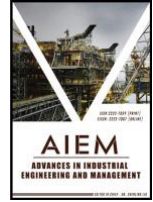


ZIBELINE INTERNATIONAL™
P U B L I S H I N G

ISSN: 2222-7059 (Print)

EISSN: 2222-7067 (Online)

Advances in Industrial Engineering and Management (AIEM)

DOI: <http://doi.org/10.7508/aiem.01.2023.18.23>

REVIEW ARTICLE

THE APPLICATION OF FACTOR EXPANSION IN FINANCIAL ANALYSIS: CASE STUDY OF DU PONT ANALYSIS FORMULA ANALYSIS

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ARTICLE DETAILS

Article History:

Received 15 January 2023

Accepted 28 February 2023

Available online 22 March 2023

ABSTRACT

Accounting is a dual attribute discipline with both natural attributes (natural link to mathematics) and social attributes (accounting account setting, conceptual control, summarisation). Based on the natural properties of accounting as a starting point, this paper builds on the DuPont formula and DuPont analysis to produce a mathematical mechanism and its logical framing equation, and to factor extensions, adding and subtracting factor variables to make the DuPont equation and the DuPont analysis method more complete, while achieving the goal of refined financial analysis. In the case application, the authors used the logarithmic ratio method of factor analysis indices (the scientifically correct apportionment of the interaction between factors) to verify the comparison of the ROE differences between the DuPont formula and the extended DuPont formula as the basic analytical equation, making the ROE DuPont refinement and quantitative analysis more accurate.

KEYWORDS

Dupont formula, factor expansion, analysis of the application

1. INTRODUCTION

The application of mathematical methods in management accounting changes the social attributes of accounting, turning accounting into a social attribute into a natural attribute with both social attributes and a natural connection to mathematics, showing the duality of accounting. Factor expansion is a mathematical method category, usually from a main economic indicators, fission into a number of factors, this fission process, mainly through mathematical methods, add or subtract items, multiplier items, decomposition, reorganisation, construction into analytical equations, thus, to achieve the analysis of the main indicators into a number of factors refinement analysis. By analysing the variation of the main factors of the same company over time, or over the same period of time for different companies, we can calculate the specific impact of the increase or decrease of each factor on the increase or decrease of the main factors. The equation model derived from this factor expansion still follows the mathematical equation; it is also qualitatively different from the equation of the independent and dependent variables in the multiple regression empirical model. The empirical approach in which one expects to find out the economic content of the main indicator in a subjective indicator relies only on the normal distribution of the data (variables) and the binomial distribution (dummy variables), the factor expansion approach, following the subjective explanatory indicator and

the explained indicator exist in an inherent equation relationship.

This paper attempts to analyze the origin and application of the theoretical formula of knowledge points from the financial analysis in management accounting, reveal the natural attribute of accounting, and reveal the correlation between mathematical methods and management accounting. At the same time, also for the teacher to trace the source, clarify the context, deep and simple, difficult to easy; It also provides opportunities for accounting method researchers to get enlightenment, explore, decrypt and discover more relations between management accounting and mathematics, and make innovations and inventions.

2. THEORETICAL OVERVIEW

Application examples of DuPont analysis e.g., Liu (2020) used DuPont analysis to analyse the ROE of Anhui Hefei Co. Shi (2019), an analysis of the quality of earnings, based on DuPont research of publicly traded firms. Integrated financial analysis methods such as Liu and Wang (2020) DuPont analysis method, integrated analysis of the company's profitability, operating capacity and solvency, with net profit margin as the core. And using the example of the Yuan Tong Express Co. The financial data of this company. 2016.2017.2018 three years were analysed by DuPont decomposition and three-factor analysis of the

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Website
www.aiem.com.myDOI:
[10.7508/aiem.01.2023.18.23](https://doi.org/10.7508/aiem.01.2023.18.23)

company. In order to improve the financial situation of this company and achieve the short-term goals and long-term goals, some specific recommendations are made to control costs, increase the current asset ratio and non-current asset ratio. Optimising the capital structure and controlling financial leverage. The article also points out the shortcomings of the DuPont analysis system: it does not consider the factors influencing corporate performance comprehensively and does not take into account the differences in operating income and cash inflows. The analysis of Roundabout using SWOT is an application of the factor analysis method, but the calculation method and analysis method are rather outdated.

