

Analysis of the Impact of Covid-19 on Daily Chemical Companies and Forecast for Future Development

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Abstract. Covid-19 was the most serious issue in the past two years, and it has influenced many industries a lot. However, little research had qualified and predicted the influence of Covid-19 that had and will have on daily chemical industry. Therefore, this project focuses on the analysis of financial performance of two major daily chemical companies in the pandemic period. In this research, DuPont and Classification analysis were used in the data calculation and measurement, comparison analysis was used while comparing the difference of financial performance between the two companies this study chooses, while the prediction method was applied when predicting the future development. Our research find that GDP decrease dramatically during 2019-2020, to a negative growth. In terms of the daily chemical industry, one of the most major companies, Jahwa faced more challenge in the operating activities, while L'Oreal still have a great potential although it also has been affected in the pandemic period.

Keywords: Effect of Covid-19, Daily Chemical Companies, Comparison and Prediction Model, Data from Annual Report.

1. Introduction

Covid-19 was the most serious issue in the past two to three years, our society was affected a lot including people's daily life and many industries. For example, many businesses have been shut down because of the poor financial performance in this pandemic period, which also leads to many people lose their jobs and fail to make ends meet. According to a financial investigation in China, only 40% of the company's working capital is functioning properly while more than 40% companies faced with serious capital operation problems [1]. In a short, it is obvious that the global economic was depressed in this period, many enterprises are affected by this. Therefore, to quantify the impact that Covid-19 had on one particular industry through the analysis of the financial performance of some major companies in the industry and predict its performance in the post-pandemic period is indispensable.

In general, prior work is limited to a subset of the analysis of the overall economic performance in the market during the epidemic period of Covid-19, but fewer focused on one specific industry. In terms of the previous research related to the companies, they typically only investigated the problem more about the sales of one particular product, but less about the analysis of comprehensive financial performance, and future development in the post-pandemic era. For example, one article focusses on the analysis of the effect of Covid-19 on the largest coffeehouse--- Starbucks [2]. In this article, it compared Starbucks' revenue performance and selling situation in the epidemic period with its performance in the last decade, to indicate Starbucks' depression in the pandemic period. However, this article only focused on the analysis of Starbucks' financial performance in the pandemic period, without more analysis on the prediction in the post-pandemic period. Besides, some similar research which also focused on the coffee industry, made some comparison between two major coffeehouses like the Starbucks and the Luckin, but more of them only compared the difference of operating strategies with some basic comparison of financial performance [3]. Less of them include more comprehensive comparison in the differences of financial performance, like the liability of solvency. Furthermore, limited literature has focused on the daily chemical industry, most of them only

investigate into the analysis of one company in this industry, without more intension to reflect the impact of epidemic to the whole industry through extend the data analysis.

This research focuses on the effect that Covid-19 had on the daily chemical industry, and Jahwa and L'Oreal as objects was chosen for the analysis. This study would show more comprehensive analysis on the daily chemical companies compared with other previous research, as the performance of revenue and selling cannot reflect one company's operation and financial performance to the best level. More other factors like the ability of solvency (both in short-term and long-term), operating cost and change in the dividends, and this research made the analysis with the use of Dupont analysis. Besides, this paper not only analyze the pandemic effect had on the daily chemical industry, but also make more prediction about the financial performance of the two companies analyzed in the study (Jahwa and L'Oreal), in this industry in the post-pandemic era with the help of some specific methods like comparison method, the linear regression and the exponential smoothing method. With the help of these methods, the development trend in the next 2-3 years could be predicted. This can help more related companies adjust or improve their strategy to achieve a better performance in the market or overcome the problem they have in the pandemic period.

2. The impact of covid-19 on daily chemical companies

2.1 Dataset description and preprocessing

In this study, we used various financial data from the 2018-2020 annual report of Jahwa and Loreal respectively, and we can access the annual reports through searching on their official website [4, 5]. These data provided us with details of these two companies' financial performance in the pandemic period from 2018 to 2020, from each category of data, like the operating profit in the balance sheet, or the dividends to the shareholders in the equity.

