

# DETERMINING MODEL OF EFFECT OF QUALITY OF ACCOUNTING INFORMATION SYSTEMS ON FIRM PERFORMANCE

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## Abstract

The study was designed to determine a model that could explain the effect of the quality of accounting information system on the firm performance appropriately. Unit of analysis is the regional owned enterprises (BUMDs) of the financial service sector in West Java and Banten Province. Data analysis is descriptive and SEM PLS analysis. The results of this research indicate that increasing the quality of accounting information systems significantly influence to the improvement of firm performance of BUMDs. Non-linear equation model and linear equation are both feasible to be used, but non-linear equation model is more viable to be used. Production elasticity indicates that the scale of business BUMDs financial service sector is on the decreasing return to scale.

**Keywords:** Accounting information systems; Firm performance; Equation model; Regional owned enterprises

## Introduction

The role of Regional-Owned Enterprises which is expected to be large enough to sustain local revenue (PAD) is in fact far from expectations. The role and profit contribution of BUMD in PAD revenue in both provincial and district/city areas are still minimal. The average PAD composition in all provinces in Indonesia is 81.60 percent of local taxes, 9.64 percent of regional levies, 6.43 percent of other PAD, and only 2.33 percent comes from BUMD [1, 2]. Deputy Head of the Financial and Development Supervisory Agency (BPK) in the State Accounting Firm, some BUMDs in Indonesia have not contributed APBD in their respective regions.

Types of BUMDs that need particular attention include the BUMD of the financial services sector including BPR (Rural Banks) and Micro Finance Institutions [3], the economic and efficiency performance needs to be improved immediately by the Regional Rural Bank. A total of 1,007 BUMDs with assets amounting to Rp 340.118 trillion, recorded a profit of Rp 10.372 trillion or average benefit to asset (ROA) ratio of 3.0 percent. The low level of ROA indicates that BUMD management has not been optimal, either from financial aspect or performance. With this condition, and added the existence of mismanagement practices that lead to inefficiency and fraud, the BUMD is necessary and essential to make improvements so that the acceleration of public services.

Running a business is not an exclusive activity, as it is influenced by the business environment, internal and external [2, 4, 5]. Accounting Information System (AIS) has become an essential strategic tool to achieve organizational goals. Many organizations are implementing it in order to achieve efficiency, increase productivity and improve performance [6]. The use of accounting and management information systems is very important within the organization in the context of technological development in the world [7, 8].

The cause of poor performance of the company, among others, is due to the inadequate accounting information system in the internal business environment of the company. Such as, random asset management and a constantly negative balance sheet result in the inability of BUMD to increase capital expenditure (provision of new tools, preventive, and predictive maintenance). According to [9-13] that accounting information systems significantly affect management performance and organizational performance. It is necessary to examine the effect of accounting information system quality on the performance of BUMD financial services sector companies. So with it can be done various forms of solutions for improving corporate performance through accounting information systems.

In fact, not all data distribution relationships between variables have a linear form, so making regression with the linear model will lead to errors in the analysis [14, 15]. Selection of the wrong type of function can be fatal. So linked with the BUMD, it is necessary to examine the appropriate model of equation function that can be applied to the study of the influence of accounting information system quality towards company performance, whether the model is feasible linear or non-linear. Based on the above description, the research problem is formulated as follows:

- (1) How is the effect of the quality of accounting information systems to the firm performance?
- (2) Which model should be used to describe the effect of quality of accounting information system on firm performance?

### **Literature Review**

The economic theory of David Ricardo on the law of diminishing return, states that the more resources are combined in production on specific fixed funds, the increased output decreases [16]. The organisational theory states about how organisations function and how organisations affect and are influenced by the internal and external environments in which organisations operate [17]. Based on economic theory and organisational theory, the accounting information system is an internal input organisation, and corporate performance is the output organisation that is influenced by internal input resources organisation. Quality accounting information system (AIS) is a measure of the ability of accounting information systems in generating accounting information by user needs. The quality of accounting information systems includes accessibility, integration, reliability, flexibility and timeliness, and relevance [11, 18-26].

Company performance is the result of the company's overall management activities in meeting the company's objectives for a specified period. Measurement of business/company performance includes two dimensions, financial performance and

operational performance or non-financial performance [27, 28] mention the second dimension with the term strategic performance.

