

Big Data Financial Analysis of BYD Company Profitability Based on Power BI Software

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Abstract: Big data financial analysis comprehensively considers all the information of the company and can comprehensively reflect the financial status of the company. This paper uses Power BI software to present the results of big data financial analysis on BYD's profitability; using industry analysis and trend analysis, it analyzes BYD's profitability from three aspects: capital profitability, asset profitability and commodity profitability. The industry analysis method can be used to observe the current level of BYD in the industry, compare the company's five-year average, judge the company's development status, and study the strengths and weaknesses of the target company's capabilities; the trend diagram method can be used to observe BYD in different time periods. Changes in indicators, find out the hidden problems in the company's operation process, analyze the reasons for changes and put forward optimization suggestions.

1 INTRODUCTION

Big data financial analysis is the fusion of big data technology and financial analysis. Different from traditional financial analysis, it adopts big data technology, comprehensively analyzes the financial information and non-financial information of the enterprise, and reflects the financial status of the enterprise more comprehensively (George, 2014).

Big data financial analysis through PowerBI software can connect relevant data sources and generate multi-dimensional financial statements in real time, which is convenient for accounting information users to view the company's trend changes over the years, compare trends with industry competitors, find the company's shortcomings and improve them to improve company achievements (Kaufmann, 2001). The use of PowerBI software greatly improves the work efficiency of financial personnel (Fan, 2014).

This paper uses PowerBI software to conduct big data financial analysis on BYD, which can build multi-dimensional analysis models and make instant financial statements. BYD's 2020 operating income is 156,597,691,000yuan, an increase of 28,859,167,900 yuan compared with the previous year's operating income, and the operating income growth rate is 22.59%. The net profit in 2022 will be

6,013,963,000yuan, an increase of 3,895,106,000 yuan compared with the previous year's net profit. The growth rate was 183.83%. BYD's revenue and profits have grown, and its overall performance has been on the rise. In 2020, the operating income growth rate of BYD's automobile manufacturing industry is 3.52%, and the net profit growth rate is 22.23%. At present, the overall performance of the industry is on the rise. This paper takes BYD as the research object, and analyzes BYD's profitability from three aspects: capital profitability, asset profitability and commodity profitability.

2 CAPITAL PROFITABILITY ANALYSIS

Profitability of capital operation refers to the ability of the company to obtain profit by investing in capital operation (Revsine, 2012). ROE is a core indicator reflecting profitability.

Table 1: Profitability Indicators.

Classification	Index	2020			Average 2016-2020		
		BYD	Automotive Manufacturing	SAIC	BYD	Automotive Manufacturing	SAIC
Capital profitability	ROE	9.47%	6.56%	9.55%	7.86%	10.18%	15.46%
Asset profitability	ROA	3.47%	3.11%	4.06%	4.45%	5.39%	6.92%
Commodity profitability	Net sales margin	3.84%	3.35%	4.04%	3.63%	4.68%	5.03%
	Cash to sales ratio	88.55%	91.79%	88.19%	85.19%	98.03%	103.03%

2.1 Change Trend of ROE

As shown in Figure 1, BYD's ROE generally showed a downward trend from 2016 to 2019, from 11.98% to 3.43%. From 2019 to 2020, there was a substantial growth trend, from 3.43% to 9.46%. BYD's five-year average is only 7.86%. From 2016 to 2019, the ROE of BYD, the automobile manufacturing industry and the benchmarking company SAIC all showed a downward trend. The average ROE of BYD over the years is 4 percentage points lower than the average ROE of the industry over the years, and the average ROE of the automobile manufacturing industry is nearly 4 percentage points lower than that of the benchmark company SAIC. In 2020, after BYD's ROE rose, it was on par with the benchmark company SAIC. The ROE of the automobile manufacturing industry is in line with the downward trend of the benchmark company SAIC, and the profitability of capital is declining year by year. SAIC's ROE has shown a downward trend over the years. Its five-year average

ROE is still as high as 15.46%, and the industry's five-year average ROE is 10.18%.

