Probe into the application and improvement of DuPont analysis method -- Taking Yuantong express company as an example

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Abstract: DuPont analysis is a comprehensive financial analysis method, which takes equity net interest rate as the core, and comprehensively analyzes the profitability, operation ability and debt paying ability of enterprises. Taking Yuantong express company as an example, this paper uses DuPont decomposition and triple factor analysis to analyze the financial data of the company in 2016-2017 and 2017-2018 respectively and comprehensively. Combined with the development goal of the enterprise, this paper puts forward some suggestions for the short-term and long-term financial situation of the enterprise, such as strengthening the cost monitoring, improving the utilization efficiency of current and noncurrent assets, and optimizing the financial leverage. In addition, the deficiencies of DuPont analysis system, such as: the factors affecting the performance of enterprises are not considered comprehensively, the cash flow statement is not fully utilized, etc., and the corresponding supplementary scheme is proposed. This paper takes the SWOT supplementary analysis of Yuantong express company as an example to illustrate.

1. Introduction

As a comprehensive financial analysis method, DuPont analysis has become an important means for many companies to carry out financial analysis. Through the application of DuPont analysis in Yuantong company, this paper finds out the financial problems existing in Yuantong express company, puts forward development suggestions, and puts forward supplementary suggestions for the deficiencies of DuPont analysis system, hoping to promote the sustainable development of the company.

2. Overview of DuPont analysis

DuPont analysis is proposed by Pierre DuPont and Donaldson Brown of the United States. It is a complete system for comprehensive analysis of corporate performance and financial situation, which is first used by DuPont company. DuPont analysis method takes equity net interest rate as the core, through the analysis of financial indicators after the decomposition of equity net interest rate, to analyze the current situation of corporate profitability, operating capacity and solvency, as well as the impact of their changes on the changes of equity net interest rate. It is beneficial for enterprises to improve the corresponding financial indicators and achieve the goal of maximizing the net interest rate of shareholders' equity in DuPont analysis.

3. Application of DuPont analysis in financial analysis of Yuantong express company

Taking Yuantong express as an example, this paper uses DuPont analysis method and 2016-2018 financial data to analyze Yuantong's profitability, solvency and operating capacity. Find out the problems existing in the current situation of operation and put forward suggestions for improvement.

In order to make the enterprise in the operation and development to pursue profits and avoid disadvantages, improve the performance of the company, and maximize the wealth of shareholders.
1.Analysis of financial indicators of Yuantong Express

Select the main financial data related to DuPont analysis in the annual report 2016-2018 of Yuantong company, and prepare Figure 1

Table1. Financial data of Yuantong express company in 2016-2018, unit: Yuan

	In 2016	In 2017	In 2018
Total assets	11167863396.72	14143164000.66	19968534981.94
Sales revenue	16817825633.40	19982200966.66	27465144549.14
Net profit	1371909976.88	1446853640.28	1931688434.19
Total owner's equity	8205351741.27	9362736034.28	11793919535.98
Profit Margin	8.16%	7.24%	7.03%
Total asset turnover	1.94	1.58	1.61
Equity multiplier	1.36	1.51	1.69
Return on equity	21.53%	17.27%	19.13%

(1) In 2016-2018, the sales net interest rate of Yuantong company was in a state of continuous decline, while the sales revenue kept a high speed of growth, indicating that the growth rate of cost and expense of the enterprise exceeded the growth rate of sales revenue, and the cost control of the enterprise was not in place, which made the profitability of the enterprise decline.

(2) The equity multiplier is in a state of continuous rise, and the asset liability ratio of the enterprise is also in a state of continuous rise, which indicates that the enterprise's liabilities are increasing. It is expected that the enterprise's development will be realized by strengthening the use of financial leverage, and the debt service burden of the enterprise will be increased at the same time

(3) The turnover rate of total assets decreased significantly in 2016-2017, and recovered in 2017-2018. However, the overall situation is in a downward trend, indicating that the operating capacity of the enterprise has declined, and the utilization efficiency of assets needs to be further strengthened.