The Baldrige Criteria for Performance Excellence (BCPE) method pioneered by Malcolm Baldrige is widely adopted by the organization as a means of assessment to improve the company's performance which is an operational assessment tool of quality management practices. The application and usefulness of the BCPE model has been evident from numerous empirical studies [29]. The core concepts contained in the BCPE consist of seven key dimensions that explain processes, procedures and outcomes associated with a quality organization [29]. According to the National Institute of Standards and Technology (NIST), United States Department of Commerce (NIST, 2013), seven categories of Baldrige's Superior Performance, namely leadership; strategic planning; customer focus; measurement, analysis, and knowledge management; workforce focus; operation focus; and result.

Accounting information systems have an important role for business [30]. Accounting information system had been widely used by many organizations to automate and integrate their business operations, efficiency and competitive advantages [31]. Accounting information systems (AIS) significantly affect on management performance and organisational performance [10-12, 32]. Accounting information system is a significant variable in a company and hugely influential on financial performance, and financial performance with efficient management performance in building organisational performance [33]. The higher the quality of the AIS implementation, the company's performance, productivity and profitability are significantly higher [34]. The Farida's research show that the accounting information system implementation had a significant positive effect on organizational performance through the quality of financial reporting [35].

Based on some literature above, it can be concluded that the increasing quality of accounting information systems has a positive influence on company performance. So the research hypothesis formulated as follows:

H<sub>0</sub>: The quality of accounting information system (QAIS) does not affect to the firm performance (FP).

H<sub>1</sub>: The quality of accounting information system (QAIS) affects to the firm performance (FP).

### ***Research Methodology***

The research was designed to determine the model that can explain the influence of quality of accounting information system to the firm performance. The object of research is the quality of accounting information systems, and firm performance. The research used survey method with descriptive and verification-based research type which conducted by cross-sectional studies. The unit of analysis is a Regional Owned Enterprises (BUMDs) of the financial services sector in West Java and Banten Province. The subjects of the study were the head of BUMD, the chief of accounting and general, as well as accounting and finance officers in the financial services sector.

The population is the entire BUMD of the financial services sector in West Java and Banten with 67 units. The sample size of the research is 38 units of the business entity. They meet the requirement research namely have implemented computer-based accounting information system during three years in order. Data analysis was done through descriptive statistical analysis and SEM-based partial least square (SEM-PLS) analysis. The operational variables are as follows.

*Table 1*

### **Operationalization and Measurement of Research Variables**

Variable	Indicator	Measurement Scale
Quality of accounting information system (X) References: [20, 22, 23, 36]	Integration	Ordinal
	Reliability	Ordinal
	Flexibility	Ordinal
	Relevant	Ordinal
	Timeliness	Ordinal
Firm Performance (Y) References: [1, 29, 37-39]	Leadership	Ordinal
	Strategic Planning	Ordinal
	Customer Focus	Ordinal
	Measurement, Analysis and Knowledge Management	Ordinal
	Workforce Focus	Ordinal
	Operational Focus	Ordinal
	Results	Ordinal

**Result and Discussion**

**Linear Equation Model**

The measurement model analysis was done through confirmatory factor analysis (CFA) on both variables, namely quality of accounting information systems and firm performance. Due to be each variable has a unidimensional construct form, then the CFA through first order construct is the latent construct of variable formed by its indicators.

Table 2 shows that the indicators in both variables have a loading factor value higher than 0.70 and from Table 3 an average variance extracted (AVE) greater than 0.5. These findings mean that the indicators on both variables are converged on the constructs of each variable. Therefore each indicator has a convergent validity as its respective variable.

Table 3, composite reliability (CR) and cronbach’s alpha in both variables are greater than 0.7. This finding indicates that each indicator in both variables has accuracy, consistency and precision in measuring their respective constructs.

