

Financial Statement Analysis Based on Harvard Analysis Framework

—Taking Apple Inc. as an Example

Xiangmin Tian^{1,a,*}

¹International Business, Southwestern University of Finance and Economics, Chengdu 611130, China

a. 42052005@smail.swufe.edu.cn

**corresponding author*

Abstract: In recent years, the high-technology products have become the most important tools which can make the daily life more convenient. With the developments of the current technology level, in the high-technology industry, there are more and more companies and the competition become more and more intensive. Therefore, for the companies, it is important to analyze companies' financial statement through the essential data in the financial statements and the overall environment of the industries. The comprehensive financial statement analysis can help the companies to identify their competitive advantages and adopt the favorable strategies. By selecting Apple Inc. as the subject, this research, based on Harvard analysis framework, provides a comprehensive analysis of Apple's financial situation from strategic, accounting, financial and prospective these four dimensions. In the first part, the background and significance of this paper, and a review of the relevant literature are presented. And in the second part, this research focuses on the theoretical framework of the Harvard framework. The third part, the focus of this research, is about the financial statement analysis of Apple. The last part, is about the conclusion and shortcomings of this research. Through the analysis, this research can help to identify the financial and strategic situation of Apple.

Keywords: financial statement analysis, Harvard analysis framework, high-technology industry

1. Introduction

1.1. Background

With the development of the technology and globalization, the high-technology industry plays an important role in the global market. Now, it has been one of the fastest growing and largest industries in the world. More and more governments are paying attention to supporting the development of their domestic high-technology companies to encourage them to enter the global market, with the aim to grow their national economies and technology level. In the past, the high-technology industry was dominated by Nokia, Samsung and some other companies. But since 2007, when Apple launched its

first generation iPhone, the market landscape has changed rapidly. In 2022, Apple's market capitalization has reached \$2.6 trillion, ranking the first in the global high-technology industry. Nowadays, every product of Apple can change the development direction of the world high-technology industry and deeply affect people's lives. This research is based on the background of Apple's great success, trying to use financial statement analysis theory and method to research the strategy and financial situation of Apple, and since provide some useful suggestions for other high-technology companies.

1.2. Significance

Now, the competition in the high-technology industry is more and more intensive. The financial statement analysis is an essential method for the managers to know more about the environment of the industry and their companies. This is beneficial for the managers to make the more suitable corporate strategies, which can make their companies attain more competition advantage and market share. Through analyzing Apple, although some information of Apple is unique, this research can still provide a reference for other companies and make more managers aware of the importance of financial statement analysis.

2. Literature Review

2.1. The Definitions of Financial Statement Analysis

About the financial statement analysis, different scholars have the different understandings and definitions. The concept of financial statement analysis first came from the American banking industry. It was used by the financiers. Through analyzing the financial statements, they calculated the credit rate of the companies to identify whether they have the ability to pay the debts. As the development of the market, scholars continue to research the financial statement analysis. Yang considered that the financial statement analysis is consists of two parts. The first part is using the professional tools to analyze the financial situation, and the second part is the application of the results of the analysis when the company is operating [1]. In the subsequent researches, some scholars explained and added to this concept. Helfert argued that financial statement analysis is a process which focuses on the analysis of the company's operations, investment activities and assessed values [2]. Stickney argued that financial statement analysis should include the process to compensate for the shortcomings of companies which show in the analysis [3]. Zhang pointed that the financial statement analysis includes four processes which are preparation, analysis, reporting and conclusion respectively [4].

2.2. The Methods of Financial Statement Analysis

About the financial statement analysis, currently, there are three methods in the academia which are Du Pont analysis, ratio analysis and Harvard analysis framework.

Kaplan and Norton established a method of financial statement analysis which is called Du Pont analysis. In addition to financial indicators, they encouraged to use some non-financial indicators to analyze the financial performance of companies, such as customer satisfaction, operational efficiency and innovation [5]. This is the initial method of financial statement analysis.

Based on Du Pont analysis, Wole created the method of ratio analysis. He chose seven indicators of a company's financial situation and linked them in a linear relationship to analyze the financial statement of companies [6]. These ratios, such as inventory turnover ratio and non-current assets ratio, are used in the current financial statement analysis.

Now, the methods generally adopted by scholars are Harvard analysis framework. Palepu, Healy and Bernard, based previous research, combined the analysis of corporate strategies with financial statement and proposed the Harvard analysis framework [7]. The Harvard analysis framework not only includes the qualitative and quantitative analysis, but also is consists of strategic, accounting, financial and prospective analysis. Therefore, it can be seen as a comprehensive method of financial statement analysis.

