

Resource Analysis in Indonesia Textile Industry: “A Development of Industrial Data Analytic Framework”

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Abstract— The future trend in the field of management is the increasingly applied analytic data in every management decision, both for development and investment. Data submitted by companies are processed and evaluated by investors. However, the calculation pattern that is done is still based on financial analysis. This paper is intended to develop an analytic data framework that can be used by CEOs or investors in managing and valuing an industry. The research methodology used is using historical data in the Company's annual reports for the past five years and calculate it using SEM-PLS. This data is then entered into the analytic data framework and then being evaluated to get the essential resources or critical processes that have a strategic position or value in the industry. This research is using textile industry data. In the textile industry, it is found that the critical strategic resources are raw materials that significantly affect the Company's performance. This key finding is in line with the development of technology in raw material in the textile industry. This analysis method is intended to complement existing financial-based analyses that has been done for a long time. With this new analysis framework, the CEO and Investor will get a new perspective on the industry and take advantage of additional information from its result.

Keywords— analytic, data, management, technology, textile, strategic, performance

1. Introduction

The textile industry is essential in the economic structure of each country. The world market value of the textile industry reaches USD 961.5 billion in 2019. It is expected to achieve a CAGR growth of 4.3% for the period 2020 to 2027 [4]. Indonesia is one of the ten best textile & apparel producing

countries in the world. It is ranked 12th among the leading textile & apparel exporters in the Association of Southeast Asian Nations (ASEAN). Indeed, with achievements, the textile industry plays an essential role in the Indonesian economy, especially by contributing revenues of \$ 13.8 billion in exports in 2019 [11].

Moreover, it is not only bringing colour and creativity, but it also gives the country's character. This industry supports the clothing industry, fashion, uniforms, sports up to the military industry. The fashion industry competes in designs, shapes, and models. However, in military industries, they demand more specialized finished materials for a particular purpose. Thus, each type of raw material produced into textiles has finish products with different specifications and uses.

Competition and technology are not the only things that influence the industry. The increasing welfare of the population and the purchasing power of consumers have a high demand for various style or fashion. The increasing number of the middle-class population also brings consumerism into the next level of demands and needs. Consumer demand is also increasingly varied, while competition in the textile industry continues to be increasingly fierce. The Company must strive to be superior to its competitors so that its market share does not deteriorate while simultaneously meeting the needs and demands of loyal consumers. Innovation and high creativity become the fuel to continue to compete and develop the Company. If the Company does not increase innovation and creativity, it will not be able to compete to meet market needs and consumer desires.

The textile industry is a capital-intensive industry. In each production process, the cost factor is the most critical consideration. Miscalculation of production cost or process will cause failure to achieve sustainable profit growth. In addition to the issue of raw materials, the textile industry depends heavily on electric power, yarn spinning machines, computer motifs, designers, and of course, operational funds. The textile industry is very vulnerable to changing fashion trends. Besides, innovations in spinning machines make old machines old and very fast.

The textile industry trends are driven by consumerism [6] and play a critical role in economic growth [2]. The technology enhances the textile design and production system. Consumers are getting easy to buy goods and lower price products, but they are quickly bored with clothing models. The game is shorter life cycle products. The middle-class population that continues to grow, the demand for lower clothing prices. As a result, the pressure on producers is higher, not to mention the Company's competition.

Therefore, management must always monitor this trend. Barney (1991), in his research, said the importance of resources in the Company [3]. Each industry has its characteristics. The industry's situation affects the Company's characteristic, including determining the processes that are "commonly" carried out in the industry or determining the resources needed in the Company to achieve its revenue targets.

For investors who are not from this industry, this condition will be challenging to evaluate. Most investors currently will conduct evaluations based on financial reports, investor releases, analyst reports, or annual reports. For a prominent investor, that has a time constraint, a method that can be used to conduct analysis other than the financial statements is urgently needed. The question that often arises is what resources or processes play a strategic role in the Company that is the hallmark of the industry. So, this research will develop a simple analysis method as an initial stage of the industry level, which will then be used as a guide in analysing a company.

2. Literature Review

In the era of global competition, textile industry companies must increase their innovation and creativity through enhancing the quality of human resources, machinery, and combined with selected raw materials. With these activities, The Company can continue to produce unique and different products and to compete with other companies. Human resources must continue to be trained and follow the trend of market motives. Employing highly competent employees is expected to increase the Company's competitiveness in the face of changes in the business situation that will occur.