3.1 Using Triple factor analysis method to analyze the return on net assets

In this paper, Triple factor analysis method is used to analyze the data of Yuantong company from 2016 to 2018, so as to understand the main reasons for the change of return on net assets, analyze the main business advantages and disadvantages of the company, and give targeted opinions on the financial problems encountered in the analysis process. Give the formula: Return on equity (ROE) = Net profit on sales (PM) × Turnover of total assets (TAT) × Equity multiplier (EM). (1) Factor analysis of ROE in 2016-2017

① Application of the first factor method: Factor analysis of roe change

In 2016, ROE: 21.53%=8.16%×1.94×1.36; in 2017, ROE: 17.27%=7.24%×1.58×1.51 ; change of ROE in 2016-2017: 17.27%-21.53%=-4.26%; influence of PM: (7.24%-8.16%)×1.94×1.36=-2.43%; influence of TAT: 7.24%×(1.58-1.94)×1.36=-3.54%; influence of EM: 7.24% ×1.58× (1.51-1.36) = 1.72%; influence of all related factors: - 2.43% - 3.54% + 1.72% = - 4.25%; change of ROE is almost the same as that of all related factors.

It can be seen from the Factor analysis that TAT has the greatest impact on the decline of ROE, PM has the second, and EM and ROE have reverse changes. Enterprises should improve the utilization efficiency of total assets and further analyze the factors that affect the turnover rate of total assets. For the sales net interest rate, because the growth rate of cost is faster than the growth rate of sales revenue, Company should strengthen the effective control of cost by strengthening the cost budget management to increase its sales net interest rate.

② The application of the second factor analysis method: Factor analysis of the change of the turnover rate of total assets

Formula: Turnover rate of total assets = Sales revenue / Average balance of total assets; In

2016-2017, change of TAT: 1.58-1.94 = -0.36; impact of sales revenue: $(19982200966.66-16817825633.40) \times \frac{1}{8685630532.625} = 0.36$; impact of average balance of total assets: $19982200966.66 \times (\frac{1}{12655513698.69} - \frac{1}{8685630532.625}) = -0.72$; impact of all factors: 0.36-0.72 = -0.36; the change of TAT was almost the same as that of all factors.

It can be seen from the above that the decline of the turnover rate of total assets represents the decline of the operating capacity of an enterprise, which is mainly caused by the increase speed of total assets greater than that of sales revenue. The growth rate of investment scale is higher than that of sales level, reflecting the low efficiency of asset utilization. Further factor analysis is needed for changes in total assets.

③ The application of the third factor analysis method: Factor analysis of the change of average total assets

Formula: Average total assets = Average current assets + Average noncurrent assets; change of average total assets: 12655513698.69 - 8685630532.625 = 3969883166.075; influence of average current assets: 6742401482.09 - 4988476248.6 = 1753925233.49; influence of average noncurrent assets: 5913112216.60 - 3697154284.025 = 2215957932.575; influence of all factors: 1753925233.49 + 2215957932.575 = 3969883167.065; the change of average total assets is almost the same as that of all factors.

From the above analysis, we can see that the main reason for the increase of average total assets is the substantial increase of average noncurrent assets. By querying the annual report of the enterprise, we can find the assets with the largest increase and the reasons for the increase. First, the absolute growth of fixed assets is the largest, with a relative growth of 41.46%. The increase is mainly due to the investment in the construction of some transit centers and the purchase of new freighters to expand the scale of enterprises. Secondly, the growth rate of other noncurrent assets is 323.82% compared with 2016, with the highest relative growth rate. The increase is mainly due to the increase of land payment in advance for the construction of transfer center and the increase of project payment.

④ To sum up: Through DuPont decomposition and Factor analysis, it can be seen that enterprises invest a lot in noncurrent assets for the construction of new transit centers, expand the scale of enterprises, and increase the average total assets. However, the low utilization efficiency of major new assets leads to the decrease of total asset turnover, which is the main reason for the decrease of ROE. In order to improve the ROE of enterprises, Company need to improve the main influencing factors: increase the reasonable investment of enterprises, abolish unnecessary investment; improve the capital utilization efficiency, improve the transportation efficiency and production capacity of trucks and machinery, the utilization rate of transfer center, and take appropriate marketing strategies to improve the asset turnover rate, and then improve the ROE. In addition, to improve the secondary factors, through strengthening the control of cost and budget, maintaining the use of financial leverage, improving the accounts receivable turnover rate and inventory turnover rate and other ways to improve ROE.

3.2 Factor analysis of ROE in 2017-2018

① Application of the first factor analysis method: Factor analysis of roe change

In 2017, ROE: 17.27%=7.24%×1.58×1.51; in 2018, ROE: 19.13%=7.03%×1.61×1.69 ; change of ROE in 2017-2018: 19.13%-17.27%=1.86%; influence of EM: 7.03%×1.61×(1.69-1.51)=2.04%; influence of TAT: 7.03%×(1.61-1.58)×1.51=0.32%; influence of PM: (7.03%-7.24%)×1.58×1.51=-0.5%; influence of all related factors: -0.5%+0.32%+2.04% =1.86%; change of ROE is almost the same as that of all related factors.