2.2 BYD's Capital Profitability

ROE is equal to net profit divided by average net assets, also known as net interest rate on equity (Gibson, 2013). ROE, as an indicator of capital profitability, reflects the profitability of all invested funds. The higher the ROE, the stronger the profitability of BYD, and vice versa. The ROE indicator is the core indicator reflecting profitability. BYD's ROE generally showed a downward trend from 2016 to 2019, and increased from 2019 to 2020. From 2016 to 2019, ROE dropped significantly to 3.43%, and BYD's capital profitability was relatively weak. In 2020, BYD's capital profitability has been greatly improved, and the utilization efficiency of shareholders' invested capital has been significantly improved.

Table 2: Change trend of ROE.

ROE	2016	2017	2018	2019	2020
BYD	11.98%	8.52%	5.89%	3.43%	9.46%
Industry	15.18%	13.72%	9.79%	5.64%	6.56%
SAIC	19.71%	18.57%	17.38%	12.05%	9.55%

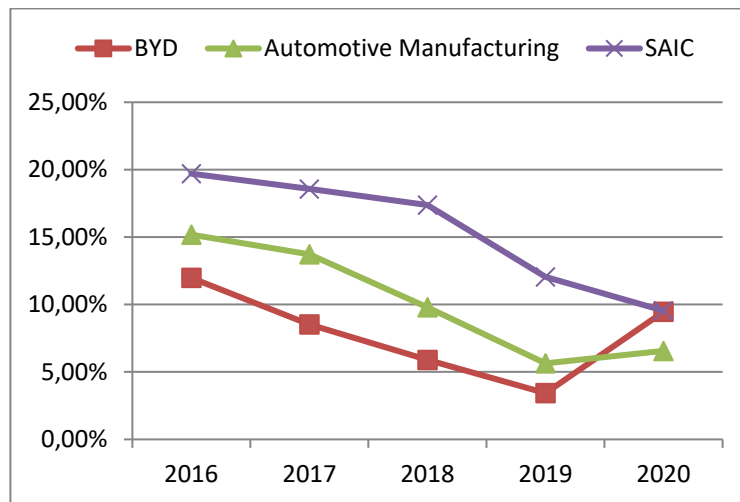


Figure 1: Change trend of ROE.

3 ASSET PROFITABILITY ANALYSIS

Asset management capability refers to the ability of the company to operate assets and generate profits. ROA reflects the profitability of asset management.

3.1 The Changing Trend of ROA

As shown in Figure 2, BYD's ROA generally showed a downward trend from 2016 to 2019, and the decline in five years was relatively obvious, from 6.52% in 2016 to 3.13% in 2019, and ROA increased slightly from 2019 to 2020, rising to 3.47%. BYD's five-year average ROA is 4.45%. From 2016 to 2020, the industry ROA of BYD's auto manufacturing industry showed a downward trend, from 7.90% in 2016 to 3.11% in 2020. The five-year average ROA of the automobile manufacturing industry is 5.39%. The change trend of ROA of the benchmark enterprise SAIC is in line with the industry, from 9.29% in 2016 to 4.06% in 2020. The five-year average ROA of SAIC is 6.92%.

3.2 BYD's Asset Profitability

ROA is equal to EBIT divided by average total assets. The higher the ROA, the stronger the asset profitability of the company, and vice versa. When only operating conditions are considered, ROA reflects the benefits of management's management of all assets, that is, management's ability to create value from the company's existing resources. Although the ROA trend of BYD, the automobile manufacturing industry and SAIC is in the same downward trend, the decline rate of BYD is significantly slower than that of the other two parties. At the same time, BYD achieved a slight increase in ROA in 2020 (3.47%), which is higher than the industry ROA of 3.11%, and the gap with SAIC is also small (4.06%). The asset profitability of the auto manufacturing industry is generally low. The profitability of BYD's assets in the last five years is not strong, although there will be a slight rebound in 2020, which needs the attention of BYD's management.

Table 3: Change trend of ROA.

ROA	2016	2017	2018	2019	2020
BYD	6.52%	4.97%	4.15%	3.13%	3.47%
Industry	7.90%	7.15%	5.43%	3.41%	3.11%
SAIC	9.29%	8.47%	7.47%	5.27%	4.06%

