IT VALUE ESTIMATION USING PARTIAL ADJUSTMENT VALUATION WITH MVA DYNAMIC FACTOR

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ABSTRACT
This paper discusses the substance of the value of IT in an IT-based company, namely PT. Telkom Indonesia. IT value is a value in financial benefits when capital expenditures include IT factors compared with capital expenditures that do not include IT. Nowadays, IT has become a business enabler that can improve the performance of business organizations efficiently and effectively in the company. The method used in this study is Partial Adjustment Valuation (PAV), which states that changes in output that occur in the production process are usually not exactly the desired one, so a Speed of Adjustment coefficient is needed to bridge the desired output with the actual output. This paper uses Dynamic Speed of Adjustment to calculate the fluctuates in IT values and the Market Value Added (MVA) factor to measure its dynamics. This study uses two calculation models: a three-factor model (K, L, and I) and a two-factor model (K and L) to prove the benefits of the IT value within a company. These measurements are split into two units: the currency unit (Performance Value) and the ratio unit (Performance Ratio). This paper leads to an understanding that the value of IT is real in improving business performance and refutes the paradox that states there is no relationship between IT investment and the size of the profits received by the company. Thus, the results of this study are open to studies that discuss the value of IT to develop further.

Keywords: it value, mva, pav, speed of adjustment, spss.

INTRODUCTION

Information technology (IT) is currently one of the strategic factors in the everyday world of industry. This is related to improving the performance of business organizations efficiently and effectively or commonly referred to as an IT business enabler (Abdurrahman, 2019). Value in Information Technology (IT) is called IT value. The IT value is an added value in the form of quantitative units of currency that can be measure in an index ratio as a benefit from spending on IT resources that are managed to improve company performance. This research was conducted to study how far the IT value affects the company's business performance (Abdurrahman, Suhardi, & Langi, 2014).

When measuring the value of IT, it is crucial to consider the measurement that should focus on the reference (Tohidi, 2011). Performance Value is an IT value in the form of currency units, and Performance Ratio is an IT value in the form of a ratio index unit (Abdurrahman, 2019). Speed of Adjustment (SoA) is the speed orientation used to calculate the TI value. Dynamic SoA uses several unknown values (Abdurrahman, 2019). This paper uses the theory of Partial Adjustment Valuation (PAV) with the Dynamic Speed of Adjustment and Market Value Added (MVA) to adjust its dynamics. MVA is a calculation that shows the difference between the market value of a company and the capital provided by investors (Firdausi, Rahadian, & Dewi, 2019), (Hardiyanti & Widodo, 2015). Measurements using the dynamic factor MVA are divided into two models: the three-factor model (using IT) and the two-factor model (not using IT). The results of the two models are compared to see how big the difference and the effect of the value of IT on company performance (Abdurrahman, 2019), both in measurement using currency units (PV) and in ratio index units (PR). The company's annual report is a source of information used in this study to complement the analysis of the estimated IT value at PT. Telkom Indonesia.

LITERATURE REVIEW

(1) IT Value

IT is a production engine, so IT generates value in the configuration it creates and financial gains from other ongoing business processes. In other forms, IT value can appear in the form of improving business processes so that the time in running a business process becomes more effective and generates an advantage over the competition (Abdurrahman, 2019). The current position of IT is based on demands that are technological advancements, not as market-driven demands.

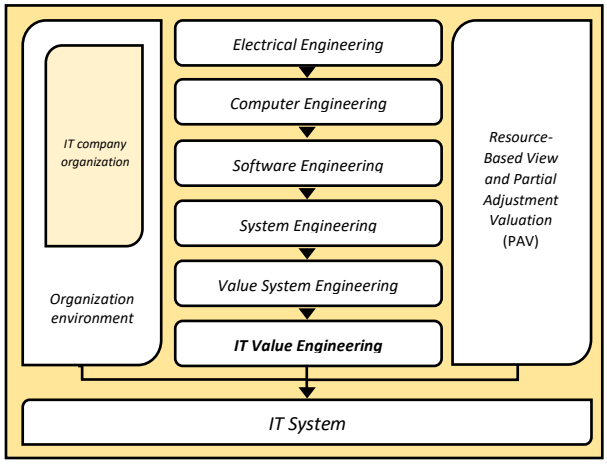

Figure 1. Value Engineering Mapping in IT Systems

Figure 1 shows that the value of IT is at the top layer, which has undergone engineering processes and precedes the engineering of electrical, computer, software, systems, and complex systems (Abdurrahman, Suhardi, & Langi, 2016a).

