USM-ICOSS

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Submission date: 12-Sep-2017 08:40AM (UTC+0700)
Submission ID: 845741176
File name: 2015_USM-ICOSS_2015.pdf (410.68K)
Word count: 4805
Character count: 32030

USM INTERNATIONAL CONFERENCE ON SOCIAL SCIENCES (USM-ICOSS) 2015
27th – 28th AUGUST 2015
eISBN 978-967-11473-3-7

The Impact of a Dynamic Environment on Budgetary Participation with Information Processing as a Mediating Variable (An Empirical Study on Public SOE Managers and Staff Perception in Indonesia)

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Abstract

The study aims to find empirical evidence and to assess the factors influencing budgetary participation, which are the impacts of: (i) a dynamic environment on budgetary participation, (ii) a dynamic environment on information processesing (task exceptions, task analysis, information technology, and information system), (iii) information processesing on budgetary participation, and (iv) information processesing that mediates the impact of a dynamic environment on budgetary participaion. The study uses primary data from mail survey on the perception of Planning and Budgeting staff in 19 public SOEs in Indonesia. The study used path analysis to identify several factors that influence budgetary participation.

The results indicate that (i) a dynamic environment has a positive impact on budgetary participation, (ii) a dynamic environment has a positive impact on information processes (task exception, task analysis, information technology, and information system), (iii) information processesing has a positive impact on budgetary participatio, and (iv) information processesing mediates the impact of dynamic environment on budgetary participation.

Keywords: dynamic environment, information processesing, budgetary participation, task analysis, technology

1. Introduction Background of the Problem

State-Owned Enterprise (SOE), by definition, is a business entity that is either wholly or largely owned by the government through direct investments from separated state assets (Act 19, 2003). SOEs are expected to survive and remain competitive in the era of globalization. SOEs tend to be less prepared or slower to respond to the dynamic environment. They felt that they are part ofgovernment asset, therefore competitive capacity is unnecessary and, consequently, they are fairly poor in efficiency and performance. Thus, compared to private enterprises, SOEs are still lagging far behind them in term of professionalism (Iskan, 2012).

eISBN 978-967-11473-3-7

SOEs are required to implement governance through the issuance of Decree of the Minister of State-Owned Enterprises No. 117 of 2002 on the Implementation of Corporate Governance (CG) Practices for SOEs. The implementation of CG underlies the realization of budgetary participation in the enterprises. This was the case because the CG elements provide support for the budgetary participation. These elements are: (i) transparency, related to unveiling the budgetary issues in SOEs, (ii) accountability, all activities in budgeting can be calculated and taken into account, (iii) responsibility, all activities can be outlined and accounted for, including those processes of budgetary participation, (iv) independence, and (v) fairness. Budgetary participation is basically a manifestation of independence of a division or unit of organization to take part in the budgeting, while the principle of fairness is a form of prudence in budgetary participation to determine the reasonable number. Budgetary participation is manifested in the Work Plan and Budget developed by the directors annually, that is detailed business budget for scheduled activities.

The question then arise is whether the company budgeting that reflects the program or scheduled activities in the RKAP (Rencana Kerja dan Anggaran Perusahaan) has implemented the components of budgetary participation? Iskan (2012) admitted that the 2012 draft budget of the Ministry of SOE is a mere plagiary (cut-n-paste) of earlier draft, and, in fact, the budget allocation also tends to be not creative and less productive, with a slight change in year and figures. It is interesting to take his statement into consideration by asking the following questions: Is it true that budgetary participation remains nonexistent in SOEs? What are the factors that influence budgetary participation in a dynamic economic environment system?

A turbulent dynamic environment causes various changes such as technological shift to smarter one require preparedness in Information Processing Theory (IPT), including information in budgeting (Mulyadi, 2005). IPT is used in this study in an attempt to overcome the gap between the dynamic environment, information management, and budgetaru participation. This study attempts to analyze how the role or the influence IPT have on information in a dynamic environment correlates to budgetary participation.

2. Hypothesis Development

2.1 Dynamic Environment and Budgetary Participation

A dynamic environment put manager under pressure to obtain information in an anticipation of the unexpected events (Brownell and Hirst, 1986). Shields and Shields (1998), in their study, concluded that a dynamic environment affects budgetary participation. Wing *et al.* (2010) also concluded that a dynamic environment influences budgetary participation. In a dynamic environment as reflected in high uncertainty and centrality, it is highly likely that information discrepancy existed. Larger organizations require decentralization because top management can not sort the overloaded information and making far too many decisions, therefore centralization simply does not fit larger organizations.

