

# Effect of Implementation ERP on Profitability of Firm Value Sector Manufacture Companies Listed on the Indonesia Stock Exchange

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**Abstract.** The research aims to analyze the effect of Enterprise Resources Planning system implementation on the profitability of firm value. This research sample uses purposive sampling with criteria manufacturing corporations have listed in BEI for three years, 2017-2019. This research uses a quantitative method such as analyzing descriptive and hypothesis tests with partial, simultaneously, chi-square, and paired sample t-tests. This research proves that not every variable can be affected by ERP. Partially ratio ROE is a significant variable before and after ERP implementation. Paired sample t-tests have significant variables ROA, ROE, and ROI have significant differences between before and after implementation ERP showed by profitability.

**Keywords:** Enterprise Resources Planning, Profitability, Firm Value, Manufacture Companies

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## Introduction

Enterprise Resources Planning (ERP) is software that aims to generate comprehensive business information using information technology (Klaus, Rosemann, & Gable, 2000). ERP is an information technology (IT) that allows companies to manage projects effectively and efficiently (AboAbdo, Aldholena, and Al-Amrib, 2019). Meanwhile, Kertahadi (2017) explains that this technology can overcome the problems of all aspects that exist in accounting information systems where ERP software is widely applied by companies, namely the SAP and ORACLE applications.

In Indonesia, many companies experience difficulties adapting, so it takes longer to implement ERP in their companies. Companies generally take 6 to 12 months to adapt to the ERP system to be successful (Fitrah, 2010). In line with Rahmawati (2008), which states that not a few companies have constraints of lack of funds or are not in line with the company's project schedule, it is terrible for the company. Middle and upper companies implementing ERP require about 0.82% of funds, and lower middle companies need funds for 13.65% of the company's revenue. (Mabert, 2000).

Research from Rini and Febriani (2017) explains that the influence of ERP impacts the ups and downs of company profitability in managing its business processes. This study believes that with the implementation of ERP, the company's size is calculated from the high and low total assets. This research is a replication of Rini and Febriani's research (2017) which analyzes the Impact of Enterprise Resources Planning (ERP) Implementation on the Effect of Profitability on Firm Value using financial report data listed on the IDX. The difference with previous studies using the multiplication method of analysis of the two independent variables NPM (Net Profit Margin) and Dummy ERP with the dependent variables MVE (Market Value of Equity) and MBVA (Market to Book Value of Assets).

From the discussion about ERP technology, a question arises regarding the results of implementing an ERP system, including the influence of ERP implementation on profitability and firm value and the comparison between before and after ERP implementation on profitability and firm value. In

this study, profitability uses the aspect ratio of ROA (Return On Assets), ROE (Return On Equity), ROI (Return On Investment), and firm value using Tobin's Q proxy.

The company's value will run well if it is based on implementing a sound system and exemplary leadership in company management. The company's performance supports implementing the ERP system (Hopp, Wentzel, and Rose, 2020). The applicable state of the company is a reflection of the high value of the company (Jones, Cline, and Ryan, 2006). Good profitability indicates that the company has the maximum ability to manage its business processes (Rini and Febriani, 2017). A positive ROA (Return on Assets) shows the total assets used to provide high profits for the company and vice versa. If it has a negative value, the number of assets used to operate provides a loss for the company (Megginson, William, and Brian, 2008). ROE (Return on Equity) is assessed as a picture of investors to see the rate of return on share capital. The higher the ROE, the higher the net profit generated by own capital (Husnan and Pudjiastuti, 2004). ROI (Return on Investment) measures the ability of the capital invested into the overall assets to see the results of the net profit of the investment itself (Bambang, 2004).

## Literature Review

Raharjo (2007) states that stewardship theory is needed by company management because it provides high company performance. Managers in management believe that the purpose of the steward is the same as the principal's interests. However, if the two opinions differ, the steward will invite the principal to work together. Because for the steward, the main results of the company are more important than the stewards' interests.

