



**A STUDY OF BYD'S PROFITABILITY BASED ON DUPONT
ANALYSIS**



**WANG MENGLI
6417195023**

**AN INDEPENDENT STUDY SUBMITTED IN PARTIAL FULFILLMENT
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WANG MENGLI
6417195023

This Independent Study has been approved as a Partial Fulfillment of the Requirements for the Degree of Master of Business Administration

Advisor:
(Dr. Ma Yu)

Date: 6 1 2 1 2025

.....
(Associate Professor Dr. Jomphong Mongkhonvanit)
Dean, Graduate School of Business

Date..... 13 2 2025

Title: A Study of BYD's Profitability Based on DuPont Analysis
By: Wang Mengli
Degree: Master of Business Administration
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Advisor: Ma Yu
(Dr. Ma Yu)
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ABSTRACT

As an important basis for enterprise operation and development, profit maximization is an important driving force for enterprises to carry out business activities and to accomplish strategic goals. In the macro-environment of fierce competition, enterprises need to maintain long-term profitability in order to achieve long-term and stable development. Before the 21st century, the method of analyzing the profitability of enterprises is relatively single, and it is difficult to carry out a comprehensive and integrated examination and planning of the profitability of enterprises. As one of the world's leading manufacturers of new energy vehicles, Build you Dream (BYD)'s profitability remains stable and growth-oriented, and continues to lead in the industry competition. It helps managers to make objective decisions on corporate development strategies, and investors to evaluate corporate performance and make correct investment choices.

In order to explore how to improve the profitability of enterprises, this study took BYD as a case study and analyzed the influencing factors of profitability through financial statements. The study aimed to examine the impact of balance sheet, income statement, and cash flow statement on profitability.

This study is based on the theory of performance evaluation and management, using the qualitative research method to analyse the data based on the DuPont Analysis. The annual reports of listed companies, the balance sheet, income statement, and cash flow statement for 2019-2022 were successfully collected and analysed. The results of the study show that; 1) The solvency capacity under the balance sheet has an impact on the profitability of the enterprise; 2) The operating capacity under the joint influence of the income statement and balance sheet has an impact on the profitability of the enterprise; 3) The net increase in cash and cash equivalents in the statement of cash flows has an impact on profitability. Based on the findings of the study, recommendations include strengthening accounts payable operational capacity, improving accounts receivable operations and enhancing debt-servicing capacity.

Keywords: DuPont analysis, profitability, BYD Company

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Wang Mengli

Declaration

I, Wang Mengli, hereby certify that the work embodied in this independent study entitled “A Study of BYD's Profitability Based on DuPont Analysis” is a result of original research and has not been submitted for a higher degree to any other university or institution.

(Wang Mengli)
Sept 1, 2024

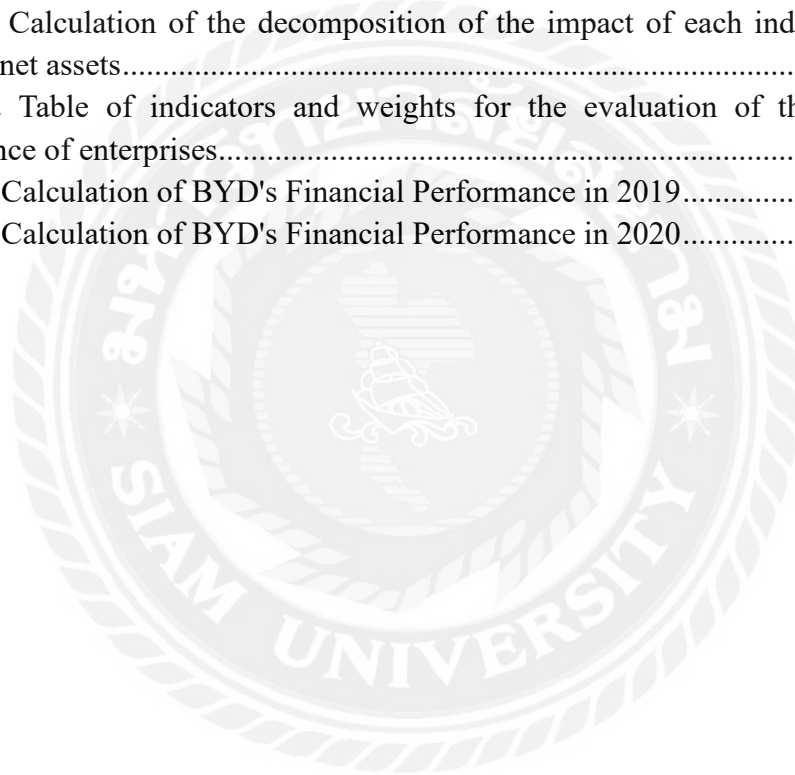


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Chapter 1 Introduction

1.1 Background of the Study

In recent years, the United States Enron, General Motors, Lehman Brothers and other large international companies are frequently exposed to financial scandals and even bankruptcy, shocking the world. Domestically, there are also financial fraud incidents such as Qiongminyinuan, Yinguangxia, Zheng Baiwen, Lantian shares, etc., which have caused great shocks to the accounting profession and made people think deeply. How to correctly evaluate the operating performance of listed companies to assist in making scientific and reasonable decisions has always been a topic of concern for corporate stakeholders (Gao, 2018).

The stakeholders of the enterprise include not only shareholders, but also creditors, employees, suppliers and the government. New energy vehicles are a popular investment in recent years, the financial performance status of the enterprise is the focus of attention (Li, 2019). Analysis of corporate profitability reveals problems in corporate development, good profitability is very important for the development of China's economy. The level of profitability depends on the capital structure of the enterprise, operational development and many other factors (Yang, 2022).

The real energy automobile industry is a raw industry compared to the ordinary fuel automobile industry, which requires a large amount of investment in infrastructure and research and development to ensure the sustainable development of the enterprise. Therefore, one of the keys to the success of an enterprise is the sustainable growth of profitability. It determines the economic foundation of the enterprise, only with high profitability can it afford high R & D funds and win a place in the market competition (Li, 2020). The strength of profitability is determined by past business decisions and strategic directions, and is also the basis for future strategy development. Through the analysis of profitability, it can predict the level of brand premium, capital operation ability, internal governance ability, and timely adjust the marketing model, capital structure, asset management model, and the ability to open up new sources of revenue and cut down on expenses, so it is necessary to analyze the profitability of the enterprise (Zhang, 2022).

Financial statements are the simplest, most direct, most effective and most formal path for outsiders to understand a company. Investors read the annual report to understand the profitability of the enterprise, business status and future trends, and then weigh the return on investment and risk; creditors read the annual report to analyze the solvency of the enterprise, assess the risk of recovery of receivables; suppliers with the help of the company's annual report published by the company's operations and financial situation can have a systematic understanding of the company, in order to determine what kind of strategic cooperation should be provided; customers read the annual report to evaluate the company's ability to continue to supply, in order to decide whether to

sign a long-term supply contract with the company. Customers read the annual report to evaluate the company's ability to continue to supply, in order to decide whether to sign a long-term supply contract with the company. The same annual report will be interpreted from different perspectives by various stakeholders to reach their own conclusions (Gao, 2012).

For an enterprise to survive and grow sustainably over the long term, the strength of its overall profitability is key. This ability reflects the strength of an enterprise's ability to generate profits from the market and increase shareholders' wealth, and is of great significance to shareholders, management and other stakeholders. The level of consolidated profitability determines the size of the final operating results of the enterprise and is an important criterion for measuring how well the enterprise is doing. Therefore, no matter from which point of view, enterprises should conduct a systematic evaluation and exploration of comprehensive profitability. For shareholders, an accurate and in-depth understanding of the profitability of an enterprise can provide a clear perception of the return on their investment. For the management of the enterprise, with the accurate evaluation of the comprehensive profitability, it can effectively carry out the target assignment and performance appraisal for the internal organization of the enterprise, summarize and absorb the lessons learned in time, with a view to further improving the profitability of the enterprise and improving the operation situation. For employees, the stable and sustainable profitability of the enterprise is the fundamental guarantee for the survival and development of all employees (Ren, 2020).

When analyzing the overall financial situation of an enterprise, it is important to have a full understanding of the factors inherent in the enterprise's financial situation and their interrelationships in order to systematically understand the enterprise's financial situation. The DuPont analysis is to utilize the relationship between several major financial indicators to carry out a comprehensive analysis of the enterprise's financial situation. In the current economic context, in-depth research and exploration of the DuPont analysis system can help create greater value for the operation of enterprises. Enhance the profitability of the enterprise and play a decisive role in the future survival and development of the enterprise (Li, 2022).

BYD, as a leading company in the field of new energy vehicles, has been expanding and maintaining its leading position in the industry. To continue to improve the competitiveness and long-term sustainable development of the company, a healthy financial status is a prerequisite. It provides a basis for management decision-making through in-depth analysis of the company's financial situation, which can evaluate the company's profitability, solvency, development ability, operating ability and other key indicators, helping management identify problems in a timely manner, formulate effective business strategies, optimize resource allocation and reduce risks. This study analyzes BYD's profitability based on DuPont analysis system.

1.2 Problems of the Study

The purpose of financial analysis is to comprehensively, accurately and objectively reveal and disclose an enterprise's financial position and operating results, and to make a reasonable assessment of the strengths and weaknesses of the enterprise's economic performance. Obviously, just by measuring a few simple and isolated financial ratios, or stacking some financial analysis indicators together and examining them without any connection with each other, it is impossible to draw reasonable and correct comprehensive conclusions, and sometimes even the opposite conclusions will be drawn. Therefore, only by taking the return on net assets as the starting point, taking the net interest rate on total assets and the equity multiplier as the basis, focusing on revealing the influence of the profitability of the enterprise and the equity multiplier on the return on net assets, as well as the mutual influence and role of the relationship between the relevant indicators, forming a complete set of systems, cooperating with each other, and making a comprehensive evaluation, can we grasp the strengths and weaknesses of the enterprise's financial condition and operation in general.

The financial statements of a company can visualize the financial status and operating results of the enterprise, which is an important basis for stakeholders to make decisions. However, it is one-sided to judge the strength or weakness of a company's operation only by the increase or decrease of absolute numbers in the financial statements. Therefore, when analyzing the operating conditions of an enterprise, it usually adopts the composition ratio, efficiency ratio and related ratio to analyze, and through the vertical comparison of the increase and decrease of financial ratios, so as to arrive at the strengths and weaknesses of the enterprise's operating conditions in a certain period of time. In this study, BYD's profitability, operating ability, solvency, development ability and cash flow are selected as five important indicators to systematically analyze the company's operating conditions, and to lay the foundation for an in-depth analysis of BYD's financial performance evaluation under the perspective of performance evaluation theory in the following section.

Based on BYD's financial statements and other information materials, this study adopts the DuPont analysis and financial performance evaluation to analyze BYD's financial status and operation, reflecting the development trend of the enterprise in the process of operation, to ensure that the enterprise achieves economic benefits while realizing a harmonious win-win situation, and to promote BYD's sustained and healthy development amidst the fierce market competition.

1.3 Objectives of the Study

In the financial and fiscal management system, the balance sheet, income statement and cash flow statement are collectively referred to as the financial statements of an enterprise, which are the basis for auditing and statistical work. The balance sheet demonstrates the assets, liabilities and owner's equity of an enterprise at a specific point in time, reflecting the financial position of the enterprise, the income statement records the revenues, expenses and net profits of an enterprise during a certain period, revealing

the profitability of the enterprise, and the cash flow statement displays the cash flow of the enterprise in its operating, investing and financing activities, providing a comprehensive view of the enterprise's cash management and financial health. Based on this, this study presents the following research objectives:

- 1) To examine the impact of balance sheet indicators on profitability.
- 2) To examine the impact of income statement indicators on profitability.
- 3) To examine the impact of cash flow statement indicators on profitability.

1.4 Significance of the Study

1.4.1 Theoretical Significance

The DuPont analysis has certain limitations, may not be able to objectively measure the actual financial situation of the enterprise, the main basis of the analysis system is the balance sheet and income statement, and these two statements are easy to be artificially modified, and in the DuPont analysis system on the basis of the analysis of the statement of cash flows, which to a certain extent to make up for the limitations of the statement of cash flows in the data is based on the cash cash realization system, which It shows that its data is more real and reliable (Dai, 2022).

Due to the diversification of business operations, so that the traditional financial performance evaluation methods can not meet the needs of modern enterprises, though the more widely used financial performance evaluation methods have their own advantages and disadvantages. After analyzing the advantages and disadvantages and the scope of application of each evaluation method, the researcher implements the Wall scoring method to construct the financial performance evaluation system and apply the constructed evaluation system to the enterprise financial performance evaluation. Compared with other evaluation methods, it can be used to analyze the financial performance of an enterprise comprehensively after linking individual and irrelevant financial data to form a correlation relationship. Although the Wall scoring method has strong operability, the selection of financial indicators is flexible, and the results are not uniform among industries, so it is necessary to select appropriate indicators according to the actual development characteristics of the industry: at the same time, in order to guarantee the accuracy of the evaluation results, it is necessary to make further improvements in the calculation method. Therefore, in order to supplement the theoretical basis of the Wall scoring method and the financial performance evaluation system of the automobile industry, this study selects the financial indicators suitable for the automobile industry, and constructs the performance evaluation system after improving the Wall scoring method (Zhao, 2021).

When analyzing BYD's profitability, this study takes the DuPont analysis system as a basis, analyzes the comprehensive cash flow statement, and evaluates the results as a way to analyze BYD's profitability, and therefore complements the existing theory of the DuPont analysis to a certain extent, and provides a reference for subsequent scholars to study the financial situation and profitability of the new energy automobile industry.