Management involves coordinating and overseeing other work activities so that their activities are completed effectively and efficiently [9]. The meaning of efficiency itself is getting the most output from the minimum possible input, while effective is doing a job that can help the organization achieve its goals. On the external side, a strong understanding of internal resources and capabilities can drive a company's ability to compete [3]. Salvato & Vasolo added that competing also need to see the ability to interpret each task or process that occurs [10]. In every Company, employees are allowed to act, think, and the degree of freedom to perform specific actions while performing tasks, thus being able to develop opportunities to improve how the firm operates. At this stage, many company leaders, analysts, and investors ask how the actual business model or mathematical model, or business framework can be evaluated. As performed by Voronkova et al, he evaluates a land that will be used as food crop production land [13]. The optimization of the land is done by calculation. What about a company in the industry? If this can be done with certain concepts to assess the strategic components or strategic processes of a company in an industry, many company leaders will be helped. Furthermore, Raguseo observes the development of data technology and its benefits in the Company [8]. Stakeholders are having access to the Company's data, which is now available on the internet, along with the development of corporate governance and transparency. With these data, everybody can take advantage of the data, to develop new opportunities, new businesses, innovations, or new markets.

Akter et al. emphasized the role of big-data analytics capability (BDAC) in order to enhance firm performance (FPER) [1]. One of the key issues from

Akter's paper is the importance of analytics capability–business strategy alignment (ACBSA) in the big data environment. The organizations or companies must ready to adapt the data analytic in their strategies. It is something that has to be prepared across the whole company process, and activities included data gathering from the market. However, Akter et al. did not explain how the model is calculated with data analysis [1]. This paper tries to create a straightforward data analysis framework that can quickly explain the industry's character and profile.

3. Research Method

This study refers to the concept of resource-based theory by evaluating the primary resources in the Company, namely: 1. the number of human resources with bachelor educational level or above (RECRUIT), 2. financial capital (INVEST) invested into a device or infrastructure by the Company to run operations, 3. raw materials (RAWMATERIAL), and 4. revenue that is equal to the Company's performance (COMPPERFORM)

The chosen industry is the Textiles Industry. The companies are listed companies on the Indonesia Stock Exchange. Data is downloaded from the Indonesia Stock Exchange website and the Company's website.

Not all company data (secondary data) are available for every Company sampled. Of the 17 textile companies listed on the stock exchange, there are only six companies with complete data, namely 1. PT Panasia Indo Resources Tbk, 2. PT Eratex Djaya Tbk, 3. PT Sri Rejeki Isman Tbk, 4. PT Star Pertochem Tbk, 5 PT Trisula International Tbk, 6. PT Nusantara Inti Corpora Tbk. This research began in the 2012-2016 period, before the 2018 crisis to get "normal" condition. Based on Kar and Tenenhaus et al, compliance with classical test data must be met [5],[12]. All processes are carried out using SPSS 24. The proposed research model is presented in Figure 1.

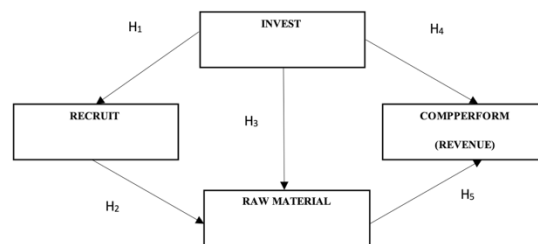


Figure 1. Proposed Research Model

This research model is taken based on the perspective, thinking that most of the manufactured operation drives by its infrastructures or machinery. Its infrastructure or machinery determines the size of the operation, the amount of raw material, and the number of operators needed. The model is the simplest model that can be expanded further. The question is which one of these resources significantly influences the revenue (COMPPERFORM): infrastructure/machinery (INVEST), number of people (RECRUIT) that we recruit or raw material (RAWMATERIAL) that can be varied from one production to another production.

4. Result and Discussion

Prior the use of these data, this research checked the normality, the autocorrelation and the multicollinearity of the data.

