

# Research on the Application of Harvard Analytical Framework in Baidu

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**Abstract:** With the arrival of data-driven era, many large-scale enterprises in the economic transition period have suffered unprecedented impacts. Traditional enterprises with large scales have a serious overcapacity phenomenon, and they have encountered double dilemma of profit decline and financing difficulty. However, the Internet companies are against the current. The number of enterprises has grown linearly, and the development momentum is very rapid. This thesis uses the Harvard analytical framework to conduct a comprehensive analysis of Baidu. The SWOT analytical method is mainly used in the strategic analysis level. The accounting analysis mainly analyzes Baidu's balance sheet and profit statement. The financial analysis mainly analyzes from two aspects of solvency and profitability. The prospect forecast mainly carries out analysis from the future possible threat and opportunity two angles. Analysis demonstrates that, at the strategic level, Baidu on the one hand should guarantee the long-term reputation of enterprise; on the other hand, it should also focus on the development of technology. From the perspective of accounting and finance, Baidu ought to improve its short-term solvency and carry out targeted scale expansion, avoiding unnecessary waste of resources.

## 1. Background Introduction

Under the background of data driven era, the progress of Internet technology has promoted the vigorous development of asset-light industry. However, at the same time, traditional medium and large enterprises are faced with the development dilemma of excess capacity, large inventories, high debt and high cost. Under the characteristics of low-occupancy cash assets, low inventory and fixed assets demand, scientific research advantages and high brand value, Internet companies, by contrast, have avoided many problems encountered by traditional enterprises in the development process.

As one of the first large-scale Internet enterprises, Baidu is still at the top of the industry pyramid after more than 20 years of development and occupies an absolute position in the field of domestic search engine. Therefore, this thesis selects Baidu as a case to study its development and operation rules, which is of strong representation.

As a result, this thesis conducts a comprehensive and overall financial analysis of Baidu's business model via the Harvard analytical framework, and it gives corresponding suggestions based on the analysis results, so as to improve the efficiency and effect of the enterprise's future application of this model. Through the analysis and research of Baidu's financial structure, it provides certain enlightenment and ideas for the transformation of the same industry and enterprises.

## 2. Literature Review

### 2.1 Proposal and Definition of Harvard Framework

Business activities and results are related to many factors, such as national policies, market environment, enterprise strategy, accounting environment and so on. This also causes that the enterprise's financial report and the real operating condition often cannot be completely consistent, so various methods of financial analysis come into being. Hence, users of financial reports can effectively extract the useful information from the report. Combined with external market

environment and the industry situation, they can correctly interpret the future development direction of the enterprise, so as to effectively utilize the report. Therefore, Harvard University three scholars K. G. Palepu, P. M. Healy and V. L. Bernard put forward the Harvard Analytical Framework, which integrates strategic analysis and financial statement analysis, in the book *Conduct Business Analysis and Evaluation Using Financial Statements*. It combines qualitative analysis with quantitative Analysis, and systematically introduces the complete logical framework of financial statement analysis, effectively making up for the shortcomings of the traditional financial analysis system.

### 2.2 Four Dimensions of Harvard Framework

The Harvard analytical framework mainly includes four aspects, namely strategic analysis, accounting analysis, financial analysis and prospect analysis. The Harvard framework analysis system takes strategic analysis as the logical starting point, which lays a foundation for subsequent accounting analysis and financial analysis. Accounting analysis mainly evaluates the company’s asset structure, debt ratio and profit quality, with a basic understanding of the company’s financial situation. Based on financial data and indicators, the financial analysis further explains the company’s development history and operational status. Ultimately, it focuses on the analysis of the company’s future development and helps companies adjust their development strategies. In short, the four analytical steps complement each other and support each other to form a complete logical analysis framework.

### 3. Introduction of Baidu

The development of Baidu’s profit model has mainly gone through three stages. At the beginning, it mainly focused on search service and made profits through paid listing. Later, after accumulating customer traffic, it went online with diversified network products. Then, it focused on core business and deepens business cooperation in multiple areas.