1.4.2 Practical significance

For investors, the strength of the enterprise's profitability directly determines the investors' investment intention, because dividend distribution is inseparable from the enterprise's profitability. Constructing a reasonable profitability evaluation system helps investors make more accurate judgments, grasp the overall profitability of the target enterprise, development prospects, compare the strength of the profitability level of enterprises of the same type of operation, and ultimately determine the target of investment (Wan, 2022).

For enterprises, profitability is the most important measure of an enterprise, reflecting its operating ability, profitability, and ability to reduce costs. A scientific evaluation of the profitability of new energy automobile enterprises can accurately reflect the level of profit earned by an enterprise in a certain period of time, which in turn provides practical guidance for enterprise managers and administrators to identify problems, solve problems, formulate plans and development strategies, and promote the vigorous and healthy development of the enterprise (Wan, 2022).

From the practical point of view, financial performance and enterprise operation affect each other, and the level of financial performance can reflect the good or bad situation of enterprise operation. Enhancing the level of enterprise financial performance can help enterprises to find out the operational loopholes and advantages in a timely manner, and provide decision makers with data and information on the use of funds, resource allocation, investment and financing management and other decisions. Constructing a scientific and comprehensive financial performance evaluation system is conducive to improving the deficiencies of the original financial performance evaluation, and has more practical value for enterprises (Zhao, 2021).

By analyzing BYD's financial statements, we can see the company's strengths and weaknesses from a third-party perspective, so that the general shareholders can understand the story behind the company's financial report, and the regulators can understand the information comprehensively, and then do a good job of macro-control. Meanwhile, it is hoped that the all-round analysis and research of financial indicators, combined with the development trend of the new energy automobile industry to put forward reasonable suggestions, can provide valuable reference for the development of BYD.

1.5 Limitation of the Study

This study took BYD, a representative company in the new energy industry, as a case study and applied the DuPont analysis to study its profitability. However, since the relevant information in this paper comes from the annual financial statements disclosed to the public by the company, which are external to the company, and lacks BYD's internal data, it is difficult to analyze them further to some extent, and some of them cannot be quantified and do not exist in the financial statements.

Chapter 2 Literature Review

2.1 Introduction

Profitability is related to the excellent business condition of an enterprise, and various scholars have pointed out the importance of profitability to an enterprise and its relationship with the competitiveness of an enterprise. Profitability is affected by many factors and the external environment. This study mainly analyzes the internal financial status of enterprises.

In the process of reviewing the literature, it was found that previous scholars have applied the DuPont financial analysis system to many industries, but relatively few studies have been conducted on the new energy industry. This study applies the DuPont financial system to analyze the profitability of BYD Company Limited and provides optimization suggestions for the company. As one of China's new energy listed companies, BYD Co., Ltd. has a long history of development and has accumulated a certain degree of corporate strength, but nowadays there are international new energy automobile manufacturing giants in the front, followed by national newcomers and dark horses, so the competitive strength of the company is a concern if it wants to maintain its leading position in the industry. This study offers suggestions to enhance the competitiveness of BYD Co., Ltd. and gives the entire new energy industry a certain reference value.

2.2 Literature Review

2.2.1 DuPont Analysis

The DuPont analysis was proposed by Pierre DuPont and Donaldson Brown in the United States, aiming to utilize the relationship between financial ratios to measure the financial structure of the enterprise, with a focus on breaking down the return on net assets step by step into a number of financial ratios multiplied by a number of products, to see the enterprise's operating performance more thoroughly (Shoukuo Liu.2022). The DuPont analysis is a financial analysis method, mainly using the interconnection of various financial ratios to analyze the financial position of the enterprise. The main idea is to start from the company's return on net assets, expand it, and then expand it again for each financial ratio, to find the potential correlation between the ratio and the enterprise's efficiency, which is a basic method of evaluating the company's performance (Cui, 2023).

The DuPont analysis is based on the return on net assets and covers four key aspects of financial analysis: solvency, operating capacity, profitability and growth capacity. This method is not only rooted in the core indicators of financial statements, but also connects daily accounting with financial analysis, enabling even those who lack specialized accounting knowledge to draw broadly accurate financial assessment conclusions through this tool (Yan, 2022).

The American DuPont Company first proposed the DuPont analysis method in 1910, which centers on the return on net assets, uses the intrinsic relationship between the basic financial ratio indicators, establishes a set of systematic comprehensive model, and after the indicators are refined and decomposed, it carries out a comprehensive analysis of the factors affecting the financial objectives of the enterprise (Gao, 2019).

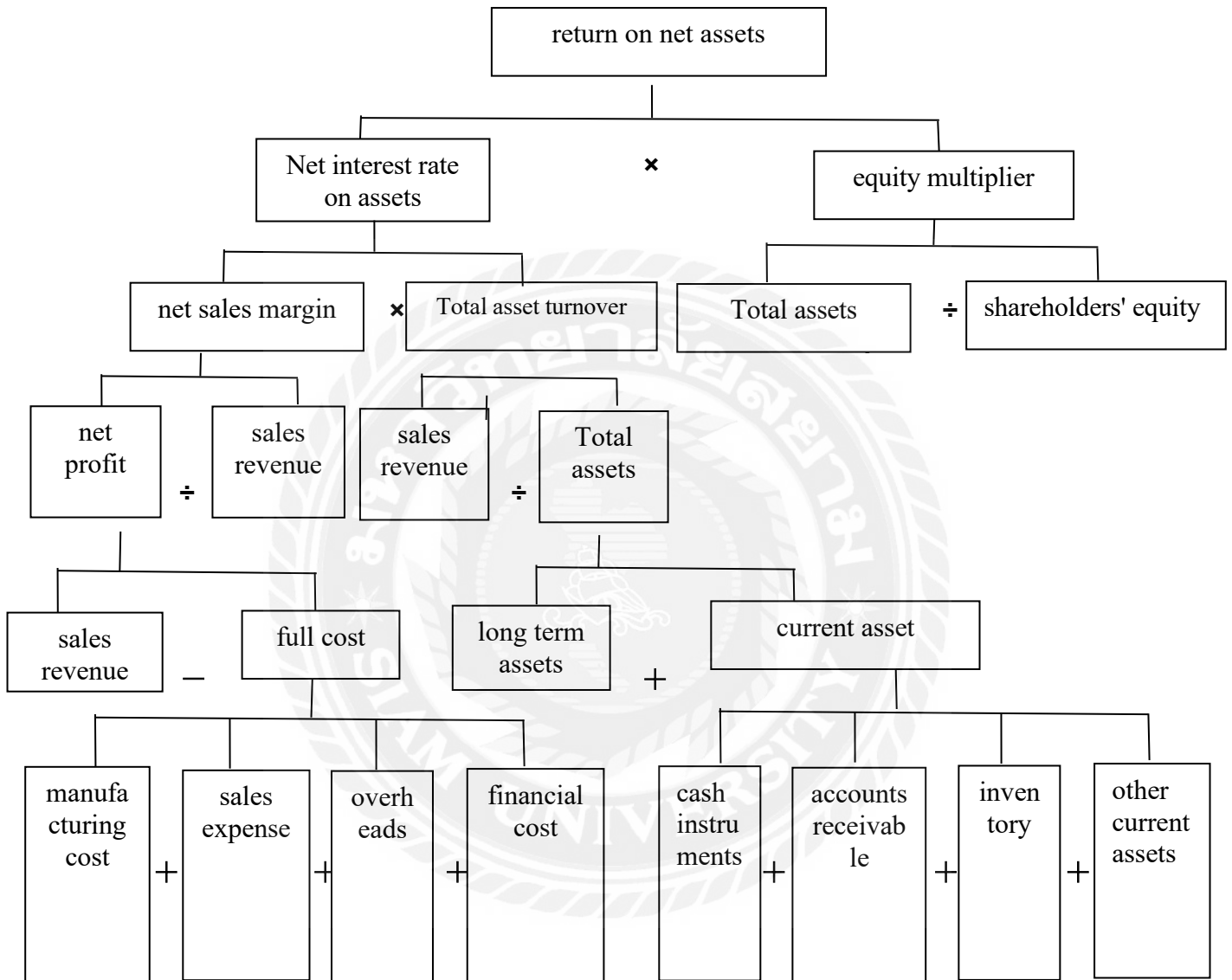


Figure 2.1 DuPont Analytical Framework

2.2.2 Profitability

Profitability refers to the ability of an enterprise to generate economic benefits, as reflected by the quantity and quality of an operating activity at any given time horizon. It measures a company's ability to market, realize assets and control costs. Secondly, the quality of profitability is determined by past business decisions and strategic approaches, and provides a basis for future strategy development. Through the analysis, it can predict the level of brand premium, the level of security of capital operation, the internal governance ability, the quality of operation and timely adjustment and control of

marketing mode, asset capital structure, asset management ability, cost and expense cost-saving ability (Zhang, 2022). Profitability is the ability to obtain profits. Profit is usually the embodiment of the business results of the enterprise, is the total revenue minus the total cost of the residual value. In practice, the specific performance of profitability is the size of the amount of income obtained by the enterprise in a certain period of time based on revenue and cost (Jiang, 2020).

The main factors affecting the profitability of enterprises: first, unreasonable capital structure control, for example, improper control of the ratio of short-term liabilities and long-term liabilities, the existence of a high level of debt capital with a low level of utilization, which affects the operating performance of the enterprise as well as its profitability. Secondly, improper management of accounts receivable and inventory, no scientific formulation of the enterprise's business decisions, which leads to the inventory occupies a large amount of funds, the proportion of accounts receivable is high, and the speed of payback is slow, which affects the liquidity of the assets as well as the normal turnover of the enterprise's capital chain. Thirdly, the market competitiveness is not strong, there are many problems in the internal management of the enterprise, or improper cost control, etc., which affects the sales revenue of the enterprise (Wang, 2020). Total asset turnover, inventory turnover, accounts receivable turnover, net sales margin, cost and expense margin are important indicators to analyze the profitability of the enterprise (Chen, 2019).

Profitability reflects the ability of an enterprise to make profits throughout the production and operation process, and is an important support for the sustainable development of the enterprise. The stronger the profitability, the greater the return on investment to shareholders, the more investors can be attracted, which is the cornerstone of the enterprise's healthy development in the future (Ren, 2020). The most important business objective of the enterprise is profitability, which is not only closely related to the return on investment of the owners of the enterprise, but also an important guarantee for the repayment of liabilities of the enterprise. The better the operation of the enterprise, the stronger the profitability of the enterprise (Li, 2022).

2.2.3 Chain of Substitution

The chain of substitution method can be simply understood as a calculation method used to determine the extent to which changes in individual factors affect an indicator when analyzing an economic activity. The use of this methodology in the analysis of an activity requires that an indicator and its constituent factors form an algebraic equation, i.e., that several constituent factors drive the indicator in a combined manner. When determining the extent to which a change in one factor affects an indicator, the value of the indicator is calculated assuming that the other factors remain constant. The value of the indicator is calculated by replacing the factors one by one in a certain order. Ultimately, the difference between the latter and the former between the equations will yield the magnitude of the impact of changes in each factor on the indicator (Ren, 2020).

The chain substitution method is a core method under the index factor analysis method, the main factors affecting the company are identified first, and then according to the chain substitution method, these influencing factors change the calculation position one by one in a certain reasonable order, and the final influencing factors are found under the calculation again and again (Cui, 2023). The chain substitution method is a commonly used analytical measure in factor analysis method, assuming that a factor changes and other factors remain unchanged under the condition of chain substitution calculation, to get the degree of influence of the change of each factor on the change of the indicator (Yan, 2019).

The calculation principle of the chain substitution method is as follows:

Assuming that the indicator N is obtained by multiplying the three indicators a, b and c, the analysis is as follows:

Base period N: $N = a \times b \times c$

Reporting period N' : $N' = a' \times b' \times c'$

First substitution: $N1 = a' \times b \times c$

Second substitution: $N2 = a' \times b' \times c$

Third substitution: $N3 = a' \times b' \times c'$

a The value of the effect of the factor change on the result: $N_a = N1 - N$

b Value of the effect of the factor change on the result: $N_b = N2 - N1$

c Influence of factor change on the result: $N_c = N3 - N2$

(Yang, 2019).

2.2.4 BYD company

BYD Company Limited (hereinafter referred to as "BYD") was founded in 1995 and listed on the Shenzhen Main Board in 2011 under the stock code 002594, with its head office located in Shenzhen, Guangdong Province. BYD is a high-tech enterprise dedicated to "meeting people's aspirations for a better life with technological innovation". BYD was founded in February 1995, and after more than 20 years of rapid development has set up more than 30 industrial parks around the world, to realize the strategic layout of the world's six continents. BYD's business layout covers electronics, automotive, new energy and rail transportation, and plays a pivotal role in these areas, from energy acquisition, storage, and then application, all-round construction of zero-emission new energy overall solutions.

BYD is mainly engaged in the automobile business, cell phone components and assembly business, secondary rechargeable battery and photovoltaic business, mainly focusing on new energy vehicles, as well as actively expanding the urban rail transit business by utilizing its own technological advantages. As a pioneer and leader in the global new energy automobile industry, the Group has established its leading position in the global new energy automobile industry and accelerated the process of transformation and upgrading of the global automobile industry by virtue of its strong technological accumulations in the fields of power batteries, electric motors and

electronic controls, and by building up its long-term and sustainable core competitive advantages through continuous technological innovations.

2.3 Research Relevant

2.3.1 Financial Analysis

Financial analysis is based on accounting and financial statements and other relevant information, using a series of analytical techniques and methods to analyze and evaluate the solvency, development ability, profitability and operating capacity of the enterprise's past and present financing activities, investment activities, operating activities, etc., in order to provide a basis for the evaluation of the current situation of the enterprise for the enterprise's investors, creditors, operators, and other organizations or individuals who care about the enterprise, Predict the future of the enterprise, and provide the basis for stakeholders to make correct decisions (Zhang, 2007).