2.3. The Applications of Harvard Analysis Framework

Current, more and more scholars are using the Harvard analysis framework to analyze the financial statement of companies, with the aim to learn more about the companies, industries, markets and to develop this method.

Liu and Wang selected Yili Inc. as the research object and adopted Harvard analysis framework to analysis its financial statement. Through the analysis of Yili's corporate strategies, finance and other two dimensions, Liu and Wang obtained the result of analysis and proposed the relevant suggestions for the company [8]. Ji analyzed the external and internal environment and forecast the future development of a home appliance company [9]. The result was useful for the development of the company. Some scholars also used Harvard analysis framework to analyze the non-profitable organizations. By analyzing the East China Normal University, Jia and Hong found the effectiveness of Harvard analysis framework in non-profitable organizations [10]. Yang selected five public universities as the samples and also indicated the validity of Harvard analysis framework [11].

2.4. Review Conclusion

According to the previous literature, this research considers that a complete financial statement analysis process should include not only a description of the existing situation of company, but also a forecast of the company's future development and the presentation of relevant suggestions. Compared to some traditional methods of financial statement analysis which only uses financial ratios, Harvard analysis framework is a more comprehensive method and combines the qualitative methods with quantitative. Kasmoui suggested that the using of Harvard analytical framework can improve the accuracy and effectiveness of the financial statement analysis [12]. Therefore, this research will adopt the Harvard analysis framework to analyze Apple's financial statement.

3. Theoretical Framework

After many academic and practice tests, in recent years, the Harvard analysis framework has been greatly developed. Now, it is mainly consists of strategic, accounting, financial and prospective analysis.

3.1. Strategic Analysis

The strategic analysis dimension is Harvard analysis framework's key difference with the traditional analysis methods. It mainly about the strategies adopted by the companies and the industries the companies belong to. With regard to the company level, the SWOT framework, generic strategies and value chains are usually used to analyze the internal and external environment of the company. With regard to the industry level, the Porter's five force model is used to identify the profitability and the competitive pressure of the industry.

3.2. Accounting Analysis

The accounting analysis is mainly about the financial statements of the companies, which includes the balance sheet, income statement and the cash flow. The common-size financial statements will be used. Through analyzing the significant changing in some key factors, such as assets, liabilities, revenue and so on, the accounting situation of the companies can be identified and it can support the subsequent analysis.

3.3. Financial Analysis

Based on the common-size financial statements, the financial analysis focuses on the financial ratios including the profitability, liquidity, efficiency and investment. And meanwhile, the financial analysis uses both vertical and horizontal comparison methods to compare not only the past and current financial situation of the companies, but also the financial situation of the companies with its competitors.

3.4. Prospective Analysis

The prospective analysis is the last part of Harvard analysis framework. It is the summary of the previous three analysis. Based the information and results obtained from the previous analysis, the prospective analysis focuses on the future risks, challenges and opportunities facing the companies and to forecast the future prospects of the companies.

Through the above theoretical analysis, this research finds that the Harvard analysis framework including strategic, accounting, financial and prospective these four dimensions is a comprehensive and accurate method. Therefore, this research will also adopt these four dimensions to analysis the financial statement of Apple.

4. Financial Statement Analysis of Apple

This part will first introduce the Apple Inc. and then analyze the financial statement of Apple based on Harvard analysis framework.

4.1. About Apple Inc.

Apple Inc. is an American company which was founded by Steve Jobs, Steve Wozniak and Ronald Wayne in 1976. It was originally known as Apple Computer Inc. and in 2007, changed to Apple Inc. Apple focuses on digital technology products and is famous for its innovation. Its products are mainly phones, computers, music players, headphones and smart watches, etc. which include almost all high-technology products. After more than three decades of rapid development, now Apple has grown to the listed company which has the largest market value in the world. It has dominated the high-technology industry.

4.2. The Strategic Analysis of Apple

4.2.1. Industry Level.

In the industry level, this research will use the Porter's five force model to analyze the high-technology industry that Apple belongs to.

The first force is the threat of new entrants. For the high-technology industry, if one company wants to enter this industry, it requires a lot of capital to invest in the R&D and the manufacture of its products. The capital requirement is high. And meanwhile, the customers switching costs is high

because each technology company's products have their own unique operation system. For example, Apple has the IOS system while Microsoft has the Windows system. So the customers will not easily switch from Apple to Microsoft. These two factors lead to a low threat of new entrants for high-technology industry.

