

# The Influence of Research and Development Activities on Company Growth: Age, Size and Market Share of Companies as Moderators

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## Abstract

*Industrial competition is currently getting higher and more competitive, especially with the presence of foreign products that characterize the domestic market. On the other hand, the presence of Industry 4.0 which has been echoed since 2011, has made global industry players more competitive to be able to advance their respective technologies based on computer technology and internet networks. Of course, domestic industry players will also not remain silent in the face of this increasingly sharp competitive climate. Supported by the government, in this case the Ministry of Industry, the competitive power of the domestic industry is constantly being honed with various programs being rolled out. One of them is the innovation of superior products as the output of research and development programs that must synergize between the government, the private sector, the community and universities. This study examines whether the research and development activities carried out by the company affect its growth. In the next stage, moderating with age, size and market share is expected to further sharpen this influence.*

## Keywords

research and development;  
company growth; market share



## I. Introduction

In the manufacturing industry, a greater level of product competition is felt, because manufacturing companies are required to be able to create new products and increase sales from time to time as an indicator of the success or failure of their business processes. Manufacturing companies are companies that are engaged in assembling or processing raw materials to be changed or made into certain products with added value. In the production process, the manufacturing industry already has standards for mass production of goods, such as what are the quality standards of raw materials, how to store finished products, and so on. This results in almost the same product specifications among competitors so that the role of product research and development is very important so that companies have a competitive advantage over their competitors.

Coad et al ., (2016) tried to analyze research and development activities in the manufacturing industry through the financing value of their research and development projects which are presented in the annual report. The innovation competition that occurs between companies can be seen economically from the value of research and development expenditures. How big is the allocation of funds, more or less can map how aggressively research and development of new products are carried out in a company. Of course, research

and development investments made by the company are not only limited to activities carried out internally, but also include external activities in the form of collaboration with third parties in an effort to research and develop new products and formulas.

On the other hand, the financing of this research and development project has a lot of uncertainty about its effect on company growth (Coad et al., 2010). The first is the uncertainty of the payback period for the capital that has been spent on financing the research and development project. This is also related to the rate of return that will be obtained by the company within a certain period of time. The second is investment in the form of research and development projects that cannot be guaranteed as company assets because this is an intangible investment. Third, information about the importance of research and development projects can lead to an asymmetric assessment of investors, because usually companies do not disclose detailed information about research and development projects that are being carried out, as a result investors will find it difficult to determine whether the investment value is good or bad. Fourth, the uncertainty of the rate of return on research and development investment can trigger the emergence of moral hazard. And fifth, the possibility of duplication of technology by competitors, causing the company's reluctance to invest in research and development projects.

In Indonesia, research and development has become a concern of the government. One proof of the government's participation in increasing investor interest is by issuing Government Regulation Number 52 of 2011 namely Government Regulation concerning the second amendment to Government Regulation number 1 of 2007 concerning income tax facilities for investment in certain business fields and/or in certain areas. ". Income Tax is a type of subjective tax whose tax obligations are attached to the relevant Tax Subject (Hendayana, 2021). Tax is a requirement that has been established by the state as a civic duty (Marpaung, 2020). Tax is a compulsory levy paid by the people to the state and will be used for the benefit of the government and the general public (Siregar, 2019). These facilities include a reduction in net income as the basis for taxation of 30% (thirty percent) of the total investment, accelerated depreciation and amortization, the imposition of Income Tax on dividends paid to foreign tax subjects of 10% (ten percent), or a lower rate according to the applicable Double Taxation Avoidance Agreement and compensation for longer losses.

In order to realize the focus of industrial development in the 2020-2024 period, the Ministry of Industry has implemented a series of programs and activities as stated in the 2020-2024 National Industrial Policy and 2020-2024 RPJMN. The third point is the Science and Technology Research and Innovation Program which is carried out through activities, one of which is Research and Development of Chemical, Pharmaceutical, Textile, Metal, Machinery, Transportation Equipment, and Electronics Industrial Technology.