The motivation theory is used in Wing et al. (2010) as the variable that mediates the relationship between organizational commitment and dynamic enviroment with the budgetary participation and performance. The dynamic environment in the study is negatively correlated to budgetary participation, meaning that when the respondents aware that their environment is dynamic their budgetary participation rate will decrease. This is because the respondents have minimum information or knowledge about when their environment is dynamic, thus prefer not to take part in the budgeting process.

Previous studies discussed budgetary participation as being influenced by many factors, and the dynamic of an environment or change will increase the needs for participation in budgeting

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process. This is because the subordinates are quicker to update their information due to a dynamic environment and in need to do revision in budgeting; therefore budgetary participation rate increase is necessary.

Based on the above description, we formulate the following hypothesis:
H_1: A dynamic environment positively affects budgetary participation.

2.2. IPT Mediates the Relationship between Dynamic Environment and Budgetary Participation

Dynamic Environment (DE) plays significant role in information processing (Edmonds, 2001). DE tends to have information complexity and managers need a good IPT for that complexity to provide information needed in budgetary participation. DE is also associated with the level of task uncertainty since it will adopt the change in environment that eventually requires involvement in the form of budgetary participation. Task uncertainty is associated with budgetary participation; when task uncertainty increases, budgetary participation is necessary to anticipate the uncertainties.

Task analysis (TA) is a process that allows task completion using the existing procedures and rules so as to make all things properly programmed. It takes more time for employees to use TA to find solutions to allow for proper task pogramming, and this requires more information. Dynamic environment poses a challenge for users of information in order to regulate the activities properly and to be able to adapt to any changes. DE makes tasks increasingly unpredictable and complex; thereby demands various kinds of information. One aspect of task uncertainty is the task frequency that is increasingly unequal and turned out to be requiring more information that poses challenges to process the task analysis (Bystrom, 1999).

DE needs task analysis to overcome uncertainties and to increase employees' involvement in the next things to come, including participation in budgeting. Managers need information concerning task uncertainty in their unit. Higher level of uncertainty will lead to an increased need for information, and higher level of uncertainty in organization can also increase the need for budgetary participation (Tushman and Nadler, 1978). Tara (2007) described that a properly analyzed task will increase budgetary participation rate because of favorable condition and the fact that the analysis motivates subordinates to take part in budgeting process.

DE must be balanced with the availability of Information Technology (IT) that supports the acquisition of information, as a consequence of the dynamics in the information. Information technology required in the information processing may reduce inefficiency and gap in many respects (Gattiker, 2007), including budgetary participation. Information technology can improve the absorption of fluctuating information as a consequence of the increasingly dynamic environment (Song et al., 2005) and improve the efficiency in budgetary participation.

DE is closely associated with the information system in organizations. Companies well-prepared to confront the dynamic environment are those equipped with visionary information system and well prepared structure to anticipate any changes. Changes in a dynamic environment may also transform the information in order to adapt to a more complex situation. Complexity of information systems represents a degree of uncertainty in an organization, meaning that the organization is in a competitive and dynamic environment. The

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higher the complexity of an environment, the higher the uncertainty or dynamics in an organization, and it requires good management of information system (Nobre *et al.*, 2009).

Based on the above description, we formulate the following hypotheses:

H_{4a}: Task exceptions mediate the dynamic environmental influence on budgetary participation.

H_{4b}: Task analysis mediates the dynamic environmental influence on budgetary participation.

H_{4c}: Information technology mediates the dynamic environmental influence on budgetary participation.

H_{4d}: Information system mediates the dynamic environmental influence on budgetary participation.

3. Research Method

3.1 Sampling

We use saturation sampling technique in this study, which means that all populations serve as the sample of this study. As for the population, they consist of: (i) manager of financial planning, and (ii) managers experienced in budgeting process in his or her division as indicated by his or her work experience in budgeting for minimally a year or in such position for a year. One year experience is included upon consideration that after one year of experience the manager had already went through various phases in budgeting processes.