The second force is the bargaining power of suppliers. In the high-technology industry, the suppliers are usually the manufacturing companies which produce the chips, CPU and so on. Because of the globalization, Apple can choose the suppliers from all over the world. And Apple has a large scale of production. Its orders are a major source of the revenue for these suppliers. Therefore, the bargaining power of suppliers for Apple is low.

The third force is the bargaining power of consumers. For the high-technology industry, the consumers are usually the individuals. So the customer concentration is low. And as mentioned before, the customers switching costs is high because each technology company's products have their own unique operation system. For Apple, it has a large and loyal user base. So, the bargaining power of consumers for Apple is low.

The forth force is threat of substitutes. In the high-technology industry, the substitutes for the products are limited. There are few substitutes to the phone, computer and so on. And the potential threat of substitutes is also low because it costs a lot for the companies to invent the new substitutes for the high-technology products. So, the threat of substitutes is low for Apple.

The last force is industry rivalry. The competition in the high-technology industry is fierce. The first reason is that there are so many companies in this industry, such as Microsoft, Huawei, Dell, Samsung and so on. These companies remain the roughly equal size and power. The second reason is that with the development of technology and industry, the competition on the price of products is more and more fierce. The price of products is lower and lower. So, the industry rivalry for the Apple is high.

Through the Porter's five force model, this research finds that the competition in the high-technology industry is more and more intense. But because of Apple's strong brand value and large number of loyal users, it still dominant the industry and have a large market share.

4.2.2. Company Level.

In the company level, this research will use the SWOT framework to analyze the internal and external environment of Apple and the strengths, weaknesses, opportunities and threats of Apple are shown in the Table 1.

Table 1: The SWOT frame of Apple Inc.

Strengths	Weaknesses
<ul style="list-style-type: none"> · Strong brand recognition and reputation for innovation. · Diversified product portfolio including products such as the iPhone, iPad and Mac. · Strong ecosystem, including the App Store and iCloud, enhance the user experience. 	<ul style="list-style-type: none"> · Higher pricing compared to its competitors. · Limited presence in some developing countries. · High reliance on iPhone for a significant portion of revenue.
Opportunities	Threats
<ul style="list-style-type: none"> · Expansion into some developing countries. · Development of new product categories, such as Virtual reality. · Expansion of Apple Music and Apple TV. 	<ul style="list-style-type: none"> · Increasing competition from other technology companies. · Increasing government regulations and scrutiny.

For the Apple, it should take advantage its strengths and to resolve its weaknesses. And it should also seize the opportunities and protect itself from the threats.

4.3. The Accounting Analysis of Apple

This research selects the balance sheet and income statement for the three years 2020-2022 to analyze the accounting situation of Apple. In the common-size balance sheet, there are some significant changes to the accounts.

4.3.1. Balance Sheet.

As shown in the Table2, about the assets, the cash and short-term investment had a significant decrease, from 28.09% to 13.69%. It means that Apple has a lower capital reserve ratio and debt paying ability. Apple has a higher risk about debt. But meanwhile, it also means that Apple has a higher fund utilization ratio and profitability. The total accounts receivable ratio increases from 11% to 17%, also means the higher risk about debt. In recent three years, Apple's inventory ratio is close and low. It is a good signal for Apple. For the long-term assets, the whole long-term assets have the increases, indicates that Apple is expected to have a good development.

Table 2: The balance sheet of Apple Inc.