The pharmaceutical industry is one of the 5 largest industrial sectors in Indonesia, and its growth since 2019 has been very significant. On the other hand, in line with the focus on national industry development that has been described previously, this research is aimed at obtaining an overview of the impact of research and development financing activities in the pharmaceutical sub-sector manufacturing industry on the growth of the company, which is represented by sales growth, employment growth, and profitability of the company. measured by ROA, as well as labor productivity. The influence relationship will be sharpened by moderating variables in the form of company age, company size and company market share, whether the company is a domestic or multinational company that has branch companies abroad.

The thing that can be used as the basis for measuring and analyzing research and development activities is the cost of research and development (which is an input to a company's innovation process) per worker (Coad, et al. 2016). Research and development activities are expected to generate innovation outputs resulting in increased market share through the introduction of new products or processes, and increased productivity through technical advances.

This study complements the literature by examining the causal interaction of research and development activities on sales growth, employment growth, company profitability growth and labor productivity growth as variables that may be positively affected. In addition, in addition to investigating the role of firm age, this study also adds to the role of firm size and market share in the causal interaction between research and development activities and firm growth.

This research is intended to contribute to supporting Making Indonesia 4.0. By taking the role as part of the academic community, we try to provide an analysis of the positive growth impact that the company will get when developing its research and development strengths.

## II. Research Methods

This study uses quantitative methods by using data in the form of numbers as a tool to analyze information about what you want to know. The analysis is carried out using metric data and emphasizes the testing process to obtain objective results. A series of instrument tests and classical assumption tests were carried out as the first step of the analysis. The next stage of testing is carried out using data on research and development costs per employee, employment growth with data on the number of human resources owned by the company, sales growth, profitability growth with ROA, labor productivity growth. The next stage is testing by entering the moderating variables of company age, company size and market share. Data were analyzed using multiple linear regression method to determine the effect of each variable.

The population used in this study includes the pharmaceutical industry that goes public in Indonesia and is listed on the IDX. Data on the number of companies listed on the IDX in the pharmaceutical industry sector are 12 companies. The sampling method used in this study is purposive sampling, namely the selection of samples is not random. The sample selection was carried out with several considerations and certain criteria, namely:

1. The pharmaceutical companies studied are companies whose shares are traded on the Indonesia Stock Exchange in 2021.
2. The pharmaceutical companies studied are those that are a type of manufacturing industry, so that companies whose main business is trade and services are excluded from the sample data.
3. The pharmaceutical companies studied were those whose financial statements were publicly presented during the study period, so companies whose annual financial statements were inaccessible were excluded from the sample data.

Of the 12 companies, there are 10 companies that qualify as research samples. The company is PT. Darya-Varia Laboratoria Tbk, PT. Indofarma Tbk, PT. Kimia Farma Tbk, PT. Kalbe Farma Tbk, PT. Merck Tbk, PT. Phapros Tbk, PT. Pyridam Farma Tbk, PT. Organon Pharma Indonesia Tbk, PT. Sido Muncul's Herbal and Pharmaceutical Industry, and PT. Tempo Scan Pacific Tbk.

The secondary data used in this study was taken from the annual financial statements of publicly listed pharmaceutical companies listed on the Indonesia Stock Exchange (IDX) in 2021. The financial statements that were sampled were financial statements for the financial

year period 2005 – 2020 or for 16 years. Thus, there are 160 sample data on annual financial statements that will be the source of research data. The source of the data is obtained by downloading the annual report and the company's annual financial report published on the official website of each company and through the Indonesia Stock Exchange website which is accessed at <https://www.idx.co.id>.

### III. Discussion

#### 3.1 Linear Regression Analysis

**Table 1.** Simple Linear Regression Equation 1a  
**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.127	.167		6,760	.000
RND Aktivitas activity	-.067	.011	-.538	-6.221	.000

a. Dependent Variable: Prt.Sales

Table 1 is a regression test for the first equation, which is to see whether or not there is a direct relationship between research and development activities on sales growth ( $y_1$ ). From the results of the t-test of research and development activity variables, it shows a significant effect between research and development activities and sales growth ( $\text{sig} < \alpha$  value;  $0.000 < 0.05$ ). It is also indicated by the (absolute) value of t arithmetic  $> t$  table which is  $6.221 > 1.98498$ , meaning that there is a significant influence between research and development activities and sales growth.