Noh et al. (2018) assessed the management of Korean hospitals using DuPont analysis, which showed that DuPont analysis can be applied to evaluate the performance of hospitals in different regions. The hospital's financial statements were used to analyse the hospital's return on net assets and return on total assets as a means of determining the hospital's management and financial position. The goal is for the hospital to generate a minimum profit and fulfil its social responsibility by providing quality healthcare services. The study found that net profit margin (PM) has the greatest impact on return on equity (ROE), based on the "Hospital Management Statistics 2016" provided by the Korea Institute of Health Industry Development, which analysed over 337 hospitals by classifying them according to scope of care, type of institution, location and number of beds, using the Dupont Identity method. The overall and financial characteristics of the hospitals were analysed using the Dupont Identity methodology. General hospitals with 160-299 beds had the highest return on equity (ROE) by number of beds.

Marioara and Lucica (2018) address the financial performance of agribusiness from the perspective of DuPont analysis. Benjamin et al. (2018) which attempts to analyse the information of asset turnover (ATO) and profitability (PM) of DuPont in explaining dividend policy. Five years of financial data from Compustat Malaysia were analysed and it was found that return on net profit and return on total assets could be resolved for dividends for the same period. The model findings suggest that PM and ATO can be used to predict a company's propensity to pay dividends. However, the results of the altered dividend model do not provide any significant thesis for PM and ATO. The practical implication of the paper is that understanding the impact of ATO and PM on dividends can make managers aware of the importance of these factors when making dividend policy decisions. Financial analysts working in securities and lenders working in banking are similarly aware of the decomposition of profitability measures into two details, A asset efficiency in this case of asset allocation policy and B profitability per unit of asset. The article examines the decomposition of ROE into PM and ATO, extending the details of previous dividend policy studies. Two factor analyses were used for the DuPont analysis, but the interaction between the factors was not considered.

Yan (2017), Yang et al. (2017), Rooplata (2016), who pointed out that DuPont analysis and its flowchart, which is a mandatory report in the analysis of financial statements of listed companies in China, this method has been widely used in financial management in the United States of China and other countries around the world and has become a worldwide corporate financial management tool. Kim (2016), Turner et al. (2015), Christina et al. (2012), which illustrates the significance of the extensive practice and practical application of the DuPont analysis in the analysis and evaluation of business performance of companies in different industries.

Sesar et al. (2015), the goal of a company is to chase profits and satisfy the needs of shareholders, followed by balancing the interests of other parties such as the company's employees, bank lenders, and government departments (taxation). It is the expectation of all stakeholders that the management of the company should be improved. In order to improve the level, it is necessary to identify possible pitfalls and possible factors of production costs, so that managers can manage the company efficiently and rationally, organise expenses and control costs, using DuPont analysis as firmware for corporate budgeting and management.

Pushkar (2015), in his article, talks about how shareholders are the claimants of the surplus value of the company and one of the objectives of financial management is, to increase the wealth of the share holders. The

DuPont analysis was created by DuPont to analyse the return on equity into three important components, which are operational efficiency, asset efficiency and financial leverage. A key measure of operational efficiency is net sales margin. An important measure of asset efficiency is the asset turnover ratio. Infosys Limited, Unilever India Limited, Larsen & Toubro Limited, Mahindra and Mahindra Limited and Sun Pharmaceutical Industries Limited are the five companies that represent each sector of the economy. The five companies represent various sectors of the economy, namely Information Technology (IT), FMCG, CG, Automotive and Pharmaceuticals. The data is taken from the audited balance sheets and income statements for the calendar year and the article examines the scope of application of the DuPont analysis and the application of the methodology to the financial management objectives of the five different companies.