*Table 2*

**Outer Loading Linier Equation Model**

Manifest variable (Indicator)	QAIS (X)	FP (Y)	Explanation
X <sub>1</sub> (Integration )	0.926		Valid
X <sub>2</sub> (Reliability)	0.953		Valid
X <sub>3</sub> (Flexibility)	0.943		Valid
X <sub>4</sub> (Relevant)	0.941		Valid
X <sub>5</sub> (Timeliness)	0.881		Valid
Y1 (Leadership)		0.866	Valid
Y2 (Strategic planning)		0.908	Valid
Y3 (Customer focus)		0.914	Valid
Y4 (Measurement, analysis and knowledge management)		0.933	Valid
Y5 (Workforce focus)		0.908	Valid

Y6 (Operations focus)	0.891	Valid
Y7 (Results)	0.935	Valid

Table 3

**AVE, CR and CA Linier Equation Model**

No	Variabel	AVE	Expla nation	Composite reliability (CR)	Cronbach's alpha (CA)	Expla nation
1	QAIS (X)	0.86	Valid	0.969	0.960	Reliable
2	FP (Y)	0.83	Valid	0.971	0.964	Reliable

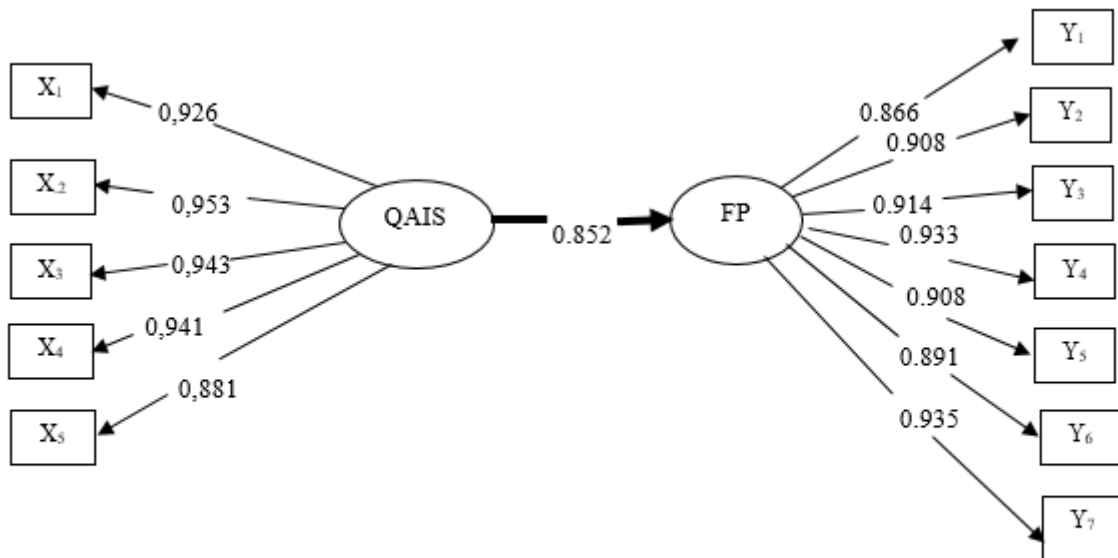


Figure 1. Structural Model of Linear Equation

Table 4

**The Goodness of Fit of Linear Equation Model**

Linear Equation	Weight	t <sub>count</sub>	t <sub>critical</sub>	Conclusion	Direct Influence	R <sup>2</sup>
QAIS→FP	0.852	2.979	1.65	H <sub>0</sub> rejected	56.1%	0.726

Based on Table 4, the lane weight of 0.852 explains that the quality of accounting information system has a positive effect on firm performance with direct effect of 56.1 %. The R-square value shows that QAIS gives 72.6% influence to FP, while the rest of 27.4% is the influence of other factors not examined.

Based on Table 4 it is known that t-count is 2.979 bigger than t-critical 1.65, hence at 5% error rate ( $\alpha$ ) decided to reject H<sub>0</sub>, so the conclusion is that the increasing of accountancy information system (QAIS) significant influence to increase of firm performance BUMD Financial Services Sector in West Java and Banten Province.

**Log-Linear Equation Model**

The measurement model analysis is done through confirmatory factor analysis (CFA) on both variables, namely quality of accounting information system and firm performance. Due to be each variable has a unidimensional construct form, then the CFA through first order construct is the latent construct of variable formed by its indicators.

Table 5 shows that the indicators in both variables have a loading factor value higher than 0.70 and from Table 6 an average variance extracted (AVE) greater than 0.5. These findings means that the indicators on both variables are converged on the constructs of each variable. Therefore each indicator has a convergent validity as its respective variable.

Table 6, composite reliability (CR) and cronbach's alpha in both variables are greater than 0.7. This finding indicates that each indicator in both variables has accuracy, consistency and precision in measuring their respective constructs.