**Table 2.** Simple Linear Regression Equation 1b  
**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.086	.073		1.188	.238
RND Aktivitas activity	-.005	.005	-.119	-1.169	.245

a. Dependent Variable: Prt.Job

Table 2 is a regression test of equation 1 to see whether or not there is a direct relationship between research and development activities on employment growth ( $y_2$ ). From the results of the t test, the regression results were not significant ( $\text{sig}$  value  $> \alpha$ ;  $0.245 > 0.05$ ). This means that there is no significant effect between research and development activities on employment growth. It is also indicated by the (absolute) value of t arithmetic  $<$

t table which is  $1.169 < 1.98498$ , meaning that there is no significant effect between research and development activities and employment growth.

**Table 3.** Simple Linear Regression Equation 1c  
**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.439	.341		1.285	.202
	RND Aktivitas activity	-.027	.022	-.125	-1,229	.222

a. Dependent Variable: Prt.profitability

Table 3 is the result of the regression test of equation 1 to see whether or not there is a direct relationship between research and development activities on the company's profitability growth as represented by ROA ( $y_3$ ). The results of the t test show that the number is not significant (sig value  $> \alpha$ ;  $0.222 > 0.05$ ), meaning that there is no significant relationship between research and development activities on the company's profitability growth. It is also shown by the value (absolute) t arithmetic  $< t$  table which is  $1.229 < 1.98498$ , meaning that there is no significant effect between research and development activities on the growth of company profitability.

**Table 4.** Simple Linear Regression Equation 1d  
**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.015	.158		6.422	.000
	RND Aktivitas activity	-.060	.010	-.515	-5,861	.000

a. Dependent Variable: Prt.ProductivityTK

Table 4 is a regression test of equation 1 to see whether or not there is a direct relationship between research and development activities on labor productivity growth ( $y_4$ ). From the results of the t-test of research and development activity variables, it shows a significant effect between research and development activities and labor productivity growth (sig  $< \alpha$ ;  $0.000 < 0.05$ ). It is also indicated by the (absolute) value of t arithmetic  $> t$  table which is  $5.861 > 1.98498$ , meaning that there is a significant influence between research and development activities and sales growth.

**Table 5. Moderated Regression Analysis (MRA) Equation 2a**  
**Coefficients <sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1,208	.264		4,577	.000
RND Aktivitas activity	-.077	.018	-.617	-4.190	.000
Age	.047	.023	.184	2,027	.046
Size	.049	.041	.140	1.192	.237
P.market	.013	.023	.051	.565	.573
X*Z1	.042	.024	.191	1,723	.088
X*Z2	.029	.021	.226	1.365	.176
X*Z3	-.075	.022	-.479	-3.436	.001

a. Dependent Variable: Prt.Sales

The results of the moderating regression in table 5 are a test of equation 2 against  $y_1$ . The test results show that only the  $x*z3$  interaction has a significant effect on sales growth of 0.001. This means that the company's market share variable is able to moderate the relationship between research and development activities on sales growth. The wider the company's market share, the stronger the interaction between research and development activities and sales growth.

**Table 6. Moderated Regression Analysis (MRA) Equation 2b**  
**Coefficients <sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.107	.122		.872	.386
RND Aktivitas activity	-.008	.008	-.182	-.987	.326
Age	.001	.011	.006	.051	.959
Size	.019	.019	.147	1,000	.320
P.market	.011	.011	.113	.989	.325
X*Z1	.010	.011	.118	.846	.400
X*Z2	.010	.010	.200	.964	.338
X*Z3	-.020	.010	-.345	-1.979	.051

a. Dependent Variable: Prt.Job

The results of the moderating regression in table 4.18 are a test of equation 2 against  $y_2$ . The results of the t test show that from all interactions, both  $x*z1$  interactions,  $x*z2$  interactions and  $x*z3$  interactions, none of them have a significant effect. This shows that the

three moderating variables tested are not able to moderate the relationship between research and development activities on employment growth.