In terms of the data preprocessing, we classified the data we would use for the analysis in our research for the preprocessing at first because there are many types of financial data in the annual reports. In order to do this, we classify the economic performance of companies into four categories, including the solvency profitability, operational ability, profitability and development ability. And then we figure out the formula we would use in each category because we can understand which data we would put in the related category. For example, in the Solvency Ability category we need to calculate the asset-liability ratio, so through the formula: the asset-liability ratio = total liability/total asset, we know we should find the data of total liability and total asset from the annual reports.

Another step we made for the data preprocessing was the data comparison. Because in the preprocessing step we need to reflect the change of index we would use in the future comparison. Therefore, we need to show the change of the data from 2018-2020, which is the reason why we also apply comparison method in this step. Table 1 represents some indicators of Jahwa that we will use for the analysis of liability of solvency in the next step. Table 2 indicates that the change of some ratios during 2017-2020, which was the pandemic period.

Table 1: Indicators for Jahwa

indicators	2018-2019 indicator difference	2019-2020 indicators difference	change in current assets		change in current lia abilities	
current ration	0.27	0.09	23.03%	4.72%	6.45%	0.37%
quick ratio	0.28	0.11	-			
cash ratio	15.09%	-11.42	change in money funds		-	
cash flow debt ratio	-7.46%	-4.53%	45.56%	-20.04%		

Table 2: The ratio changes during 2017-2020.

Indicators	2017	2018	2019	2020
Cost utilization ratio	7.67%	9.86 [^]	9.85&	8.14%

2.2 Proposed approach

In this study, we mainly use the method Dupont analysis to calculate some specific financial data, the data comparison method for the comparison of the financial performance of Jahwa and Loreal, and linear regression method for the future prediction.

1) Dupont method. Dupont method is to use the relation between several major financial ratios to comprehensively analyze the financial situation of enterprises. And this method divides ROE ratio into three parts: net rate of return, total asset turnover and financial leverage.

DuPont Model

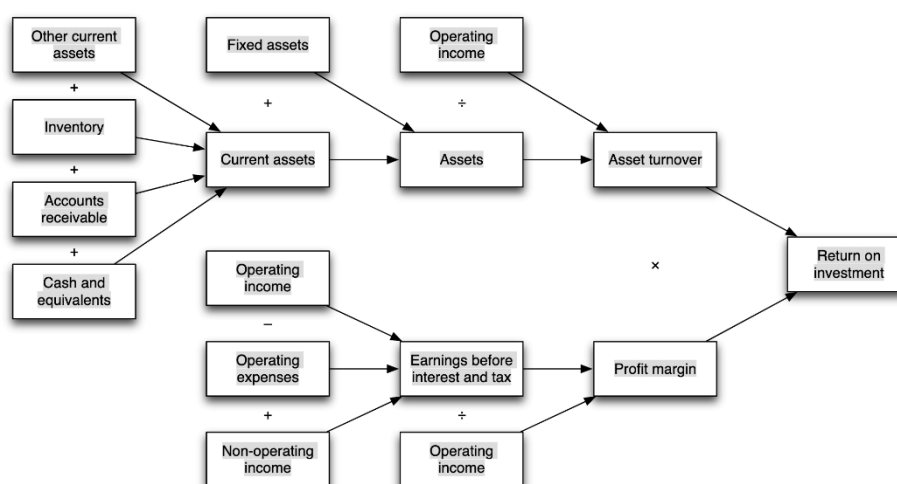


Figure 1. DuPont model [6].

2) Comparison method. In terms of the comparison method, as in the last step we have processed the data or the index from 2018-2020 we would use in this step, we need to transfer the data into different kinds of charts to make a visual comparison, like line charts, bar charts and so on. We unify the size of the interval units of coordinates and shows the size of the corresponding value of data in the coordinates.