As'ari (2017) states that if the company's performance goes well, it has been operating efficiently to get a high-profit level. Nurhanifah's research (2013) examined the effect of ERP implementation on profitability and activities in companies listed on the IDX using the paired sample t-test and Wilcoxon Signed Ranks Test and then obtained significant results between the differences before and after ERP implementation on profitability and activity company. Research by Daoud and Triki (2013) ERP implementation on the performance of

companies in Tunisia utilizes an ERP system with accounting techniques that are applied after ERP benefits from ERP implementation in increasing company efficiency and reducing costs to the company.

In their research, Rini and Febriani (2017) stated that the variable testing in this study had a positive effect on profitability but not significant on NPM. This study states that, in general, the implementation of ERP has a positive impact on company performance. Wicaksono, Mulyo, and Riantono (2015) prove that ERP implementation positively impacts company profitability. Hunton, Lippincott, and Reck (2003) stated that the indicators used to calculate profitability, namely ROA (Return On Assets), ROE (Return On Equity), and ROI (Return On Investment) stated that these indicators were significant for three years so that ERP implementation had a good effect on profitability. So the proposed hypothesis is.

H<sub>1</sub> : ERP implementation has a positive effect on profitability

Syafira, Tohir, and Suwaryo (2014) In his research, he examined the effect of corporate governance, leverage, and profitability mechanisms on firm value using Tobin's Q ratio, resulting in profitability having a positive effect on firm value. Pillemer, Graham, and Burke (2014) state that the effect of increasing company profitability depends on the characteristics of the company's culture and performance, so the proposed hypothesis is.

H<sub>2</sub>: Profitability has a positive effect on firm value

Alghifari, Triharjono, and Juhaeni (2013) in his research revealed that ROA has an influence on Tobin's Q. This research is corroborated by Uchida (2006) and Makaryanawati (2002), who conclude that ROA has a positive influence on firm value, so the proposed hypothesis is.

H<sub>2a</sub>: Return on Assets has a positive effect on Firm Value

Rahmawati (2015) concluded that ROE increases along with the company's ability to generate and determine profits from the company's capital, so ROE is declared to influence firm value positively. Rahmantio, Saifi, and Nurlaili (2018) partially tested the ROE of Tobin's Q resulting in a significant value, so the proposed hypothesis is.

H<sub>2b</sub>: Return on Equity has a positive effect on Firm Value

Priatinah and Kusuma (2010) concluded that the increase in profits in the company had a positive impact on the company's performance. This study states that the investment value influences the value of the company. The company's increasing value will get a positive response from investors to increase the company's shares. So the proposed hypothesis is.

H<sub>2c</sub>: Return on Investment has a positive effect on Firm Value

Davenport (2000) stated that the increase in the company's performance would increase the profit earned by the company. The research results by Morris (2011) state that the relationship between ERP systems that affect company performance results in high company revenues. Rini and Febriani's research (2017) which supports the implementation of ERP, has a positive effect on company profitability and performance. So the proposed hypothesis is.

H<sub>3</sub> : ERP implementation moderates the relationship between profitability and firm value simultaneously

Nurhanifah (2013) compared the same sample and paired samples before and after ERP implementation with significant results, and there were differences between before and after ERP implementation on profitability and company activities. Research by Liu, Miao, & Li (2007) ERP implementation during the two years of implementation and three years before implementation did not show significant performance improvements during the first two years of ERP implementation between ROA, ROS, and COGS, so the proposed hypothesis is.

H<sub>4</sub> : There is a difference in profitability between before and after ERP implementation

Hassan, Hassab, Woosang, and Mark (2019) stated that ERP implementation positively impacts increasing financial and non-financial ROA quality. Hitt, Wu, and Zhou (2002) used ROA and NPM ratios to compare financial performance before and after ERP implementation, showing that company performance consistently scored better after ERP implementation, and almost all metrics during ERP adoption showed a substantial improvement. So the proposed hypothesis is.

H<sub>4a</sub>: There is a difference in ROA between before and after ERP implementation.

Kurniawati, Gunarta, and Baihaqi (2015) concluded that ERP implementation does not affect financial performance as measured by ROE, ROA,

and NPM, with the results of ERP implementation not having a direct effect on profitability. Nurhanifah (2013) obtained significant results between the differences before and after ERP implementation on profitability and company activities, So the proposed hypothesis is.

H<sub>4b</sub>: There is a difference in ROE between before and after ERP implementation.

