RESEARCH ARTICLE

PREDICTION MODEL OF VALUE CHAIN ANALYSIS IMPLEMENTATIONS AT INDONESIA'S BUSINESS OF STATE-OWNED ENTERPRISE

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ABSTRACT

Value chain analysis (VCA) of implementation is sequential event of business activities, we justification sicle of research and development, design of production process or not, productions or not, marketing, distribution, and customer services. Based on literature reviews conclude the relationship between VCA of implementation and management accounting systems, budget tightness and perceived environmental uncertainty. Because that is CEO need any information's to support day to day decision making and business activity. The research method using the explanatory research. The population of research in Indonesia business with research sample are 85 State-Owned Enterprise's. The type of data in this research is primary data and data collections with a questionnaire design were represent by a manager or director as the unit of observation. Validity and reliability data were tested before examining the hypotheses. The hypotheses testing were used binary logistic regression model. Based on hypotheses testing indicate that 59 unit samples were conducted of VCA implementations in business activities with of the predicted percentage correct of 93,70% and 13 unit samples fail to conduct of VCA, the percentage correct of 84,70%. And the management accounting systems, budget tightness and perceived environmental uncertainty indicate positively effect on VCA implementations. Further analysis show that, state-owned enterprise in Indonesia's indicate that the higher weight average of firm performance were conducted of VCA implementations because run of business will be support by sophisticated concept of management accounting systems, budget emphasis and prudent action in change of environmental uncertainty, and another word the lower of firm performance fail to conduct of VCA day to day in business activities. Never the less, budget tightness to be anticipations of environmental uncertainty, sometime cause to VCA conducted less effectiveness. That is effect by the systems and operating procedure of administration requirement.

INTRODUCTION

Value Chain analysis (VCA) is the sequence of events or activities of a company, from research and development, operation and product design, production, marketing, distribution, and finally to customer service – the ideal cycle of general business processes. While the definition is mostly applicable to manufacturing companies, it is also possible to implement VCA in trade and service companies, except in the production process (Horngren *et al.,* 2015; Hilton, 2009). Strategic decisions and management accountant role have become the important pillars in providing information to the management, including strategic cost management in implementing VCA (Horngren *et al.,* 2015; Hilton, 2009). To that effect, value chain analysis contributes positively in establishing the outline and stages of business processes. Value chain analysis is conducted as follows:

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Uncertainties in business environments may change at any moment (Wheelen and Hunger, 2012). Managers should seriously consider the factors involved in decision making, such as designing the value chain of their businesses. Many managers lack the ability to do so, resulting in the decline of their company's performance. Such decline may also be caused by a budget's inability to support planned business strategies, which in turn negatively affect the company's performance (Govindarajan, 1986). Given the above, this study's emphasises on contingency approach as developed by Fisher (1998) and Chenhall (2003). The approach noted that a good fit could improve a company's performance while a poor fit tends to be otherwise. In other words, VCA becomes important for a company in developing conducive business and optimum performance achievements. Tight budgets in uncertain external environments could assist the management to improve the company's performance (Govindarajan, 1986). Van der Stede (2001) noted that budgets may be loose or tight, the implementation of which is adjusted to the daily needs of management.
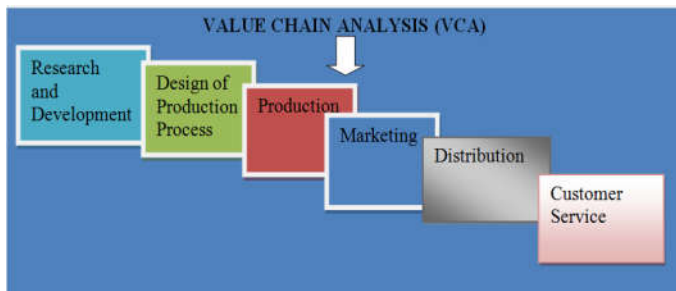
Figure 1

As such, budgets could provide additional points of consideration on company activities upon which decisions are made and caution the management on changes to come. Ideally, budgeting should always consider inevitable future changes and current anticipation for such. This way, the budget will fit the due change and inform for the management. Management accounting is contingent in nature, in that there is no universal management accounting system applicable to each and every company in every situation. A possible suit is not a guarantee of fit since each management accounting system is based on the unique contingency factors (Otley, 1980). Wolk *et al.* (1989) added that the accounting policies of a company must consider the external environment in which it operates. In other words, the management accounting system, external environment, and organization structure are interconnected with each other. If management wants to design a management accounting system, it should ideally refer to the organisation structure and contingency factors, such as external environment uncertainties and budgeting system in use to ensure compatibility and balance so as to ensure continuous development of management accounting information systems and planned business strategies (Baines and Langfield-Smith, 2003). Upon deeper consideration, implementation of VCA involves a number of influencing factors. The factors, among others, include budgeting systems, external environment uncertainties, and management accounting systems in place.