(2) Partial Adjustment Valuation (PAV)

Most of the previous research conducted using Partial Adjustment theory assumes that Speed of Adjustment is static rather than dynamic. Especially in the study using the PAV approach with a static speed of adjustment proposed by Lin et al., (2010) who cannot provide an explanation of dynamic adjustments that are influenced by changes in

patterns and other variables of an organization/company performance from time to time. Therefore, this study assumes dynamic speed of adjustment as a linear function which makes speed adjustment more dynamic and varied.

This theory explains that changes in output in the production process are usually not the same as the desired output (Abdurrahman, Langi, & Simatupang, 2018). Then, to bridge the two measurement changes, namely between the current period (time t) and the measurement of changes in the previous period (t-1), a constant is needed. That constant is called the speed of adjustment (Lin et al., 2010), (Lin & Chuang, 2013). The mathematical writing is as follows (Abdurrahman, 2019), (Lin & Kao, 2014):

$$y_t + y_{t-1} = \mu(y_t^* - y_{t-1}) \quad (1)$$

Equation above states that it is the actual output of a production process in the company at time t. Then is the actual outcome of the same process unit at time t-1 and is the coefficient of the speed of adjustment constant (Lin & Kao, 2014). In the calculation process, there may be an old-fashioned random error ($\in_t$) [8] to complete the above formula; the formula will adjust to (Abdurrahman, 2019):

$$y_t = \mu\, y_t^* + (1-\mu)y_{t-1} + \in_t \quad (2)$$

(Lin & Kao, 2014) suggested that μ in formulas (1) and (2) can be a dynamic variable so that μ can turn into μ_t where t is the movement of time due to its dynamic nature. Then the two equations above can be adjusted into the following formula (Lin et al., 2010; Lin & Kao, 2014):

$$y_t = \mu_t\, f\,(X_t;\beta) + (1-\mu_t)y_{t-1} + \in_t \quad (3)$$

$$\mu_t = g(S_t;\gamma) \quad 0 \le \mu_t \le 1 \quad (4)$$

Formula (3) is an alternative function of the desired output function (y_t^*) , which describes the shape of the production function. Equation (4) represents a dynamic speed of adjustment (Lin et al., 2010). On the other hand, μ_t is a function of S_t that affects the company's speed of adjustment, and γ is an unknown parameter (Abdurrahman, 2019), (Abdurrahman et al., 2018). Then formula (3) can be defined as follows:

$$y_t - y_{t-1} = \mu_t\, f\,(X_t;\beta) - \mu_t y_{t-1} + \in_t \quad (5)$$

Therefore, the production function in formula (3), namely $f\,(X_t;\beta)$, can be derived from various production functions (Abdurrahman et al., 2016a). However, this explanation only uses the Cobb-Douglas production function (CD) to replace the function $f\,(X_t;\beta)$ in formula (3) because it is simpler and easier (Abdurrahman, Suhardi, & Langi, 2016b; Hong, Guo, & Li, 2013). Then the formula adjusts to:

$$f\,(X_t;\beta) = \alpha K_t^{\beta 1} L_t^{\beta 2} I_t^{\beta 3} e^{vt-ut} \quad (6)$$

