hypotheses Development

2.1 The Influence of Feed forward control system on knowledge

MCS is a tool designed by managers to help them in decision making process (Bisbe *et al.*, 2007). The more important the role of the control in the decision making process, the larger the use of feedback and feed forward control system (Grafton *et al.*, 2010). These two controls are used to evaluate actual outcome and predict future result. MCS is the key of organizational routine that acts as variable to build capability (Henri, 2006). Both feedback and feed forward control system are part of MCS. Main difference is that feedback control focuses on evaluation of actual outcomes; meanwhile feed forward control system focuses on formulation and prediction of them (Horvath *et al.*, 2014).

Feed forward control system is used to facilitate goal setting and develop action plan (Smandek *et al.*, 2010). In using feed forward control system, managers test variances between predicted and expected outcome, and then tries to minimize those variances (Henri, 2006). Feed forward control system has a role to communicate strategy that is used by an organization to reach organizational purposes. This control system also guides organizational members to get opportunities and capabilities needed in the future (Grafton *et al.*, 2010). Information from the uses of performance measurement will be used as a base to predict impact of future performance.

Feed forward control system is characterized by frequent active dialogues between managers and their employee. Feed forward control system is used regularly and personally by managers to involve them in a process that is based on employee's input (Henri, 2006). The purpose of feed forward control system is to focus the attention and push the dialogue and learning through organization which is reflected through signs sent by managers. Feed forward control system is used to reach organizational purpose in searching new way to position itself strategically in dynamic market condition. Based on the explanation above, the author proposes hypothesis as follow:

H1: Feed forward control system positively influences knowledge.

2.2 The Influence of Feedback control system on knowledge

In using feedback control system, managers test the variance between actual and expected outcome, then decide and search the trigger of the difference between these two outcomes (Agyemang and Broadbent, 2015). Feedback control system provides mechanism to the managers through outcome information that is not suited with expectation. Feedback control system has a function as a catalyst to identify routine problem, pays attention on critical process. Information given by this control system become valuable source to evaluate learning process (Henri, 2006; Grafton *et al.*,

2010) and the base to do reparation of plan and strategy (Henri, 2006). Main focus of feedback control system is the achievement of applied organizational purpose.

Feedback control and feed forward control system will be used simultaneously to complete each other. If it is used individually, it will not provide maximum function (Henri, 2006). The use of information comes from feedback control system will facilitate the process of how to get knowledge (Khedhaouria and Jamal, 2015). Knowledge itself comes from routine experience. Based on experience, an organization will perform formalization on "routine that will lead employee's behavior" (Khedhaouria and Jamal, 2015). Feedback control is a formalized routine. Feedback control will help managers by providing unpredicted end information, and it will be an example of single loop learning (Meutia, 2017).

Feedback actual report on outcome will become a learning process and competitive advantage will be enhanced as well (Grafton *et al.*, 2010). As a whole, MCS is a general system in which the manager will influence other members in an organization to implement strategy (Anthony and Govindrajana, 2007). Strategy used in this study is knowledge. Based on the explanation above, the author proposes hypotheses as follow:

H2: Feedback control positively influences knowledge.

2.3 The influence of knowledge on competitive advantage

Competitive advantage is a higher competitiveness compared with competitor that will be reached through lower price offering or larger benefit providing with a higher price. Competitive advantage is closely related with profit and value (Bosse *et al.*, 2009; Liapis *et al.*, 2013). Competitive advantage on SME will be reached if SME can improve efficiency, quality, productivity and cost saving (Hussain *et al.*, 2015; Thalassinou *et al.*, 2010; 2012). Knowledge owned by SME is a resource to reach competitive advantage (Mahr *et al.*, 2014).

Knowledge is a reflection of individual's experience which attaches on rule and procedure (Massingham, 2014). An organization always tries hard to develop valuable knowledge to get competitive advantage (Khedhaouria and Jamal, 2015). Exploration that leads to knowledge will provide new insight, ideas, inspiration that will lead to innovation that becomes inimitable capability. This study uses knowledge as process to perform knowledge acquisition, dissemination and application (Lee *et al.*, 2016). The capability to create, save, disseminate and use knowledge will be the main tool of an organization to reach competitive advantage (Khedhaouria and Jamal, 2015). Based on the explanation above, the author proposes hypotheses as follow:

H3: Knowledge positively influences competitive advantage.