Research objectives

Given the research questions and problems above, the aims of this study are:

- To test the effect of management accounting systems in predicting if a company implements Value Chain Analysis (VCA);
- To test the effect of budget tightness in predicting if a company implements Value Chain Analysis (VCA);
- To test the effect of external environment uncertainties in predicting if a company implements Value Chain Analysis (VCA); and,
- Whether a company with a high performance average implements VCA in its business processes.

MATERIALS AND METHODS

The study adopts the explanatory and verificative method, in that it describes in detail the causal links between the variables studied or objects of focus (Cooper and Schindler, 2006). The method is selected as it refers to theories relevant to the variables studied, thus the developed hypothesis may be used to describe a current phenomenon. The population of this study is each member of the state-owned enterprises population in Indonesia, in particular limited liability companies (PT) and public companies (Perum). Both types of companies are chosen for their relatively high accountability compared with other legal bodies. Each analysis unit is sent one questionnaire addressed to managers (middle and top-level) represented by either the Finance Director, Operations Director (Productions), Marketing Director, or manager. Each is considered as respondent and observation unit. This study uses both quantitative and qualitative data. This study adopts the Time Order Decision method for data collection (Johnson and Onwugbuzie (2004) in Elvia R. Shauki (2016)). The method is chosen because data collection is interspersed with interviews with selected respondents to reaffirm the questionnaire data and further inquire on budget tightness implementation, external environment uncertainties, management accounting system, and value chain analysis implementation in the company. The research model is as follows:

Paradigm Emphasis Decision	Dominant Status	QUAN + qual

Figure 2. Concurrent

The independent variable, management accounting system, is calculated with reference to the dimensions and indicators developed by Chenhall and Morris (1996). External environment uncertainties (Gordon and Narayanan (1984), budget tightness (Van der Stede, 2001), and dependent variable VCA are calculated using the dummy method based on company performance.

RESULTS AND DISCUSSION

Data Description

Table 1 shows that the average value of the studied variables is high, between 53.2000 and 137.8118. This means that the variables management accounting system, budget tightness, and external environment uncertainties strongly suggest that implementing VCA may improve company performance. Multicollinearity test is also conducted to see whether the independent variables in the model have perfect correlation. Variance inflation factors (VIF) values (VIF of independent variables < 10) show that there is no perfect correlation in the model. The value indicates that the model is rational. Validity and reliability tests show that the studied variables are valid and reliable.

Logistic Regression Analysis

Logistic regression analysis is used to see the effects of Budget Tightness, External Environment, and Management Accounting System on VCA Implementation. The model to predict if a company implements VCA uses binary logistic regression, as follows:

$$\log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

Where :

$$\log\left(\frac{p}{1-p}\right) = \text{Implementations of VCA}$$

Table 1. Descriptive Statistics

	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation
X1 (Keketatan Anggaran)	85	79.00	82.00	161.00	10706.00	125.9529	16.48080
X2 (Lingkungan Eksternal)	85	45.00	32.00	77.00	4522.00	53.2000	10.65230
X3 (Sistem Akuntansi Manajemen)	85	112.00	85.00	197.00	11714.00	137.8118	21.26841
Y (VCA)	85	1.00	.00	1.00	63.00	.7412	.44059
Valid N (listwise)	85						

Table 2. Estimation Logit Model of Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp (B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	X1_Budget tightness	.045	.023	3.774	1	.052	1.046	1.000	1.095
	X2_Percieved environmental uncertainty	.067	.033	4.087	1	.043	1.069	1.002	1.141
	X3 Management accounting systems	.045	.018	6.071	1	.014	1.046	1.009	1.083
	Constanta	-13.802	3.539	15.206	1	.000	.000		
a. Variable(s) entered on step 1: X1_Budget tightness, X2_Percieved environmental uncertainty, X3_Management accounting systems.									