P. Bauman (2014), in his article, refers to the study of the relationship between the changes in both profitability and operational assets, net by dividing the direction of change. The DuPont formula is decomposed into the conversion of return on net operating assets into assets and profitability to identify potential drivers of net operating margin. Previous research has found that changes in asset turnover can be interpreted as changes in net operating income over the year, but changes in profitability cannot be interpreted as changes in asset turnover. The paper finds that the direction of changes in profitability has an impact on future changes in net operating assets, using forecasting improvements, and the findings are consistent in examining how information from financial reports can be used to improve the predictive power of a company's performance. The results of this study indicate the profitability ratio determinants, but the study does not consider the existence of interactions in the structure of the factor products, nor does it conduct an analysis of variance.

In summary, the use of the in respect to a number of key financial ratios to analyze the financial. Position of a company in an integrated manner is the core of the DuPont DuPont analysis method, a method mainly used to assess a company's profitability and rate of return on shareholders' equity. This method is used to analyse and evaluate the business performance of companies in different industries and has become one of the major financial management tools worldwide. The vast majority of the literature is devoted to the study of the practical and applied implications of the DuPont analysis, with few scholars examining the mathematical mechanisms that led to its creation and the shortcomings of its application. In this paper, we look at the mathematical and logical mechanics of the DuPont analysis, analyse the shortcomings of the method, improve and solve the flaws and problems of the DuPont analysis, and thus enhance the usefulness of the DuPont analysis in practice.

3. MATHEMATICAL MECHANISMS OF FACTOR EXPANSION AND DUPONT'S FORMULA

DuPont analysis, a classical method of analysis for evaluating company business performance that is currently popular worldwide, has been introduced in many textbooks such as Management Accounting, Financial Cost Management and Financial Analysis in China and the United States; the formulae in DuPont analysis are included in the financial analysis of every quarterly report of Chinese listed companies, forming a framework structured quantitative analysis that has become the norm. This widespread use also shows that the scientific nature of the analysis method and the fairness of the analysis results have been widely recognised by the authorities and professionals.

3.1 Dupont Formula

The main financial indicator relationships in dupont formula are:

Return on net assets = net interest rate on assets (net profit/total assets) × equity multiplier (total assets/total equity capital)

While: net interest rate on assets (net profit/total assets) = net interest rate on sales (net profit/total income) × asset turnover rate (total income/total assets)

That is: return on equity (ROE) = net interest rate on sales (NPM) × asset

Table 1: Table of financial indicator variables

Financial Indicators	Net profit	Operating income	Owner's Equity	Liabilities	Total Assets	ROE
Variables	m	x	a	b	a+b	m/a
Financial Indicators	Value of output	Cash inflows	Current assets	NPM	AU	EM
Variables	y	x [^]	c	m/x	x/(a+b)	(a+b)/a

turnover (AU, asset utilization) × equity multiplier (EM)

ROE (Rate of Return on Common Stockholders' Equity), ROE = NPM * AU * EM.

In order to facilitate factor expansion, the financial indicators mentioned above are replaced by the following symbols, as shown in Table 1.

The actual factors involved in the DuPont formula are four, the relative number principal factor is net profit m/a, the factors are m/x, x/(a+b), (a+b)/a; the absolute number principal factor is net profit m, the factors are operating income x, total assets (a+b), net assets a. Considering the dynamic comparability of the indicators, we default the above indicators to all being point-in-time static indicators, so that total assets and net assets, from static at the beginning of the period plus the end of the period to period dynamic indicators (in practice, to make the indicators comparable, usually use (beginning of the period + end of the period)/2, to transform static indicators into dynamic).

Relative number formula of dupont formula:

$$\frac{m}{a} = \frac{m}{x} \times \frac{x}{a+b} \times \frac{a+b}{a} \tag{1}$$

Formula (1), m/x, net profit and operating income ratio, net operating margin, the net operating margin is a reflection of the overall profitability of the enterprise, the greater the ratio the better the company's profitability, and vice versa; X / (a + b), operating income and total assets ratio, the return on total assets, the indicator reflects. How corporate income and asset occupancy are related. Generally, the higher the return on total assets, the stronger the operating capacity of the company's total assets and the more efficient its operations; (a+b)/a, total assets divided by net assets, is the equity ratio, also known as the financial leverage ratio, which refers to the means by which a company uses debt to adjust its return on equity capital.