3.4 The influence of feedback control and feedforward control on competitive advantage

The function of MCS is to provide useful information to perform any decision planning and evaluation (Agyemang and Broadbent, 2015). MCS will control decision making process by guiding organizational behavior to reach organizational purpose (Bhimani *et al.*, 2008). MCS consists of some control systems that are closely related to reach competitive advantage (Malmi and Brown, 2008).

Henri (2006) found that diagnostic and interactive system will work together to reach organizational performance. As MCS, feedback control and feed forward control system will be used as a tool to maintain and keep organizational member from unwanted action (Grafton *et al.*, 2010). The confrontation against unwanted action will improve competitive advantage (Henri and Jourenault, 2010). Competitive advantage that is got will be in the forms such as cost, material, and process and production (Henri and Journeault, 2010). MCS will improve performance by doing reparation on accounting information (Kallunki *et al.*, 2011). Enough accounting information will effectively manage resources and provide contribution to improve competitive advantage (Malmi and Brown, 2008; Yazid and Suryanto, 2016; Theriou, 2015; Suryanto, 2016; Setyawan *et al.*, 2014).

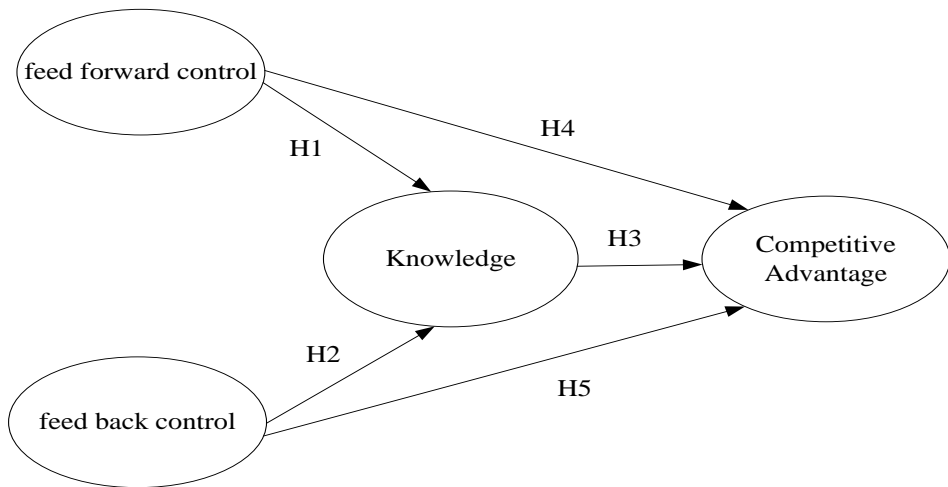
Feedback control will push alignment among business strategy, environment and value (Grafton *et al.*, 2010). Further, feedback control will enable managers to perform: (i) strategy adjustment when facing unexpected result occurs, (ii) communication improvement to reach expected result, (iii) performance motivation based on organizational value, (iv) direct attention from managers on critical factor to each success, and (vi) deeper comprehension on action and result (Choong, 2013). Feedback control will finally improve competitive advantage (Lee *et al.*, 2016). Feedback control promotes goal congruence between organization and individual, coordination of main strategy, resource allocation based on organizational purpose (Lee *et al.*, 2016). Therefore, by mobilizing resources, feedback control will push continuous competitive advantage. Feedback control will also ensure that organizational purpose is reached as it has been expected before, by performing reparation on unwanted result. The use of feedback information will focus on present position of an organization and facilitate an organization to exploit present capability (Grafton *et al.*, 2010).

The use of feed forward control system will focus on future positioning condition as a catalyst to reach competitive advantage by identifying new capabilities. Feed forward control system is a control system that will improve manager's ability to anticipate, manage and rule uncertain future (Grafton *et al.*, 2010). Formally, it will be expressed in hypotheses as follow:

H4: Feed forward control positively influences competitive advantage.

H5: Feedback control positively influences competitive advantage.

The following model is developed to study the effect of feed forward control, feedback control and knowledge on competitive advantage (Figure1).

Figure 1. Theoretical model

4. Methodology

Respondents in this study are 157 SME managers in Indonesia. Data is collected by providing direct questionnaire to SME managers. Variables in theoretical model are latent variables. Structural equation modeling is used simultaneously to solve problems among latent variables relatedness. Data is collected and managed by using AMOS 21 program. Respondents are asked to fill their agreement on the statements that are explained in questionnaire, scale 1 shows “totally disagree” and scale 7 shows “totally agree”.