Table 1. Normality Test

		RECRUIT	INVEST	COMPPERFORM	RAWMATERIAL
N		30	30	30	30
Normal Parameters ^{a,b}	Mean	.4497	.6007	-.0154	.3988
	Std. Deviation	.30417	.37999	.58132	.25670
Most Extreme Differences	Absolute	.127	.147	.158	.153
	Positive	.127	.147	.158	.153
	Negative	-.116	-.145	-.142	-.121
Test Statistic		.127	.147	.158	.153
Asymp. Sig. (2-tailed)		.200 ^{c,d}	.099 ^c	.053 ^c	.070 ^c

a. Test distribution is Normal.
 b. Calculated from data.
 c. Lilliefors Significance Correction.
 d. This is a lower bound of the true significance.

Rely on the Kolmogorov & Smirnov Test, we found that all the data are distributed normally. It has been seen that the values of significance are greater than 0.05 (INVEST = 0.07; COMPPERFORM = 0.906; RAWMATERIAL = 0.704; RECRUIT = 0.086). Detail of the normality test can be seen in Table 1 above.

Table 2. Autocorrelation Test

Model	Std. Error of the Estimate	Durbin-Watson
1	.38745	1.010

a. Predictors: (Constant), RAWMATERIAL, INVEST, RECRUIT
 b. Dependent Variable: COMPPERFORM

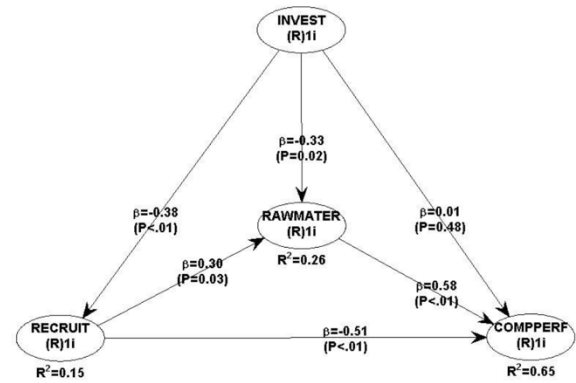
Based on Table 2 above, it can be seen that the Durbin Watson value is 1.010. Then the value is compared with the values du and dl. The dl and du values can be seen from the Durbin-Watson table with $\alpha = 5\%$ —the value of $d < dL$ is checked, and the result is $1.010 > 1.006$. So, in conclusion, there is no positive autocorrelation. Then the value $(4 - d) < dU$ is checked, and the result is $2.99 > 1.421$, so it is concluded that there is no negative autocorrelation.

Table 3. Multicollinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	RECRUIT	.913	1.096
	INVEST	.920	1.087
	RAWMATERIAL	.972	1.028

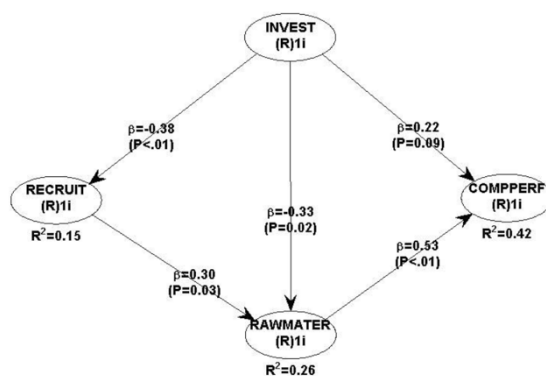
a. Dependent Variable: COMPPERFORM

Based on the VIF data from all variables (VIF RECRUIT = 1.096; VIF INVEST = 1.087; VIF RAWMATERIAL = 1.028) < 10 . It can be concluded that there is no multicollinearity among the independent variables. The next process is processing data in Warp PLS ver. 6.0. The result was in Figure 2.



As we have seen in Figure 2.a, on the results of the R² value, in general, this research model can translate the combination of these variables by 42%. The remaining 58% is determined by other things outside these variables. Based on the path analysis in the model above, the raw material (RAWMATER), has the highest significance level while investment (INVEST) is not significant.