3) Linear regression method. Besides, we also use the linear regression method to analysis the development trend in the post-pandemic period. Because we separately analyze the development of one or two specific variable, we only apply simple linear regression here [7, 8], which can be observed in equation (1).

$$y = \beta_0 + \beta_1 x + \varepsilon \quad (1)$$

3. Result and discussion

3.1 Global Economic Trends

From Figure 2, we can see that GDP decrease dramatically during 2019-2020, which was the period Covid-19 outbreak, decrease more than 5% compared with 2018. In this chart, we use of simple linear regression for the prediction of GDP change during and after pandemic period. However, we can find that some limitation incurred in the use of simple linear regression here with the huge decrease in 2019. In fact, machine learning algorithms that have better prediction performance should

be considered in this case [9-11]. And because of this, the prediction for the GDP change in the future is not so accurate, while this can reflect the great effect that Covid-19 had on the GDP change. As it has some misleading on the prediction of the data we use here.

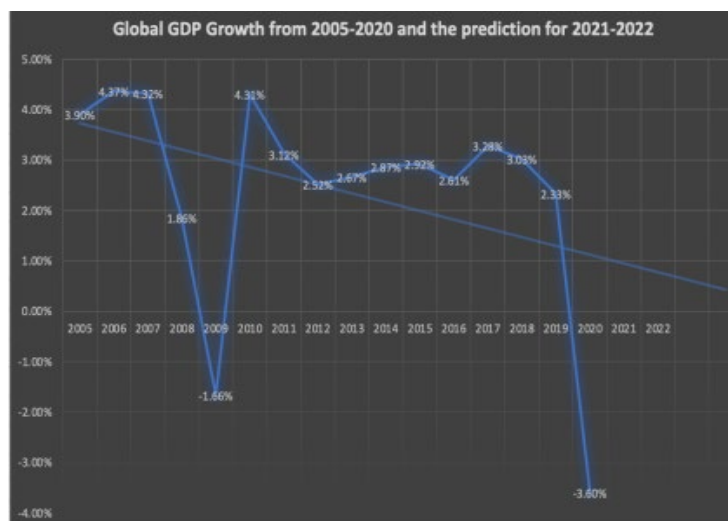


Figure 2. Change of GDP in global GDP.

3.2 Solvency analysis of jahwa and L'Oreal

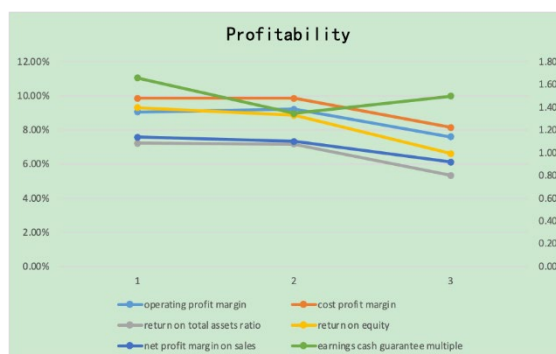


Figure 3. Solvency ability of Jahwa

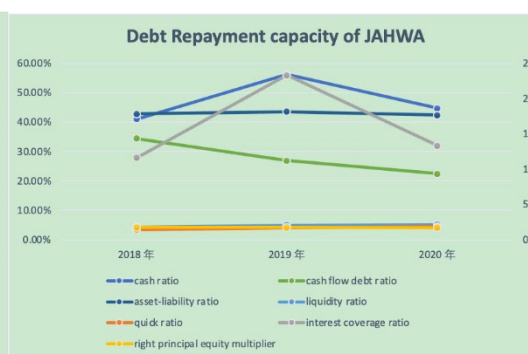


Figure 4. Profitability of Jahwa

Figure 3 indicates that overall solvency ability of Jahwa decreased in the pandemic period, because each indicator is either stable or declining in these periods; Figure 4 indicates that Jahwa's profitability was also diminished, almost all of the related indicators show a decrease. We can conclude that Jahwa's operating performance was affected a lot by the pandemic, the company face more problems about how to increase its revenue with decreasing the costs. Besides, the weaker liability of solvency means they may have more debt and financial stress in the future.