Formula (6) describes the function CD with vector X_t consisting of K_t, L_t, and I_t which has accommodated the existence of IT capital. Meanwhile α, β_1, β_2, and β_3 are unknown parameters (Abdurrahman et al., 2018). If there is no I_t in the CD production function, then the formula becomes as follows (Abdurrahman et al., 2016b):

$$f\,(X_t;\beta) = \alpha K_t^{\beta 1} L_t^{\beta 2} e^{vt-ut} \quad (7)$$

Then in formula (4), the speed of adjustment can be reformulated as in equation (8) (Abdurrahman et al., 2016b):

$$\mu_t = \gamma_1 + \gamma_2 S_t \quad (8)$$

Then if equation (6) and formula (8) replace the components in equation (5), the following equation (9) is produced (Abdurrahman, 2019; Abdurrahman et al., 2016b):

$$\begin{aligned} y_t - y_{t-1} = {} & \left(\gamma_1 \alpha K_t^{\beta 1} L_t^{\beta 2} I_t^{\beta 3} e^{vt-\mu t}\right) + \\ & + \left(\gamma_2 S_t \alpha K_t^{\beta 1} L_t^{\beta 2} I_t^{\beta 3} e^{vt-\mu t}\right) - (y_t y_{t-1}) - \\ & (y_2 S_t y_{t-1}) + \in_t \end{aligned} \quad (9)$$

The PAV equation with the two-factor production function in formula (6) and formula (7) can be combined into formula (5), then the final equation will be as follows. (Abdurrahman, 2019):

$$\begin{aligned} y_t - y_{t-1} = {} & \left(\gamma_1 \alpha K_t^{\beta 1} L_t^{\beta 2} e^{vt-\mu t}\right) + \\ & \left(\gamma_2 S_t \alpha K_t^{\beta 1} L_t^{\beta 2} e^{vt-\mu t}\right) - (\gamma_t y_{t-1}) - \\ & (y_2 S_t y_{t-1}) + \in_t \end{aligned} \quad (10)$$

(3) Dynamic Speed of Adjustment Estimation

In dynamic speed adjustment, the calculation uses unknown parameters. In the speed of adjustment method, the PAV theory is more detailed and focuses on calculating the value of IT in the company. Formulas (9) and (10) produce several unknown parameters, including γ_1 and γ_2 in equation (8). Therefore, dynamic speed of adjustment can estimate dynamics μ_t which has an average speed of adjustment (ASA) (Lin & Kao, 2014). This method makes it possible to discuss the dynamics of the speed of adjustment and the disparity of values between the three-factor model (K_t, L_t, and I_t) and the two-factor model (K_t, and Lt_t). The following formula (11) is the formula used for the three-factor model, and the formula (12) is used for the two-factor model. (Abdurrahman, 2019):

$$y_t = (\gamma_1 + \gamma_2 S_t)\left(\alpha K_t^{\beta 1} L_t^{\beta 2} I_t^{\beta 3} e^{vt-ut}\right) - (\gamma_1 + \gamma_2 S_{t-1}) y_{t-1} + \epsilon_{it} \quad (11)$$

$$y_t = (\gamma_1 + \gamma_2 S_t)\left(\alpha K_t^{\beta 1} L_t^{\beta 2} e^{vt-ut}\right) - (\gamma_1 + \gamma_2 S_{t-1}) y_{t-1} + \epsilon_{it} \quad (12)$$

(4) Market Value Added (MVA)

MVA is the result of a cumulative calculation consisting of the company's performance resulting from investments that have been made or in the future (Gulo & Ermawati, 2016), MVA can measure the company's level of success to maximize the value of investors' wealth because optimizing the company's value is the same as maximizing the stock price (Brigham & Ehrhardt, 2017). In addition, MVA is a measuring tool for company management whether it produces significant added value or not in a certain period (Hardiyanti & Widodo, 2015). MVA can be obtained by the following formula (13) (Hardiyanti & Widodo, 2015) (Firdausi et al., 2019):

MVA = Market Capital (MC) – Invested Capital (IC) (13)

To get the MC value, the formula (14) is used as follows:

Market Capital (MC) = Market Value (ME) + Debt (14)

Then, to get the IC value, the formula (15) is used as follows:

Invested Capital (IC) = Total Debt + Equity (15)

The total debt in formula (15) consists of short-term debt, long-term debt, long-term debt maturing within one year, and a deferred acquisition cost of a business combination. The value of debt and equity is contained in the company's annual report. The value of debt in the annual report can be equated with the value of liabilities or consolidated debt balances.