3.2 The Mathematical Mechanics of the DuPont Formula: Factor Expansion

In the expansion process, the following expansion formula is used to introduce operational income in the first phase and total assets in the second step on the basis of the previous stage.

The evolution of the above formula after the introduction of operating income and total assets provides a clearer picture of the role played by each financial indicator in the DuPont system:

- a) The beginning point and central component of the entire analysis system is return on equity. The index shows how profitable investors' net assets are. Roe is calculated using the equity multiplier, total asset turnover, and rate of return on sales.
- b) The enterprise's level of debt is indicated by the equity coefficient. The index's size determines how much debt the company has, which is the opposite of the asset equity ratio.

$$\frac{m}{a} \rightarrow \left\{ \frac{m \times x}{a \times x} \rightarrow \left\{ \frac{m}{x} \times \frac{x}{m} \rightarrow \left\{ \frac{m}{x} \times \frac{x}{a} \rightarrow \left\{ \frac{m}{x} \times \frac{x}{(a+b)} \rightarrow \left\{ \frac{m}{x} \times \frac{x}{a+b} \times \frac{a+b}{a} \right. \right. \right. \right. \right. \tag{2}$$

c) The rate of return on total assets, which is a full picture of the enterprise's sales performance and asset operation, is the product of the rate of return on sales and the turnover rate of total assets. Increased sales income and decreased capital occupation are required to raise the rate of return on total assets.

d) The total asset turnover rate reveals the business's overall capacity to generate revenue. Analysis of the enterprise's asset structure is required to determine whether it is appropriate. the proportion of short-term assets to long-term assets. In order to determine the precise causes for the change in the turnover rate of total assets, it is also important to study the turnover rates of current assets, inventories, accounts receivables, and other pertinent efficiency indicators of the use of assets.

3.3 Scientific Validity and Shortcomings of DuPont Analysis

DuPont analysis differs from empirical models in that the equation is relatively stable. The DuPont formula and DuPont analysis are widely used worldwide and are scientifically sound in that:

- a) In terms of indicator structure, factor expansion is a mathematical equation between the main factor and the factor; and this equation, even with the product structure, the factor can be reduced approximately to the original.
- b) In terms of its analytical role, it can be analysed as a single indicator or as a combination of multiple indicators.
- c) In terms of indicator selection, the factor data can be extended to balance sheet and income statement account indicators, forming a pagoda-shaped diagram of the analytical framework.
- d) The extended factorisation at the core of the equity margin can be understood as an analysis of a company's profitability in terms of operating income (sales size); a measure of a company's performance in terms of total asset occupancy (resource occupancy) and an analysis of a company's profitability in terms of net asset (own capital) occupancy.

The fatal shortcoming of the DuPont formula in the application of performance evaluation of Chinese companies is that it does not take into account the basis of accounting and the opt-in of cash flow statement data; it does not take into account the differences that exist between the accrual and cash basis of accounting, such differences, in essence, are included in the operating income of accounts receivable and the actual unrealized profits brought about in accounts receivable resulting in unrealistic operating income and profits.

4. DUPONT FORMULA MULTIFACTOR EXTENSION

4.1 Extended to a 5-factor Formula

By following the method of factor expansion and introducing output and liability indicators into equation (1), we can expand the DuPont formula into a 5-factor formula. Putting y denotes output value and b denotes liabilities. The factor expansion process is as follows.