Nicolaou and Lawrence (2011), in their research using the ROI ratio, experienced a significant increase after ERP implementation. This study states that companies that implement ERP can enjoy a superior differential in financial performance compared to those that do not. So the proposed hypothesis is.

H<sub>4c</sub>: There is a difference in ROI between before and after ERP implementation.

Morris (2011) stated that although the business value of ERP implementation has been widely argued, many statements can be detrimental to costs and risks. However, in the end, companies that invest in ERP show higher performance. Sehwan, Hyunmi, and Saerom (2016) stated that it does not find a positive effect between companies that implement ERP on company performance in profit ratios. So the proposed hypothesis is.

H<sub>5</sub>: There is a difference in firm value between before and after ERP implementation.

**Research Method**

The kind of research used in this study is quantitative research. This study collected secondary information from manufacturing firms on the Indonesia Stock Exchange (IDX) using the financial report data from 2017 to 2019. The data used in this study is the company's financial statements before and after ERP implementation. The IDX was chosen because it was more structured and systematic. So the researcher wants to analyze the impact of ERP implementation on the profitability of firm value.

This study analyses financial statements recorded for three years between 2017 and 2019. The study employs a purposive sampling technique, which involves choosing samples based on predetermined standards (Sugiyono, 2008). The following steps are used in this study's data processing: (1) selecting the variables, entering them into the frequency table; (2) determining what is needed for the research and

performing data calculations (tabulations); (3) validating the data; and (4) performing data analysis calculations using SPSS statistical data processing.

The research uses a purposive sampling technique, namely selecting samples with specific criteria. This study analyzes recorded financial statements from 2017 to 2019 for three years. The data processing techniques in this study (1) determine the variables and then enter them into the frequency table (2) determine what is needed in research and perform data calculations (tabulations) in Microsoft excel (3) check data (4) perform data analysis calculations using SPSS statistical data processing.

This study uses independent variables, namely: profitability and firm value, and one dependent variable, dummy ERP. The operational definition of variables can be seen in table 1.

Table 1  
Variable Operational Definition

Variable	Indicator
<b>Dummy ERP</b>	“1” for companies implementing ERP '0' for companies that have not implemented ERP
<b>Profitability</b>	
ROA	$\frac{\text{Net Income}}{\text{Total Assets}}$
ROE	$\frac{\text{Net Income}}{\text{Equity}}$
ROI	$\frac{\text{Total Sales} - \text{Investment}}{\text{Investment} \times 100\%}$
<b>The value of the company</b>	
Tobin's Q	$\frac{\text{Market Capitalization} + \text{Total Debt}}{\text{Total Assets}}$

The data in this study are described using statistical data analysis approaches that use maximum, minimum, average, and standard deviation as metric variables (Ghozali, 2016). The classical assumption tests, such as normality, multicollinearity, heteroscedasticity, and autocorrelation, are used to test the multiple regression analysis techniques (Ghozali, 2016). Partial tests, simultaneous tests, chi-square tests, and paired sample tests are used to test the hypothesis.

## Results and Discussion

The companies that are sampled are companies that are selected based on specific criteria. The companies studied are manufacturing companies that implement ERP. The company was listed on the IDX between the period 2017 and 2019.

Table 2  
Number of Research Samples

Information	Amount
Number of companies implementing ERP and used in research	29
Number of companies that have not implemented ERP and are used in research	45
<b>Number of Companies</b>	<b>74</b>
Observation Period	29 x 3 years = 87 45 x 3 years = 135
<b>Number of Observation data</b>	<b>222</b>
Outliers	(111)
<b>The total amount of data used in the study</b>	<b>111</b>

The companies selected as samples were 74 companies with three years, so 222 data were collected. The outlier data indicator determined by the researcher was based on the need to obtain normally distributed regression data. So in the outlier data normality test, what is needed is to reduce the negative value, which causes the SPSS output to produce a significance value of 0.000 which is smaller than the alpha number of 0.05. before doing the outlier, there were 74 companies, so it became 37 companies. After doing the outlier data, 111 data were collected.