(5) Statistical Product and Service Solutions (SPSS)
SPSS is an application that helps the user to make a statistical analysis. Some of the statistics included in the essential SPSS software are (Purnomo, 2016):

- Descriptive Statistics (Cross Tabulation, Frequency, Description, Search, etc.)
- Bivariate Statistics (Mean, t-test, ANOVA, Correlation (bivariate, partial, distance)
- Prediction of Numerical Results (Linear Regression, Nonlinear Regression)
- Prediction to identify groups (Factor Analysis, Cluster Analysis (two-step, K-means, hierarchical)

Because the mathematical nature of PAV is a nonlinear regression equation, the calculation applied is a nonlinear regression estimation using IBM SPSS version 26 with the Levenberg-Marquardt method, which could estimate nonlinear least squares (Abdurrahman et al., 2018).

METHOD

(1) Defining the Problem
The main problem of this research is that there is no IT performance measurement at PT. Telkom Indonesia, which is an IT-based company. Meanwhile, it is important for the company to know how much profit is received by implementing IT in its performance to accelerate the company's managerial professional decision making. Therefore, to determine the impact resulting from the IT value, speed of adjustment is used with the dynamic factor of MVA and measurement in currency units (PV) as well as in ratio units (PR).

(2) Collecting Data
The data used in this study were obtained from the Annual Report of PT. Telkom Indonesia. The data collected is data in currency units (billion rupiah) and is divided into 2 groups of data, namely primary data, and secondary data. Primary data include the value of equity, labour costs, IT spending costs, revenue, and previous year's income. Secondary data in this study is additional data used by dynamic MVA factors, including the number of outstanding shares, closing price of shares, total debt, inventory value, and current asset value.

(3) Generating Dynamic Speed of Adjustment and Unknown Parameters
In dynamic speed of adjustment, the calculations performed will generate and use unknown parameters, so the values of these parameters must be searched first using the SPSS analysis tool with nonlinear regression using equation (11) for three-factor model and equation (12) for two-factor model.

(4) Measuring the IT value in the measurement of PV and PR
The value of IT is estimated with the amount of Performance Value (PV) and Performance Ratio (PR) (Lin & Kao, 2014). Performance Value is the value of IT in the form of currency units, while PR estimates the amount of TI value in units of ratio index, which is the division between PV value and income from a production process at time t. IT value is the result of subtracting from the three-factor model with the two-factor model (in PV and PR).

RESULT AND DISCUSSION

In processing data from IT values using the dynamic MVA factor, MVA Values should have known in advance with several calculations. MVA as a measuring tool for company management whether it produces significant added value or not in a certain period [5], where if the MVA value is more than zero (MVA> 0), it means that the MVA is positive; thus, the company has succeeded in increasing the capital provided by investors, but if the MVA value is less than zero (MVA < 0) then the MVA is negative which means it failed to increase the value of the capital invested provided by investors [16]. The annual report of PT. Telkom Indonesia from 2004 to 2019 was used as a data processing source using the dynamic factor MVA factor.

Table 1 Calculation Results with MVA Dynamic Factor (In Billion Rp)

Years	Market Value Added (MVA) Values		
	MC	*IC*	*MVA*
2004	97274	34.744	62.530
2005	118960	37.025	81.935
2006	203.631	43.681	159.950
2007	204637	49.748	154.889
2008	137114	54.655	82.459
2009	190535	61.222	129.313
2010	160289	66.434	93.855
2011	142142	65.381	76.761
2012	182455	70.816	111.639
2013	208782	80.079	128.703
2014	281292	91.173	190.119
2015	304858	109.748	195.110
2016	394293	116.183	278.110
2017	439874	128.185	311.689
2018	371528	142.997	228.531
2019	393338	151.645	241.693

The MVA value presented in Table 1 shows that the MVA value is positive because the value is more than zero. It means that the company's management can increase the company's wealth and provide optimal results to the investors and the performance of PT. Telkom Indonesia is in healthy condition. Furthermore, this calculation results will be used in estimating the IT value using a two-factor model (without TI) and a three-factor model (with TI). MVA value is obtained with equation (13).