3.2 Operational Definition and Variable Measurement

Budgetary Participation (BP) is defined as the involvement of subordinates in budgeting processes (Wing *et al.*, 2010). This variable is measured using 6 instruments developed by Milani (1975). Dynamic Environment (DE) is a state of uncertainty of change that is fluctuative from both within and without organizations (Wing *et al.*, 2010). The dynamic environment is measured using 12 instruments devised by Duncan (1972). Task Exceptions(TE) constitute the frequency of unpredicted or unexpected events in a conversion process (Brownell and Dunk, 1991). This variable is measured using 5 instruments developed by Whitney et al. (1983). Task Analysis (TA) is defined as the extent to which activity or work can be reduced to scheduled technical steps (Brownell and Dunk, 1991). This variable is measured using 5 instruments developed by Whitney *et al.* (1983. Information Technology (IT) is the availability of facilities and infrastructures for processing available data (Song *et al.*, 2005). This variable is measured using 3 instruments developed by Song *et al.* (2005). Information System (IS) is how the existing system in organizations properly developed for the present and future purposes (Osborne, 1994). This variable is measured using 10 questions devised by Osborne (1994).

4. Results and Discussion

The Influence of Dynamic Environment on Budgetary Participation (H_1)

The following hypothesis testing determines the influence of the independent variable on dependent variable; i.e. dynamic environment and budgetary participation, respectively.

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Table 2. H_1 Testing Summary

Equation $PA=\alpha+b_1LD+e_1$		
Description	**Results**	
Constant	1.337	
Dynamic Environment	0.424	0.000***
F Test	45.309	0.000***
Adjusted R^2	0.176	

Note: *** significant at α=1%
Source : Processed data

It can be concluded from Table 2 that statistically, at a significance level of 5%, dynamic environment does influence the budgetary participation with a positive coefficient of 0.424. With such results, H_1, stating dynamic environment affect positively the budgetary participation, is supported. It is expressed in probability value of 0.000*** and positive coefficient value, which means that the higher the dynamic level of an environment, the higher the budgetary participation rate will be.

The above hypothesis testing indicates that statistically H_1 is supported; that is, dynamic environment positively influence budgetary participation, the higher the dynamic level of an environment, the higher the budgetary participation rate will be. The results coincide with those of previous study stating that dynamic environment as reflected in unpredictable changes will increase the demand for budgetary participation as an effort to respond immediately any environmental change in budgeting processes.

Dynamic environment accustoms managers to dealing with various unpredictable situations and anticipate them, and, therefore, managers are also under pressure to perform budgetary participation. This proved to be true because managers are in a position that makes them more aware of the dynamic of their organizational environment. While SOEs are owned by the government, their management is expected to be equal to that of private companies so as to make them more capable of competing and profit making for public, especially Public SOEs supervised by various parties. A continually dynamic environment is inevitably confronted by SOEs, especially the dynamic in business competition and changes in the existing customer demand.

SOEs as state owned organizations do not necessarily safe from volatile environments because their products are also consumed by general public that undergo a dramatic change in demand and needs. Such changes in society are followed by changes in competition in private sectors that are more responsive to market demand. Private sectors are quick to adapt to any changes because of flexibility in budgeting process, unlike SOEs that are stuck with the applicable legislation. A dynamic environment proved to increase budgetary participation rate in SOEs as a manifestation of competitive strategy in the marketplace.

Considering the dynamic environment, it is irrelevant for the SOEs to continually using "cut-n-paste" method in devising their budget from earlier year budget with slight adaptation and increase in percent, or even reusing budget with certain interest as a consequence of demand for transparency in implementing CG in SOEs. This makes demand for budgetary participation keep increasing as the environment becomes even more dynamic, and anything could occur unpredictably. In such a situation budgeting processes cannot be implemented rigidly, it requires participation instead. The results of this study coincide with those conducted

eISBN 978-967-11473-3-7

by Hopwood (1976), Govindarajan (1986), Kren (1992), Shields and Shields (1998), and Wing *et al*. (2010).

Task Exceptions (H_{2a}) Mediation

The following hypothesis testing is of the task exceptions that mediate the influence of dynamic environment on budgetary participation.