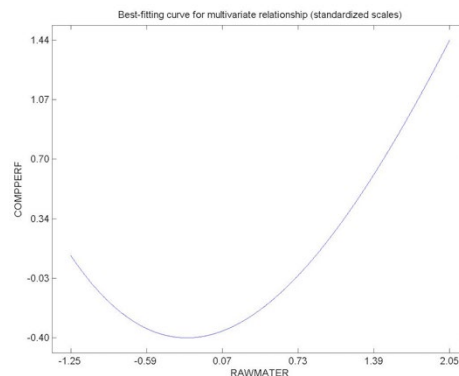
Considering R² still reaches 42%, then with the help of the WarpPLS software, another construct is developed by creating a link from recruitment (RECRUIT) to company performance (COMPPERF). The results can be seen in Figure 2.b. With this change in construct, a better R² result is obtained, by 65%. It shows that human resources (RECRUIT) have a significant influence in supporting company performance (COMPPERF). 2 variables have a directly significant influence. Those are raw materials (RAWMATER) and human resources (RECRUIT). The interesting note is that the RAWMATER coefficient path to COMPPERF is positive with a value of 0.58, while the RECRUIT path to COMPPERF has a negative number of 0.51. It means the addition of raw materials will have a positive impact but a negative impact if the addition is in the human resources section. WARPPLS has a graphical facility for the relationship between these two variables. The picture is in Figure 3.



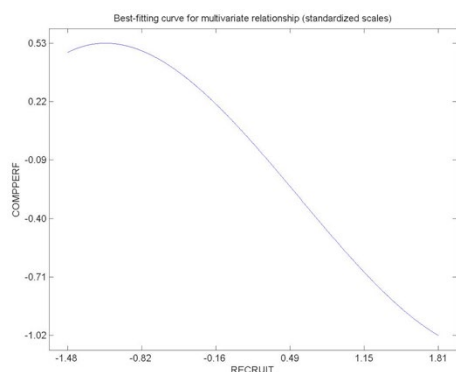
(a)

(b)

Figure 2. Result



(a)



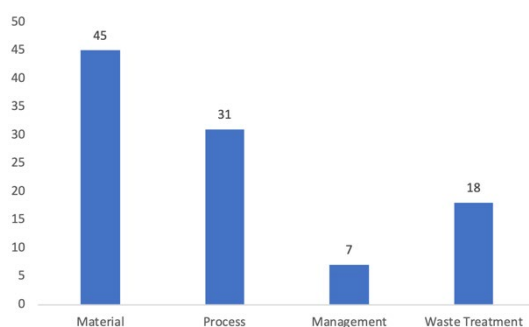
(b)

Figure 3. Graphic Result

It appears in Figure 3, the relationship between Company Performance and raw materials. Meanwhile, human resources recruitment has a negative graph if the new number of resources will continue.

The author also briefly conducted a literature review of previous research. From the analysis of 480 journals between 2018 - April 2020, only 110 journals conducted specialized research in the field of textiles. Of the 110 journals, 45 journals discussed raw materials, 31 journals discussed the process of textile production, seven journals discussed management and 18 journals discussed waste treatment. These results conclude that raw materials receive the highest attention given that technological developments continue to run rapidly, and the variation in demand for textile materials continues to expand.

Figure 4. Research on Textile between 2018-2020



5. Conclusion

The development of this industry does not rely on clothing or fashion, but it continues to grow to a variety of needs and demands. In one of the journals in 2019, a smart textile fabricated with a simple dip-

coating method is developed with multiple functionalities. The purpose of this production method that the material could harvest energy, physical sensing, and even gas sensing. It is another breakthrough in material development that is combined with other technology such as nanotechnology. The development of raw materials also continues in flexibility, breathability, lightweight, and strength with various users and applications.

From the analysis of data at the industry level, by using secondary data, as we have done above, the CEO or management of the company can do the same analysis process in the company, which then compares the results. This process can be repeated and updated from time to time. In the era of big data, good governance, and transparency of management, industry data will be more easily obtained from local or international companies. So, investors who do not understand the industry can begin taking the benefit from this analysis system in addition to the Company's fundamental analysis obtained from the financial statements. Investors could also start comparing data from country to country, from one industry to another industry. The benefit of data comparison and rationalizing the data could provide additional insight or trend of the industry and perhaps the country. Industrial or technical analysis or company data evaluation is something that must be available and exist in the company. It is part of corporate governance. Especially for a listed or public company, management must provide company data on the Company's website. Transparency is a critical point in the financial system, such as banks, financial institutions, and capital markets. Industrial or technical analysis, aside from financial data analysis, should be integrated with the industrial evaluation system. As a result, stakeholders will monitor the industry. The industry will increasingly focus on developing company resources and strategies as well as sustainable development. Industry becomes efficient, and the investors are being protected.

This research is still just the beginning. There are still many other variables that can be analysed for further research, for example, training, advertising, allocation of employee bonuses, which in the end, are all expected to support company performance.

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