The data in Table 1 is the result of the Dynamic Speed of Adjustment constant, which later the outcomes will be used to do the PAV calculations using the three-factor model (with I) with the formula (11) and the two-factor model (without I) with the equation (12). The data processing is processed using SPSS version 26 software. Table 2 presents the estimation results for unknown parameter values (α, β, γ) [6].

Table 2 Parameter Estimates Values

Parameter Estimates		
Parameter	*Three-factor models*	*Two-factor models*
α (A)	10,027	6,950
β1 (B1)	0,464	0,383
β2 (B2)	0,361	0,577
β3 (B3)	0,070	-
γ1 (C1)	0,363	0,312
γ2 (C2)	1,116E-6	9,343E-7

After the parameter values of the two models are found, the next step is to calculate Dynamic Speed of Adjustment (μ) using equation (8), St means MVA values, and γ1 γ2 is the value results from the estimated MVA parameter (see Table 2). Dynamic Speed Adjustment calculation result (μ) using three-factor and two-factor models with dynamic factor MVA are presented in Table 3.

Table 3 Results of Dynamic Speed Adjustment Values

Years	Dynamic Speed of Adjustment (μ) Values	
	Three-factor Models	*Two-factor Models*
2004	0,4328	0,3704
2005	0,4544	0,3886
2006	0,5415	0,4615
2007	0,5359	0,4567
2008	0,4550	0,3890
2009	0,5073	0,4328
2010	0,4677	0,3997
2011	0,4487	0,3837
2012	0,4876	0,4163
2013	0,5066	0,4323
2014	0,5752	0,4896
2015	0,5807	0,4943
2016	0,6734	0,5719
2017	0,7108	0,6032
2018	0,6180	0,5255
2019	0,6327	0,5378
Average	**0,5393**	**0,4596**

Calculation results with Dynamic Speed of Adjustment (μ) using a three-factor and two-factor model with dynamic factor MVA is also presented in the form of a diagram in Figure 2.

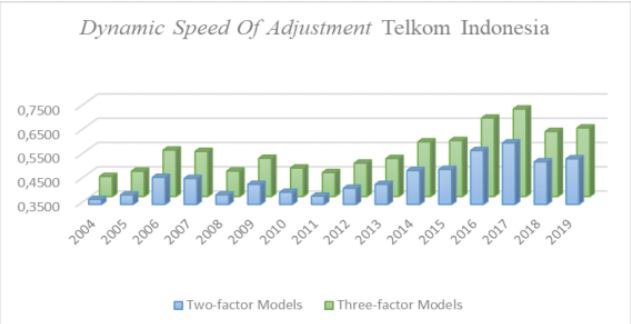

Figure 2 Result of Dynamic Speed of Adjustment Values in Chart Diagram

As seen in Table 3 and Figure 2 the value of μ Telkom Indonesia has increased and decreased every year, and this is normal for every company. One factor that causes μ's value to increase and decrease is because the MVA value produced by Telkom Indonesia fluctuates every year. However, the result of μ value can continue the process of calculating PV because it still meets the criteria; the value is not less than 0 and not more than 1 (Abdurrahman, 2019), (Abdurrahman et al., 2016a). Before calculating the PV value, the value of $f(X,\beta)$ must know in advance using the formula (16) to find the value of $f(X,\beta)$ three-factor model (with TI), and formula (17) to find the value of $f(X,\beta)$ two-factor model (without IT)(Abdurrahman, 2019).

$$f(X,\beta) = \alpha * K_t^{\beta 1} L_t^{\beta 2} I_t^{\beta 3} \qquad (t = 1,.,s) \quad (16)$$

$$f(X,\beta) = \alpha * K_t^{\beta 1} L_t^{\beta 2} \qquad (t = 1,.,s) \quad (17)$$

Value of $f(X,\beta)$ the two formulas above are alternative functions of the desired output, K_t is the value of regular equity, L_t is the regular labour cost, and I_t which is only used in formula (16) is the value of IT spending (Abdurrahman et al., 2016a), and α, β is an unknown parameter. To calculate the performance measurement of PT. Telkom Indonesia in currency units (PV) and in ratio units (PR) each year, formula (18) and formula (19) are used below (Abdurrahman, 2019), (Lin et al., 2010):

$$PV = \mu * f(X,\beta) \qquad (18)$$

$$PR = PV/yt \qquad (19)$$

The value of y_t in the formula (19) is the income at time t and is the constant of Dynamic Speed of Adjustment. Table 4 presents alternative functions whose values are known and the two measures of company performance, namely Performance Ratio to describe the ratio index unit and Performance Value to describe currency units (billions of rupiah) (Abdurrahman, 2019).