The above factor extensions are multiplied by the numerator and denominator by the same factor. The factor extension of equation (4) becomes, from step four, the net interest margin explained by the net

$$\frac{m}{a} \rightarrow \left\{ \begin{matrix} m/x \\ x/a \end{matrix} \right\} \rightarrow \left\{ \begin{matrix} m/x \\ x/(a+b) \\ (a+b)/a \end{matrix} \right\} \rightarrow \left\{ \begin{matrix} m/x \\ x/(a+b) \\ (a+b)/y \\ y/a \end{matrix} \right\} \rightarrow \left\{ \begin{matrix} m/x \\ x/(a+b) \\ (a+b)/y \\ y/b \\ b/a \end{matrix} \right\} \rightarrow \left\{ \frac{m}{x} \times \frac{x}{a+b} \times \frac{a+b}{y} \times \frac{y}{b} \times \frac{b}{a} \right\} \quad (3)$$

sales margin, asset turnover, output asset ratio and net asset value ratio. The fifth step introduces a debt indicator and the main indicator, net equity margin, consists of five factors, which are net sales margin, asset turnover, output asset ratio, debt production ratio and debt leverage, the product of even multiplication of the five factors, which can still be approximately simplified as m/a. The formula for net equity margin after the expansion to five factors is:

$$\frac{m}{a} = \frac{m}{x} \times \frac{x}{a+b} \times \frac{a+b}{x} \times \frac{y}{b} \times \frac{b}{a} \quad (4)$$

Equation (4), the evolution of the financial indicators in the five-factor expansion formula can be seen, (a + b)/y, the ratio of total assets to output value, the inverse of the output ratio of total assets, enhance the value of this *measure*, the lower the input-output ratio of the enterprise's assets, the worse the enterprise's total assets operation; y/b, the ratio of output value and liabilities, how much output value can be created under debt operation, the larger the indicator proves that it is suitable for debt operation. The larger the indicator, the greater the risk to the business.

4.2 Extended to a 7-factor Formula

As above, the DuPont formula can be reintroduced, with operating cash inflows x'' and current asset indicator c, for a total of seven factors to explain the main factor net interest margin on equity. That is, the main factor of return on net assets can be refined into net operating cash inflow rate, operating cash flow to operating income ratio, operating business income current assets to total assets ratio, current assets-to-current assets ratio, output asset ratio, debt output ratio and debt leverage. The following is an extension of the process.

The above factor formula is extended to the following formula:

$$\frac{m}{a} \rightarrow \left\{ \begin{matrix} m/x \\ x/a \end{matrix} \right\} \rightarrow \left\{ \begin{matrix} m/x \\ x/(a+b) \\ (a+b)/a \end{matrix} \right\} \rightarrow \left\{ \begin{matrix} m/x \\ x/(a+b) \\ (a+b)/y \\ y/a \end{matrix} \right\} \rightarrow \left\{ \begin{matrix} m/x \\ x/(a+b) \\ (a+b)/y \\ y/b \\ b/a \end{matrix} \right\} \rightarrow \left\{ \begin{matrix} m/x' \\ x'/x \\ x/(a+b) \\ (a+b)/y \\ y/b \\ b/a \end{matrix} \right\} \rightarrow \left\{ \begin{matrix} m/x' \\ x'/x \\ x/c \\ c/(a+b) \\ (a+b)/y \\ y/b \\ b/a \end{matrix} \right\} \quad (5)$$

5. EXTENDED MULTI-FACTOR ANALYSIS

In order to verify the accuracy of the analysis of the DuPont formula before and after the extension, we compared the results of the above 3- factor, 5- factor and 7-factor calculations for the same enterprise as follows.

5.1 SELECTION OF MULTI-FACTOR INDICATOR VALUES

The article uses data from the 2019 annual report of Makara Foods Limited to analyse the extended formula of the DuPont analysis, which is shown in Table 2.

$$\frac{m}{a} = \frac{m}{x} \times \frac{x'}{x} \times \frac{x}{c} \times \frac{c}{a+b} \times \frac{a+b}{y} \times \frac{y}{b} \times \frac{b}{a} \quad (6)$$