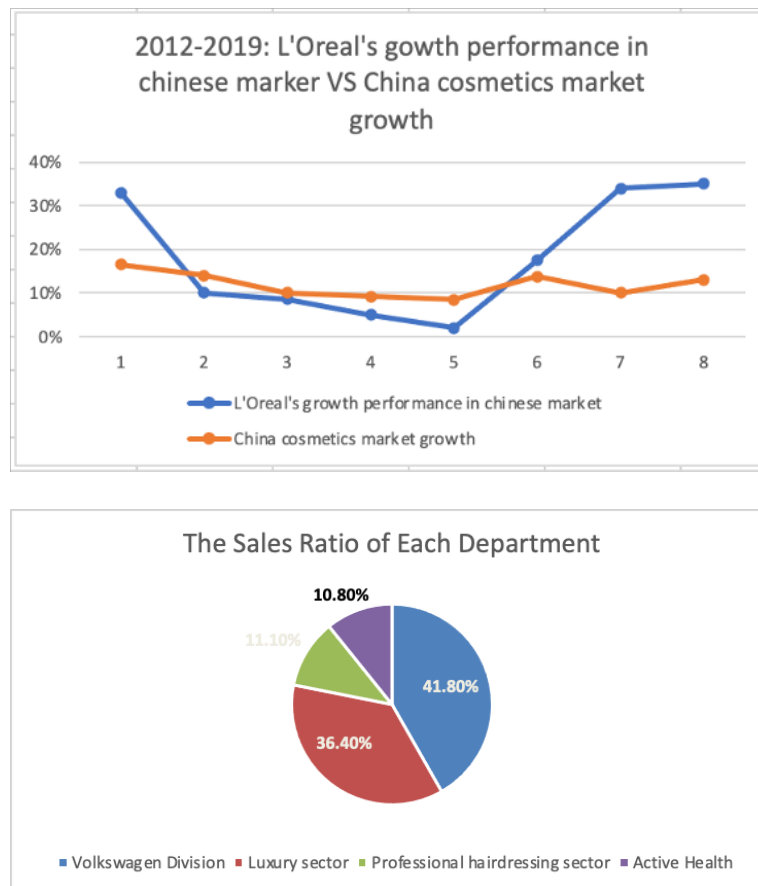


Figure 5. Sales ratio of each department in L'Oreal, and its Growth performance in Chinese Market.

From Figure 5, we can see that the sales of cosmetic products are the main proportion of the total sales in each department of L'Oreal, and we can see that from 2012-2019, L'Oreal have gained more in both Chinese markets, especially after 2016, its growth in Chinese market showed a huge improvement, increasing from 2% in 2016 to almost 40% in 2018.