Table 3. Summary of H_{4a} Testing

Description	Equation 1		Equation 2		Equation 3		Equation 4	
	$PA=\alpha+b_1LD+e_1$		$TE=\alpha+b_1LD+e_1$		$PA=\alpha+b_1TE+e_1$		$PA=\alpha+b_1LD+b_2TE+e_1$	
Constant	1.337		2.544		3.299		1.021	
Dynamic Environment	0.424	0.000***	0.252	0.000***			0.395	0.000***
Task Exceptions					0.213	0.002***	0.114	0.008***
F Test	45.309	0.000***	14.029***	0.000***	9.870	0.002***	24.429***	0.000***
Adjusted R^2	0.176		0.059		0.041		0.184	

Note: *** significant at α=1%
Source : Processed data

Regression analysis of fist equation in Table 3 indicates that statistically dynamic environment significantly affects budgetary participation (Sig.<0.05) with a coefficient of 0.424. Regression analysis of second equation demonstrates statistically that dynamic environment significantly affects task exceptions (Sig.<0.05) with a coefficient of 0.252, which means that the dynamic environment positively affect the task exceptions; the more dynamic an environment, the more task exceptions. Regression analysis of third equation statistically indicates that task exceptions significantly affects budgetary participation (Sig.<0.05) with a coefficient of 0.213, meaning that task exceptions have positive influence on budgetary participation; the more task exceptions, the higher the budgetary participation rate. Finally, the regression analysis of fourth equation statistically indicates that task exceptions affect budgetary participation after controlling dynamic environment (Sig.<0.05) with a coefficient of 0.395.

We can see from the Table that the coefficient of direct influence of dynamic environment on budgetary participation in mediating equation of 0.395 is lower than the coefficient of direct influence of dynamic environment on budgetary participation in the first equation of 0.424. This, according to Baron and Kenny (1986), can be concluded that the effect of dynamic environment on budgetary participation is in part mediated by task exceptions. The results demonstrate that task exceptions mediate partially the influence of dynamic environment on budgetary participation. The partial mediation with a positive coefficient indicates that the more dynamic the environment, the more the task exceptions, and the more the task exceptios, the higher the budgetary participation rate. Thus, it can be concluded that H2, stating that task exceptions partially mediate the influence of dynamic environment on budgetary participation, is supported.

Task Analysis Mediation (H_{2b})

The following hypothesis testing is of the task analysis that mediates the influence of dynamic environment on budgetary participation.

Table 4. H_{2b} Testing Summary

Description	Equation 1	Equation 2	Equation 3	Equation 4
	$PA=\alpha+b_1LD+e_1$	$AT=\alpha+b_1LD+e_1$	$PA=\alpha+b_1AT+e_1$	$PA=\alpha+b_1LD+b_2AT+e_1$
Constant	1.337	1.629	2.740	0.998

eISBN 978-967-11473-3-7

LD	0.424	0.000***	0.399	0.000***			0.335	0.000***
AT					0.357	0.000***	0.223	0.001***
F Test	45.309	0.000***	39.086	0.000***	30.147	0.000***	29.296	0.000***
Ajusted R^2	0.176		0.155		0.123		0.214	

Note : *** significant at α=1%
Source : Processed data

Regression analysis of first equation in Table 4 indicates that, statistically, dynamic environment significantly influence budgetary participation (Sig.<0.05) with a coefficient of 0.424; that is, dynamic environment positively influence budgetary participation, the more dynamic an environment, the more task analyses will be. Regression analysis of second equation demonstrates that, statistically, dynamic environment significantly influence budgetary participation (Sig.<0.05) with a coefficient of 0.399. Thus, dynamic environment positively influence task analysis; that is, the dynamic an environment, the more task analyses will be. Regression analysis of third equation demonstrates that, statistically, task analysis significantly influence budgetary participation (Sig.<0.05) with a coefficient of 0.357. This means that task analysis positively influences budgetary participation; that is, the more task analyses, the higher the budgetary participation rate will be. As for the regression analysis of the fourth equation, it indicates that task analysis influence budgetary participation after controlling the dynamic environment (Sig.<0.05) with a coefficient of 0.335.

We can see from the table that the coefficient of direct influence of dynamic environment on budgetary participation in mediation equation of 0.335 is smaller than that of direct influence of dynamic environment on budgetary participation in the first equation of 0.424. From these results, according to Baron and Kenny (1986), it can be concluded that task analysis partially mediates the influence of dynamic environment on budgetary participation. By the partial mediation and positive coefficient it can be stated that the more dynamic an environment, the more task analyses there will be, and the more task analyses, the higher the budgetary participation rate will be. Therefore, it can be concluded that H_{2b}, stating that task analysis partially mediates the influence of dynamic environment on budgetary participation, is supported.