This study examines the impact of ERP implementation on the profitability of the value of manufacturing sector companies listed on the IDX. Factors that affect profitability in ERP implementation are seen in ROA (Return on Assets), ROE (Return on Equity), and ROI (Return on Investment), while those affecting firm values are seen in Tobin's Q. The provision of dummy ERP is "1" for companies that implement ERP and "0" for companies that have not implemented ERP. Descriptive statistics can be seen in table 3.

Table 3  
Descriptive Analysis

Variable	N	Min	Max	mean	Std. Dev.
Dummy ERP	111	0	1	0.46	0.50
ROA	111	2.30	8.45	5.98	1.26
ROE	111	1.10	9.55	6.54	1.33
ROI	111	3.33	10.54	7.85	0.99
Tobin's Q	111	4.06	9.33	7.92	0.85

First, the classical assumption test is carried out. This test consists of a normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test. Normality test has the purpose to determine whether the independent and dependent variables are normally distributed. The regression model is declared normal if it obtains a significance value above 0.05 and vice versa (Ghozali, 2016).

Table 4  
Normality

	Unstandardized Residual
N	111
Kolmogorov-Smirnov Z	1,249
asyp. Sig. (2-tailed)	0.088

Based on table 4.3 it can be seen that Asymp. Sig of 0.088 is greater than 0.05 then the regression model is declared normally distributed.

Next, the normality test is carried out. provided that the tolerance value is greater than 0.10, and the VIF value is less than 10.00 (Ghozali, 2016).

Table 5  
Multicolonierity

Model	Collinearity Statistics	
	Tolerance	VIF
ROA	0.263	3.802
ROE	0.263	3.798
ROI	0.960	1.041
Tobin's Q	0.958	1.044

Based on table 5, it can be seen that all variables are at a tolerance significance value greater than 0.10 and a VIF value less than 10.00. It is stated that the regression model does not occur multicollinearity.

Next, the heteroscedasticity test is carried out. This study uses the Glejser test with a significance value

above 0.05 by regressing the absolute residual value on the independent variable. If the independent variable is significant to the dependent variable, there is no heteroscedasticity symptom.

Table 6  
Heteroscedasticity

Model	Sig.
ROA	0.927
ROE	0.106
ROI	0.101
Tobin's Q	0.149

Table 6 shows that the Glejser test is above the significance value of 0.05, which shows that the dependent variable has a significant effect on the independent variable with the AbsUt (Absolute Ut) value.

Next, the autocorrelation test is carried out. This test aims to see a correlation between errors in period (t) and the previous (t-1) period (Ghozali, 2016).

Table 7  
Autocorrelation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.481a	0.231	0.202	0.44709	0.402

Based on table 7, it can be seen that the autocorrelation test was analyzed using the provisions of the decision-making table whether there was autocorrelation with the provisions of  $0 < d < dL$ , the Durbin Watson provisions of  $0.402 > 0$ , and less than the value (dL) 1.6167 with the decision stated that H was not supported and there was no autocorrelation.

Next, the hypothesis test is carried out. Hypothesis testing is statistically carried out using partial, simultaneous, chi-square, and paired samples.

The first hypothesis can be accepted if the significance value is below 0.05 and vice versa.

Table 8  
First Hypothesis Results

Model	Unstandardized Coefficients	Sig.
(Constant)	0.863	0.004
ROA	0.029	0.637
ROE	-0.024	0.694
ROI	-0.016	0.385

Based on table 8, it can be seen that all profitability ratio variables are above the alpha value of 0.05. ROA ratio of 0.637 is greater than 0.05, based on the results of statistical testing dummy ERP has a positive but not significant effect. While ROE of 0.694 and ROI of 0.385, which are greater than 0.05, have an insignificant negative effect, so it is stated that H<sub>1</sub> is not supported.

This second hypothesis can be accepted if the significance value is below 0.05 and vice versa.