Table 5

**Outer Loading Log-Linier Equation Model**

Manifest variable (Indicator)	Ln QAIS (Ln X)	Ln FP (Ln Y)	Explanation
X <sub>1</sub> (Integration )	0.866		Valid
X <sub>2</sub> (Reliability)	0.897		Valid
X <sub>3</sub> (Flexibility)	0.852		Valid
X <sub>4</sub> (Relevant)	0.850		Valid
X <sub>5</sub> (Timeliness)	0.828		Valid
Y <sub>1</sub> (Leadership)		0.821	Valid
Y <sub>2</sub> (Strategic planning)		0.897	Valid
Y <sub>3</sub> (Customer focus)		0.899	Valid
Y <sub>4</sub> (Measurement, analysis and knowledge management)		0.904	Valid
Y <sub>5</sub> (Workforce focus)		0.890	Valid
Y <sub>6</sub> (Operations focus)		0.814	Valid
Y <sub>7</sub> (Results)		0.923	Valid

Table 6

**AVE, CR and CALog-Linier Equation Model**

No	Variable	AVE	Explanation	Composite reliability (CR)	Cronbach's alpha (CA)	Explanation
1	Ln QAIS	0.738	Valid	0.934	0.911	Reliable
2	Ln FP	0.773	Valid	0.960	0.951	Reliable

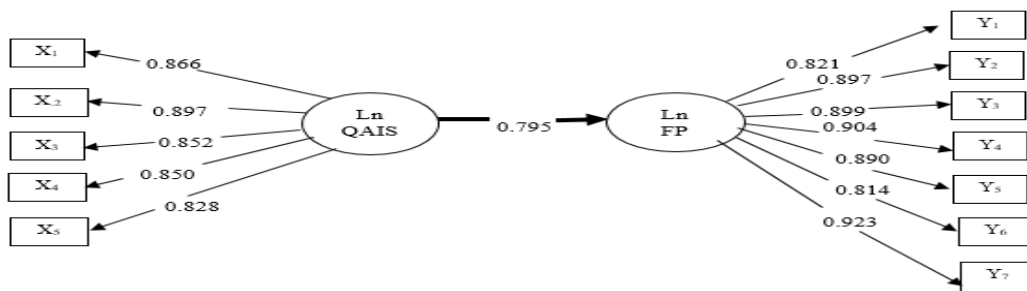


Figure 1. Structural Model of Log-Linear Equation

Table 7

**The Goodness of Fit of Log-Linear Equation Model**



Linear Equations	Weight	t <sub>count</sub>	t <sub>critical</sub>	Conclusion	Direct Influence	R <sup>2</sup>
Ln QAIS→Ln FP	0.794	9.014	1.65	H <sub>0</sub> rejected	79.4%	0.6304

Based on Table 7, the lane weight of 0.794 explains that the quality of accounting information system has a positive effect on firm performance with direct effect of 79.4 %. The R-square value shows that QAIS gives 63.04 % influence to FP, while the rest of 36.96 % is the influence of other factors not examined.

Based on Table 6 it is known that t-count is 9.014 higher than t-critical 1.65, hence at 5% error rate (α) decided to reject H<sub>0</sub>, so the conclusion is that the quality of the accounting information system influence significantly to the firm performance of BUMD Financial Services Sector in West Java and Banten Province.

**The Influence of Quality of Accounting Information Systems to Firm Performance**

The result of the research shows that the quality of accounting information systems have significant effect to the firm performance of BUMD of the financial services sector in West Java and Banten Province, both in linear and log-linear equation model. Relationship model between variables in each equation model as follows:

- Linear equation model :  $Y = 0.852 X$  ..... (1)
- Log-linear equation model:  $\text{Ln } Y = 0.795 \text{ Ln } X$  ..... (2)

The value of the coefficient of line weight on linear equation model 0.852 means that every increase of variable X (quality of accounting information system) is 10 units, then variable Y (company performance) will increase by 8.52 units. In log-linear equation model, the weight coefficient of 0.795 means that every increase of X variable (quality of accounting information system) is 10%, then variable Y (firm performance) will increase by 7.95 %.

The coefficient of line weight on the log-linear equation is also the value of elasticity of production of firm performance with input factor of quality of accounting information system. The value of production elasticity of 0.795 indicates decreasing return to scale. Therefore, the results of the research that the quality of accounting information systems influence on the performance of the BUMDs of the financial services sector in West Java and Banten Province confirm the economic theory of David Ricardo about the law of diminishing return.