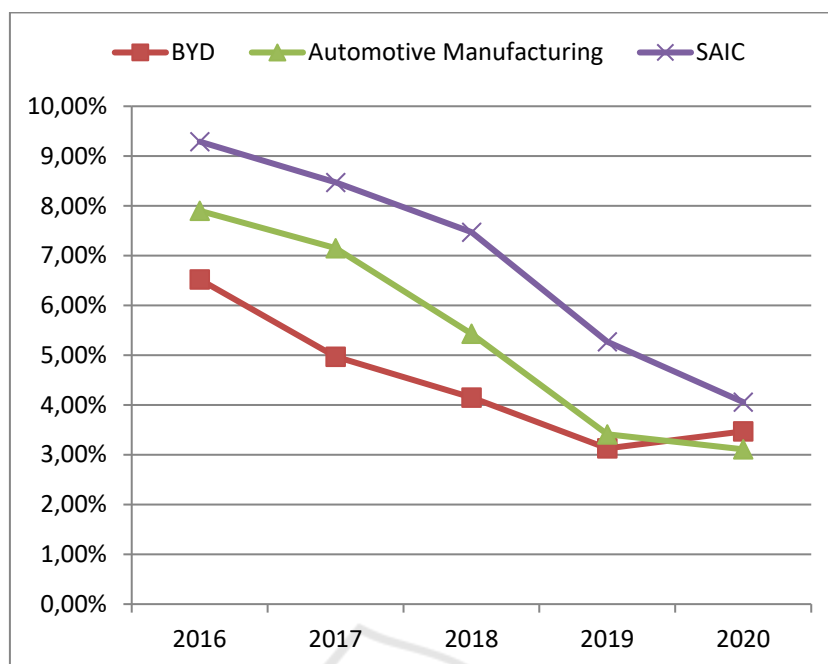


Figure 2: Change trend of ROA.

4 PRODUCT PROFITABILITY

The profitability of commodity operation does not consider the financing or investment of the enterprise, and only studies the ratio between profit and income or cost. In this paper, the net profit ratio of sales and the ratio of cash sales are used to reflect the profitability of commodities.

4.1 Change Trend of Net Sales Margin

As shown in Figure 3, BYD's net sales margin from 2016 to 2019 generally showed a downward trend, and the decline in the five years was relatively obvious, from 5.29% in 2016 to 1.66% in 2019, and

the net sales margin from 2019 to 2020. It increased slightly to 3.84%. The five-year average of BYD's net sales margin is 3.63%. From 2016 to 2019, the net sales margin of BYD's auto manufacturing industry showed a downward trend, from 6.53% in 2016 to 2.84% in 2020. From 2019 to 2020, the net sales margin in the automobile manufacturing industry increased slightly to 3.35%. The average five-year sales net sales margin of the automobile manufacturing industry is 4.68%. The net sales margin of benchmark company SAIC showed a gradual downward trend, from 5.89% in 2016 to 4.04% in 2020. The five-year average of SAIC's net sales margin is 5.03%.

Table 4: Change trend of Net sales margin.

Net sales margin	2016	2017	2018	2019	2020
BYD	5.29%	4.64%	2.73%	1.66%	3.84%
Industry	6.53%	6.01%	4.66%	2.84%	3.35%
SAIC	5.89%	5.49%	5.45%	4.27%	4.04%

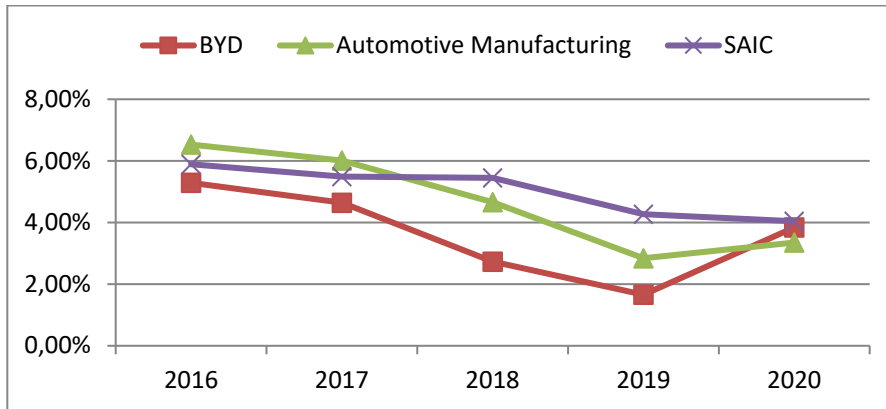


Figure 3: Change trend of Net sales margin.