First of all, through its powerful search engine technology, Baidu launched free search services for users. For merchants and partners, it created the main source of revenue for Baidu through “paid listing”, thus accumulating a large number of users. Then, via a series of Internet value-added services, it turned the potential user market into a customer source, making advertising revenue become an important part of Baidu’s revenue. Finally, through extensive user advantages, the company expanded its business and conducted diversified development. By taking advantage of Baidu’s popularity and brand effect, it developed a series of products such as Baidu input method and Baidu cloud, and the income from these related products became another major source of income for Baidu.

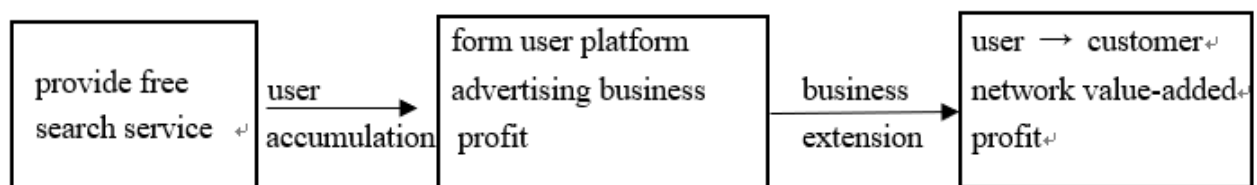


Figure 1. Composition of Baidu value chain

Baidu has always centered on the network market. By 2017, Baidu has not launched offline business or opened stores. This operation mode largely saved a lot of investment in heavy assets, which enables the company to put more energy into network operations, and more funds can be invested in light assets such as R&D and brand.

### 4. Harvard Analysis of Baidu

The asset-light feature of Baidu is its basis of rapid and long-term development, However, because of asset-light enterprises have various characteristics that cannot be replicated by other

enterprises, accounting analysis of Baidu will be slightly biased only from the perspective of financial statements. Accounting data is only the “financial performance” in the company’s implementation of its business strategy. It must also focus on its non-financial data, analyzing and evaluating the financial status of the company from a strategic perspective.

#### **4.1 Strategic Analysis (SWOTPEST)**

##### **4.1.1 Analysis of Baidu’s Internal Strengths**

As a Chinese company, Baidu has a great advantage in localization. Baidu focuses on the Chinese market, and designs its operation mode in a very Chinese way, and its use and operation also try to fit the habit of local people. Meanwhile, in order to better meet the demands of Chinese market, Baidu has also commercialized its services in a Chinese way and developed a series of products and services that are in line with China’s characteristics, such as Chinese associative-word search, precision advertising and so on. Baidu provides Chinese search users with a very nice user experience, making Chinese users hold a strong psychological identity of Baidu.

##### **4.1.2 Analysis of Baidu’s Internal Weakness**

Baidu’s commercial promotion paid listing model has been controversial. For users, they hope to get relatively fair and objective information by searching, and the same goes for advertising. However, Baidu’s source of current main profit is the paid listing mode of advertising, which makes the information provided not only focus on user demand. Therefore, Baidu suffers from users’ doubts and even criticism.

##### **4.1.3 Analysis of Baidu’s External Opportunities**

With the continuous development of the Internet, the improvement of people’s living standards and the pursuit of spiritual life, China’s network market will continue to expand, and the number of Internet users will continue to increase. This means that there are more possibilities and opportunities for the development of Baidu in the future.

##### **4.1.4 External Threats of Baidu**

At present, Google has begun to notice the Chinese market, and Google China is a test of its entry into the Chinese Internet market. In terms of channel operation, Google has adopted the strategy of combining direct selling and agency to establish its own channel. In addition to Google, Yahoo search is also trying to enter the Chinese market. Its current main business is e-commerce services, which is mainly targeted at small and medium-sized enterprises, and it is also the small and medium-sized enterprises that are willing to pay for the search. Therefore, the development of Yahoo will also pose a certain threat to Baidu. In particular, Alibaba’s unprecedented development in the e-commerce industry has made various types of e-commerce customers emerge in endless in recent years, and these customers are likely to become consumers of Yahoo’s search engine.