**Table 7. Moderated Regression Analysis (MRA) Equation 2c**  
**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.083	.558		.148	.883
RND Aktivitas activity	.000	.039	-.003	-.015	.988
Age	-.044	.049	-.099	-.898	.371
Size	-.056	.086	-.093	-.652	.516
P.market	.001	.049	.002	.016	.988
X*Z1	.094	.051	.246	1,819	.072
X*Z2	.012	.045	.052	.257	.798
X*Z3	-.093	.046	-.345	-2.034	.045

a. Dependent Variable: Prt.profitability

The results of the moderating regression in table 4.19 are a test of equation 2 against  $y_3$ . The test results show that only the  $x*z_3$  interaction has a significant effect on the company's profitability growth of 0.045. This means that the company's market share variable is able to moderate the relationship between research and development activities on the company's profitability growth. The wider the company's market share, the stronger the interaction between research and development activities and the company's profitability growth.

**Table 8. Moderated Regression Analysis (MRA) Equation 2d**  
**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.026	.257		3.996	.000
RND Aktivitas activity	-.063	.018	-.545	-3.542	.001
Age	.048	.023	.202	2.136	.035
Size	.025	.040	.076	.621	.536
P.market	.000	.022	.000	-.005	.996
X*Z1	.032	.024	.159	1.368	.175
X*Z2	.015	.021	.122	.705	.483
X*Z3	-.054	.021	-.369	-2,535	.013

a. Dependent Variable: Prt.Productivity nagker

The results of the moderating regression in table 4.20 are a test of equation 2 against  $y_4$ . The t-test results show that only the  $x \cdot z_3$  interaction has a significant effect on the growth of labor productivity of 0.013. This means that the company's market share variable is able to moderate the relationship between research and development activities on the growth of labor productivity. The wider the company's market share, the stronger the interaction between research and development activities and labor productivity.

### 3.2 Coefficient of Determination Test

**Table 9.** Coefficient of Determination Test for Equation 2a

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	Durbin-Watson
1	.636 <sup>a</sup>	.405	.358	.09805	2,067

a. Predictors: (Constant),  $X \cdot Z_3$ , Market P, Age, Size,  $X \cdot Z_1$ , RND Activity,  $X \cdot Z_2$

b. Dependent Variable: Prt.Sales

**Table 10.** Coefficient of Determination Test for Equation 2b

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	Durbin-Watson
1	.259 <sup>a</sup>	.067	-.006	.04545	1,938

a. Predictors: (Constant),  $X \cdot Z_3$ , Market P, Age, Size,  $X \cdot Z_1$ , RND Activity,  $X \cdot Z_2$

b. Dependent Variable: Prt.Job

**Table 11.** Coefficient of Determination Test for Equation 2c

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	Durbin-Watson
1	.348 <sup>a</sup>	-.121	.052	.20745	2015

a. Predictors: (Constant),  $X \cdot Z_3$ , Market P, Age, Size,  $X \cdot Z_1$ , RND Activity,  $X \cdot Z_2$

b. Dependent Variable: Prt.Profitability

**Table 12.** Coefficient of Determination Test for Equation 2d

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	Durbin-Watson
1	.594 <sup>a</sup>	.352	.301	.09547	1,908

a. Predictors: (Constant),  $X \cdot Z_3$ , Market P, Age, Size,  $X \cdot Z_1$ , RND Activity,  $X \cdot Z_2$

b. Dependent Variable: Prt.Productivity nagker



The results of the coefficient of determination test are shown in tables 4.21 to 4.24. For the R value in the independent variable test on sales growth and labor productivity growth, it is indicated by a number above 0.5 which means it is close to 1. It can be concluded that the independent variable is able to explain the dependent variable of sales growth and labor productivity growth quite well. However, it is not good at explaining the dependent variable of profitability growth and employment growth. With the sample data used in this study, the two regression equations turned out to be more influenced by other variables outside the study.