Table 4 PT. Telkom Indonesia's Performance Measure with MVA Factor

Years	Yt	Three-factor Models			Two-factor Models		
		f (X, β)	*PV*	*PR*	*f (X, β)*	*PV*	*PR*
2004	33,948	38,521.98	16,671.68	0.4911	40,057.78	14,838.52	0.4371
2005	41,807	49,518.95	22,503.36	0.5383	52,130.64	20,255.89	0.4845
2006	54,748	60,322.68	32,664.99	0.5966	65,064.31	30,024.40	0.5484
2007	62,683	65,249.85	34,964.53	0.5578	69,732.62	31,848.86	0.5081
2008	64,166	69,094.35	31,439.61	0.4900	73,097.90	28,438.72	0.4432
2009	67,678	69,990.80	35,507.26	0.5247	72,765.65	31,495.16	0.4654
2010	68,629	69,204.92	32,370.06	0.4717	71,160.17	28,442.59	0.4144
2011	71,253	76,250.31	34,210.87	0.4801	79,814.98	30,627.04	0.4298
2012	77,143	84,107.05	41,009.68	0.5316	88,985.36	37,045.98	0.4802
2013	82,967	92,420.74	46,823.35	0.5644	94,139.40	40,692.70	0.4905
2014	89,696	97,258.69	55,940.55	0.6237	97,800.18	47,887.58	0.5339
2015	102,470	110,664.28	64,267.48	0.6272	114,94157	56,816.86	0.5545
2016	116,333	123,559.82	83,201.57	0.7152	130,021.56	74,354.91	0.6392
2017	128,256	129,942.30	92,368.82	0.7202	134,319.78	81,027.36	0.6318
2018	130,784	132,766.95	82,055.36	0.6274	135,617.26	71,272.21	0.5450
2019	135,567	133,350.25	84,374.62	0.6224	134,967.59	72,590.69	0.5355
Average			**49,398.36**	**0.5739**		**43,603.72**	**0.5088**

Performance Value (PV) is a value in currency units (billions of rupiah) that can represent the existence of IT value in companies that apply IT in their performance (Abdurrahman et al., 2016a). PV presented is an estimate of performance with dynamic adjustment (Dynamic Speed of Adjustment) at PT. Telkom Indonesia from 2004 to 2019 in currency units (billion rupiah), the PV value can be calculated using the formula (18) (Abdurrahman, 2019)(Lin & Kao, 2014).

Performance Ratio (PR) is a measurement value of company performance in ratio units that can represent the existence of IT values in companies that apply IT in their performance. By using the PR method (Lin et al., 2010), the comparison between the performance of companies using IT and those that do not use IT becomes more relevant and reasonable, because the calculation of the IT value using

PAV theory is indeed a study that is able to explore the functionality of an IT value within the company (Abdurrahman, 2019). The PR value is obtained by dividing the PV value by the real output (y_t) (Abdurrahman, 2019), (Abdurrahman et al., 2016a), PR value presented is an estimate of performance with Dynamic Speed of Adjustment at PT. Telkom Indonesia from 2004 to 2019 in ratio units, the PR value can be calculated using the formula (19).