In formula (6), the meaning represented by each financial indicator is, m/x'' the ratio of net profit to net cash inflow, which represents how much of the inflowing cash flow is profit, the larger the ratio, the more cash the enterprise can freely dispose of; x''/x the ratio of net cash inflow to operating income, how much cash is received from the sale of goods, that is, whether the sale achieves the return of profit to the enterprise and whether generate accounts receivable, the larger the indicator, proving that the greater the enterprise's sales link of the word; x/c the ratio of sales revenue to current assets, the current asset turnover rate, the current asset turnover rate refers to the average amount of current assets occupied in a certain period of time to complete the number of product sales turnover, is the ratio of net income from main business and the average balance of all current assets, reflecting the speed of current asset turnover and current asset utilization. It reflects the speed of current assets turnover and the effectiveness of current assets utilisation. Fast turnover speed will relatively save current assets, which equals to relatively expand asset investment and enhance the profitability of the enterprise; c/(a+b) indicates that the utilization rate of current assets of the enterprise is relatively high and the operating ability of the enterprise is still okay. If the proportion of current assets is relatively large, there may be too large a proportion of accounts receivable, or inventories, resulting in inefficient use of assets.

The DuPont formula, extended to a 7-factor, introduces indicators such as economic output, in addition to operating cash inflows in the cash flow statement, which are accounted for on a cash basis, effectively circumventing the results of unrealistic analysis of operating income and net profit due to accounting for accounts receivable. It is clear that the 7-factor is a more comprehensive evaluation of operating performance than the 5-factor, with the introduction of operating cash inflows and asset structure indicators for analysis and assessment.

The sales rate of output value is 95%, and the data at the end of the period is taken; the operating cash inflow excludes the sales tax, because the operating income does not include tax revenue.

5.2 Results of Different Equation Calculations are Obviously Different

The results of the three-, five- and seven-factor calculations using a combination of Makara AG's financial indicators are shown in Table 3.

The calculation result of m/a differs under the influence of different factors. the calculation result of 3 factor is 0.047, the calculation result

m	x	a+b	b	a	y	c	x''
6.34E+05	2.02E+06	5.29E+06	2.12E+06	3.17E+06	2.13E+06	1.96E+06	1.62E+06

Table 3: Comparison of multi-factor calculation results of return on net assets

	m/a	m/	/x	x/c	c/(a+b)	(a+b)/y	y/b	b/a
3factor	2.00E-01	3.13E-01	3.82E-01	1.67E+00	-	-	-	-
	4.67E-02	-5.04E-01	-4.17E-01	2.22E-01	4.67E-02	-	-	-
5factor	1.99E-01	3.13E-01	3.80E-01	2.48E+00	1.01E+00	6.68E-01	-	-
	1.09E-09	-5.04E-01	-4.20E-01	3.95E-01	2.25E-03	-1.75E-01	-3.30E-05	-
7factor	2.00E-01	3.92E-01	8.00E-01	1.03E+00	3.71E-01	2.48E+00	1.01E+00	6.68E-01
	3.65E-08	-4.07E-01	-9.69E-02	1.37E-02	-4.31E-01	3.95E-01	2.25E-03	-1.75E-01

Table 4: Analysis indicators

	m	x	A+b	b	a	y	c	X"
Actual indicators	6.30E+05	2.02E+06	5.29E+06	2.12E+06	3.17E+06	2.13E+06	1.96E+06	1.62E+06
Budgeted Indicators	1.80E+05	1.34E+06	2.98E+06	1.61E+06	1.37E+06	1.54E+06	9.78E+05	1.31E+06

Table 5: Factor difference analysis

7Factor	Actualnumber	Budget number	differences	Index logarithmic	Factors affecting
m/x"	3.92E-01	1.37E-01	2.55E-01	1.05E+00	1.52E-01
x"/x	8.00E-01	9.80E-01	-1.80E-01	-2.03E-01	-2.95E-02
x/c	8.26E-01	1.37E+00	-5.43E-01	-5.06E-01	-7.34E-02
c/(a+b)	3.71E-01	3.28E-01	4.27E-02	1.23E-01	1.78E-02
(a+b)/y	2.48E+00	1.94E+00	5.42E-01	2.46E-01	3.57E-02
y/b	1.01E+00	9.52E-01	5.31E-02	5.43E-02	7.90E-03
b/a	6.68E-01	1.18E+00	-5.09E-01	-5.67E-01	-8.23E-02
m/a	1.60E-01	1.31E-01	2.85E-02	1.97E-01	2.85E-02

of 5 factor after introducing the indicators of output value and liabilities is 1.094, and the calculation result of m/a in 7 factor is 3.646. from the calculation results of the three DuPont formulas, it is found that the of net assets returned differs greatly, and the primary factor is that after introducing the indicators of output value, liabilities and operating cash inflow, the sales volume and inventory share of the enterprise had an impact on the calculation results, the enterprise's operating income in the current year accounts receivable accounted for a larger proportion of operating income, the profit generated by accounts receivable and operating income made the company's return on net assets indicator significantly lower.