With the rapid development of the times, the impact of financial information on China's economic development and social construction is also growing, the application of financial analysis theory has become more and more extensive, may have an impact on the theory of financial analysis of the elements are also more and more. First, the principle of financial analysis, the principle of financial analysis is a brief description of financial analysis, this part is mainly used to analyze accounting ratios and analyze the financial introduction. Secondly, financial analysis practice, this work is combined with the actual needs of financial analysis, on the analysis of the main body and the analysis of the target point of view to start, mainly contains the following content: combined with the financial analysis of the financial markets; combined with the decision-making support of financial analysis; combined with the management and control of financial analysis and combined with the financial analysis of the stakeholders. Finally, the topic of financial analysis, this work is the special elements of the current financial analysis activities as the main body of the financial analysis based on the consolidated statements, such elements can be mapped out in the special circumstances of the reliability of the enterprise's financial analysis and the problems it faces (Gao, 2020).

2.3.2 Cash Flow Theory

At the beginning of the 20th century, cash flow theory was first mentioned in the beginning of the British accountant T-A-Lee that cash flow can reflect the enterprise in a certain period of cash flow situation, the impact of external factors on cash flow activities is very small, and the feasibility of manipulation of external factors on the implementation of cash flow activities is also very small. After this theory was put forward, the accounting profession launched a further study of the cash flow theory, the study found that cash flow can reflect the authenticity of the enterprise financial data, but also to help the users of financial reports to determine the profitability of the enterprise as well as the operating conditions, and the applicability of the enterprise's management policy to make a correct judgment. In 1986, some scholars in the United States put forward the financial concept of free cash flow, on the basis of cash flow theory, the study of the enterprise's freely disposable and real surplus cash flow, this

study strengthens the authenticity, openness and symmetry of the enterprise's financial data (Jin, 2023).

Most of the financial data involved in daily corporate financial analysis, including DuPont analysis, come from the balance sheet and income statement, which, as we all know, are easy to create convenient conditions for enterprises to fabricate profits, in other words, enterprises may embellish their statements for reasons of interest, so the "quality" of their profits cannot be accurately reflected. The cash flow statement is based on the cash basis of accounting, which means that the cash flow statement records the actual cash received and spent, so it is very unlikely that the enterprise can manipulate the cash flow statement. Therefore, the introduction of cash flow in the DuPont analysis system is a certain necessity, based on the cash flow statement can analyze the actual profitability of the enterprise quality, the main purpose of the existence of the enterprise is to make profits, and the cash flow can be the most real and direct reflection of the enterprise to get the profitability of the situation.

2.3.3 Performance Evaluation Theory

One of the pioneers of comprehensive corporate financial analysis was Alexander Wall. In the early 20th century "Credit Barometer Study" and "Financial Statement Ratio Analysis" put forward the concept of credit capacity index, known as the Wall scoring method. Seven financial indicators are selected, weights are assigned, standard values are selected, scores for each indicator are calculated, and the composite score is summarized. Among the performance evaluation methods, the Wall scoring method is more comprehensive in its evaluation and can provide a comprehensive evaluation of enterprise performance (Zhao, 2022).

The Wall scoring method integrates the various indicators of the enterprise, sets the weights of the indicators based on the consideration of the development strategy and importance of the enterprise, selects the standard values according to the research objectives, and calculates the various scores and the overall score through a specific formula. Comparing the scores and overall scores with the size of standard values, the enterprises are judged to be ranked in the same industry, in terms of various capabilities and comprehensive financial performance. (Cheng, 2017).

2.4 Conceptual Framework

This study aims to comprehensively analyse the factors affecting BYD's profitability under the DuPont analysis system, based on the performance evaluation theory and the cash flow theory, and evaluate BYD's financial performance by analyzing the issues of the company's solvency, operating ability, development ability, profitability, and ability to obtain cash, combined with the comprehensive performance evaluation indexes of the automobile industry. The purpose is to improve the profitability of the company and help managers, investors and other stakeholders understand the financial health of the company so that they can make more informed decisions.

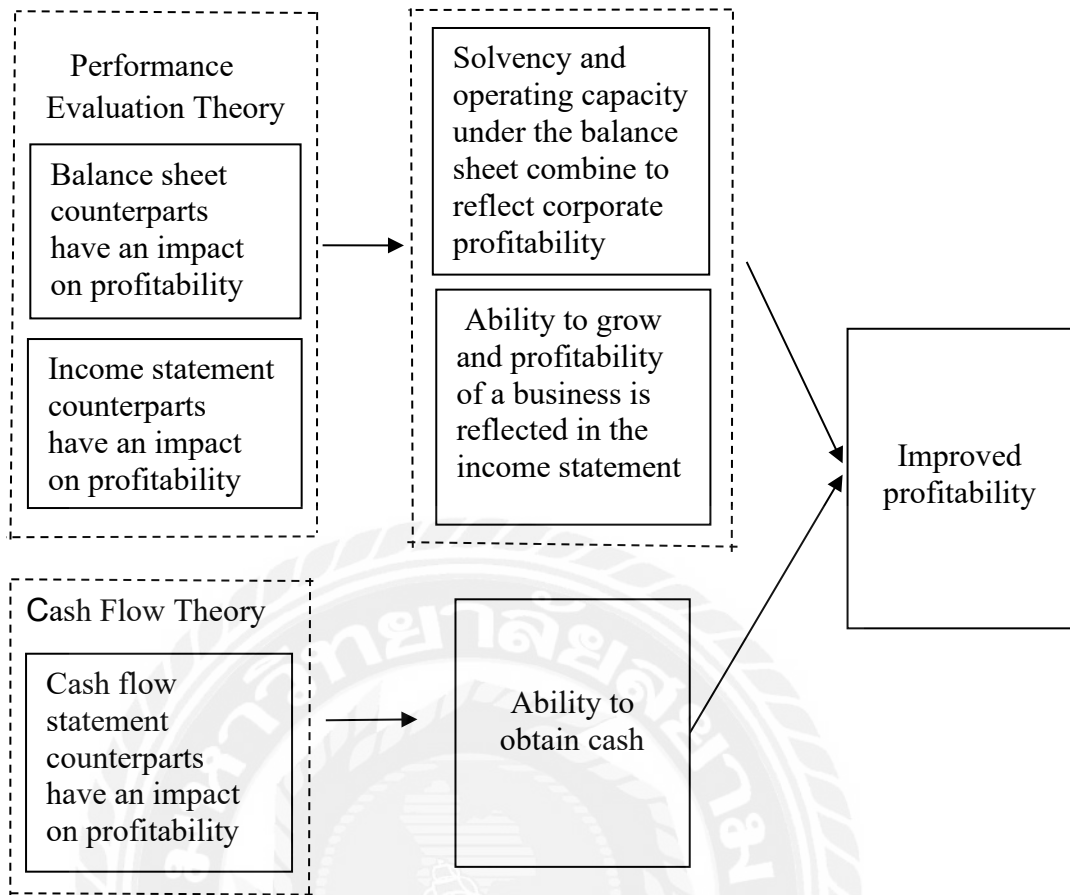


Figure 2.2 Conceptual Framework

Chapter 3 Research Methodology

3.1 Research Design

Qualitative research method was used in this study by collecting and analyzing the data related to BYD's balance sheet, income statement and cash flow statement from 2019 to 2022, based on the return on net assets, and focusing on revealing the impact of solvency, profitability, operating ability, development ability, and cash flow on the enterprise. The Wall Scoring System was used in analyzing the data.

3.2 Research Process

1) Gain a comprehensive understanding of the wide range of applications of DuPont's analytical methods in finance and trends in related research. 2) Study literature covering the fundamentals of DuPont analysis, including the return on net worth decomposition model and its derived financial indicators such as net sales margin, total asset turnover and equity multiplier. 3) Observe the application of existing studies to different industries, firm sizes and regions, as well as the perceived value of DuPont analysis in financial management, investment decision-making and performance evaluation.

The financial data of BYD from 2019 to 2022 were collected, including financial analysis reports, annual reports, and information from suppliers and buyers. These data were obtained through the Shenzhen Stock Exchange, Hong Kong Stock Exchange, and Oriental Wealth Network. Key financial data such as BYD's balance sheet, income statement and cash flow statement were found in these financial reports. More financial information and analysis about BYD Company were obtained by reviewing financial analysts' research reports and industry analysis materials. In addition, more information about BYD's business and industry development was referred to the company's annual audit report.

Combining the DuPont analysis system and the chain substitution method, the researcher selected the basic financial data that needed to be involved in the calculation of the indicators from the company's balance sheet, income statement and cash flow statement. The study analyzed the financial indicators obtained from the calculations, on the trend of the changes in the indicators and the factors affecting them, and the changes in the key indicators of the company's asset utilization efficiency, profitability, and financial leverage. The researcher also analyzed the reasons for these changes. By breaking down the influencing factors of each indicator and comparing the financial status of different companies, the study comprehensively assessed the company's profitability, identified its strengths and weaknesses, and put forward targeted recommendations for improvement, which will help the company to make strategic decisions and improve its performance level.

Based on the results of data analysis, the profitability of BYD was evaluated using the Wall Score method, which is oriented to the purpose of the study and points out the problems faced by the company. Finally, recommendations are made for the study of this paper in order to continue the profitability.

3.3 Data Collection

3.3.1 BYD's Key Metrics Financials 2019-2022

According to the DuPont analysis system in Figure 2.1, it can be seen that after the layer-by-layer decomposition, the data that ultimately affect the DuPont analysis are all costs, total assets, sales revenue, and owner's equity. These data mainly come from the balance sheet and income statement in the three major statements, so when collecting data, the key financial indicators related to DuPont analysis are mainly selected in Table 1. The data collection mainly comes from the annual report of BYD Company Limited for 2019-2022, in which the financial statements have been audited and approved by Ernst & Young Hua Ming Accounting Firm (Special General Partnership), and are available for viewing in the regular reports in the information disclosure in the Shenzhen Stock Exchange.

Table 3.1 Key Financial Indicators of BYD Balance Sheet and Income Statement, 2019-2022

Financial Indicators	2019	2020	2021	2022
Total asset	195.6 billion	201 billion	295.8 billion	493.9 billion
Total liabilities	133 billion	136.6 billion	191.5 billion	372.5 billion
Total shareholders' equity	62.6 billion	64.45 billion	104.2 billion	121.4 billion
Total revenue	127.7 billion	156.6 billion	216.1 billion	424.1 billion
Total operating costs	125.6 billion	149 billion	212.6 billion	401.2 billion
Business costs	106.9 billion	126.3 billion	188 billion	351.8 billion
R&D costs	5,629 million	7,465 million	7,991 million	18.65 billion
Business taxes and surcharges	1,561 million	2,154 million	3,035 million	7,267 million
Sales expense	4,346 million	5,056 million	6,082 million	15.06 billion
Overhead	4,141 million	4,321 million	5.71 billion	10.01 billion
Financial cost	3,014 million	3,763 million	1,787 million	-1,618 million
Net profit	2,119 million	6,014 million	3,967 million	17.71 billion

Source: Audited and publicly available corporate annual reports

BYD's financial data show that from 2019 to 2022, total assets show a continuous growth trend from 195.6 billion yuan to 493.9 billion yuan, which reflects the continued expansion of the company's business scale and the appreciation of its asset value; at the same time, total liabilities show a year-on-year increase from 133 billion yuan to 372.5 billion yuan, which indicates the company's expansion of its business and investment. However, the increase in total shareholders' equity was slightly lower than that of total liabilities, which may indicate that the company relied on more external financing in the process of expansion. Taken together, the growth in assets indicates the company's rapid business development, but the growth in liabilities is also a reminder of the need to carefully manage risks and maintain a balanced asset-liability structure to ensure sound long-term development.

BYD's financial data over the past four years show a continuous growth trend. Total operating revenue, total operating costs and operating costs increased from \$127.7 billion to \$424.1 billion, \$125.6 billion to \$401.2 billion and \$106.9 billion to \$351.8 billion from 2019 to 2022, respectively. This indicates the expansion of the Company's business scale, but also the challenge of increasing cost pressures. Research and development expenses, selling expenses and administrative expenses have also been increasing year on year, especially research and development expenses which have increased significantly to \$18.65 billion in 2022, reflecting the company's increased investment in technological innovation and market expansion. However, finance costs are negative in 2022, possibly reflecting the company's progress in financial optimisation. Most importantly, net profit also showed a significant increase, from \$2.119 billion to \$17.71 billion, indicating a significant improvement in the company's profitability, possibly due to the combined effects of business scale expansion, cost control and efficiency improvement. These figures show that BYD Company has achieved rapid growth and improved profitability over the past few years, but it also needs to pay close attention to cost management and financial risks.

3.3.2 BYD Statement of Cash Flows 2019-2022

According to the theory of cash flow analysis, the main indicators commonly used when analysing the statement of cash flows include net cash flows from operating activities, net cash flows from investing activities, net cash flows from financing activities and net increase in cash and cash equivalents. These indicators can comprehensively reflect the cash flows of enterprises in operating, investing and financing activities. The data collection mainly comes from the annual report of BYD Company Limited for 2019-2022, in which the financial statements have been audited and approved by Ernst & Young Hua Ming Accounting Firm (Special General Partnership), and are available for viewing in the regular reports in the information disclosure in the Shenzhen Stock Exchange.