In this model, there are four latent variables (1) feedback control, (2) feed forward control, (3) knowledge, and (4) competitive advantage. Feed forward control is measured through some indicators from Grafton *et al.* (2010) such as: goal determination (fw1), guide strategy implementation (fw2), action plans development (fw3) and important aspect communication (fw4). Indicators used to measure feedback control come from Grafton *et al.* (2010) such as promote organizational learning (fb1), analyze impact of previous decision (fb2), test strategy of target (fb3), and identify correctional action (fb4).

There are three indicators used which are adapted from Lee *et al.* (2016) to measure knowledge construct; they are: system that enables SME to learn business success from other organization (kn1), master information technology as a tool to distribute information to each member of organization (kn2), and knowledge application (kn3). Indicators used to measure competitive advantage come from Lee *et al.*, (2016), they are: efficiency improvement (ca1), quality improvement (ca2), productivity improvement (ca3), and cost saving improvement (ca4).

5. Result and Discussion

5.1 Descriptive Statistic

Respondents in this study have average working experience as eight years five months. Mean, standard deviation, minimum and maximum answer to each construct of feed forward control, feedback control, knowledge, and competitive advantage will be shown in Table 1. The result of descriptive statistic in this study describes that SME managers use high feed forward and feedback control system. It can be seen from the average value of both constructs above in their median value, and also in knowledge and competitive advantage.

Table 1. Descriptive Statistic for each construct

Construct	Mean score	SD	Min	Max
Job related exprience (years)	8.5	0.9	3	12
Feed forward control	5.3	0.71	1	7
Feedback control	4.8	1.12	1	7
Knowledge	5.4	1.14	1	7
Competitive advantage	4.7	1.13	1	7

5.2 Hypothesis testing

Main requirement to perform SEM analyses is normally distributed data (Byrne, 2010). Normality testing in this study uses Jarque Bera test (JB test). The result from JB test is smaller than chi square value at $\alpha = 5$ percent. The value of $\chi^2 (0.005, 2) = 5,99$, the result of JB shows that all indicators have value as 4,99. It means that data is normally distributed. Based on table 2, the result of data calculation shows that there is a positive relationship between feed forward and knowledge as 0,46 with significant rate as 0.001, therefore hypotheses 1 is accepted. Sampled SME managers have determined the purposes and provide guidance to all employees on how to implement business strategy, perform suitable action as preplanned to all organizational members. By performing four factors above, it has proven that the factors positively influence knowledge development of SME organizational member. Feed forward control system improves managers' ability to anticipate, manage uncertainty. The use of feed forward control system will provide knowledge that comes from double loop learning through active communication among organizational members (Grafton *et al.*, 2010).

Table 2. Output Result

	Standarde estimate	SE	Critical Ratio	Probability	Hypothesis
--	-----------------------	----	-------------------	-------------	------------

Feed forward	--->	Knowledge	0.46	4	3.176	***	Supported
Feedback	--->	Knowledge	0.38	2	4.176	***	Supported
Knowledge	--->	Competitive ad.	0.44	3	4.292	***	Supported
Feed forward	--->	Competitive ad.	0.35	1	3.782	***	Supported
Feedback	--->	Competitive ad.	0.26	3	3.162	***	Supported

	Average variance extracted (AVE)	□AVE	Composite reliability
Feed forward	0.713	0.844393	0.931
Feedback	0.14	0.374166	0.926
Knowledge Competitive ad.	0.621	0.788036	0.813
	0.752	0.867179	0.787

Fit indices

Root mean square error of approximation (RMSEA)	0.055
Adjusted goodness of fit index (AGFI)	0.934
Tucker-Lewis Index (TLI)	0.954
Comparative Fit Index (CFI)	0.972

Note: *** Significant at the level 0.001

The result of hypotheses 2 (H2) that test the relationship between feedback control and knowledge shows that there is a positive and significant relationship at level 0.001 by analyzing the impact of preplanned discussion and promoting organizational learning, identifying correctional action, performing single loop learning of SME. Feedback control system will help managers providing result information that is not suited with expectation; it will be the example of knowledge as the result from single loop learning process (Meutia, 2017).

The result from hypotheses 3 (H3) that tests the relationship between knowledge and competitive advantage shows that there is a positive and significant relationship. It is consistent with the coefficient value of standard estimation as 0,44 and significant at 0.001. Sampled SME on the system enables SME to learn business success from other organizations. SME organization formed by SME managers is aimed to distribute information and knowledge on how SME managers and their members use

social media as a tool to get and distribute knowledge owned by the other members. The knowledge that is got from SME managers will be tested on their business; it will be the knowledge application that will become competitive advantage of SME (Lee *et al.*, 2016).