Balance Sheet-USD(\$)\$ in Millions	2022		2021		2020	
Assets						
Cash & Short Term Investments	48,304	13.69%	62,639	17.85%	90,979	28.09%
Total Accounts Receivable	60,932	17.27%	51,506	14.67%	37,445	11.56%
Inventories	4,946	1.40%	6,580	1.87%	4,061	1.25%
Other Current Assets	21,223	6.02%	14,111	4.02%	11,228	3.47%
Total Current Assets	135,405	38.38%	134,836	38.41%	143,713	44.37%
Net Property, Plant & Equipment	52,534	14.89%	49,527	14.11%	45,336	14.00%
Total Investments and Advances	120,805	34.25%	127,877	36.43%	102,624	31.69%
Other Assets	44,011	12.48%	38,762	11.04%	32,215	9.95%
Total Long-Term Assets	217,350	61.62%	216,166	61.59%	180,175	55.63%
Total Assets	352,755	100.00%	351,002	100.00%	323,888	100.00%
Liabilities						
ST Debt & Current Portion LT Debt	22,773	6.46%	17,141	4.88%	15,229	4.70%
Accounts Payable	64,115	18.18%	54,763	15.60%	42,296	13.06%
Other Current Liabilities	67,064	19.01%	53,577	15.26%	47,867	14.78%
Total Current Liabilities	153,982	43.65%	125,481	35.75%	105,392	32.54%
Long-Term Debt	109,707	31.10%	119,381	34.01%	107,049	33.05%
Provision for Risks & Charges	16,657	4.72%	24,689	7.03%	28,170	8.70%
Other Liabilities	21,737	6.16%	18,361	5.23%	17,938	5.54%
Total Liabilities	302,083	85.64%	287,912	82.03%	258,549	79.83%
Equity						
Common Equity (Total)	50,672	14.36%	63,090	17.97%	65,339	20.17%
Total Shareholders' Equity	50,672	14.36%	63,090	17.97%	65,339	20.17%
Total Equity	50,672	14.36%	63,090	17.97%	65,339	20.17%

Table 2: (continued).

Liabilities & Shareholders' Equity	352,755	100.00%	351,002	100.00%	323,888	100.00%
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About the liabilities and equity part, overall, Apple has the high liability ratios. They are above 80%. And there is an increasing in the current liabilities. And combined with the decreasing cash mentioned before, this change should get Apple's attention. About the equity, both the number and ratio have the decreases. There are maybe three reasons for the decreases. Stock buybacks and dividend payouts, Covid-19 and intensive competition. This research thinks that the reason is the first one. In 2020 and 2021, through stock buybacks and dividend payouts, Apple returned \$73 billion and \$90 billion to shareholders, which reduces the equity.

4.3.2. Income Statement.

As shown in Table 3, in recent three years, there is a continuous increase in the revenue of Apple and in 2021, the sales and revenue had a significant increase. This research thinks it was because, at the end of 2020, Apple launched iPhone 12 which support 5g network. So, in 2021, so many people updated their mobile phone which makes the revenue of Apple increase significantly. About the gross income ratio, there is an increase. It is because Apple invested more in the R&D which reduces the cost.

Through the accounting analysis, this research finds that Apple has some risk in the debt and cash. Although Apple has a stable development in the profitability, this issue should be taken seriously by some managers.

Table 3: The income statement of Apple Inc.

Income Statement-USD(\$)\$ in Millions	2022		2021		2020	
Products	316,211	80.18%	297,409	81.30%	220,738	80.41%
Services	78,117	19.81%	68,408	18.70%	53,777	19.59%
Sales/Revenue	394,328	100.00%	365,817	100.00%	274,515	100.00%
Cost of Goods Sold (COGS) incl. D&A	223,546	56.69%	212,981	58.22%	169,559	61.77%
Gross Income	170,782	43.31%	152,836	41.78%	104,956	38.23%
SG&A Expense	25,094	6.36%	21,973	6.01%	19,916	7.25%
R&D Expense	26,251	6.66%	21,914	5.99%	18,752	6.83%
Operating Expense	51,345	13.02%	43,887	12.00%	38,668	14.09%
Operating Income	119,437	30.29%	108,949	29.78%	66,288	24.15%
Non-Operating Income(Expense)	-334	-0.08%	258	0.07%	803	0.29%
Pre-tax Income	119,103	30.20%	109,207	29.85%	67,091	24.44%
Income Tax	19,300	4.89%	14,527	3.97%	9,680	3.53%
Net Income	99,803	25.31%	94,680	25.88%	57,411	20.91%

4.4. The Financial Analysis of Apple

In this section, the financial ratios, include the profitability, liquidity, efficiency and investment, will be calculate and the vertical and horizontal comparison methods will be used to analyze some key financial indicators of Apple.

4.4.1. Profitability Ratios.

As shown in Table 4, Apple has the steady and increasing gross profit margin and net profit margin. These indicate Apple has a stable growth and it has control every steps of business including quality, price, cost and so on. Apple has a high ROCE ratio and it increases from 40.59% to 76.09%. It shows that Apple has the good ability of using investor funds to generate profit. Compared with its competitors, Apple's ROE ratio is very high. In recent three years, Apple's average ROE ratio is 145% while Samsung's average ROE ratio is 17%. It is beneficial for the Apple and the investors.