Table 3.2 BYD Cash Flow Statement Key Financial Indicators 2019-2022

Financial Indicators	2019	2020	2021	2022
Cash inflow from operating activities	113.7 billion	148.7 billion	213.4 billion	441.4 billion
Cash outflows from operating activities	98.98 billion	103.3 billion	148 billion	300.5 billion
Net cash flows from operating activities	14.74 billion	45.39 billion	65.47 billion	140.8 billion
Cash inflows from investing activities	2,401 million	18.82 billion	12.72 billion	13.31 billion
Cash outflows from investing activities	23.28 billion	33.26 billion	58.13 billion	133.9 billion
Net cash flows from investing activities	-20.88 billion	-14.44 billion	-45.40 billion	-120.6 billion
Cash inflows from financing activities	79.80 billion	45.43 billion	70.19 billion	31.18 billion
Cash outflows from financing activities	73.19 billion	74.34 billion	54.12 billion	50.66 billion
Net cash flows from financing activities	6,610 million	-28.91 billion	16.06 billion	-19.49 billion
Balance of cash and cash equivalents at end of period	11.67 billion	13.74 billion	49.82 billion	51.18 billion
Net increase in cash and cash equivalents	523.2 million	2,064 million	36.08 billion	1,363 million

Source: Audited and publicly available corporate annual reports

From the data in Table3.2, it can be seen that the net cash flow from operating activities is increasing year by year, and the net cash flow from investing activities has been negative in 4 years, and the company's income from investment is much lower than the expenditure, which indicates that the company is making a large amount of investment in fixed assets, production houses, equipment and so on. The trend of net cash flow from financing activities shows an M-curve with two highs and two lows, reaching the lowest point as of 2022, indicating that the company has been borrowing a lot of liabilities in recent years and the capital structure is unstable.

3.4 Data Analysis

3.4.1 Profitability analysis

Profitability is the ability of the enterprise to obtain profits, the relevant risk indicators calculation formula, the significance of the value is shown in Table 3.3

Table 3.3 Key indicators of profitability

Norm	Formula	Significance of the indicators
Net sales margin	$\text{Net Profit} \div \text{Operating Income} \times 100\%$	Indicators are positively correlated with corporate profitability
Net interest rate on total assets	$\text{Net profit} \div \text{Average total assets} \times 100\%$	The higher the indicator, the higher the utilization of the enterprise's assets and the higher the enterprise's profitability
Return on net assets	$\text{Net profit} \div \text{average owner's equity} \times 100\%$	The higher the indicator, the higher the profitability of the company

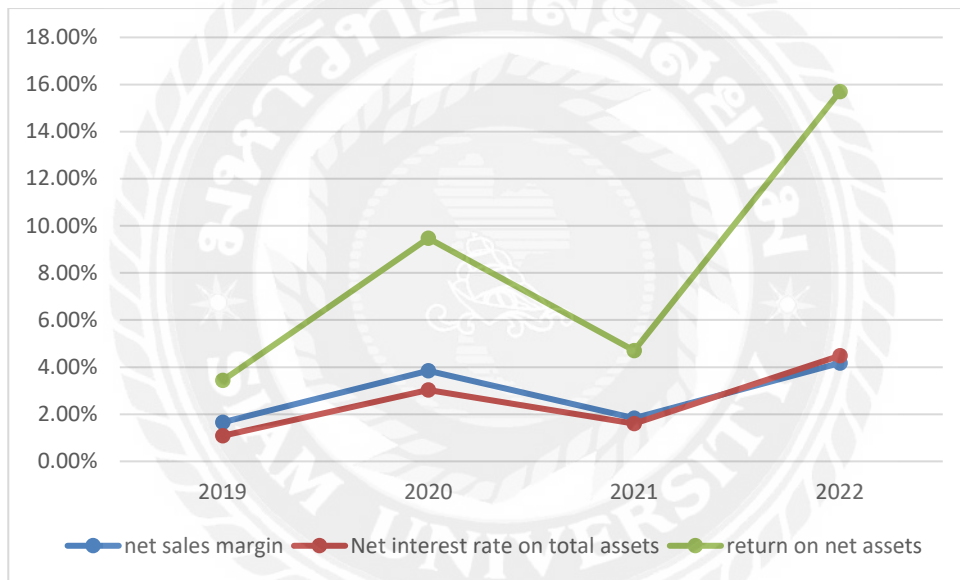


Figure 3.1: Profitability Analysis

Source: Audited and publicly available corporate annual reports

According to Figure 3.1, the return on net assets, net interest margin on total assets and net interest margin on sales have shown a year-on-year growth trend, especially in 2022, which shows a significant increase from 2.62%, 1.09% and 1.66% in 2019 to 16.14%, 4.49% and 4.18%, respectively. This indicates that the company has achieved significant improvement in terms of profitability. Meanwhile, the total asset turnover ratio also showed a year-on-year increase from 0.65 times to 1.07 times, which indicates that the company's asset utilization efficiency is gradually improving, and the turnover of operating income relative to total assets is accelerating, which is conducive to improving profitability. It is worth noting that the equity multiplier fluctuated during the period. ups and downs in the years 2019-2021, especially in 2021 when it declined to 2.84, which may reflect the company's adjustments in its capital structure or changes in the operation of funds. By 2022 the equity multiplier shoots up to 4.07, which implies

that the company used too much debt financing in that year, which may increase the financial leverage of the company and may intensify the pressure on debt servicing in the event of operational difficulties.

The net sales margin also shows significant fluctuation with an overall increasing trend from 1.66% in 2019 to 4.18% in 2022. This indicates that the company has achieved a high level of profitability in its business activities, especially in 2022, which has achieved significant growth, showing a strong improvement in its profitability. Reflecting BYD's growth and improved profitability in its sales operations, it provides a positive signal for the company's financial performance and future growth.

3.4.2 Solvency analysis

Solvency refers to the ability of an enterprise to repay the debt it owes. The analysis of solvency is conducive to the correct borrowing and lending decisions of creditors; to the correct investment decisions of investors; to the correct operational decisions of business operators; and to the correct evaluation of the financial situation of enterprises. Solvency related indicators, calculation formulas, and numerical significance are shown in Table 3.4, and BYD's solvency in 2019-2022 is shown in Figure 3. 2.

Table 3.4 Key indicators of solvency

Norm	Formula	Numerical significance
Current ratio	$=\text{Current assets} \div \text{Current liabilities} \times 100\%$	The higher the indicator, the higher the short-term solvency.
Gearing	$=\text{Total liabilities} \div \text{total assets} \times 100\%$	The higher the indicator, the weaker the short-term solvency.
Equity ratio	$=\text{Total liabilities} \div \text{Shareholders' equity}$	The higher the indicator, the higher the risk, which is inversely related to the solvency of the enterprise.

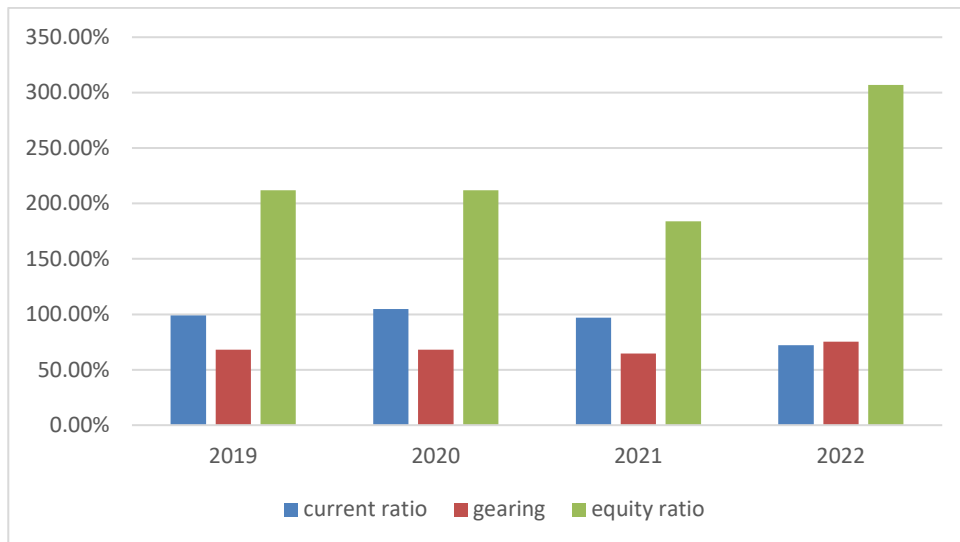


Figure 3.2: Solvency Analysis

Source space: Audited and publicly available corporate annual reports

In the past five years, the current ratio of BYD Company first increases and then decreases, but only in 2020 the current ratio is more than 1, which indicates that the current assets of the enterprise can meet the enterprise's capital requirements except for debt service in that year, but in 2021 the ratio decreases to 96.96%, and even to as low as 72.25% in 2022.

Figure 3.2 shows that the equity ratio is inversely proportional to the long-term solvency of the enterprise, and BYD's equity ratio and gearing ratio in 2019-2022 have been showing a rising trend, which indicates that BYD's financial structure is not sound, and the enterprise's ability to use its own funds for liabilities is poor, and the enterprise should adjust its financial structure and control the scale of liabilities in time to reduce financial risks.

Figure 3.2 data show that BYD's total assets and total liabilities have been growing continuously, which indicates that BYD has a tendency to expand its business scale and support the expansion through debt financing. Meanwhile, total owner's equity has been increasing year after year, indicating that BYD has increased its shareholders' equity through earnings and other means. BYD's gearing ratio does not change much from 2019 to 2020, basically remaining at around 68%. However, the gearing ratio decreased by 4 points in 2021 and increased significantly in 2022, which could mean that the company has increased its debt as it expands or engages in other financial activities. But higher gearing is usually accompanied by higher interest expenses, which can reduce a company's net income and free cash flow, and it is more vulnerable to operational volatility in a high-debt environment. If market conditions deteriorate, sales decline, or the company faces other operational challenges, high debt levels may make it more difficult to respond to these changes. Changes in the equity multiplier indicate a change in the relationship between assets and shareholders' equity, particularly the higher equity multiplier in 2022, suggesting that companies are more reliant on debt financing to expand their business.

3.4.3 Analysis of operating capacity

Operational capacity mainly refers to the efficiency of asset utilization and circulation. Generally speaking, the faster the speed of capital turnover, the higher the level of capital management of the enterprise, the higher the efficiency of capital utilization, and the enterprise can obtain more benefits with less inputs, therefore, the index of operating capacity is reflected by the relationship between inputs and outputs. The main risk indicators, calculation formulas and numerical significance of the operating capacity are shown in Table 3.5.

Table 3.5 Key indicators of operating capacity

Norm	Formula	Numerical significance
Accounts receivable turnover ratio	$=\text{Operating income} \div \text{average balance of accounts receivable} \times 100\%$	Indicators are positively correlated with the operational efficiency of firms
Inventory turnover	$=\text{Operating costs} \div \text{average inventory balance} \times 100\%$	The larger the indicator, the greater the sales and operational capacity of the enterprise
Current asset turnover ratio	$=\text{Operating income} \div \text{average balance of current assets} \times 100\%$	The larger the indicator, the more efficient the utilization of current assets
Total asset turnover	$=\text{Operating income} \div \text{average balance of total assets} \times 100\%$	The higher the indicator, the better the utilization of assets and the more effective the operation
Accounts payable turnover	$=\text{Operating costs} \div \text{average balance of accounts payable} \times 100\%$	Within a certain range, the lower the indicator, the better for the business

Table 3.6 Analysis of operating capacity indicators

Norm	2019	2020	2021	2022
Accounts receivable turnover ratio	2.74	3.68	5.58	11.3
Inventory turnover	4.84	5.23	5.69	6.55
Current asset turnover ratio	1.15	1.43	1.56	2.08
Accounts payable turnover	2.59	2.87	2.84	3.14
Total asset turnover	0.65	0.79	0.87	1.07

Source space: Audited and publicly available corporate annual reports.

Accounts receivable turnover ratio indicates the average number of times accounts receivable are converted into cash in a year, reflecting the speed of capital turnover. As can be seen from the above table, the accounts receivable turnover rate of BYD Company has continued to rise since 2019, indicating that the ability to pay back has been improving, but the side-by-side comparison seems to be much lower than SAIC

Group, probably because BYD Company has a larger amount of accounts receivable and longer credit period, which pulls down the accounts receivable turnover rate.

Inventory turnover rate reflects the turnover of funds invested in inventory from the input to the completion of the speed of sales. From the above table, we can see that BYD's inventory turnover rate is steadily increasing in the past five years, and the trend of change is not obvious. Combined with the study of inventory accounts in the accounting analysis, BYD's inventory amount has been climbing year by year, and its inventory turnover ratio is still steadily increasing, which indicates that the growth of its inventory amount is healthy. In the analysis of BYD's inventory composition can be seen, BYD inventory of each part of the amount has risen, but in terms of the proportion of only inventory goods appeared to decline, indicating that BYD does not have a large inventory pressure, but compared with other enterprises, BYD inventory turnover rate there is still room to rise.

The current asset turnover rate reflects the utilization efficiency of current assets. From the above table, the current asset turnover ratio of BYD has shown a significant upward trend in the past two years, and the current asset turnover ratio in 2022 has reached the highest in the past five years, which indicates that BYD's asset utilization efficiency has improved, and the management ability of the assets has been strengthened.

Accounts payable turnover ratio refers to the number of turnover times of accounts payable during the year, reflecting the degree of liquidity of the enterprise's accounts payable, and is an indicator reflecting the ability to pay current liabilities and the status of occupied suppliers' funds. The higher the accounts payable turnover rate, the less favorable the payment terms are, and the company is always pushing for the need to pay what it owes as soon as possible. All other things being equal, the lower the accounts payable turnover, the better. In the table, BYD's accounts payable turnover ratio in the last five years has shown a steady upward trend, indicating that BYD's suppliers' bargaining power has been increasing, which leads to the decreasing ability of BYD to be able to use its suppliers' funds, and that the upstream suppliers' negotiating power has increased, and the demand for quick payment back has been increased.

In the past four years, BYD reached the highest data in 2022, with operating income of 424.1 billion yuan, average total assets of 394.85 billion yuan, and total asset turnover ratio of 1.07. The operating income in 2022, compared with that in 2021, doubled its income. It shows that the multi-brand gradient layout constructed by the company relying on the continuous iteration and innovation of core technology and adhering to professional and personalized brands has been recognized by consumers. The scale of assets has been expanding and the efficiency of asset utilization has been improving, enabling more effective utilization of assets to generate sales revenue.