The results of this study provide empirical evidence of the importance of improving the quality of accounting information systems to improve the performance of BUMDs of financial services sector enterprises in Province of West Java and Banten. The influence of accounting information system quality on firm performance also confirm the organisational theory , because the accounting information system as an internal component of the organisation proved to have a significant positive effect on the performance of BUMDs in the financial services sector in West Java and Banten Province. The BUMDs as a business organisation are an organization that affects and are influenced by internal environmental components where the company BUMD operate.

In the linear equation model, the improvement of firm performance due to the increase of accounting information system quality is the same as absolute, and

different relative (percentage), the increase is not proportional, the higher the performance level, the smaller the percentage of performance increase. While in the log-linear equation model, the improvement of company performance due to the increase of accounting information system quality is different in absolute, but the same relative (percentage), so-called the elasticity of constant production. It is very rational and realistic to the business situation in the field where the business will experience three stages of the economies scale, which is increasing the return to scale, constant return to scale and decreasing return to scale (decreased productivity).

**Goodness Fit of Equation Model**

*Table 8*

**Comparison of Linear and Log-Linear Equation Model**

Linearity	Components	Linear Equation	Log-Linear Equations
QAIS → FP	t-count	8.834	9.014

Table 8 shows that the value of t-count of log-linear equation model gives more significant results than linear equations, meaning that the log-linear equation model has predictive relevance more than the linear equation. Based on this, log-linear equation model is more feasible used to describe the effect of accounting information system quality on company performance [17].

Log-linear equation model is more feasible than linear equation model because linear equation model has no minimum and maximum limit [40], whereas in fact, the improvement of company performance due to continuous improvement of accounting information system quality will have saturation point at its maximum point. The log-linear equation model from equation (2) generates Cobb Douglass production function model after be made to anti logarithm form as follows :

$$Y = X^{0.795} \dots \dots \dots (3)$$

The magnitude of the coefficient of fath weight in equation (3) shows the elasticity of production output of firm performance. With a production elasticity value of 0.795, it means that BUMD companies in the financial services sector in West Java and Banten province are in decreasing returns to scale where the company's performance output increases smaller proportion than the increase in the input quality or accounting information system.

The concept of decreasing return to scale in BUMD companies of West Java and Banten provinces provides a logical consequence that improving the quality of accounting information systems should be accompanied by expansion in business scale to achieve cost savings, or product and market development to obtain improved productivity of company performance.

**Conclusion and Recommendation**  
**Conclusions**

The quality of accounting information systems have significant effect to the firm performance of BUMD of the financial services sector in West Java and Banten Province, both in linear and log-linear equation model.



The non-linear equation model of Cobb Douglass production function with the form of log-linear transformation function, and the linear equation model, both feasible to be used to describe the influence of quality of accounting information systems to the firm performance of BUMD company of financial services sector in West Java and Banten Province, but non-linear equation model is more feasible to use than the model of linear equation model.

In non-linear equations, the percentage of corporate performance change as a result of a shift in percentage change of quality of accounting information system constant value equal to specific rate. However, because the production elasticity of the company's performance is less than 1, the productivity of the accounting information systems on the performance of the company is in decreasing return to scale where the increasing of accounting information system can improve firm performance, but with decreasing yield (decreased productivity).

### Recommendations

BUMDs of the financial services sector in West Java and Banten Province are in diseconomies of scale. The application of information technology in accounting information system leads companies to improve the quality of accounting information system, but without accompanying increasing of business scale and or product and market development, company performance in decreasing return. BUMD financial services sector should:

Reduce using no longer productive fixed inputs such as labour and renegotiations of fixed lease payments if any.

Diversification of existing product or market penetration or new market development.

Transformation of BUMD in the form of Micro Finance Institutions (MFIs) into Rural Banks (BPRs) and BUMD in the form of BPR become commercial banks, so there is an opportunity to develop product and market.

The use of the non-linear model in analysing the influence between variables is very appropriate and rational in theory and reality in the field. Therefore, for the development of sciences, the researchers always perform testing model used before conducting further hypothesis testing, whether linear or non-linear. It aims to avoid fatal errors due to wrong in the selection of function form.

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