Table 4: The profitability ratios of Apple Inc.

Profitability ratios:	2022	2021	2020
gross profit margin	43.31%	41.78%	38.23%
net profit margin	25.31%	25.88%	20.91%
return on capital employed	76.09%	61.30%	40.59%
return on equity	196.96%	150.07%	87.87%
EBIT	122,034	111,852	69,964

4.4.2. Liquidity Ratios.

As shown in the Table 5, Apple has the low current ratio and quick assets ratio and they are decreasing which means Apple's assets has a low liquidity. For the high-technology industry, the average current ratio is 197%, almost twice as high as Apple's. It is not beneficial for Apple because Apple will have the risk about not being able to pay the day-to-day expenses and liabilities. So Apple should pay more attention to the liquidity of its assets.

Table 5: The liquidity ratios of Apple Inc.

Liquidity ratios:			
current ratio	87.94%	107.46%	136.36%
quick assets ration	84.72%	102.21%	132.51%

4.4.3. Efficiency Ratios.

As shown in the Table 6, in recent years, Apple has a low inventory holding period while the average inventory holding period for Huawei and Samsung are 101 days and 52 days respectively. It is beneficial for Apple because in high-technology, the update of the products leads to the high inventory cost. Apple's receivable collection period is low while its payable payment period is high which leads to the negative working capital cycle. This shows that Apple has a high bargaining power between suppliers and consumers. As a result, Apple can use its funds more efficiently.

Table 6: The efficiency ratios of Apple Inc.

Efficiency ratios:			
Inventory holding period(in days)	9	9	9
Receivables collection period(in days)	56	51	50
Payables payment period(in days)	105	94	91
working capital cycle	-39	-33	-32

4.4.4. Investment Ratios.

As shown in the Table 7, Apple's EPS increases from 3.31 to 6.15 which shows its profitability is increasing. It is a good signal for investors to invest. However, in the high-technology industry, it is ranked better than 68.5% of the companies. Compared with its competitors, it is not Apple's competitive advantage. In 2020, Apple's P/E ratio is above 30%, which shows that Apple is overestimated because for the high-technology industry, the benchmark is around 20%. In recent two years, it is around 25%, which is normal in the high-technology industry.

Table 7: The investment ratios of Apple Inc.

Investment ratios:	2022	2021	2020
earning per share(EPS)	6.15	5.67	3.31
P/E ratio	24.22%	25.65%	33.45%

4.5. The Prospective Analysis of Apple

According to the product life cycle theory, every product goes through the introduction, growth, maturity and decline period [13]. For Apple, each year it will launch the new products to maintain its profitability and some the breakthrough products, such as iPhone 12, can make a large increasing in the revenue of Apple. So, based on the accounting analysis and the product life cycle theory, this research assumes that Apple launches a breakthrough product every 2 to 3 years and obtains the following revenue forecast for a ten-year period. As shown in the Fig. 1.



Figure 1: The revenue forecast of Apple.

However, these risks could have an impact on Apple's future revenue. The pandemic caused interruptions at a few of the company's component suppliers, which led to supply shortages that impacted sales globally. Such disruptions may still happen in the future. The price of Apple products may be materially adversely impacted by trade policies, disputes, and other international conflicts, especially if they lead to tariffs and other restrictions on international trade in areas where the company has significant supply chain operations and sources a sizable portion of its revenues.

5. Conclusion

In summary, as a mature and dominant company in the high-technology industry, at the current time, Apple faces increasingly fierce competition, which is a big threat for it. Compared with its

competitors, Apple has some competition advantages, such as diversified products and high innovation capacity. Apple is financially healthy and uses its resources efficiently. It also generates significant income for its investors. In the future, Apple is expected to have a stable and favourable development. However, some uncertainties, such as unfavourable trade policies and the rapid changes in the industry, could create the challenges for Apple's growth.

Through the financial statement analysis of Apple, based on the Harvard analysis framework, this research can provide some reference for analyzing other companies. And this research expects to help to improve the accuracy and science of the financial analysis of the high-tech industry and other industries.

However, this research still has some shortcomings, which can be improved. In the account analysis and financial analysis, this research only selected the financial statements of Apple for the past three years as the samples, which leads to the less convincing analysis results. And the financial statements in this research are obtained from the Apple's publicly available annual reports. Therefore, for the information that is not disclosed by Apple in the annual reports, such as goodwill, is not analyzed in this research.

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