3.4.4 Development capacity analysis

Development capability mainly refers to the ability of the enterprise in terms of growth, expansion and innovation. The main indicators, calculation formula, and numerical significance of development capacity are shown in Table 7. BYD 2019-2022 development capacity indicators are analyzed as shown in Table 3.7.

Table 3.7 Key indicators of development capacity

Norm	Formula	Numerical significance
Operating profit growth rate	$\frac{\text{Increase in operating profit for the year}}{\text{Total operating profit for the previous year}} \times 100\%$	Indicators are positively correlated with the ability of companies to develop.
Net profit growth rate	$\frac{\text{Increase in net profit for the year}}{\text{Net profit for the previous year}} \times 100\%$	Indicators are positively correlated with the ability of companies to develop.

Table 3.8 Analysis of the development of operational capacity indicators

norm	2019	2020	2021	2022
Operating profit growth rate	-45.50%	206.49%	-34.63%	365.03%
Net profit growth rate	-40.41%	183.81%	-34.04%	346.43%

Source space: Audited and publicly available corporate annual reports.

According to Table 3.8, BYD's realized net profit from 2019 to 2022 is unstable, decreasing, then increasing and then decreasing, showing an M-shape, bottoming out at 2.119 billion yuan in 2019, rebounding to reach 6.014 billion yuan in 2020 and then decreasing to 3.967 billion yuan in 2021, which suggests that BYD has insufficient capacity for development.

3.4.5 Cash flow analysis

Cash flow analysis generally includes the structure of cash flow, liquidity, ability to obtain cash, financial flexibility and quality of earnings analysis, this study analyzes BYD's ability to obtain cash and quality of earnings.

Table 3.9 BYD's operating cash ratio

Norm	2019	2020	2021	2022
Net increase in cash and cash equivalents (billions)	5.23	20.64	360.8	13.63
Net cash flows from operating activities (billions)	147.4	453.9	654.7	1408
Operating income (billions)	1277	1566	2161	4241
Operating cash ratio	0.12	0.29	0.3	0.33

Source space: Audited and publicly available corporate annual reports.

From 2019 to 2022, the Company's net cash flows from operating activities show a significant growth trend, from \$14.74 billion to \$140.8 billion. Operating income grows from \$127.7 billion in 2019 to \$424.1 billion in 2022. The operating cash ratio also shows an overall upward trend, but the doubling of net cash flow from operating activities and operating income growth from 2021 to 2022, but the operating cash ratio is basically the same as in 2021, indicating that BYD's ability to obtain cash is weakening, and that although profits are made, no cash is received, and it may not be able to pay its suppliers in a timely manner due to insufficient cash flow, employees or debts, which could lead to liquidity difficulties.

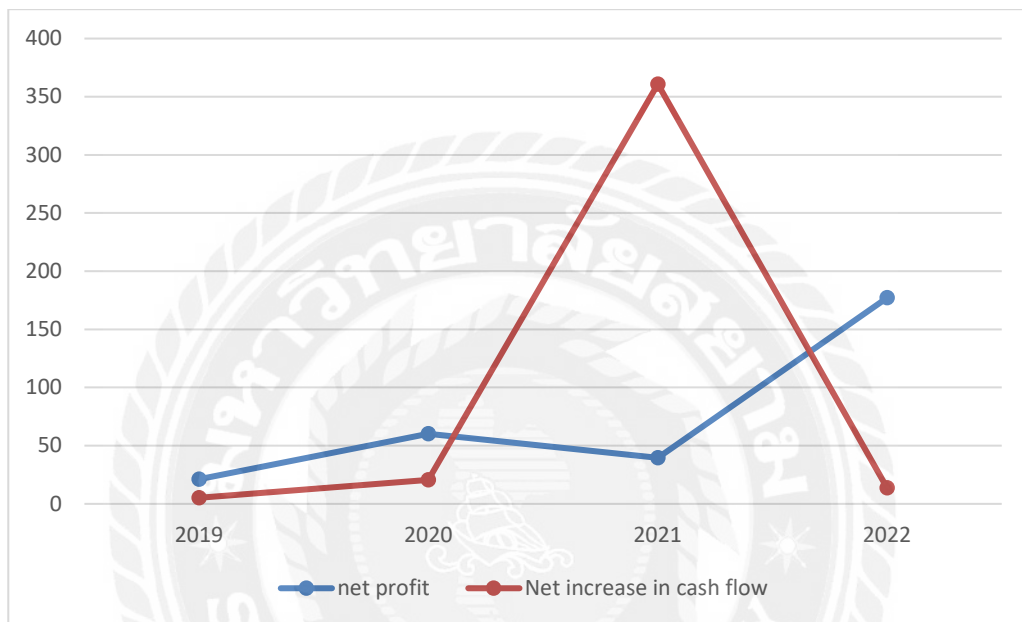


Figure 3.3 Trend of BYD's Net Profit, Net Increase in Cash Flow

Data source space: audited and publicized corporate annual reports

Figure 3.3 is the trend chart of BYD's net profit and net increase in cash flow comparison, net profit data from Table 1, net increase in cash flow from Table 2, according to Figure 4, we can see that BYD's net profit from 2019 to 2022 has been maintaining an upward trend, which shows that the company has a good profitability, but the net increase in cash flow in 2019 to 2020, although not fully recovered funds, but it also increases with the net profit year-on-year. By 2021 net profit reaches the lowest point in 4 years, but net increase in cash flow does reach the highest point in 4 years, creating two extremes, which, in addition to normal cash flow from operating activities, indicates that BYD receives the money owed by the previous payment for the goods in 2021 and realizes the return of funds, but the most important reason is because BYD carries out a large amount of fundraising in 2021, which reaches 23.7% of the cash inflow are from borrowed liabilities. By 2022, net profit is at its highest, but cash flow declines significantly.

Chapter 4 Results of the Study

4.1 Introduction

The previous chapter explores the core concepts of the DuPont financial analysis system and the key elements that break it down. This chapter focuses on BYD's annual financial statement data from 2019 to 2022 to further break down the DuPont analysis metrics, calculate and analyze the changes in these metrics, and identify the key factors affecting BYD in terms of profitability.

4.2 Key drivers of profitability under the chain substitution approach

According to the calculation results of Table 3.3, Table 3.4 and Table 3.5 in Chapter 3 as the basis, and the serial substitution method in Chapter 2 as the theoretical support, BYD's data in the past 4 years are used as mutual standards for analysis and comparison.

(1) The analysis is conducted for the base period of 2019 and the reporting period of 2020:

Return on net assets = net sales margin x total asset turnover x equity multiplier

Base period 2019: $N = 1.66\% \times 0.65 \times 3.13 = 3.38\%$

2020 reporting period: $N'' = 3.84\% \times 0.79 \times 3.12 = 9.46\%$

First substitution: $N_1 = 3.84\% \times 0.65 \times 3.13 = 7.81$

Second substitution: $N_2 = 3.84 \text{ per cent} \times 0.79 \times 3.13 = 9.5 \text{ per cent}$

Third substitution: $N_3 = 3.84 \text{ per cent} \times 0.79 \times 3.12 = 9.46 \text{ per cent}$

Value of net sales margin on profitability = $N_1 - N = 7.81\% - 3.38\% = 4.44$

Value of impact of total asset turnover on profitability = $N_2 - N_1 = 9.5 \text{ per cent} - 7.81 \text{ per cent} = 1.68 \text{ per cent}$

Effect of equity multiplier on profitability = $N_3 - N_2 = 9.46 \text{ per cent} - 9.5 \text{ per cent} = 0 \text{ per cent}$

(2) The analysis with 2020 as the base period and 2021 as the reporting period:

Return on net assets = net sales margin × total asset turnover × equity multiplier

Base period of 2020: $N = 3.84\% \times 0.79 \times 3.12 = 9.46\%$

Reporting period 2021: $N'' = 1.84\% \times 0.87 \times 2.84 = 4.55$

First substitution: $N_1 = 1.84 \text{ per cent} \times 0.79 \times 3.12 = 4.54 \text{ per cent}$

Second substitution: $N_2 = 1.84 \text{ per cent} \times 0.87 \times 3.12 = 4.99 \text{ per cent}$

Third substitution: $N_3 = 1.84 \text{ per cent} \times 0.87 \times 2.84 = 4.55 \text{ per cent}$

Value of Net Sales Margin on Profitability = $N_1 - N = 4.54\% - 9.46\% = -4.93$

Value of impact of total asset turnover on profitability = $N_2 - N_1 = 4.99\% - 4.54\% = 0.46\%$

Effect of equity multiplier on profitability = $N_3 - N_2 = 4.55 \text{ per cent} - 4.99 \text{ per cent} = -0.45 \text{ per cent}$

(3) The analysis with 2021 as the base period and 2022 as the reporting period:

Return on net assets = net sales margin × total asset turnover × equity multiplier

Base period 2021: $N=1.84\% \times 0.87 \times 2.84=4.55$
Reporting period 2021: $N''=4.18\% \times 1.07 \times 4.07=18.2$
First substitution: $N1 = 4.18 \text{ per cent} \times 0.87 \times 2.84 = 10.33 \text{ per cent}$
Second substitution: $N2 = 4.18 \text{ per cent} \times 1.07 \times 2.84 = 12.7 \text{ per cent}$
Third substitution: $N3 = 4.18 \text{ per cent} \times 1.07 \times 4.07 = 18.2 \text{ per cent}$
Value of Net Sales Margin on Profitability = $N1-N = 10.33\% - 4.55\% = 5.78$
Value of impact of total asset turnover on profitability = $N2 - N1 = 12.7\% - 10.33\%$
 $= 2.37$
Effect of equity multiplier on profitability = $N3-N2 = 18.2 \text{ per cent} - 12.7 \text{ per cent}$
 $= 5.5 \text{ per cent}$

Table 4.1 Calculation of the decomposition of the impact of each indicator on the return on net assets

Indicator/year	2020 Compared to 2019	2021 Compared to 2020	2022 Compared to 2021
Extent to which net sales margin affects return on net assets ratio	4.44%	-4.93%	5.78%
Extent of impact of total asset turnover on return on net assets	1.68%	0.46%	2.37%
Extent of impact of equity multiplier on return on net assets	0.00%	-0.45%	5.5%

Source space: Audited and publicly available corporate annual reports.

As can be seen from the percentage of the degree of influence in Table 4.1, the indicator that has the greatest impact on the return on net assets of BYD is the net sales margin, which basically stays above 4.4% in the degree of influence on the return on net assets between 2019-2022, while at the same time the total asset turnover ratio is all in the midst of fluctuation. Compared to 2021, the equity multiplier realized a substantial increase in 2022, resulting in a linear increase in the proportion of the degree of impact on the return on net assets.

4.3 Financial performance evaluation

4.3.1 Selection of indicators

As stipulated in the Interim Measures for the Administration of Comprehensive Performance Evaluation of Central Enterprises and the relevant requirements of the Implementing Rules for Comprehensive Performance Evaluation of Central Enterprises, the quantitative evaluation indicators of financial performance consist of eight basic indicators and fourteen revised indicators, and the weights of the indicators are set

separately to comprehensively calculate the financial performance. The status of enterprises in the four aspects of profitability, asset quality, debt risk and operational growth can all be reflected by the selected indicators, as shown in Table 4.2:

Table 4.2 Performance Evaluation Indicators and Weighting Table for Comprehensive Enterprise Performance Evaluation

Evaluation indicator	Basic indicator	Weight	Revised Indicator	Weight
Profitability status	Return on Net Assets	20	Sales (operating) margins	10
			Profit Cash Coverage Multiple	9
			Cost and Expense Margin	8
			Return on Capital	7
Asset quality position	Total assets turnover	10	Non-performing assets ratio	9
			Current Asset Turnover Ratio	7
			Accounts receivable turnover	6
			Asset Cash Recovery Ratio	
Debt risk profile	Gearing ratio	12	Quick ratio	6
			Interest earned multiple	6
			Cash Flow Debt Ratio	5
			Interest-bearing debt ratio	5
			Contingent liability ratio	
Business Growth Status	Sales (operating) growth rate	12	Sales (operating) profit growth rate	10
			Capital appreciation rate	7
			Total Assets Appreciation Ratio	5
			Technology Investment Ratio	

According to the "Operational Rules for Enterprise Performance Evaluation" and "Standard Values for Enterprise Performance Evaluation" issued by the State-owned Assets Supervision and Administration Commission (SASAC), and taking into account the operating characteristics of listed companies in the automobile manufacturing industry. The weights of each financial indicator are assigned as follows.

The survival of the enterprise needs to rely on profit support, most enterprises will maximize profits as the development goal. Through the analysis of profitability, we can obtain financial information such as the performance of business income, cost and so on, which can help enterprises to find the factors affecting profitability and play a key role in the development of enterprises. Therefore, this paper gives it 34 points of weight in

the evaluation system.

Solvency, a reflection of the enterprise's debt repayment. Strong solvency means that the ability to protect creditors is strong, and it is easier to gain trust and increase enterprise creditworthiness. A better creditworthiness of the enterprise can attract more investment to provide financial security for the operation of the enterprise. It can be seen that solvency has an important impact on the operation of the enterprise, so this paper gives it a weight of 22 points in the evaluation system.

Operating ability is the enterprise's ability to manage and utilize resources. This study gives it 22 points of weight in the evaluation system, and selects two indicators, namely, accounts receivable turnover ratio and total asset turnover ratio. These two indicators, respectively, reflect the application and management efficiency of enterprises to different assets. The first indicator calculates the number of times cash is recovered from accounts receivable. It is often set as a standard value by the enterprise, and a lower value indicates a failure to collect accounts receivable in a timely manner and poor management of them. The second indicator is the efficiency with which the enterprise utilizes all of its assets; the better the investment in assets, the higher the score.