Information Technology Mediation (H_{2c})

The following hypothesis testing is of the information technology that mediates the influence of dynamic environment on budgetary participation.

Table 5. H_{2c} Testing Summary

Description	Equation 1		Equation 2		Equation 3		Equation 4	
	$PA=\alpha+b_1LD+e_1$		$TI=\alpha+b_1LD+e_1$		$PA=\alpha+b_1TI+e_1$		$PA=\alpha+b_1LD+b_2TI+e_1$	
Constant	1.337		1.367		2.294		0.932	
LD	0.424	0.000***	0.472	0.000***			0.290	0.000***
TI					0.421	0.000***	0.284	0.000***
F Test	45.309	0.000***	59.183	0.000***	44.493	0.000***	32.932	0.000***
Ajusted R^2	0.176		0.219		0.173		0.235	

Note : *** significant at α=1%
Source : Processed data

Regression analysis of first equation in Table 5 demonstrates that, statistically, dynamic environment significantly influence budgetary participation (Sig.<0.05) with a coefficient of 0.424. This means that the dynamic environment positively influences budgetary participation; that is, the more dynamic an environment, the higher the budgetary participation rate will be. Regression analysis of second equation indicates that, statistically, dynamic environment significantly influence information technology (Sig.<0.05) with a coefficient of 0.472. This

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means that the dynamic environment positively influences the information technology; i.e., the more dynamic an environment, the higher the information technology. Regression analysis of third equation demonstrates that, statistically, information technology significantly influences budgetary participation (Sig.<0.05) with a coefficient of 0.421. This means that information technology positively influences budgetary participation; that is, the higher the information technology, the higher the budgetary participation rate. Finally, the regression analysis of fourth equation indicates that information technology significantly influences budgetary participation after controlling dynamic environment (Sig.<0.05) with a coefficient of 0.290.

From the table we can see that the coefficient of direct influence of dynamic environment on budgetary participation in mediation equation of 0.290 is lower than that of direct influence of dynamic environment on budgetary participation in the first equation of 0.424. Baron and Kenny (1986) concluded, from the results, that the influence of dynamic environment on budgetary participation is partially mediated by information technology. The results tell us that information technology partially mediates the influence of dynamic environment on budgetary participation with a positive coefficient. Thus, it can be stated that the more dynamic an environment, the higher the information technology, and the higher the information technology, the higher the budgetary participation rate. Thus, we can conclude that H_{2c}, stating that information technology partially mediates the influence of dynamic environment on budgetary participation, is supported.

Information System Mediation (H_{2d})

The following hypothesis testing is of the information system that mediates the influence of dynamic environment on budgetary participation.

Table 6. H_{2d} Testing Summary

Description	Equation 1		Equation 2		Equation 3		Equation 4	
	$PA=\alpha+b_1LD+e_1$		$SI=\alpha+b_1LD+e_1$		$PA=\alpha+b_1SI+e_1$		$PA=\alpha+b_1LD+b_2SI+e_1$	
Constant	1.337		3.586		2.670		0.213	
LD	0.424	0.000***	0.120	0.004***			0.384	0.000***
SI					0.379	0.000***	0.333	0.000***
F Test	45.309	0.000***	3.019	0.004***	34.822	0.000***	32.932	0.000***
Ajusted R^2	0.176		0.010		0.14			

Note : *** significant at α=1%
Source : Processed data

Regression analysis of first equation in Table 6 demonstrates that, statistically, dynamic environment significantly influence budgetary participation (Sig.<0.05) with a coefficient of 0.424. This means that dynamic environment positively influence budgetary participation; that is, the more dynamic an environment, the higher the budgetary participation rate there will be. Regression analysis of second equation indicates that, statistically, dynamic environment significantly influences information system (Sig.<0.05) with a coefficient of 0.120, which means that a dynamic environment positively influences information system; that is, the more dynamic an environment, the higher the budgetary participation. Regression analysis of third equation indicates that, statistically, information system significantly affects budgetary participation (Sig.<0.05) with a coefficient of 0.379. This means that information system positively affects budgetary participation; that is, more sophisticated information system will increase budgetary participation rate. Regression analysis of fourth equation indicates that information system significantly influences budgetary participation after controlling the dynamic environment (Sig.<0.05) with a coefficient of 0.384.