5.3 Use Multi-Factor Difference Analysis to Clarify Responsibilities

Still using MYGF data, using a seven-factor model to analyze the company's performance execution budget completion, the budget indicators as shown in the Table 4:

Using the exponential logarithmic scale method, the factor analysis as shown in the Table 5.

MYGF's return on net assets in 2019 is 15.99%, which is 2.85% higher than the budget target of 13.13%. The impact of various factors on the main factor (net asset return rate) is: operating cash inflow net interest rate increases the net asset return rate by 15.22%; operating cash inflow ratio to operating income reduces the main indicator by 2.95%; current asset income rate The main index is 7.34%; the ratio of current assets to total assets increases the main factor by 1.78%; the output value asset ratio increases the main index by 3.57%; the debt output value ratio increases the main index by 7.9 %; the debt leverage factor reduces the main index by 8.25 %; The total impact is: 2.85%.

This is just the impact of the obtained indicators and resource occupancy factors on the net asset profit rate. If we include the cost and

expense indicators into the analysis and evaluation, we will quantify the responsibilities and provide a scientific basis for the company to correctly implement its responsibilities and rights and implement incentive policies .

6. RESEARCH CONCLUSION

From the above mathematical derivation and example verification, we can get the following conclusions:

- a) The DuPont formula factor expansion method is to multiply the numerator and denominator of a relative number by an accounting indicator, and then recompose it into two relative index products that multiply each other. This denominator and numerator continuous product structure enables the final expanded equation to be reduced to the original single index of relative numbers. The prerequisite must be a continuous product structure.
- b) The Dupont formula after factor expansion, we can expand the accounting indicators to be analyzed to give full play to the advantages of both single indicator analysis and comprehensive analysis to make the analysis more detailed and specific.
- c) The expanded seven-factor analysis in the article introduces the "operating cash inflow" indicator, which is derived from the company's cash flow statement, and makes up for the discrepancies formed between the prepared cash flow statements have led to the defect that the analysis results are not true. The linkage of the three accounting statements is selected on the index; the analysis results are more objective and precise.
- d) In the performance analysis of the same company or companies in the same industry, the actual indicators and budget indicators of the current period (the analysis standard can also be the average level of the

same industry, the number of previous years, the benchmark level, etc.); Substitute into the equation to calculate the variance analysis, the overall variance can be decomposed into the variance of each factor, which provides a scientific quantitative basis for clarifying the relationship between department responsibilities and attribution rights.

e) On the comparability of financial indicators in the DuPont formula. In the current DuPont analysis formula, the comparability of indicators (numerator denominator comparability) is often considered. For example, net profit is formed during the period, is a dynamic indicator; total assets, net assets are point-in-time indicators, static indicators, the practical application, in order to make it comparable, the point-in-time indicators, usually using (opening + closing) / 2 to static indicators total assets, net assets point-in-time, static indicators, into the period, dynamic indicators. For calculation purposes, the financial indicators in ROE in this case are considered point-in-time, static indicators, the same as point-in-time cross-sectional data in econometrics.

ACKNOWLEDGEMENT

This work was supported by Project source Education Department of Guangdong: Study on Improvement of Dupont Analysis under Factor Analysis (No.2018WQNCX310); Scientific Research Project of Guangdong Education Department: Research on financial Risk early warning mechanism of enterprises in the era of digital intelligence (No.2021WTSCX121); Youth academic research project of Huashang College: Research on early warning mechanism of enterprise financial risk based on neural network model (No.2021HSXQ01).

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