Development capability, as a kind of development potential, examines whether the enterprise can grow the enterprise by relying on its own operation. In this study, it is given a weight of 22 points in the evaluation system, and the business growth rate and capital preservation and appreciation rate are selected. The first indicator reflects the change of business income, the lower the value represents the slower growth of business income, and the development prospect is uncertain; the second indicator reflects the efficiency and safety of enterprise capital operation, the higher the indicator is, the better the capital preservation status of the enterprise, the faster the growth of owner's equity, the more the creditors' debt is secured, and the more the enterprise's development power is strong.

4.3.2 BYD Financial Performance Evaluation

Using the results derived from the calculations in Chapter 3, the financial performance for 2019 and 2020 is calculated in conjunction with the financial performance evaluation indicators, as shown in Table 4.3.

Table 4.3 Calculation of BYD's Financial Performance in 2019

Evaluation criteria and weight	Basic indicators	stand	Stand	Industr	highest	minim	Actu	Per cent ratio	discr	adjust	Final rating
		ard rating	ard ratios	y Highest	rating	um rating	al 2019		pancy	ment fraction	
		①	②	③	④= ①*1.5	⑤= ①*0.5	⑥	⑦ = ((③ - ②) / (④ - ①))	⑧ = ⑥ - ②	⑨ = ⑧ / ⑦	⑩ = ① + ⑨
Profit ability status	return on net assets	20	9.6	20	30	10	3.38	1.04	-6.22	-5.98	14.02
	return on total assets	14	8.8	17.3	21	7	1.08	1.21	-7.72	-6.38	7.62
Asset quality position	Total asset turnover	10	2.1	3.5	15	5	0.65	0.28	-1.45	-5.18	4.82
	Accounts receivable turnover ratio	12	10.6	43.3	18	6	2.74	5.45	-7.86	-1.44	10.56
Debt risk profile	gearing	12	59	49	18	6	68	-1.67	9	-5.39	6.61
	Interest earned multiple	10	5.6	9.4	15	5	0.7	0.76	-4.9	-6.45	3.55
Business Growth Status	Sales (operating) growth rate	12	5.3	15.6	18	6	-1.84	1.72	-7.14	-4.15	7.85
	Capital preservation and enhancement ratio	10	108.5	118.8	15	5	103	2.06	-5.5	-2.67	7.33
add up the total		100									62.36

Table 4.4 Calculation of BYD's Financial Performance in 2020

Evaluation criteria and weight	Basic indicators	stand	Stand	Industr	highes	mini	Actual 2020	Per cent ratio	discrepancy	adjustment fraction	Final rating
		ard rating	ard ratios	y Highest	t rating	mum rating					
		①	②	③	④ = ①*1.5	⑤ = ①*0.5	⑥	⑦ = (③ - ②) / (④ - ①)	⑧ = ⑥ - ②	⑨ = ⑧ / ⑦	⑩ = ① + ⑨
Profitability status 34	return on net assets	20	7.6	20	30	10	9.46	1.24	1.86	1.5	21.5
	return on total assets	14	7	17.3	21	7	3.03	1.47	-3.97	-2.7	11.3
Asset quality position 22	Total asset turnover	10	2.1	3.5	15	5	0.79	0.28	-1.31	-4.68	5.32
	Accounts receivable turnover ratio	12	10.6	43.3	18	6	3.68	5.45	-6.92	-1.27	10.73
Debt risk profile 22	gearing	12	58.6	49	18	6	67.96	-1.6	9.36	-5.85	6.15
	Interest earned multiple	10	5.6	9.4	15	5	2.2	0.76	-3.4	-4.47	5.53
Business Growth Status 22	Sales (operating) growth rate	12	5.2	15.6	18	6	22.63	1.73	17.43	10.08	22.08
	Capital preservation and enhancement ratio	10	105.2	118.8	15	5	110	2.72	4.8	1.76	11.76
add up the total		100									94.37

Based on the results of the financial performance evaluation, the enterprise has shown significant improvement in its profitability profile. The final score for return on net assets for 2020 is 21.5, which is higher than the 2019 score of 14.02 and well above the standard score of 20. This indicates that the enterprise has effectively improved its ability to return on shareholders' equity in 2020, and that the management's strategy and execution in this area has clearly been a success. In terms of return on total assets, the final score for 2020 is 11.3, which is an improvement from 7.62 in 2019, but is still below the standard score of 14. Nonetheless, this improvement suggests that the enterprise has improved the efficiency of its asset utilization and that the overall return on assets has improved. Taken together, these two metrics suggest that the enterprise is significantly more profitable in 2020, and the improved score reflects the management team's efforts and effectiveness in improving profitability.

In terms of asset quality, the final score for the total asset turnover ratio in 2020 is 5.32, slightly higher than the 4.82 in 2019, but still lower than the standard score of 10. This indicates that the enterprise still has much room for improvement in enhancing the efficiency of asset turnover, and that it should further optimize its asset allocation and utilization. For accounts receivable turnover, the final score for 2020 is 10.73, slightly higher than the 10.56 in 2019, but still short of the standard score of 12. This means that the enterprise has made some progress in managing accounts receivable, but it needs to further strengthen the management of customer credit as well as the efficiency of collection. Overall, although enterprises have made progress in asset quality, they still need to make more efforts in improving asset turnover efficiency and accounts receivable management.

In terms of debt risk profile, the final score for gearing ratio in 2020 is 6.15, lower than the 6.61 in 2019 and significantly lower than the standard score of 12. This suggests that enterprises have higher levels of debt and that the gearing structure needs to be further optimized in order to reduce financial risk. In terms of earned interest multiples, the final score for 2020 is 5.53, up from 3.55 in 2019, but still lower than the standard score of 10. This reflects that the enterprise's ability to repay the interest on its debt has increased, but it still needs to further improve its profitability to ensure sufficient interest coverage multiples. On balance, the enterprise's debt risk profile has improved in 2020, but it still needs to strengthen its debt management and optimize its capital structure in order to improve its financial stability and risk resistance.

In terms of operational growth profile, the enterprise's performance in 2020 is particularly impressive. The final score for sales (operating) growth rate is 22.08, significantly higher than 7.85 in 2019 and the standard score of 12. This indicates that the enterprise has achieved significant sales growth in 2020 and made important breakthroughs in market development and business expansion. In terms of Capital Value Retention and Appreciation, the final score for 2020 is 11.76, higher than the 7.33 for 2019 and slightly higher than the standard score of 10. This shows the success of the business in sustaining growth in capital value, with an increased ability to add value to

its assets. Overall, the enterprise is performing well in terms of its business growth profile, particularly in terms of sales growth, which has made significant progress and provides a good foundation for continued growth in the future.

Combining the analysis of these metrics, the enterprise has an overall score of 94.37 in 2020, a significant improvement from 62.36 in 2019. The enterprise performs particularly well in the areas of profitability and operational growth, with return on net assets and sales growth rates both significantly higher than the standard score, reflecting the success of the enterprise in these areas. However, the enterprise still has some issues with asset quality and debt risk, with total asset turnover and interest earned multiples improving but still below the standard score, suggesting further optimization and improvement is needed in these areas. Overall, the enterprise has made significant progress in 2020 and management's strategy to improve profitability and promote business growth has yielded good results, but continued efforts are needed to improve asset quality and reduce debt risk to ensure the long-term sustainability of the business.



Chapter 5 Conclusion and Recommendations

This chapter summarizes the entire study, focusing on the impact of solvency, profitability, operating capacity, development capacity and cash flow on BYD's profitability. An empirical analysis was conducted through the Wall Score method, specifically verifying the impact of the balance sheet, income statement, and cash flow statement. The results of the empirical tests are summarized, from which the research conclusions are extracted. And policy recommendations are made accordingly.

5.1 Conclusion

5.1.1 Solvency under the balance sheet has an impact on profitability

The proportion of BYD's own funds is too low, and the overall debt is dominated by external debt, which brings greater pressure on debt servicing. According to BYD's 2021 balance sheet, 295.78 billion yuan of assets, 191.536 billion yuan, or 64.76%, is debt capital. BYD's current ratio and quick ratio are far below the industry average. It can be seen that its current liabilities accounted for too large a proportion, the capital structure needs to be optimized.

Large amounts of financing are mainly short-term borrowing, the allocation of short-term and long-term borrowing is unreasonable, and the pressure of short-term debt repayment is large. R&D and market expansion of new energy automobile industry is often a long-term process, the speed of capital recovery is slow, and short-term borrowing brings a large amount of short-term debt repayment pressure will limit the enterprise's capital flow, resulting in a lack of funds, the debt service pressure doubled the situation.

BYD's gearing ratio is high, debt service capacity is weak. From the book data, BYD's profit on the books is rising year by year, but most of the last 2 years are through debt for business expansion. BYD's gearing ratio has continued to rise since 2019, and in 2022 it will be as high as 75.42%. This indicates that the enterprise has \$76.42 in debt for every \$100, which has affected the profitability and cash flow of the business, limiting its company's ability to invest and expand. Comparing to the bank loan standard, the corporate gearing ratio must be below 70% in order to apply for a loan, if it exceeds this standard means that the company may face greater pressure on its debt, and be more vulnerable in the face of rising market interest rates or economic downturns, which increases the financial risk. Failure to manage debt effectively may lead to debt servicing difficulties and jeopardize development plans.

5.1.2 Operating capacity under the combined influence of the balance sheet and income statement has an impact on profitability

In terms of operating capacity, BYD's total asset utilization ratio and current asset utilization ratio perform well, and the overall operation of the enterprise is good, but the scoring results show that the accounts receivable and accounts payable turnover ratios do not perform well, which affects the liquidity of the enterprise and weakens the

efficiency of capital recovery. A low accounts receivable turnover ratio implies that the enterprise is slow to recover its accounts after selling products or services, which may lead to an impact on the enterprise's cash flow. Failure to recover accounts in a timely manner will take up the enterprise's liquidity, limiting its ability to utilize funds in other areas. It reflects that the enterprise has problems in credit management and customer repayment, and needs to strengthen customer credit assessment and collection management in order to improve the efficiency of account recovery. A low accounts payable turnover ratio implies that an enterprise is slower in paying its suppliers, which may lead to strained supplier relationships and affect the enterprise's supply chain management and procurement efficiency. Although slower payment can temporarily relieve financial pressure, in the long run, this practice may damage the relationship between the enterprise and its suppliers and increase supply chain risks. Therefore, improving the accounts payable turnover ratio and ensuring timely payment of suppliers' accounts are critical to maintaining good supplier relationships and a stable supply chain.

5.1.3 Net increase in cash and cash equivalents in the statement of cash flows has an impact on profitability

BYD invested in new projects, the proportion of profitable companies is relatively low, only in 2019, its investment in Tengshi new energy company lost 5.386 billion yuan, the company has been in the red since registration. And BYD's shareholding for the company reaches 90%. Combined with BYD's sales and profit statistics, BYD's main sales in 2022 are concentrated in the dynasty network and the ocean network, and the further layout of the Tengsei brand investment will bring a high investment risk for the enterprise.

Comprehensive BYD cash flow analysis shows that BYD has achieved profitability on the books, but does not have enough cash flow to support its business operations and growth, the reason for this is because BYD is expanding its business in 2022, and the cash flow expenditure from investment activities is as high as 27.6%. The rising accounts payable turnover ratio reflects the weakened ability of this business to use the funds of supplier companies free of charge, making the business need more liquidity to maintain operations. It shows that the quality of BYD's profitability under cash flow analysis needs to be improved.

5.2 Recommendation

5.2.1 Strengthening accounts payable operational capacity

At the strategic level, strategic partnerships can be established with key suppliers to mitigate the risk of fluctuating procurement costs by mitigating suppliers' excessive price sensitivity through long-term cooperation. Conduct a diversified supply chain to reduce dependence on a single supplier and mitigate the impact of potential price fluctuations on the company. Even implement backward integration for raw materials with higher technical requirements to minimize the bargaining power of suppliers.

From the business level, improve procurement negotiation ability. Raw material procurement negotiation ability is crucial for production enterprises, the cost of raw materials directly affects the gross profit of product sales and corporate net profit. This process not only involves the price of materials, but also includes payment methods and deadlines and other aspects. Enterprises should have an in-depth understanding of the supplier's product quality, major customers, financial situation and so on. This can increase the bargaining chips for enterprises in the negotiations. At the same time, it is also necessary to conduct a background investigation of the negotiator sent by the supplier to understand his background, character, preferences and attitudes to the world, in order to better understand each other. Through such understanding, the company can better insight into the psychology of the other party and find common ground. During the negotiation phase, the company should send experienced personnel who are skilled in negotiation techniques. These personnel need to have the ability to fight for the company's interests in the negotiations. Through the negotiation team, a favorable deal can be reached with more certainty. Therefore, improving procurement negotiation skills requires in-depth planning and targeted training at various stages.

5.2.2 Improving accounts receivable operations

From the management side, the differentiation strategy can be continued through product innovation, branding and value-added services, providing excellent after-sales service, customer support and quality assurance to increase customer loyalty and reduce buyers' over-sensitivity to price. Backward integration strategy can even be realized for the main products so as to ensure a leading position even after the withdrawal of a series of government subsidies.