From the factor analysis and annual report, we can see that EM has the greatest impact on the growth of ROE, TAT has the second impact on the growth of ROE, and PM and ROE have reverse changes. Enterprises have increased the use of financial leverage, increased current liabilities for production and operation investment, and increased the debt service burden of enterprises while improving ROE. By improving the utilization efficiency of current assets such as accounts receivable, the turnover rate of total assets is increased, but the utilization efficiency of noncurrent assets needs

to be further enhanced. In addition, PM is still a negative number, so enterprises should continue to strengthen the control of cost and strive to improve sales revenue.

②Application of the second factor analysis method: Factor analysis of equity multiplier

Equity multiplier (EM)= Total assets / Total shareholders' equity; change of EM: 1.69-1.51 = 0.18, impact of total assets: (19968534981.94-14143164000.66) / 9362736034.28 = 0.62; impact of total shareholders' equity: $19968534981.94 \times (\frac{1}{11793919535.98} - \frac{1}{9362736034.28}) = -0.44$; impact of all factors: 0.62 - 0.44 = 0.18 The change of EM was almost the same as that of all factors.

It can be seen from the above: the increase of total assets is the main reason for the change of equity multiplier, which means that the growth rate of liabilities is faster than that of shareholders' equity, and enterprises use leverage effect to operate enterprises. It is necessary to further analyze the capital flow of the enterprise.

③ Application of the third factor analysis method: Factor analysis of total assets change

Formula: Total assets = Current assets + Noncurrent assets; change of total assets: 19968534981.94 - 1414316400.66 = 5825370981.28; influence of current assets: 8804111189.91 - 6912269100.46 = 1891842089.45; influence of noncurrent assets: 11164423792.03-7230894900.20 = 3933528891.17; change of total assets is almost the same as that of all factors.

It can be seen from the above analysis that the main reason for the rise of total assets is the substantial increase of noncurrent assets. By querying the annual report of an enterprise, we can find the noncurrent assets with the largest increase and the reasons for the increase. First, the absolute growth of fixed assets is the largest, with a relative growth of 80.73%. The increase of fixed assets is mainly due to the investment in the construction of some transit centers and the purchase of new aircraft, vehicles, machinery and equipment to expand the scale of enterprises. Secondly, the growth rate of available for sale financial assets is 95046.69% compared with 2017, with the highest relative growth rate. The increase is mainly due to the investment in Zhejiang post station and Gongqing Chengtai investment management partnership. It can be seen that in 2018, while expanding the production scale, the enterprise focused on the development of investment

④ To sum up: according to DuPont decomposition and Factor analysis, in 2018, Yuantong Express mainly expanded its investment in enterprise assets, especially noncurrent assets, and improved enterprise EM, thus improving enterprise ROE. This method makes good use of the principle of financial leverage to carry out business operation, but also increases the debt risk of the enterprise, so the company should strengthen the monitoring of the cash flow and debt paying ability of the enterprise. In addition, enterprises should continue to improve the utilization efficiency of current assets and noncurrent assets, strengthen the effective control of cost, so as to improve the operation and profitability of enterprises.

3.3 Financial overview and revelation

Through the analysis of Yuantong express company in the past two years, we can see that Yuantong company is committed to expanding the enterprise scale and developing well. Roe has a slight fluctuation. The main reasons for the fluctuation are the investment of noncurrent assets and the expansion of enterprise scale. It can be seen that the fluctuation of roe is closely related to the selection of enterprise objectives and the management strategies of relevant indicators. In the next few years, in order to ensure the maximization of shareholders' rights and interests, the company should clarify its own objectives and strengthen the supervision and management of relevant financial indicators. Focus on strengthening cost budgeting and effectively controlling costs. Improve the utilization efficiency of current assets and noncurrent assets, increase publicity, improve competitive advantage and promote the growth of sales revenue. It should increase leverage and pay more attention to the cash flow and solvency of enterprises. In order to avoid the decline of roe to some extent.