Other result from this study is feed forward control system that positively influences on competitive advantage, as shown in Table 2 on column 2 of estimation standard value. The relationship between both constructs is 0.35 and significant at 0.001. Meanwhile, the relationship between feedback control and competitive advantage also provides positive value with estimation standard value as 0,26 and significant at 0,001. Sampled SME managers have improved efficiency, quality, productivity, and cost saving. They will be the main factors to reach competitive advantage. By using feedback and feed forward control system will facilitate SME to exploit capability (Grafton *et al.*, 2010). SME managers improve productivity, quality and cost saving by controlling and mobilizing resources owned by SME (Henri and Journeault, 2010).

6. Conclusion and Implication

This study contributes on literature by building the view of relationship between control system and performance, by exploring on how managers use feed forward control and feedback control system to mobilize resources to improve competitive advantage. The result from this study said that feedback control and feed forward control system as a part of MCS not only positively influences knowledge improvement but also competitive advantage of SME. This study fills the research gap on how managers influence Management Control System on competitive advantage of SME in developing countries. Practical implication from this study said that SME will pay large attention on the use of feed forward control and feedback control system to improve competitive advantage. It is in line with resource based view theory which said that knowledge is a part of capabilities. SME had better invest on knowledge to improve competitive advantage.

References

- Agyemang, A., Broadbent, J. 2015. Management control systems and research management in universities: An empirical and conceptual exploration. *Accounting, Auditing & Accountability Journal*. 28 (7), 1018 – 1046.
- Anthony, R.N., Govindarajan, V. 2007. *Management Control System*, (12th ed). New York: McGraw-Hill.
- Bhimani, A., Horngren, C., Datar, S., Foster, G. 2008. *Management and Cost Accounting*. Hemel Hempstead: Prentice Hall.
- Bisbe, J., Batista-Foguet, J.M., Chenhall, R.H. 2007. Defining management accounting constructs: A methodological note on the risks of conceptual miss-specification. *Accounting, Organizations and Society*, 32(7/8), 789–820.
- Bosse, D.A., Philips, R.A., Harrison, J.S. 2009. Stakeholders, reciprocity and firm performance. *Strategic Management Journal*, 30(4), 447-456.

- Břečková, P. and Havlíček, K. 2013. Leaders Management and Personnel Controlling in SMEs. *European Research Studies Journal*, 16 (4), Special Issue on SMEs.
- Břečková, P. 2016. Family Business in the Czech Republic. *European Research Studies Journal*, 19(4), 3-16.
- Byrne, B.M. 2010. *Structural Equation Modeling With Amos: Basic Concepts, Applications, and Programming*, 2nd ed., Taylor & Francis Group, New York, NY.
- Chawla, D., Joshi, H. 2010. Knowledge management initiatives in Indian public and private sector organizations. *Journal of Knowledge Management*, 14(6), 811-827.
- Choong, K.K. 2013. Understanding the features of performance measurement system: a literature review. *Measuring Business Excellence*.
- De Geuser, F., Mooraj, S., Oyon, D. 2009. Does the balanced scorecard add value? Empirical evidence on its effect on performance. *European Accounting Review*, 18(1), 93–122.
- Epifanova, T., Romanenko, N., Mosienko, T., Skvortsova, T. and Kupchinskiy, A. 2015. Modernization of Institutional Environment of Entrepreneurship in Russia for Development of Innovation Initiative in Small Business Structures. *European Research Studies Journal*, 18(3), 137-148.
- Frank, V.E., Mashevskaya, V.O., Ermolina, V.L. 2016. Innovational Mechanism of Implementation of Cluster Initiatives in Business. *European Research Studies Journal*, 19(1), 179-188.
- Grafton, J., Lillis, A.M., Widener, S.K. 2010. The role of performance measurement and evaluation in building organizational capabilities and performance. *Accounting, Organizations and Society*, 35(7), 689–706.
- Havlíček, K., Thalassinos I.E. and Berezkinova, L. 2013. Innovation Management and Controlling in SMEs. *European Research Studies Journal*, 16(4), 57-70, Special Issue on SMEs.
- Henri, J.F. 2006. Management control systems and strategy: A resource based perspective. *Accounting, Organizations and Society*, 31(6), 529–558.
- Henri, J.F., Journeault, M. 2010. Eco-control: The influence of management control systems on environmental and economic performance. *Accounting, Organizations and Society*, 35(1), 63-80.
- Horvath, P., Berlin, P., Putter, J.M. 2014. Environmental management control system in SMEs—an implementation schedule. *Behavioral Implication and Human Actions. Studies in Managerial and Financial Accounting*, 28 (1), 53-79.
- Hussain, M. Ajmal, M.A. Khan, M., Saber, H. 2015. Competitive priorities and knowledge management: An empirical investigation of manufacturing companies in UAE. *Journal of Manufacturing Technology Management*, 26 (6), 791 – 806.
- Ismail, T. 2016. Culture control, capability and performance: Evidence from creative industries in Indonesia. *Asian Review of Accounting*, 24 (2), 171-184.
- Ismail, T., Ghozali, I. 2015. Control system, strategy and learning. *Academy of Strategic Management Journal*, 14 (1), pp. 58-72.
- Kallunki, J. P., Laitinen, E.K., Silvola, H. 2011. Impact of enterprise resource planning systems on management control system and firm performance. *International Journal of Accounting Information Systems*, 12 (1), 20-39.
- Khedhaouria, A., Jamal, A. 2015. Sourcing knowledge for innovation: knowledge reuse and creation in project teams. *Journal of Knowledge Management*, 19(5), 932 – 948.
- Kormishkin, D.E., Sausheva, S.O., Gorin, A.V and Zemskova, S.E. 2016. Innovation and Investment Safety as the Condition for Neo-Industrial Development. *European Research Studies Journal*, 19(3) Part A, 94-109.