The total assets of Baidu have been increasing year by year, from \$16.064 billion in 2014 to \$43.340 billion in 2018, which has increased by nearly \$27 billion in five years, indicating that the company has been expanding during this period. As can be seen from table 1, current assets account for a large proportion of the total assets, rising from \$ 10.612 billion in 2014 to \$ 22.589 billion in 2018, with an increase of 226.59%. The above data indicates that the change of enterprise’s total assets is greatly affected by the change of current assets, and the increase of current assets is beneficial for enhancing the liquidity of enterprise assets and improving the debt paying ability.

From 2014 to 2018, Baidu’s total liabilities increased by \$13.628 billion, an increase of 272.12%. In the past five years, the company’s liabilities and owner’s equity have both increased significantly. The growth of Baidu’s total liabilities is mainly reflected in the growth of current liabilities, which shows a steady and sustained increase trend on the whole. As is suggested in table 1, current liabilities nearly doubled in 2018 compared with 2017. The sharp increase of current liabilities might bring some pressure of debt to the company, but it also enhances the asset liquidity.

## 4.2 Accounting Analysis

### 4.2.1 Balance Sheet Analysis

Table 1. 2014-2018 Balance sheet of Baidu (unit: million US dollars)

	2018	2017	2016	2015	2014
Asset column					
Current asset	22,589.68	23,213.91	14,354.83	12,047.81	10,612.85
Among them: cash and short-term investment	20,602.85	18,284.24	12,973.46	10,475.73	9,362.52
Among them: cash and short-term investment	4,344.35	1,740.79	1,613.93	1,548.59	2,299.49
Account receivable	1,326.45	4,451.63	959.09	987.62	701.74
Liability column					
Current liability	8,280.73	12,600.89	6,633.87	4,019.77	3,267.45
Long-term liability	7,996.71	5,499.39	4,960.20	5,228.26	3,797.17
Deferred tax liability	597.03	518.27	516.47	529.95	184.37
Other liability	867.94	17.2	13.35	22.06	29.69
Total: gross liability	17,742.40	18,635.75	12,123.89	9,800.05	7,278.68

### 4.2.2 Profit Statement Analysis

Table 2. Simplified version of Baidu's profit statement from 2014 to 2018 (unit: 100 million US dollars)

	2018	2017	2016	2015	2014
Operating revenue	15,456.68	12,549.01	10,619.21	10,561.73	7,949.42
Operating cost	7,819.84	6,432.76	5,366.92	4,420.71	3,103.55
Operating margin	7,636.83	6,116.25	5,252.29	6,141.02	4,845.87
Sales, management and administrative expense	5,289.85	3,794.49	3,739.68	4,284.01	2,755.49
Other expense	0	0	0	0	0
Pre-tax operating profit	2,346.98	2,321.76	1,512.61	1,857.01	2,090.38
Net non-operating income	2,079.04	1,075.73	882.51	4,358.46	377
Interest expense	284.57	238.97	174.24	165.69	101.87
Total profit	4,141.45	3,158.52	2,183.95	6,031.17	2,350.11
Income tax	716.79	443.16	438.56	871.01	361.58
Combined net profit	4,147.34	2,710.48	1,666.93	5,303.80	2,128.56

Baidu's annual revenue growth is relatively stable. However, there was a slight growth in 2016, mainly because Baidu's network marketing revenue growth in 2016 was far behind the average growth rate of 40.4% in the previous three years. Meanwhile, it was also, to some extent, related with the Tieba incident, "Wei Zexi incident" and the Internet advertising law, affecting the revenue amount about 25 billion yuan. In terms of total profit analysis, the total profit of Baidu has been increasing year by year, among which the sudden and substantial profit growth in 2015 was caused by the significant increase of non-operating income. The analysis of net profit can be seen from the above table. In addition to the substantial increase of non-operating income in 2015, the figure of conceptual net profit was relatively objective, and the overall net profit level of Baidu in other years was relatively low.

Through the analysis of its income tax data, it can be concluded that the main reason for the change of the company's net profit is the change of the total profit.

### 4.3 Financial Analysis

#### 4.3.1 Solvency Analysis

Table 3. Baidu Company's solvency indicator from 2014 to 2018

Items	2014	2015	2016	2017	2018
Current ratio (times)	3.90	3.25	3	2.16	1.84
Quick ratio (times)	3.90	3.19	3	2.16	1.84
Cash ratio (times)	90.19	70.37	38.16	23.64	13.51

The three indicators in Table 3 are the basic indicators to evaluate a company's solvency. The current ratio measures the ability of an enterprise's current assets to be realized and used to repay liabilities before the short-term debt comes due.