4. Defects of DuPont analysis system

4.1 Pay too much attention to short-term financial indicators and lack of analysis on the

long-term development of enterprises

The calculation and analysis of the core indicators of DuPont analysis system come from the financial information that has occurred. The demand for ROE growth makes managers pay too much attention to the improvement of short-term profit index and ignore the pursuit of long-term benefits of enterprises. An enterprise whose long-term development goal is not clear and whose analysis and monitoring are not in place cannot grow well in the existing market or even survive for a long time. Therefore, the enterprise should strengthen the positioning and monitoring of long-term development

4.2 DuPont analysis system does not fully reflect the performance of enterprises

There are many factors that affect the company's performance. To some extent, DuPont analysis system comprehensively reflects the impact of the company's existing financial situation on the company's performance, but there are many other factors, such as company strategy, customer satisfaction, employee learning and growth, which have a certain impact on the company's performance

4.3 Ignore the analysis of enterprise cash flow

DuPont's analysis of financial information mainly comes from the income statement and balance sheet of the enterprise, but ignores the use of the information in the cash flow statement. The analysis of cash flow can better avoid the behavior of virtual increase of corporate profits, reflect the business quality more directly and comprehensively, and carry out a more comprehensive dynamic analysis of enterprises. Without the analysis of cash flow, it can not reflect the real business situation of the enterprise to a certain extent.

5. Suggestions for improvement of DuPont analysis system

Strengthen the positioning and management of enterprise development direction

Table2. SWOT analysis of Yuantong express company

Internal factors ╲ External factors	Strengths	Weaknesses
	①Self-owned aviation advantage; ② Brand advantage; ③Service standardization advantage; ④ Logistics network advantage; ⑤ Internet information service advantage	①Fierce industry competition, more homogeneous services; ②Loose internal management ③Different quality of employees
Opportunities	**S/O strategies**	**W/O strategies**
①National policy support；②The development of overseas express delivery and the increase of online shopping indicate a huge market potential.	①With the support of national policies, expand domestic and foreign markets by taking advantage of our own aviation and quality service. ②Take advantage of Internet services, strengthen cooperation with e-commerce platforms, and increase market share.	①Increase the coverage of outlets, provide differentiated services, establish a high-quality brand image, and seize market share. ②Improve corporate culture, internal management and control system, and provide high-quality services.
Threats	**S/T strategies**	**W/T strategies**
①Customers' increasing demands for logistics service quality；②The self-built logistics system of e-commerce platform takes market share.	①Strengthen the networking and intelligence of logistics service, continuously improve service quality, reduce service cost and seize market share.	①Innovation and creation of new services, new packaging, new lines, new tools. ②Standardize the quality of employees, strengthen the management of enterprises.

The positioning and management of the enterprise's future trend can be enhanced by "extending" DuPont analysis. In order to locate and manage the development direction of the enterprise in the future, the comparative analysis and trend forecast analysis of the DuPont analysis results for several consecutive years are carried out. In addition, combined with the overall strategic analysis of the enterprise, company can introduce the Balanced Scorecard analysis, SWOT analysis, Porter's five forces analysis, etc. to make clear the competitive advantage and development orientation of the enterprise, and show the development goal results to various indicators, so as to facilitate the development of the long-term interests of the enterprise. Combined with the DuPont analysis and strategic analysis of Yuantong express in the past two years (taking SWOT analysis as an example, as shown in the table below), we can see that enterprises want to take advantage of their own advantages, improve management system, expand scale and seize market share. In terms of financial indicators, sales revenue and fixed assets have increased, but the efforts to enhance the asset turnover efficiency and cost monitoring still need to be further improved.

(2) Increase the analysis of other factors affecting the company's performance, and supplement the DuPont analysis system

Establish a reasonable analysis system and management method for other factors affecting the company's performance, such as: effectively manage and analyze the company's strategy by introducing the balanced scorecard method, comprehensively evaluate customer satisfaction by means of customer repurchase rate and questionnaire survey, and consider the stability of suppliers by means of supplier's supply capacity and supply mode analysis, etc. Finally the impact of other factors shall be considered in the evaluation of business results.

(3) Increase analysis of cash flow of enterprises

Through the analysis of relevant cash flow indicators, the ability of enterprises to receive cash is evaluated. At the same time of increasing the profitability of enterprises, company should pay more attention to the improvement of the cash collection ability of enterprises, to avoid the occurrence of the rupture of the capital chain or the bankruptcy of enterprises due to the untimely capital turnover or the shortage of cash in the case of high assets and high income. Just like Yuantong express company, the financial leverage is gradually increasing, and enterprises in sustainable development should pay more attention to cash flow.

6. Conclusions

Based on the DuPont analysis of Yuantong express company, this paper comprehensively evaluates the operation of the enterprise, and puts forward suggestions for improvement in view of the financial problems of the enterprise. Because DuPont analysis system has some defects in the comprehensive analysis of enterprise performance, it makes some supplementary improvements. It is hoped that the enterprise can comprehensively analyze the enterprise performance, maximize the shareholder value and maintain the sustainable development of the company.

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