### 3.3 F test ( *Goodness of Fit Test* )

**Table 13.** F test of Equation 2a

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.583	7	.083	8,658	.000 <sup>a</sup>
	Residual	.856	89	.010		
	Total	1.438	96			

a. Predictors: (Constant), X\*Z3, Market P, Age, Size, X\*Z1, RND Activity, X\*Z2

b. Dependent Variable: Prt.Sales

**Table 14.** F test of Equation 2b

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.013	7	.002	.914	.499 <sup>a</sup>
	Residual	.184	89	.002		
	Total	.197	96			

a. Predictors: (Constant), X\*Z3, Market P, Age, Size, X\*Z1, RND Activity, X\*Z2

b. Dependent Variable: Prt.Job

**Table 15.** F test of Equation 2c

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.529	7	.076	1,754	.107 <sup>a</sup>
	Residual	3,830	89	.043		
	Total	4.359	96			

a. Predictors: (Constant), X\*Z3, Market P, Age, Size, X\*Z1, RND Activity, X\*Z2

b. Dependent Variable: Prt.profitability

**Table 16.** F Test of Equation 2d  
**ANOVA<sup>b</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.441	7	.063	6.919	.000 <sup>a</sup>
Residual	.811	89	.009		
Total	1.253	96			

a. Predictors: (Constant), X\*Z3, Market P, Age, Size, X\*Z1, RND Activity, X\*Z2

b. Dependent Variable: Prt.ProductivityTK

From all the test results, the F test showed significant results on the dependent variable of sales growth ( $\text{sig} < \alpha$ ;  $0.000 < 0.05$ ) and labor productivity growth ( $\text{sig} < \alpha$ ;  $0.000 < 0.05$ ). This means that the independent variable simultaneously has a significant effect on the dependent variable of sales growth and labor productivity growth.

Meanwhile, for the F test on the dependent variable of employment growth and profitability growth, the value of  $\text{sig} > \alpha$  is 0.499 and 0.107, respectively. The same result is also obtained when calculated using the F table, with the value of  $\text{df } 1 = 7$ ,  $\text{df } 2 = 89$ , the value of F table = 2.11 is obtained, so that for the two dependent variables the calculated F value  $< F$  table. That is, respectively  $0.914 < 2.11$  and  $1.754 < 2.11$ . That is, the independent variable simultaneously does not have a significant effect on the dependent variable employment growth and profitability growth. Or it could also mean that the sample data used in this study were not able to show the simultaneous effect.

### 3.4 T test

Statistical testing of T equation 1 for hypotheses 1a, 1b, 1c and 1d is shown in tables 1 to 4. Table 1 shows that hypothesis 1a is supported by a significance level of 0.000, which means that research and development activities have a significant effect on sales growth. Table 2 shows the test results for hypothesis 1b, where a significance result of 0.245 is obtained, meaning that research and development activities do not significantly affect employment growth. Table 3 is the test results for hypothesis 1c, and it can be seen in the table that the results of the T test indicate that hypothesis 1c is not supported with a significance level of 0.222. This means that there is no significant effect between the variables of research and development activities on profitability growth represented by ROA. Furthermore, the results of the T test for hypothesis 1d are shown in table 4.16 with a significant test result at 0.000, meaning that research and development activities have a significant effect on the growth of labor productivity.

The T-test of equation 2 for testing hypotheses 2a, 2b, 2c and 2d is shown in Tables 5 to 4.20. Table 4.17 presents the results of the T test for hypothesis 2a. Of the three moderating variables tested, only the moderating variable of company market share ( $x*z3$ ) is supported with a significance level of 0.001. This means that the company's market share moderates the relationship between variable x and variable y1.

Table 6 is the result of testing hypothesis 2b. Where of the three moderating variables tested, none is supported. This means that age, company size and market share are not able to moderate the relationship between variable x and variable y2.

Hypothesis testing 2c is shown in table 4.19. Although in the test with equation 1c the relationship between this variable is not significant, but in the test with equation 2 it can be seen that the moderating variable of market share ( $x*z3$ ) is able to moderate the relationship between variable x and variable y3 with a significance value of 0.045. The results of the last

T-test to test the 2d hypothesis are shown in table 4.20. Where of the three moderating variables tested, only one moderating variable is supported, namely market share ( $x \cdot z_3$ ) with a significance value of 0.013. This means that the company's market share is able to moderate the relationship between variable  $x$  and variable  $y_4$ .

The summary of the T test results from all hypotheses is presented in table 4.29 below.