In general, we are convinced that it is reasonable to have a current ratio of more than 2:1, that is, current assets are twice as much as the current liabilities. In this way, even if half of current assets cannot be realized in the short term, all current liabilities can be guaranteed to be repaid.

The cash ratio reflects the ability of the company to repay debts directly through cash assets. During 2013-2014, Baidu's cash ratio was very high, indicating that its cash assets were highly held. But by 2015, there was a large fall in cash ratio, and it continued to decline in the following two years. In 2017, the indicator was 13.51%. From its balance sheet in 2015, the reason for the significant impact of this indicator was due to a dramatic increase in long-term investment in 2015. As a result, Baidu ought to focus on the steady progress in the future investment activities. They should not rashly increase too much long-term investment, otherwise it would make the company's short-term solvency weakened.

#### 4.3.2 Profitability Analysis

Table 4. Profitability index of Baidu from 2014 to 2018

Items	2014	2015	2016	2017	2018
Gross profit margin (%)	63.36	60.96	58.14	49.46	48.74
Net profit margin (%)	32.93	26.78	50.22	15.70	21.60
Return on total assets (%)	17.98	15.32	27.32	6.81	8.36
Return on equity (%)	32.03	28.46	50.58	13.00	17.49

(1) As can be seen from Table 4, the gross profit margin of Baidu has decreased in recent five years, indicating that Baidu's profitability has weakened in recent years, but it remained at a high level with strong profitability.

(2) The net profit margin on sales is consistent with the gross profit margin on sales. The higher this index, the stronger the profitability of the enterprise. In addition to a large increase in 2015, Baidu's net profit margin on sale has only a small fluctuation in other years, with the average index maintaining at around 20%, indicating that Baidu's profitability is relatively stable.

(3) Return on total assets from 2014 to 2018, Baidu's return on total assets decreased year by year, but it was still at a relatively high level compared with the traditional industry, indicating that Baidu has a high level of input-output and effective cost control, which should be maintained in the future to improve the enterprise management ability.

(4) Return on equity, also known as return on stockholder's equity, is the ratio of net profit to average shareholder's equity, reflecting the profitability of its own capital. The return on equity of Baidu has also declined year by year in the past five years, indicating that the profit from its own capital was relatively low.

## **4.4 Prospect Analysis**

### **4.4.1 Potential Threats to Baidu in the Future**

First of all, the excessive exploitation of the market leads to cost risk. The diversified development strategy will make the operating cost of Baidu increase dramatically, which will affect the company's revenue and profit margin. Although the Internet industry is in the rising stage and the pressure of competition is high, it is unwise to blindly expand business or even invest capital in many unfamiliar fields to seize the market. Too rapid growth of operating costs will seriously affect the profitability of the enterprise.

### **4.4.2 Favorable Factors for Baidu's Future Development**

Through the strategic analysis, accounting analysis, financial analysis of Baidu, it can be seen that Baidu, as the pioneer of Internet enterprises, still has a high market share and great resource advantage. First of all, Baidu has been developing for a long time and has a high degree of national trust. Secondly, the development of Internet enterprises is getting more and more support and attention at the national level.

## **4.5 Comprehensive Evaluation of Baidu under the Harvard Framework**

Firstly, from the perspective of development strategy, Baidu must maintain its own technological advantages, implement the technology-centered development strategy, and give full play to the role of Baidu Research.

Baidu should always pay attention to that, as an Internet enterprise, if it wants to enhance the strength of the company in the future, it must emphasize the technological progress and innovation, and develop steadily according to the established strategy. At the same time, under the premise of technical advantages guarantee, it should also focus on the details. For instance, the current Baidu's profit method for search paid listing needs to be further explored and improved. Although paid listing has brought high revenue to Baidu, word of mouth is very important if the enterprises want to achieve long-term development. Consequently, Baidu can make some adjustments on the basis of the current paid listing. They can find a balance between the pursuit of profit and the availability of search results.