Table 9  
Second Hypothesis Results

Model	Unstandardized Coefficients	Sig.
<b>B</b>		
<b>H2a : Return on Assets (ROA)</b>		
(Constant)	7.568	0.000
TobinsQ	-0.200	0.155
<b>H2b : Return on Equity (ROE)</b>		
(Constant)	7.663	0.000
TobinsQ	-0.142	0.339
<b>H2c : Return on Investment (ROI)</b>		
(Constant)	6.467	0.000
TobinsQ	0.175	0.114

Based on table 9, it can be seen that the ROA ratio to Tobin's Q obtained a significance value of 0.155 greater than 0.05, the ROE ratio to Tobin's Q obtained a significance value of 0.339 greater than 0.05, and the ROI ratio obtained a significance value of 0.114 greater than 0.05. So it can be concluded that the results of statistical testing of the second hypothesis, which states that profitability affects firm value, cannot be accepted because it has a positive but insignificant effect. So H<sub>2a</sub>, H<sub>2b</sub>, and H<sub>2c</sub> are not supported.

The ANOVA test's third hypothesis is acceptable if the significance value is below 0.05 and vice versa.

Table 10  
Third Hypothesis Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.045	4	0.011	0.558	0.694b
Residual	0.935	46	0.020		
Total	0.980	50			

Based on table 10, it is known that the firm value and profitability variables are not significant to the ERP dummy variable. It can be seen from the significance value of 0.694, greater than 0.000. So,

H<sub>3</sub> is not supported because it does not have a significant effect simultaneously.

The fourth hypothesis can be accepted if the significance value is below 0.05 and vice versa.

Table 11  
Fourth Hypothesis Results

Model	Unstandardized	
	Coefficients	Sig.
<b>B</b>		
H <sub>4a</sub> : Return on Assets (ROA)		
ROA after ERP implementation		
(Constant)	0.947	0.000
ROA	0.005	0.811
ROA before ERP implementation		
(Constant)	.044	0.540
ROA	-0.005	0.694
H <sub>4b</sub> : Return on Equity (ROE)		
ROE after ERP implementation		
(Constant)	0.974	0.000
ROE	0.001	0.967
ROE before ERP implementation		
(Constant)	0.043	0.559
ROE	-0.004	0.712
H <sub>4c</sub> : Return on Investment (ROI)		
ROI after ERP implementation		
(Constant)	0.498	0.000
ROI	0.064	0.000
ROI before ERP implementation		
(Constant)	-0.028	0.885
ROI	0.005	0.816

Table 11 shows that the ROA variable before and after ERP implementation is above the 0.05 level of significance, which states that there is a positive but not significant effect. The ROE variable before and after ERP implementation is above the 0.05 level of significance, which states that there is a positive but not significant effect. The ROI variable before ERP implementation is 0.816 from 0.05, and after ERP implementation, 0.000 is below the 0.05 significance level, which stated that there is a positive and significant influence on companies implementing ERP in terms of return on investment. So, it is concluded that only the ROI ratio has a significant change after ERP implementation.

Table 12  
Fifth Hypothesis Results

Model	Unstandardized	
	Coefficients	Sig.
<b>B</b>		
H <sub>5</sub> : Tobin's Q		
Tobin's Q after ERP implementation		
(Constant)	0.917	0.000
TOBIN'S Q	0.008	0.754

Model	Unstandardized	
	Coefficients	Sig.
<b>B</b>		
H <sub>5</sub> : Tobin's Q		
Tobin's Q before ERP implementation		
(Constant)	0.165	0.276
TOBIN'S Q	-0.018	0.324

Table 12 shows that the Tobin's Q variable after ERP is above the 0.05 significance level, which states that there is a positive but not significant effect. Tobin's Q variable before ERP is above the 0.05 level of significance, which states that there is an insignificant negative effect. Then it is stated that H<sub>5</sub> is not supported.

Chi-square testing is also conducted to analyze the fourth and fifth hypotheses with the provisions of the significance value below 0.05 and vice versa.

Table 13  
Chi-square test

	Variable	Sig.	Decision
<i>Pearson Chi-Square</i>	ROA	0.445	No Relationship
<i>Pearson Chi-Square</i>	ROE	0.604	No Relationship
<i>Pearson Chi-Square</i>	ROI	0.318	No Relationship
<i>Pearson Chi-Square</i>	Tobin's Q	0.231	No Relationship

Based on table 13, it can be seen that all the variables of the significant value of the chi-square difference test are above the value of 0.05, which means that there is not enough data to prove the difference between ERP implementation and profitability so that it is stated that the variables do not have a significant relationship. The fourth and fifth hypotheses are based on chi-square testing and are not supported.