Advice from the business side. Regardless of the type of product a company produces, the ultimate form of profitability lies in the successful sale of the product. Selling the product at the highest price and in the most reasonable manner is a key task for the company, and this requires strong sales negotiation skills. Similar to purchasing negotiations, sales negotiations are not only about the price of the product, but also about payment methods and deadlines. First and foremost is the selection of the buyer; the company should choose a company with good credit and reputation to ensure that the payment can be successfully collected. Avoid over-reliance on one or a few purchasers, as changes in their intentions can have a significant impact on the company. Be careful in the selection of purchasers and maintain diversified customer relationships. Secondly, during the preparation stage, the company needs to understand the buyers in detail. Find out information about the buyer's demand for the product, whether there are other suppliers offering the same product, the importance of the product to the buyer's normal production and operation, and whether the buyer is in urgent need of the product. This information is critical to the company's negotiation strategy and helps the company better understand the buyer's needs and pain points so that it can gain an advantageous position in the negotiation. In addition, it is important to realize the strategy of "knowing your enemy and knowing yourself" by sending personnel with excellent negotiation skills based on a thorough understanding of the other party's negotiators.

5.2.3 Enhancing debt-servicing capacity

The capital structure is a composition of the ways in which an enterprise is financed, including mainly debt financing, equity financing and internal financing. The core issue of capital structure is the proportion of debt in total capital. Reasonable use of debt financing can reduce an enterprise's cost of capital and bring about financial leverage benefits, but excessive indebtedness will increase financial risks. Enterprises should synthesize various factors to establish a target capital structure and ensure that financing decisions are consistent with that target. By optimizing the capital structure, it can achieve low-cost financing and effectively reduce the risk of debt repayment.

In the coming period, BYD needs to actively expand various financing channels according to the actual financing needs. According to the "preferential financing theory", BYD should give priority to internal financing, using the surplus or undistributed profits realized by the company in previous years. Compared with external financing, this method has stronger autonomy, low cost and risk resistance. Through internal financing, not only can it effectively reduce the problem of information asymmetry, save transaction costs and reduce financing costs, but also enhance the company's residual control.

Reasonable use of financial leverage is beneficial to the enterprise, but excessive debt will magnify the leverage effect and eventually lead to serious financial crisis. For external financing, if internal financing is still unable to meet the capital demand, it can be further considered, but in view of the high debt ratio of BYD, it should give priority to the equity financing method. Compared with debt financing, equity financing does not need to bear the pressure of debt service. By expanding equity financing and enhancing internal blood-forming capacity, the gearing ratio should be actively reduced. At the same time, the collection of accounts receivable should be accelerated to reduce the reliance on external financing and reduce debt risk. The Company also needs to actively reserve cash to cope with the possible arrival of a capital winter.

By implementing these recommendations, BYD can improve the efficiency of the company's capital operation and financial soundness to ensure that it meets its debt obligations on time and reduces financial risks while maintaining good cash flow. This will not only help to enhance the profitability and market competitiveness of the enterprise, but also strengthen the confidence of investors and creditors and promote the sustainable development of the enterprise.

References

- Acikgoz .T.,& Kilic.G.(2021). Investigation of financial performance and market value of technology firms with Dupont-regression analysis. *Journal of Accounting & Finance/Muhasebe ve Finansman Dergisi*, (90).
- Almazari, A. A. (2012). Financial performance analysis of the Jordanian Arab bank by using the DuPont system of financial analysis. *International Journal of Economics and Finance*, 4(4), 86-94.
- Bhagyalakshmi, K., & Saraswathi, S. (2019). A study on financial performance evaluation using DuPont analysis in select automobile companies. *International Journal of Management, Technology and Engineering*, IX (1).
- Curtis, A., Lewis-Western, M. F., & Toynbee, S. (2015). Historical cost measurement and the use of DuPont analysis by market participants. *Review of Accounting Studies*, 20, 1210-1245.
- Chen, H. (2019). Analysis of profitability in the new era. *Chinese Business Theory*, (11), 154-155.
- Cui, L. (2023). Research on BYD's profitability based on index factor analysis method. *National Circulation Economy*, (18), 181-184.
- Cui, Y. (2020). *Research on performance evaluation of BYD based on financial analysis system for management* [Unpublished Master's Thesis]. Huazhong University of Science and Technology.
- Chen, J., Li, C., & Lei, Z. (2023). Analysis of BYD's financial capability based on government subsidies.? *Chinese Agricultural Accounting*, (17), 32-35.
- Doorasamy, M. (2016). Using DuPont analysis to assess the financial performance of the top 3 JSE listed companies in the food industry. *Investment Management and Financial Innovations*, 13(2), 29-44.
- Duyan. (2020). An overview of capital structure theory. *Economic Management Digest* (11), 197-198.
- Du, T. (2021). *Research on Financial Risk Assessment and Prevention of BYD Company* [Unpublished Master's Thesis]. Northeastern University of Petroleum.
- Dai, Shimeng. (2022). *Research on profitability of Yonghui supermarket based on improved DuPont analysis system* (Master's thesis, Heilongjiang University).
- Fang, Y. (2019). Application analysis of DuPont analysis system in enterprises - Taking Changan automobile as an example. *Chinese Market*, (20), 88-102.
- Feng Wan. (2022). *Research on profitability analysis and development countermeasures of new energy vehicle enterprises in China* (Master's thesis, North China Electric Power University (Beijing)).
- Gao, Y. (2019). *BYD Annual report analysis* (Unpublished Master's Thesis). Southwest Jiaotong University.
- Gaojie. (2020). Discussion on the development and orientation of financial analysis theory.? *Popular Investment Guide*, (04), 27-28.

- Hu, Shiqi. (2022). *Research on the impact of industrial structure adjustment on profitability of new energy vehicle enterprises* (Master's thesis). Southwest University of Finance and Economics.
- Jiang, B. (2020). Analysis and research on enterprise profitability. *Chinese market*, (22), 75-76.
- Kim, H. S. (2016). A study of financial performance using Dupont analysis in food distribution market. *Culinary Science & Hospitality Research*, 22(6), 52-60.
- Ladvenicová, J., Bajusová, Z., Gurčík, L., & Červený, D. (2019). Dupont analysis of farms in V4 countries. *Visegrad Journal on Bioeconomy and Sustainable Development*, 8(2), 82-86.
- Lee, Xia . (2019). Research on the financial performance of new energy automobile enterprise BYD (Master's thesis, Guangdong University of Technology).
<https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202001&filename=1019891410.nh>
- Li, L., & Su, J. (2022). Analysis of BYD's profitability under the DuPont analysis system. *Marketing of Time-honored Brands*, (12), 12-14.
- Li, S. (2022). *Research on Financial Risk Management of BYD Company* (Unpublished Master's thesis). Shenyang Jianzhu University.
- Li, Y., & Li, Z. (2019). Analysis of Changan automobile's financial situation based on DuPont analysis system. *Western Leather*, 41(11), 117.
- Liu, S. (2022). Research on BYD's profitability based on DuPont analysis. *Modern Industrial Economy and Information Technology*, 12(9), 151-152+155.
- Liu, X., & Zhang, Z. (2022). Financial analysis of Great Wall Motors based on Harvard analysis framework. *Financial Management Research*, (8), 33-38.
- Liu, Y. (2019). The application of DuPont analysis in enterprise financial analysis. *China's Management Informatization*, 22(24), 40-41.
- Lu, Q. (2020). *Research on the profit model and financial evaluation of new energy company* (Unpublished Master's thesis). Harbin Institute of Technology.
- Li, Xiaomeng. (2020). *Master's thesis on profitability analysis of BYD Company Limited*, Fuyang Normal University).
- Mohanasundari, M., Sundharesalingam, P., Raja, M. S. N., & Sivaprakash, M. V. (2020). Using Dupont analysis to assess the financial performance of the selected companies in the plastic industry in India. *Gedrag & Organisatie Review*, 33(2), 2585-2605.
- Majeed, R., & Fayaz, M. (2020). Financial performance analysis of Bhel: Evidence from accounting performance metrics & DU-PONT model. *ZENITH International Journal of Multidisciplinary Research*, 10(1), 1-10.
- Qiu, J. (2023). Financial analysis of new energy vehicle enterprises from a strategic perspective - Taking BYD as an example. *Chinese Market*, (36), 138-142.
- Ren, F. (2020). *Research on the optimization of CH Electric Appliances Company's business strategy from the perspective of DuPont financial system* (Unpublished Master's Thesis). Yunnan Normal University.

- Sheela, S. C., & Karthikeyan, K. (2012). Financial performance of pharmaceutical industry in India using Dupont analysis. *European Journal of Business and Management*, 4(14), 84-91.
- Shahnia, C., & Endri, E. (2020). Dupont analysis for the financial performance of trading, service & investment companies in Indonesia. *International Journal of Innovative Science and Research Technology*, 5(4), 193-211.
- Wang, C. (2020). Analysis of enterprise profitability and research on improvement strategies. *Financial Industry*, (26), 58-59.
- Wang, J. (2019). Application of DuPont analysis method in financial analysis of listed companies - Taking BYD as an example. *Chinese and Foreign Entrepreneurs*, (23), 53-55.
- Yan, J., & Bao, J. (2022). Discussion on DuPont analysis method and its application in comprehensive financial analysis of enterprises - Taking a company's relevant financial data as an example. *Business News*, (27), 5-8.
- Yang, S. (2024). The United States may accelerate the development of new energy vehicles and restructure its industrial landscape. *World Knowledge*, (3), 64-65.
- Yang, X., & Liu, E. (2019) Soil erosion evaluation and influencing factors analysis in the three river source area based on the chain substitution method. *Hubei Agricultural Sciences*, 58(12), 69-73.
- Yang, Y. (2022). Analysis of Jinlong automobile's profitability under DuPont Analysis System. *Chinese Market*, (35), 82-84
- Yin, J. (2019). *Analysis of BYD's financial statements from the perspective of financial capability analysis* (Unpublished Master's thesis). Beijing University of Posts and Telecommunications.
- Zhang, Xianzhi. (2007). Research on the development and positioning of financial analysis theory. *Research on Financial Issues*, (4), 81-86.
- Zhang, J., & Zhou, S. (2019). Construction of DuPont financial ratio model analysis system - Taking Jinbei Automobile Co., Ltd. (Group) as an example. *Financial and Accounting Communication*, (17), 109-112.
- Zhang, M. (2019). Financial analysis based on DuPont analysis method - Taking BYD automobile company as an example. *Liaoning Economy*, (10), 90-91.
- Zhang, Q. (2022). Profitability analysis of BYD Corporation - Based on DuPont analysis and index factor analysis. *International Business Accounting*, (8), 82-85.
- Zhao, T., & Zhang, S. (2018). Financial analysis of BYD Co., Ltd. under the Harvard analysis framework. *Pay Taxes*, 12(24), 93.
- Zhao, X. (2022). Evaluation of BYD Company's business performance. *Cooperative Economy and Technology*, (13), 140-142.
- Zhao, Y. (2018). Reconstruction of DuPont financial analysis system based on sustainable growth rate. *Friends of Accounting*, (6), 28-32.
- Zhao, M. X. (2022). Research on the construction of financial performance evaluation system of Great Wall Motor under wall score method (Dissertation, Hebei Normal University).

Appendix

A BYD Balance Sheet 2019-2022

Unit: billions

balance sheet	2022-12-31	2021-12-31	2020-12-31	2019-12-31
current asset				
money funds	514.7	504.6	144.5	126.5
Financial assets held for trading	206.3	56.06	24 million	34.35 million
Notes and accounts receivable	388.3	362.5	412.2	439.3
Of which: Accounts receivable	388.3	362.5	412.2	439.3
Receivables financing	128.9	87.43	88.62	70.09
Prepayments	82.24	20.37	7.244	3.628
Total other receivables	19.1	14.11	10.51	15.61
Of which: Interest receivable	--	1.366	0.08	--
inventory (of material)	791.1	433.5	314	255.7
Contractual assets	135.5	84.93	53.46	69.87
Non-current assets due within one year		12.32	12.51	10.61
Other current assets	131.4	85.25	73.13	77.96
Other items of current assets	10.53	12.32	--	--
Total current assets	2408	1661	1116	1070
non-current asset				
Long-term receivables	11.19	11.7	18.05	12.4
Long-term equity investments	154.90	79.05	54.66	40.6
Investments in other equity instruments	44.19	29.14	14.2	19.22
Other non-current financial assets	21.47	2.34	2.849	0.47
investment property	0.85	0.88	0.94	0.97
fixed assets	1319	612.2	545.8	494.4
construction in progress	446.20	202.8	61.12	106.7
usufructuary assets	31.37	15.73	9.457	7.305
intangible asset	232.20	171	118	126.5
development expenditure	16.83	26.05	48.86	57.48
reputation of a firm's product	0.66	0.66	0.66	0.66
Long-term amortized expenses	4.581	0.77	0.67	1.316
Deferred tax assets	36.87	19.13	17.69	15.15

Other non-current assets	210.5	125.2	1.084	3.494
Total non-current assets	2531	1297	894.1	886.7
Total assets	4939	2958	2010	1956
current liability				
short term loan	51.53	102	164	403.3
Financial liabilities held for trading	0.55		0.58	0.34
Notes and accounts payable	1438.00	804.90	519.10	361.70
Of which: Notes payable	33.28	73.31	89.26	136.5
accounts payable	1404	731.6	429.8	225.2
Advance receipts		0.01	0.08	0.02
Contractual liabilities	355.2	149.3	81.86	45.02
Employee remuneration payable	120.4	58.49	48.35	37.83
Taxes payable	43.26	17.79	18.59	6.138
Total other accounts payable	1221	413.5	92.8	68.21
Of which: Interest payable	-		4.142	5.602
dividend payable		-	0.1	0.1
Projected current liabilities	12.87	23.56	19.39	18
Non-current liabilities due within one year	64.65	129.8	114.10	87
Other current liabilities	26.15	13.59	5.46	52
Other items of current liabilities			19.39	18
Total current liabilities	3333	1713	1064	1080
non-current liability				
long term loan	75.94	87.44	147.5	119.5
bonds payable		20.46	88.8	99.69
Lease liabilities	26.17	14.15	8.433	5.487
Deferred income tax liabilities	20.19	6.096	3.932	1.029
Other non-current liabilities	269	74.17	52.7	24.43
Total non-current liabilities	391.3	202.3	301.3	250.1
Total liabilities	3725	1915	1366	1330
Owners' equity (or shareholders' equity)				