Table 5 IT Values Results

Years	Performance Value (PV)			Performance Ratio (PR)		
	Three-factor Models	*Two-factor Models*	*IT Value*	*Three-factor Models*	*Two-factor Models*	*IT Value*
2004	16,671.68	14,838.52	1,833.15	0.4911	0.4371	0.0540
2005	22,503.36	20,255.89	2,247.48	0.5383	0.4845	0.0538
2006	32,664.99	30,024.40	2,640.59	0.5966	0.5484	0.0482
2007	34,964.53	31,848.86	3,115.67	0.5578	0.5081	0.0497
2008	31,439.61	28,438.72	3,000.89	0.4900	0.4432	0.0468
2009	35,507.26	31,495.16	4,012.10	0.5247	0.4654	0.0593
2010	32,370.06	28,442.59	3,927.47	0.4717	0.4144	0.0572
2011	34,210.87	30,627.04	3,583.83	0.4801	0.4298	0.0503
2012	41,009.68	37,045.98	3,963.70	0.5316	0.4802	0.0514
2013	46,823.35	40,692.70	6,130.65	0.5644	0.4905	0.0739
2014	55,940.55	47,887.58	8,052.97	0.6237	0.5339	0.0898
2015	64,267.48	56,816.86	7,450.63	0.6272	0.5545	0.0727
2016	83,201.57	74,354.91	8,846.66	0.7152	0.6392	0.0760
2017	92,368.82	81,027.36	11,341.46	0.7202	0.6318	0.0884
2018	82,055.36	71,272.21	10,783.16	0.6274	0.5450	0.0825
2019	84,374.62	72,590.69	11,783.93	0.6224	0.5355	0.0869
Avg	**49,398.36**	**43,603.72**	**5,794.65**	**0.5739**	**0.5088**	**0.0651**

Table 5 presents the estimated value of performance in units of currency (PV) and in units of ratio (PR) with the presence of IT costs as a three-factor model then compared with the estimated value of performance in units of currency (PV) and in units of ratios (PR) which are not include IT costs as a two-factor model (Lin & Kao, 2014), (Abdurrahman et al., 2016a). It can be seen in Table 5 that the average value of PV for the three-factor model is Rp. 49,398.36 billion rupiah, while the average PV of the two-factor model is Rp. 43,603.72 billion rupiah, so the influence of the existence of the value of IT in currency at PT. Telkom Indonesia is worth IDR 5,794.65 billion. Then, the PR value using the ratio index unit from a scale of 0 to 1 in its measurement (Table 5) shows the PR value at PT. Telkom Indonesia becomes higher when using IT in it. Because the average PR index of the three-factor model (with TI) is 0.065-unit ratio higher than the average PR index of the two-factor model (without TI), so in the ratio index unit, it can be proven that the presence of IT values also influences the performance of PT. Telkom Indonesia.

CONCLUSION AND RECOMMENDATION

It is not easy to evaluate the value of IT in business organizations because many factors can affect this value, including technical, managerial, environmental, etc. However, this study has carried out an IT assessment, although the results still contain shortcomings (Abdurrahman, Langi, & Suhardi, 2014). Company performance is the result obtained by the company through various activities carried out using multiple available resources (in this study, measured by the speed of adjustment with dynamic factor, MVA). Therefore, a company will lead in competition if the company can systematically achieve net profits (net profits) (Cardeal, 2012). Based on research at PT. Telkom Indonesia, which uses the dynamic factor MVA, could be seen that the existence of the value of IT implemented by the company is positive from 2004 to 2019. It is happening because the value of calculation results with the three-factor model (using IT) looks much higher than the calculation using the two-factor model (TI not included). The difference in the performance value in terms of currency (PV) between the three-factor model and the two-factor model is Rp. 5,794.65 billion. The difference in the performance ratio (PR) is 0.0651. Measurement of IT's value using the dynamic factor MVA is a measurement with very significant results in showing the effect of the IT Value. Based on the research that has been done, it can be said that the inclusion of IT costs in the estimated IT value can produce an IT value which is the difference between the three-factor model PV/PR and the two-factor model PV/PR. These values indicate that conceptually the estimation of IT value using PAV theory and dynamic factor MVA works by the initial goal, Namely knowing how big the role of IT in driving business performance needed by the company, and proving that capital expenditure for IT is one form of investment that will provide benefits for the company, and refute the paradox which states that there is no relationship between IT expenditure/investment and the size of the profits that the organization/company will receive (Bharadwaj, 2000)(Abdurrahman, Suhardi, & Langi, 2016c).

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