β_0 = Constanta
$\beta_{1.2.3}$ = Coeficient Ditermanations
X_1 = Budget Tightness
X_2 = Percieved of Environmental Uncertainty
X_3 = Management Accounting Systems

The estimated model result of the effects of Budget Tightness, External Environment, and Management Accounting System on VCA Implementation are as follows:

Based on the regression coefficient estimates, the logistic regression equation and logit model are as follows:

$$\log\left(\frac{p}{1-p}\right) = -13{,}802 + 0{,}045X_1 + 0{,}067X_2 + 0{,}045X_3$$

$$P = \frac{1}{e^{-(-13{,}802 + 0{,}045X_1 + 0{,}067X_2 + 0{,}045X_3)}}$$

Coefficient of Determination (Nagelkerke's R Squared)

Nagelkerke's R Squared coefficient of determination is used to partially calculate the effect of independent variables on dependent variables. The ability of the logit model on the variables budget tightness (X_1), external environment (X_2), and management accounting system (X_3) in determining if a company implements VCA is 0.437 (43.7%).

Prediction Accuracy of the Logit Model

Prediction accuracy of the logit model of the three predictor variables found that of the 85 companies studied, 63 may potentially implement VCA and 22 are suspected to not implement it. Prediction test results show that 13 companies are predicted to not implement VCA (prediction accuracy 59.1%) and 59 companies predicted to potentially implement VCA (prediction accuracy 93.7%). The overall prediction accuracy is 84.7%.

Goodness of Fit Test of Model

Goodness of fit test is a simultaneous test to see the effect of independent variables on dependent variables in the context of VCA implementation in companies. The overall test uses Chi-squared test as follows:

Table 3. Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	30.008	3	.000
	Block	30.008	3	.000
	Model	30.008	3	.000

The statistical Chi-squared value (calculable) from the difference of both -2Log Likelihood values is 30.008. From the Chi-squared table for an error rate of 5% and degree of freedom = 4, the $\chi^2_{(1-0.05);4}$ = 9.488. Since the calculated Chi-squared (30.008) > Chi-squared table (9.488) and the value of significance is very small (0.000), it is concluded that the independent variable positively affects VCA implementation.

DISCUSSION

Based on the research questions, research problems, and the findings above, it can be concluded that: (1) the independent variable simultaneously positively and significantly affects the prediction of Value Chain Analysis (VCA) implementation; (2) there is positive effect in the management accounting system in predicting if a company implements Value Chain Analysis (VCA); (3) there is positive effect in budget tightness in predicting if a company implements Value Chain Analysis (VCA) - consistent with that of Van der Stede (2001); and, (4) there is positive effect in external environment uncertainties in predicting if a company implements Value Chain Analysis (VCA) – consistent with that of Gordon and Narayanan (1984). The analysis is in accordance with that Horngren *et al.* (2015) and Hilton (2009) on strategic cost management and strategic decisions. Value Chain Analysis (VCA) is inseparable from strategic cost management and strategic decisions such as planning, organising, actuating, and controlling (POAC). The findings also note that companies with a high performance average always considers POAC concepts optimally in VCA design and implementation. VCA is part of a stage process of a company's operations, starting from the securing the availability of industrial raw materials, research and development, to after sales services such as customer service. Management accounting system is an information provider for management in decision making processes and assists it in evaluating the utilization of company resources. In this case, the management is consistently, based on available information, considering POAC concepts, budgeting systems, and external environment uncertainties in designing and implementing VCA so as to improve the company's

performance. Conversely, companies which tend to disregard POAC concepts and contingency factors are predicted to stagnate or decline. This finding is also consistent with that of Chenhall and Morris (1996), in that interdependent variables positively affects information availability for the management accounting system in daily administration of management duties. Future studies on VCA should focus on trading and service companies or in specific industries. The studies should also include additional variables which might have considerable effects, such as share ownership structure, decentralization, and so on.

Conclusions and recommendations

The study shows that companies with a high performance average implement VCA in their operations whereas those with low performance average are ineffective in their VCA implementations. The findings also show that management accounting systems, budget tightness, and external environment uncertainties positively and significantly affects VCA implementation. However, if management implement a tight budget regime in times of high uncertainty, VCA implementation would be less effective due to internal obstacles caused by budgeting systems and company procedures. Therefore, the management should need and prepare alternative policies so that a tight budget regime in uncertain environments does not disturb the funding of routine operations. For instance, special policies on budget revisions and funding of high priority projects.

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