**Table 17. T . Test Results**

<b>HYPOTHESIS</b>	<b>TEST RESULTS</b>
Hypothesis 1a	Supported
Hypothesis 1b	Not supported
Hypothesis 1c	Not supported
Hypothesis 1d	Supported
Hypothesis 2a, with market share moderation	Supported
Hypothesis 2b	Not supported
Hypothesis 2c, with market share moderation	Supported
2d hypothesis, with market share moderation	Supported

Research and development activities carried out by the company turned out to have a direct impact on two of the four  $y$  variables tested. The test results prove that research and development activities significantly affect sales growth and labor productivity growth. The profitability growth variable represented by ROA is not significantly influenced by research and development activities, because perhaps this is more influenced by the company's efforts to utilize the company's assets to obtain high returns so that research and development does not have much impact on its growth. Likewise with the variable employment growth. The sample data used in this study has not been able to prove a significant effect on the variable of employment growth by research and development activities carried out by the company.

The test results show that the age of the company is not able to moderate the relationship between research and development activities on company growth. However, in the t-test conducted on the sales growth variable (table 4.17) and labor productivity growth (table 4.20), it is seen that partially age actually has a direct effect on the  $y$  variable. This can occur as an influence of consumer confidence in companies that are more experienced. And age is one indicator of the more experience a company has.

Company size variable with the dummy method used in this study was not able to moderate the relationship between research and development activities on company growth. This can be seen in all the results of the interaction test of the firm size variable which shows an insignificant value.

The market share variable shows a significant value in three tests through the t test, namely the dependent variable of sales growth, profitability growth and labor productivity growth. This is because the bigger a company is, the harder it will try to stay in the top position. Then the company will tend to demand its employees to be more aggressive in innovating in line with the increasing number of human resources owned. The wider the market share the company has, the more complex the competitive climate will be. The ability to remain superior to competitors must of course continue to be improved through research and development activities which of course will have an impact on the growth of labor productivity which is the ratio between income and the number of workers.

Sales growth and profitability growth are variables  $y$  which can also be influenced by market share moderating variables. This is a positive impact from the company's successful expansion which of course has a very large role in research and development in maintaining the competitive advantage of products, especially in the global market. As the company becomes more established and experienced, the research and development activities carried out are not only limited to reaching market segments but rather to maintain market position and product expansion and modern technology. And the positive impact is of course sales growth and company profitability growth.

The results of this study are more or less able to provide an overview of the manufacturing industry players, especially in the pharmaceutical sub-sector in Indonesia, the positive impact they get when they invest in research and product development. With a fairly long period of time for taking research sample data, it is hoped that the results of the tests carried out are able to take pictures and describe the actual conditions with analysis based on supporting theories.

In a study conducted by Coad in 2016 in Spain, it was found that the age of the company was able to become a moderating variable of research and development activities on the company's growth. However, with research sample data on manufacturing companies in the pharmaceutical sub-sector in Indonesia, it was found that age was not able to moderate this relationship. This may be due to business culture and geographical factors of the region, so the findings are not the same. In addition to the variable operating model factors, as well as the amount of sample data used.

The test results that are quite interesting and have not been carried out in previous studies are moderating with market share. Which turned out to give significant results in several hypothesis testing. This provides a new fact that the breadth of a company's operating area greatly influences the research and development activities carried out to encourage the company's growth.

#### IV. Conclusion

Research and development activities significantly affect sales growth and labor productivity growth. Profitability growth and employment growth are not directly affected by research and development activities carried out by the company. The age of the company which was found to be able to moderate the relationship between research and development activities with the growth of companies in other countries, it turned out that the research sample data used was unable to explain the moderating. Firm size, found in each test cannot moderate the relationship between research and development activities with firm growth. The market share, which is represented by a dummy to distinguish national and multinational, is able to significantly moderate the relationship between research and development activities with sales growth, profitability growth and labor productivity growth.

There are still many things that can be extracted from the research and development activities carried out by the company. This can be a challenge for future researchers. One of the challenges that can be done is to expand the scope of research, not only in one sub-sector but in the entire manufacturing industry for example. Thus there will be more sample data that can enrich the test results. In addition, there is a possibility that ownership can also be a variable that affects the company's aggressiveness in conducting research and development investments. Private companies or state-owned enterprises, may have different levels of courage in investing in this field.

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