Secondly, in addition to controlling the general direction of its own development through strategic adjustment, Baidu should also pay attention to the financial aspect. This thesis vertically analyzes the balance sheet, profit statement and cash flow statement of Baidu for the past five years. It finds out that on the balance sheet, Baidu's total assets increase year by year; short-term investment increases, and current liabilities increase substantially. In terms of profit statement, the total revenue and profit of Baidu in the past five years have sought progress while maintaining stability, but the operating profit has fluctuated greatly.

Finally, by comparing the trend of various financial indicators of Baidu and the industry, it can be found that in terms of solvency, Baidu's cash ratio declined significantly in 2015, which affected its solvency.

In short, Baidu is still in the rising stage of development. The current market environment has a positive effect on Internet companies as well. Therefore, Baidu must be strict with itself from all aspects, maintain its own advantages, formulate accurate strategies, and avoid capital outflows and waste. It ought to utilize financial leverage brought by the Internet model to the Internet industry and adjust the financial direction in time, striving to explore a stronger development path in the future.

## **5. Problems Existing in the Development of Baidu and Development Proposals**

In the above analysis of Baidu's financial structure, the author makes a specific analysis of its strategy, accounting and finance through the Harvard analytical framework, and gives the prospect forecast of the company's development. The following is a summary of the analysis of problems in strategic, accounting and financial aspects, and it also gives corresponding countermeasures and suggestions.

### **5.1 Problems Detected on the Basis of Harvard Framework Analysis**

At the strategic level, the current macro environment is rather beneficial for the development of the Internet companies, and Baidu itself also has many incomparable advantages than small and medium-sized enterprises. It only needs to grasp the established strategic policies as well as timely summarize and adjust on the way forward. Baidu still has the potential of further development. However, there are still two problems in the implementation of the strategy.

(1) Baidu's paid listing model brings brand problems and trust crisis. Baidu's good reputation and brand image have a lot to do with its starting time. Baidu entered people's field of vision at the early stage of Internet popularization, and once dominated the Chinese search engine market, with strong user stickiness.

(2) There is an obvious gap between its technological level and that of developed countries. Although the current political and economic environment is very favorable for Baidu's development, for companies like Baidu, only by ensuring technological and R&D advantages can enterprise lay a foundation for sustainable development.

#### **5.1.1 Analysis of Problems and Causes at the Accounting Level**

(1) The large-scale investment expansion of enterprises affects the quality of their liabilities. Baidu's asset quality is good in recent years, but the proportion of short-term investment is relatively large, and the growth of current liabilities is relatively fast.

(2) The profitability shows a downward trend. From the perspective of profit and cash flow, the growth of operating revenue is stable, but the increase in operating profit and net profit is small, and the cash flow of investment expenditure fluctuates greatly.

#### **5.1.2 Analysis of Problems and Causes at the Financial Level**

(1) The solvency has decreased significantly. Baidu's solvency has declined year by year, especially the index value of the cash ratio has dropped significantly, indicating that cash investment is too fast and available cash flow decreases. This is due to the reduction in the amount of cash flow because of the diversification expansion and investment of the company.

(2) The owned capital has a poor profitability. Long-term solvency is strong, the overall financial risk is low, and the profitability is stable. But the owned capital has low profit, and the investment income is high. This kind of indicator change may be because Baidu's own capital base is large, but the utilization rate is low. Or there are more cases of investment failure, which affects the ratio of indicators. According to Baidu's current development, the former is more likely.

## **5.2 Related Suggestions on Baidu's Operation and Management**

At the strategic level, Baidu can adjust this mechanism to a certain degree according to the brand problem and trust crisis brought by the paid listing model. For instance, based on the quality of the product for hierarchical bidding, the products with the same or similar quality level are bidding.

Then rank them according to different quality levels, which can avoid the phenomenon of pure interest maximum and lack of fairness caused by the current paid listing to a certain extent.

In terms of upgrading the technology level, Baidu should strengthen research and development investment, attract talents with various devices and increase the opening up. It should not only strive to keep up with the international research and development technology level, but also have its own innovation points. Only innovation can make progress, so that Baidu can stabilize its position in the domestic search engine industry. At the accounting level, enterprises should pay attention to find areas for investment with development space and market potential. They might as well carry out targeted investment and expansion to avoid excessive investment and too fast debt growth.

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