- Lee, V.H., Foo, A.T., Lai-Ying, L.Y., Keng-Boon, K.B. 2016. Can competitive advantage be achieved through knowledge management? A case study on SMEs. *Expert Systems with Applications*, 65 (1), 136-151.
- Liapis, K., Rovolis, A., Galanos, C. and Thalassinou, I.E. 2013. The Clusters of Economic Similarities between EU Countries: A View Under Recent Financial and Debt Crisis. *European Research Studies Journal*, 16(1), 41-66.
- Mahr, D., Lievens, A., Blazevic, V. 2014. The value of customer co created knowledge during the innovation process. *Journal of Product Innovation Management*, 31(3), 599-615.
- Malmi, T., Brown D.A. 2008. Management control systems as a package-opportunities, challenges and research directions. *Management Accounting Research*, 19(2), 287-300.
- Mari, E., Bernardini, S. 2008. Environmental impact evaluation using a cooperative model for implementing EMS (ISO 14001) in small and medium sized enterprises. *Journal of Cleaner Production*, 16, 1447-1461.
- Massingham, P. 2014. An evaluation of knowledge management tools: Part 1 – managing knowledge resource. *Journal of Knowledge Management*, 18 (6), 1075 – 1100.
- Meutia, T.I. 2017. Proactive attitude and organizational performance. *International Journal Economic Perspective*, 11 (1), 1-15.
- Setyawan, A.A., Dharmmesta, S.B., Purwanto, M.B., Nugroho, S.S. 2014. Business Relationship Framework in Emerging Market: A Preliminary Study in Indonesia. *International Journal of Economics and Business Administration*, 2(1), 59-72.
- Smandek, B., Barthel, A., Winkler, J., Ulbig, P. 2010. Balanced score card implementation for IP rights management in a public research institution, *Measuring Business Excellence*, 14 (4), 65–75.
- Suryanto, T. 2016. Audit Delay and Its Implication for Fraudulent Financial Reporting: A Study of Companies Listed in the Indonesian Stock Exchange. *European Research Studies Journal*, 19(1), 18-31.
- Thalassinou, I.E., Deceanu, L. and Pintea, M. 2010. New Dimensions of Country Risk in the Context of the Current Crisis: A Case Study for Romania and Greece. *European Research Studies Journal*, 13(3), 225-236.
- Thalassinou, I.E., Ugurlu, E. and Muratoglu, Y. 2012. Income Inequality and Inflation in the EU. *European Research Studies Journal*, 15(1), 127-140.
- Theriou, G.N. 2015. Strategic Management Process and the Importance of Structured Formality, Financial and Non-Financial Information. *European Research Studies Journal*, 18(2), 3-28.
- Widener, S.K. 2007. An empirical analysis of the levers of control framework. *Accounting, Organizations and Society*, 32(7/8), 757–788.
- Yazid, H., Suryanto, T. 2016. An Investigation of Factors Influencing Audit Quality According to Islamic Audit: A Study for the Jakarta Islamic Index. *International Journal of Economics and Business Administration*, 4(1), 20-38.