4.2 Change Trend of the Cash-to-Sales Ratio

As shown in Figure 4, BYD's cash-to-sales ratio was generally stable from 2016 to 2020, fluctuating within the range of 79.82% to 88.55%. The five-year average of BYD's cash-to-sales ratio is 85.19%. From 2016 to 2018, the cash-to-sales ratio of BYD's

auto manufacturing industry was relatively stable, fluctuating between 100.34% and 103.84%. The average five-year cash-to-sales ratio of the automobile manufacturing industry is 98.03%. The cash-to-sales ratio of the benchmark company SAIC has shown a downward trend, from 119.48% in 2016 to 88.19% in 2020. The five-year average of SAIC's cash-to-sales ratio is 103.03%.

Table 5: Trends in Cash to Sales Ratio.

	2016	2017	2018	2019	2020
BYD	86.44%	89.07%	79.82%	83.89%	88.55%
Industry	103.84%	100.34%	102.92%	91.27%	91.79%
SAIC	119.48%	111.89%	111.50%	84.07%	88.19%

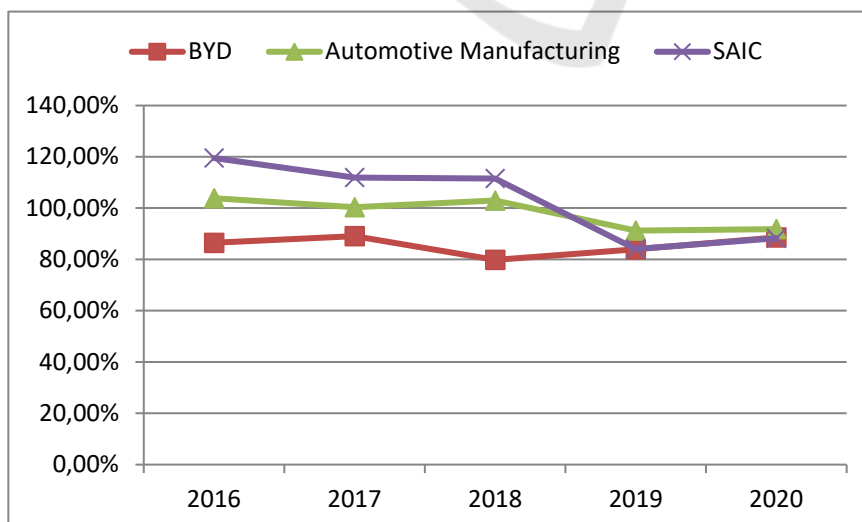


Figure 4: Trend of Cash to Sales Ratio.

4.3 BYD's Commodity Profitability

The net profit rate of sales is equal to the ratio of net profit to operating income. From 2016 to 2019, the sales net profit margin of BYD and the automobile manufacturing industry showed a similar downward trend. BYD's sales net profit margin was always 1% lower than the industry average, and SAIC's sales net profit margin was generally better than the industry average. In 2019, the inflection point of BYD's sales net profit margin appeared, rising to 3.84% in 2020, basically the same as SAIC's 4.04%, and higher than the industry average of 3.35%. Although BYD is comparable to benchmark companies, BYD's sales net profit margin is still low, and the overall profitability of goods in the auto manufacturing industry has declined.

The cash-to-sales ratio is equal to the cash received from the sale of goods and services, divided by the operating income. The higher the cash-to-sales ratio, the stronger the company's ability to obtain cash through sales, the good sales situation of the company's products, the reasonable credit policy, the timely recovery of payment for goods, and the effective collection of payments. From 2016 to 2020, BYD's cash-to-sales ratio has a relatively stable change trend, and the fluctuation range is also relatively flat, which is generally lower than the industry average and SAIC. BYD's commodity profitability indicator was little changed.

5 CONCLUSIONS

The paper uses Power BI software to carry out big data financial analysis of Vanke's solvency. The conclusions are as below. This paper uses industry analysis and trend analysis to analyze BYD's profitability. Compared with SAIC, a benchmark company in the automobile manufacturing industry, BYD's performance in 2020 is very good, and its profitability has risen sharply, which is basically the same as SAIC and higher than the industry average. But at the same time, it should be noted that the overall profitability of the automobile manufacturing industry is on a downward trend, and even the profitability of SAIC, the leading enterprise, is not high. The increase in the cost of automobile manufacturing has led to a decline in profits. It is necessary to strengthen cost management, reduce expenses, and increase corporate profits.

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