eISBN 978-967-11473-3-7

We can see from the table that the coefficient of direct influence of dynamic environment on budgetary participation in mediation equation of 0.384 is smaller than that of direct influence of dynamic environment on budgetary participation in the first equation of 0.424. From these results, according to Baron and Kenny (1986), it can be concluded that the influence of dynamic environment on budgetary participation is partially mediated by information system. The results tell us that information system partially mediates the influence of dynamic environment on budgetary participation with a positive coefficient. This means that the more dynamic an environment, the more sophisticated the information system and that more sophisticated information system will increase budgetary participation rate. Thus, it can be concluded that H2d, stating that information system partially mediates the influence of dynamic environment on budgetary participation, is supported.

The results of H_2 testing indicate that statistically H_{2a}, H_{2b}, H_{2c}, and H_{2d} are supported, which means that IPT (task exceptions, task analysis, information technology, and information system) mediates the influence of dynamic environment on budgetary participation. The results indicate that dynamic environment positively influence IPT (task exceptions, task analysis, information technology, and information system), and that more dynamic an environment will increasingly improve IPT. To put it another way, H2 is supported and IPT (task exceptions, task analysis, information technology, and information system) is positively influence budgetary participation; that is, the improved IPT will increase budgetary participation, or that H3 is supported. The study conducted subsequent analysis of whether IPT mediates the influence of dynamic environment on budgetary participation.

The results of this study coincide with those of previous studies by Tushman and Nadler (1978), Edmonds (2001), Song et al. (2005), and Tara (2007). Dynamic environment in SOEs makes it difficult to predict the activities to be implemented, therefore increases task exceptions. Such an increase motivates managers to participate in budgeting as a consequence of unpredictable events in the budgeting, therefore requires higher participation rate. Managers are motivated to take part in budgeting process in the hope that the dynamic environment and task exceptions will not impede the activities that should be implemented by their companies.

A dynamic environment motivates managers of SOE to conduct more task analyses in order to properly manage anything dynamic. Improved task analysis will invite budgetary participation because it facilitates managers in implementing the scheduled activities. From the above description we see that task analysis can mediate the influence of dynamic environment on budgetary participation.

A dynamic environment creates volatile and fluctuating situation that increases the need for IT as an effort to adapt to the existing changes. Proper IT will motivate managers to participate in budgeting processes. SOEs in Indonesia implement their activities throughout the regions with various islands and vast range that can only be achieved by information technology, especially in dynamic environments. This will increase the managers' demand for information technology to facilitate them in searching and managing information, as well as in taking part in budgeting processes. Likewise, a dynamic environemnt influences information system. The dynamic environment requires managers or companies to have a visionary information system that is capable of adapting to any changes in information and environment, and it is necessary to improve the budgeting participation processes.

5. Conclusion, Implication, and Suggestion

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The study on the influence of dynamic environment on budgetary participation with information processes as mediating variables and empirical study on Public SOE managers' perception concluded that:

1. A dynamic environment influences positively budgetary participation; the more dynamic an environment, the higher the budgetary participation rate.
2. TTT (task exceptions, task analysis, information technology, and information system) mediates the influence of a dynamic environment on budgetary participation.

These findings have several significant implications for various parties, such as: (i) The government, especially SOEs, can find out how Good Corporate Governance (GCG) is implemented in Public SOEs from the results of this study. The government can also take the factors influencing budgeting participation into account, in view of information processes in SOEs so that they can be used for future policy making relevant to the process or system of information for SOEs, and (ii) Public SOEs, to support policies relevant to information processing for budgetary participation, such as devising task analyses continually to find the standardized pattern for operating system and procedure, as well as creation or improvement of technology and information system.

The study recommends several things as follow-ups for the researcher and other policy makers: (i) to conduct similar study in other public sectors, such as Regionally-Owned Enterprises. Both Regional and Central Governments are expected to measure the implementation of CGC at their respective departments in compliance with the applicable regulations. Such an assessment may serve as an objective barometer as it is to be conducted by researchers as the external parties without any conflict of interest, (ii) to conduct follow-up research to measure the quality of CGC implementation in SOEs, either *Perum, Persero*, or Public *Persero*, for future comparative studies, and (iii) to add more variables relevant to the study on dynamic environment, information-processing theory, and budgetary participation: for example, leadership in business organizations.

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