Paid-in capital (or share capital)	29.11	29.11	27.28	27.28
Other equity instruments			10.95	43.95
Of which: perpetual bonds	--		10.95	43.95
capital surplus	617.1	608.1	247	245.3
Less: Treasury stock	18.1		--	
Other comprehensive income	4.283	-1.241	-5.561	-0.47
earmark	0.12	0.1	0.04	"one" radical in Chinese characters (Kangxi radical 1)
surplus surplus	68.39	50.09	44.48	40.99
unallocated profit	409.4	264.6	244.6	210.6
Total shareholders' equity attributable to the parent company	1110	950.7	568.7	567.6
Minority interests	103.6	91.75	75.8	58.39
Total shareholders' equity	1214	1042	644.5	626
Total liabilities and shareholders' equity	4939	2958	2010	1956

B Income Statement 2019-2022

Unit: billions

income statement	2022-12-31	2021-12-31	2020-12-31	2019-12-31
total revenue	4241	2161	1566	1277
revenues	4241	2161	1566	1277
Total operating costs	4012	2126	1490	1256
business costs	3518	1880	1263	1069
R&D costs	186.5	79.91	74.65	56.29
Business taxes and surcharges	72.67	30.35	21.54	15.61
sales expense	150.6	60.82	50.56	43.46
overhead	100.1	57.1	43.21	41.41
financial cost	-16.18	17.87	37.63	30.14
Of which: Interest expense	13.16	19.08	31.24	34.87
Of which: Interest income	18.3	6.318	2.146	3.538
Other operating gains				
Add: Gain on change in fair value	1.261	0.47	-0.51	0.09
investment income	-7.919	-57.13 million	-2.728	-8.087
Of which: Income from investments in associates and joint ventures	-6.859	-1.453	-1.868	-4.228
Gain on disposal of assets	-0.11	0.77	-0.14	-0.99
Impairment losses on assets (new)	-13.86	-8.575	-9.065	-1.392

Credit impairment losses (new)	-9.895	-3.881	-9.519	-4.969
Other gains	17.21	22.7	16.95	17.24
business profit	215.4	46.32	70.86	23.12
Add: Non-operating income	5.27	3.377	2.817	2.263
Less: Non-operating expenses	9.891	4.516	4.848	1.075
total profit	210.8	45.18	68.83	24.31
Less: Income tax	33.67	5.507	8.686	3.123
net profit	177.1	39.67	60.14	21.19
(i) Classification by business continuity				
Net profit from continuing operations	177.1	39.67	60.14	21.19
(ii) Classification by ownership				
Net profit attributable to shareholders of the parent company	166.2	30.45	42.34	16.14
Minority interests	10.91	9.221	17.80	5.04
Net profit after extraordinary gains and losses	156.4	12.55	29.54	2.31
earnings per share				
basic earnings per share	5.7100	1.0600	1.4700	0.5000
diluted earnings per share	5.7100	1.0600	1.4700	0.5000
Other comprehensive income	5.462	4.278	-5.089	2.461
Other comprehensive income attributable to shareholders of the parent company	5.524	4.32	-5.094	2.44
Other comprehensive income attributable to minority shareholders	-0.06	-0.04	-0.004	-0.02
Total comprehensive income	182.6	43.95	55.05	23.65
Total comprehensive income attributable to shareholders of the parent company	171.7	34.77	37.25	18.59
Total comprehensive income attributable to minority shareholders	10.84	9.178	17.8	5.064

C Statement of cash flows 2019-2022

Unit: billions

cash flow statement	2022-12-31	2021-12-31	2020-12-31	2019-12-31
Cash flows from operating activities				
Cash received from sales of goods and services	4132	2027	1387	1072
Tax refunds received	76.28	48.55	64.12	30.66
Other cash received in connection with operating activities	205.4	58.97	36.43	34.91
Subtotal cash inflow from operating activities	4414	2134	1487	1137
Cash paid for goods and services	2208	1044	692.6	709.3
Cash paid to and for employees	535.2	287.6	225.2	203.2
Taxes paid	185.4	78.05	61.68	35.89
Payments of other cash related to operating activities	76.43	69.88	53.8	41.44
Subtotal cash outflows from operating activities	3005	1480	1033	989.8
Net cash flows from operating activities	1408	654.7	453.9	147.4

Cash flows from investing activities				
Cash received from recovery of investments	0.14			
Cash received from investment income	1.293	2.039	2.453	0.68
Net cash recovered from disposal of fixed assets, intangible assets and other long-term assets	2.682	8.264	2.59	4.131
Cash received from disposal of subsidiaries and other operating units		2.223	0.98	-0.06
Other cash received related to investing activities	128	114.7	182.2	15.66
Other items of cash inflow from investing activities	0.96		0.0005	3.587
Subtotal cash inflows from investing activities	133.1	127.2	188.2	24.01
Cash paid for acquisition of property, plant and equipment, intangible assets and other long-term assets	974.6	373.4	117.7	206.3
Cash paid for investments	105.7	35.27	18.37	10.89
Net cash paid for acquisition of subsidiaries and other operating units				
Payments of other cash related to investing activities	258.8	172.6	196.5	15.66
Subtotal cash outflows from investing activities	1339	581.3	332.6	232.8
Cash paid for acquisition of property, plant and equipment, intangible assets and other long-term assets	974.6	373.4	117.7	206.3
Cash paid for investments	105.7	35.27	18.37	10.89
Net cash paid for acquisition of subsidiaries and other operating units				
Payments of other cash related to investing activities	258.8	172.6	196.5	15.66
Subtotal cash outflows from investing activities	1339	581.3	332.6	232.8
Net cash flows from investing activities	-1206	-454.0	-144.4	-208.8
Cash flows from financing activities				
Cash received from absorption of investments	5.076	373.1	28	1.786 million
Cash received from acquisition of loans	276.4	328.7	406.3	584.8
Cash received from bond issuance			20	200
Other cash received relating to financing activities	30.31			8.175
Other items of cash inflow from financing activities				4.988
Subtotal cash inflow from financing activities	311.8	701.9	454.3	798
Cash paid for debt service	440.5	498.8	671.2	686
Cash paid for distribution of dividends, profits or interest payments	16.33	26.19	36.86	43.89
Of which: Dividends and profits paid by subsidiaries to minority shareholders	79.46 million	1.859	54.78 million	1.504

Other cash paid in connection with financing activities	49.82	5.255	2.315	1.984
Other items in cash outflows from financing activities		11	33	
Subtotal cash outflows from financing activities	506.6	541.2	743.4	731.9
Net cash flows from financing activities	-194.9	160.6	-289.1	66.1
Effect of exchange rate changes on cash and cash equivalents	6.096	-43.85 million	23.2 million	53.33 million
Net increase in cash and cash equivalents	13.63	360.8	20.64	5.232
Add: Cash and cash equivalents balance at beginning of period	498.2	137.4	116.7	111.5
Balance of cash and cash equivalents at end of period	511.8	498.2	137.4	116.7
net profit	177.1	39.67	60.14	21.19
Provision for impairment of assets	13.86	8.575	9.065	1.392
Depreciation of fixed assets and investment properties	146	108.8	92.45	81.07
Of which: depreciation of fixed assets, depletion of oil and gas assets, depreciation of productive biological assets	146	108.8	92.42	81.04
Depreciation of investment properties	0.02	0.03	0.03	0.02
Amortization of intangible assets	50.99	29.28	30.73	14.77
Amortization of long-term amortized expenses	0.82	0.27	0.31	0.43
Loss on disposal of fixed assets, intangible assets and other long-term assets	8.761	1.128	3.757	0.997
Loss on change in fair value	-1.261	-0.47	0.51	-0.097
financial cost	6.163	19.08	31.24	34.87
Investment losses	7.692	-0.316	-0.267	2.896
Deferred income taxes	-5.686	-0.018	0.362	-0.9
Of which: Decrease in deferred income tax assets	-17.74	-1.443	-3.926	-3.376
Increase in deferred income tax liabilities	12.05	1.425	4.288	2.475
Decrease in inventory	-365.6	-128.9	-67.02	2.84
Decrease in operating receivables	-175.5	13.83	15.5	80.68
Increase in operating payables	1525	556	265.2	-99.83
(sth. or sb) else	3.94	1.208	0.784	
Net cash flows from operating activities Other items				
Net cash flows from operating activities	1408	654.7	453.9	147.4
Amounts for investing and financing activities not involving cash receipts and disbursements		9.6121	5.065	186.4
Other items				
Closing balance of cash	511.8	498.2	137.4	116.7
Less: opening balance of cash	498.2	137.4	116.7	111.5
Net increase in cash and cash equivalents	13.63	360.8	20.64	5.232

D 2019 Enterprise Performance Evaluation Criteria - Automotive OEM Manufacturing Industry

	sports event	Value	Good, good, good.	Average value	Lower value	Comparative value
Profitability status	Return on net assets (%)	20	15.7	9.6	-3.4	-15.1
	Return on total assets (%)	17.3	12.1	8.8	-1.7	-8.5
	Sales (operating) margin (%)	11.6	10.3	6	-3.6	-9.6
	Surplus cash cover multiple	7.1	5.8	4.7	4.1	2.4
	Cost-expense margin (%)	17.4	10.6	7.5	-3.6	-13
	Return on capital (%)	35.8	20.9	10	-15.4	-25
Asset quality position	Total asset turnover (times)	3.5	3.1	2.1	1.5	1.2
	Accounts receivable turnover (times)	43.3	24.8	10.6	5.6	0.9
	Non-performing assets ratio (%)	1	1.4	2.8	6.4	15.2
	Current asset turnover (times)	4.2	3.4	2.1	1.1	0.6
	Asset cash recovery rate (%)	24	15.7	5.7	-6.8	-13.6
Debt risk profile	Gearing ratio (%)	49	54	59	69	84
	Interest earned multiple	9.4	7.7	5.6	2.7	0.3
	Quick ratio (%)	146.4	120.4	83.4	61.1	29.9
	Cash current liabilities ratio (%)	46.9	28.2	12.8	-11.4	-25.4
	Interest-bearing debt ratio (%)	0.2	6.7	21	47.1	67.3
	Contingent liability ratio (%)	1.9	3.4	4.8	14.4	17.8
Business growth	Sales (operating) growth rate (%)	15.6	11.4	5.3	1.6	-6.5
	Capital appreciation rate (%)	118.8	114.6	108.5	95.6	84
	Growth rate of sales (operating) profit (%)	19.3	12.7	7.5	1.9	-5.3
	Total assets growth rate (%)	19.4	14	7.1	1.5	-7.9
	Technology input ratio (%)	6.3	5	2.9	1.3	0.3
Additional information	Inventory turnover (times)	24.8	15.5	9.7	5.3	2.1
	Amount of amortization to current assets (%)	17.4	24.5	33.5	43	54.62
	Total costs as a percentage of total operating revenues (%)	85.7	88.7	94.8	101	109.9
	Economic value added rate (%)	15.8	11.7	5.8	-6.8	-18.1
	EBITDA string (%)	24.8	16	9.7	1.1	-5.1
	Capital accumulation rate (%)	32.4	21.5	12.4	5.9	-29.1

E 2020 Enterprise Performance Evaluation Criteria- Automotive Manufacturing Industry

	sports event	Value	Good, good, good.	Average value	Lower value	Comparat ive value
Profitabilit y status	Return on net assets (%)	18	13.7	7.6	-5.5	-17.1
	Return on total assets (%)	15.6	10.4	7	-3.5	-10.2
	Sales (operating) margin (%)	11.6	10.3	6	-3.5	-9.5
	Surplus cash cover multiple	3	1.7	0.6	0	-1.7
	Cost-expense margin (%)	17.4	10.6	7.5	-3.6	-13.1
	Return on capital (%)	35.9	20.9	10	-15.4	-24.9
Asset quality position	Total asset turnover (times)	3.5	3.1	2.1	1.6	0.5
	Accounts receivable turnover (times)	43.3	24.8	10.6	5.6	0.9
	Non-performing assets ratio (%)	1.1	1.5	2.8	6.5	15.3
	Current asset turnover (times)	4.2	3.4	2.2	1.6	0.6
	Asset cash recovery rate (%)	24	15.7	5.7	-6.8	-13.6
Debt risk profile	Gearing ratio (%)	48.6	53.6	58.6	68.6	83.6
	Interest earned multiple	9.4	7.7	5.6	2.7	0.3
	Quick ratio (%)	146.4	120.4	83.4	61.1	29.9
	Cash current liabilities ratio (%)	46.9	28.2	12.8	-11.4	-25.4
	Interest-bearing debt ratio (%)	0.4	6.9	21	47.1	67.3
	Contingent liability ratio (%)	1.9	3.4	4.8	14.4	17.8
Business growth	Sales (operating) growth rate (%)	15.5	11.4	5.2	2.3	-5.8
	Capital appreciation rate (%)	118.1	112.4	105.2	96.6	84.8
	Growth rate of sales (operating) profit (%)	18.6	12.1	6.9	1.3	-5.9
	Total assets growth rate (%)	19.5	14	7.1	1.5	7.9
	Technology input ratio (%)	6.3	5	2.9	1.3	0.3
Additional informatio n	Inventory turnover (times)	24.8	15.5	9.7	5.3	2.1
	Amount of amortization to current assets (%)	38.8	46	55	64.5	76.2
	Total costs as a percentage of total operating income (%)	85.7	88.7	94.8	101	109.9
	Economic value added rate (%)	14.7	10.7	4.4	-8.9	-19.4
	EBITDA string (%)	24.8	16	9.7	1.1	-5.1
	Capital accumulation rate (%)	33.6	22.7	9.9	-8.4	-31.6