In addition, a test is conducted using paired sample t-test for hypotheses fourth and fifth. This test is a two-sample different test method with a significance decision below 0.05. The following is the normality of the paired t-test because this test requires data that are normally distributed.

Table 14  
Normality

	Unstandardized Residual
Kolmogorov-Smirnov Z	1,199
asympt. Sig. (2-tailed)	.113

Table 15  
Paired Sample Test

	Paired Differences					Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
				Lower	Upper	
ROA after ERP – ROA before ERP	1.11373	1.56424	0.21904	0.67377	1.55368	.000
ROE after ERP – ROE before ERP	1.15667	1.65159	0.23127	0.69215	1.62118	.000
ROI after ERP – ROI before ERP	-0.63667	1.33662	0.18716	-1.01260	-0.26074	.001
Tobin's Q after ERP – Tobin's Q before ERP	-0.22490	1.30144	0.18224	-0.59094	0.14113	.223

Table 15 shows that the fourth hypothesis with profitability variables before and after ERP implementation seen from ROA, ROE, and ROI is below the significance value of 0.05, which means that there is a significant influence on profitability after implementing ERP. The fourth hypothesis is stated based on paired sample t-test supported. The fifth hypothesis with the firm value variable seen from Tobin's Q shows a significance value of 0.223 above the number 0.05, which means that there is no significant effect of firm value between before and after ERP implementation, so the fifth hypothesis, based on the paired sample t-test is not supported.

#### *Testing results related to the effect of ERP implementation on profitability*

Testing the first hypothesis has no significant effect on profitability. This study's results align with Kristianti and Achjari's (2017) research that revealed that ROA has no significant effect, so it is concluded that ERP implementation does not directly affect profitability. In line with the research of Kurniawati, Gunarta, and Baihaqi (2015), which states that ERP implementation does not affect financial performance using ROA, ROE, and NPM ratios.

#### *Testing results related to the effect of profitability on firm value*

Testing the second hypothesis has no significant effect. The results of this study are in line with increased profitability can reduce the company's value if the profits obtained are not shared equally by

the shareholders of Tarima, Parengkuan, and Untu (2016). In line with Ukhriyawati and Malia (2018), profitability, measured using the ROI and ROE ratio, can decrease and is not significant to firm value.

#### *Testing results related to ERP implementation simultaneously moderate the relationship between profitability and firm value*

Kristianti and Achjari (2017), in their research, concluded that the implementation of ERP did not provide a significant difference in financial performance with the ROA ratio. As Kurniawati, Gunarta, and Baihaqi's (2015) research, ERP implementation is not significant to financial performance using ROA, ROE, and NPM ratios.

#### *Testing results related to the difference in profitability between before and after ERP implementation*

The test results show a difference in profitability before and after partial ERP implementation. Liu, Miao, and Li (2007) examined the impact of ERP implementation for two years of implementation and three years before ERP implementation, with the results of ERP implementation not showing significant performance during the first two years after ERP implementation between ROA, ROS, and COGS ratios. Putri (2016) obtained the results that there is no increase both before and after ERP implementation in the ratio of ROA and ROI.

In paired sample t-test, the fourth hypothesis shows a significant difference between before and after ERP implementation.

#### *Testing results related to the difference in firm value between before and after ERP implementation*

The test results show a difference in firm value before and after partial ERP implementation. Sehwan, Hyunmi, and Saerom (2016) found no difference between companies that implemented ERP on company performance in profit ratios.

## Conclusion

The results of this study indicate that not all variables can be affected by ERP implementation. Only the return on investment (ROI) variable is partially significant in the tests before and after ERP



implementation. In paired sample testing, the ROA, ROE, and ROI ratios show significant values, and it is stated that there is a significant difference between before and after ERP implementation. The overall results of hypothesis testing show that: (1) The results of the analysis state that ERP implementation does not partially show a significant effect on profitability.

The expected suggestion is that in future research that chooses the same topic of discussion, it is recommended to use panel data using E-Views data processing. It is also expected to add independent and dependent variables so that it is not only measured from one point of view but can see a strong influence on ERP implementation and expand the sample used in the study.

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