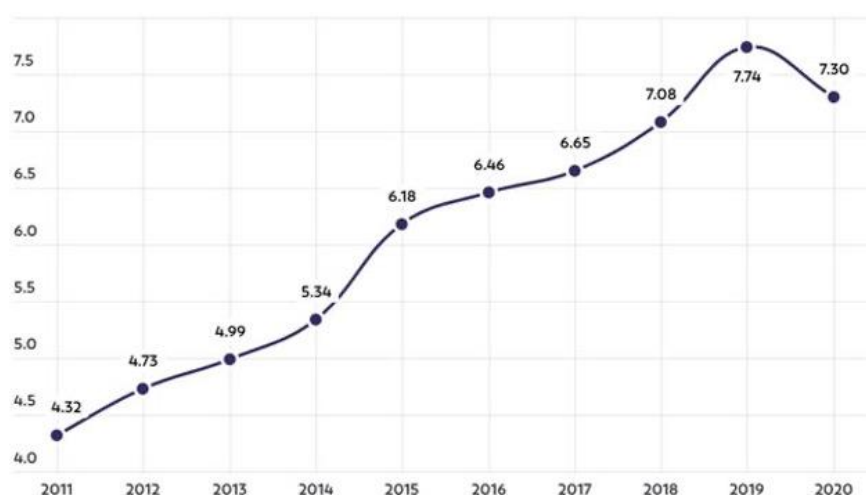


Figure 6. Net cash flow surplus.

From the Figure 6, we can see that L'Oreal's net cash flow was steadily increasing until 2019 and began to decline after 2019 (from 7.8 million dollars to less than 7.5 million dollars).

3.3 Comparison between Jahwa and L'Oreal

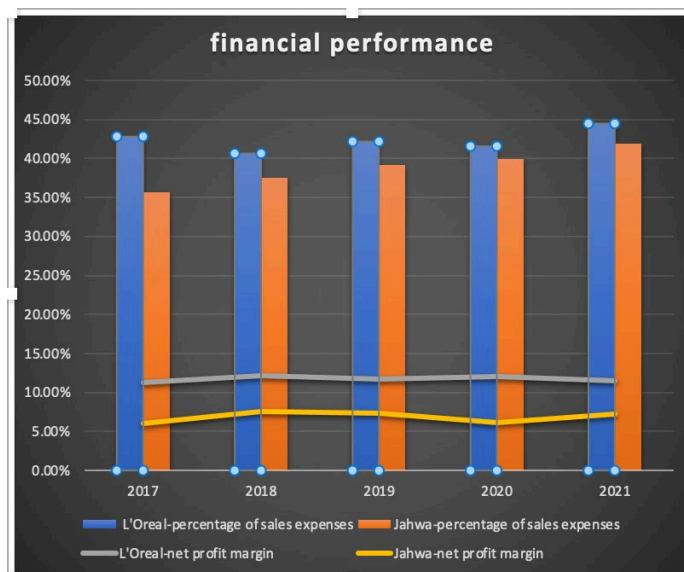


Figure 7. Financial performance for two companies.

The Figure 7 shows that the financial indicators of Jahwa and L'Oréal decreased by 2.76% and 6.29% year-on-year. Jahwa's negative growth was lower than the world economic average, while L'Oreal's negative economic growth was twice the world average. (2019-2020) The world average economic growth is -3.60%.

According to this figure, we can more intuitively discover the impact of the epidemic on domestic and foreign companies. We can see that from 2018 to 2019, the financial indicators of the two companies have risen by 9.04% and 10.89% respectively, which is about 7% higher than the world economic growth (the average growth rate of the world economy in 2018 was 3.03% [12]). In the broke of the epidemic, people's demand for mid-to-high-end daily necessities is gradually increasing. At the same time, we can also know that in the context of global economic growth, the quality of life of most people is also slowly increasing.

4. Conclusion

Overall, the overall financial performance of daily chemical companies has been declining for a period; Jahwa would face more challenge because its capacity of solvency is getting more weaken and it would have to compete with other companies which have great potential in China. However, the future development of these companies is still positive because the products they produce are similar to ours It is closely related to life and has strong adhesion with customers, such as maternal and child products and regular skin care; and have opportunities to expand Internet-related sales channels and strive to fight against the epidemic financial growth during normalization.

In terms of L'Oreal, although this company's financial sustained growth ended at the end of 2019, but it had successfully occupied a large share in Chinese market from 2016 in the daily chemical industry. We think this is one of the main reasons allows it can still maintain a good business during the pandemic period. Besides, we think L'Oreal will have more potential to extent its business and increase the profitability in the post-pandemic period, because more indicators in our study have indicated that this company will increase in the future.

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