

An Investigation of the Investment Projects for Apple's Future Development Based on SWOT Analysis and Fisher Model

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Abstract—With the acknowledgment of fierce contemporary competitions in the technology industry, as a multinational company, Apple Inc. confronts the unprecedented pressures from its rival companies, highlighting the growing necessity for conducting a refined and comprehensive financial investment analysis towards its available projects, extending its economic profit and global competitiveness to the greatest magnitude. In this essay, we have applied two analytical approaches towards the investment prophecy for Apple Inc. by the concise application of both SWOT analysis and the Fisher Separation Model. In terms of SWOT analysis, we analyze the internal and external environments of Apple Inc. and we find that the largest problems of Apple these years are its pricing strategy and lack of innovation, which need to be taken seriously. Affected by the COVID-19 outbreak, an analysis of the macroeconomic environment is offered to be referenced, explaining the inflation rate, exchange rate, and labour cost of Apple. Based on these analyses, we have also provided three investment aspects with anticipated prospects for Apple Inc. The Fisher Separation Theorem was then applied to demonstrate one method for arising with an optimal investment allocation. The final financial decision is separated from the shareholder preference, further contributing to forming a financial investment plan for Apple Inc.

Keywords- SWOT Analysis, Fisher Model, COVID-19

1. INTRODUCTION

Apple Inc. is an American multinational technology company that manufactures computer software and consumer electronics. Apple Inc. is now ranked 6th in the Global 500. As of 2021, Apple is the world's fourth-largest PC vendor by unit sales and fourth-largest smartphone manufacturer [1].

a. As we just mentioned, Apple includes a large variety of technology product categories. As a result, Apple exposes itself to a lot of severe competition from many big companies. For example, there are Samsung, Huawei, Google, and so on in the smartphone sector. In the personal computing sector, Apple also has its rival companies such as Lenovo, Dell, Microsoft, HP Inc., etc.

Financial analysis is the way of assessing businesses, projects, budgets, and other finance-related transactions to determine their performance and suitability. It can be used to evaluate economic trends, set financial policy, build long-term plans for business activity, and identify projects or companies for investment. Combinations of financial numbers and data can help analysts to get this done [2]. We basically divide the financial analysis into two types. The first type is fundamental analysis. This kind of financial analysis uses ratios taken from the company's financial statements to evaluate the businesses' values. The analyst should end up with a number that the investor can compare with a security's current price to see whether the security is undervalued or overvalued. Another type of financial analysis is technical analysis, which uses statistical trends gathered from trading activities, helping the analysts to understand the market sentiment behind price trends by looking for patterns and trends [2].

There are a lot of benefits of doing financial analysis. Generally, doing financial analysis can help the businesses thrive and help the company determine and identify financial strengths and weaknesses in your company. According to Bob Jackson, who works in Financial Planning and Analysis at The MathWorks, Inc, the benefits of doing financial analysis can be concluded into five points:

- 1). Keep Current on Debts: The Current Ratio analysis can help you determine whether you have enough liquidity to meet upcoming debts;
- 2). Determine Profit Margins: Analysts can use a Gross Margin Percentage to determine How much it costs to produce your product. This can help reduce costs of production and help increase the bottom line;
- 3). Track Inventory: The company can better manage inventory with turnover ratios or check whether you have enough inventory to reach the projected sales figures;
- 4). Determine Debt to Equity: A Debt-to-Equity Ratio determines how much total liabilities are in relation to your equity in the business on a balance sheet;
- 5). Improvement Over Time

Comparing financial numbers and data over time can let the analysts know spot trends and changes affecting the businesses [3].

Inversely, we believe that it is important for investors in Apple Inc. to do financial analysis because this will be good assistance before making investment decisions between projects.

As for the part of business analysis of Apple, we mainly check the annual report of Apple Inc in 2020 and research on former studies about the company. Plenty of authoritative researches has shown the SWOT analysis of Apple. S.K. Gupta summarized a comprehensive SWOT analysis and gave us a mass of useful information on Apple's acquisition of Regain and DeskConnect and future development and ambition in the video field [4]. Charissa Rujanavech, Joe Lessard, Sarah Chandler, Sean Shannon, Jeffrey Dahmus, Rob Guzzo proposed Liam, an eco-friendly

innovation, which provided greater possibilities for Apple [5]. Brandon illustrated that Apple is preparing to enter the automotive and mobile industries and cooperate with Kia Motors [6]. It also showed that Apple had lacked innovation on products in recent years. According to Statista and the Annual Report of Apple Inc in 2020, we have collected lots of data for analysis of the economic environment, involving the major sales regions of Apple, and influences caused by the inflation rate, interest rate, and exchange rate. At the end of this part, there is a rough investment analysis for Apple Inc, and we have found that AI, biotechnology, and environmental protection engineering are very promising in the future.

Another fundamental and essential financial index to consider is using the Calculating the Net Present Value for projects. The Availability and Profitability of a particular project are most straightforwardly notified and taken into account as the cashflow over several periods; nevertheless, attributed to the inflation and core economic theory of money value, which states the decreasing real value of per unit future currency, solely considering the cashflow are prone to errors and potential inconsistency of the real value for projects in reality. By contrast, a prevailing method of evaluation that is outstanding and widely used in contemporary financial analysis is recognized as Net Present Value. Specifically, such an approach is superior in respect of incorporating the variation of money value in separated period accounting as a net value of the difference between endowment and revenue while converting all the cashflow into unified money value in a certain year [7]. According to the information derived from the capital market, the discount rate will be assumed as a constant value in a particular time and adopted in the conversion of future gains into money value of the base year, allowing the provision of more insightful and meaningful comparison to offer the mathematical index of the profitability of the projects aiding the process of financial investment [8]. Proposed and developed by Irving Fisher, a famous American economist, and a neoclassical economist in 1930, Net Present Value is also utilized to a greater extent corresponding to the Fisher model. This model based on Fisher Separation Theorem contributed to the financial analysis to a remarkable magnitude, allowing the possibility to separate the investment decision from shareholder's personal preferences, which assures the successful financial investment decision and determination to be made in a less controversial perspective [9]. Based on the assumption of profit maximization of firms and corporations, the optimum investment operation can be concluded based on the rate of return of each project (by referring to the NPV calculation from the given discount rate of the capital market) [10]. We have simulated the application of the fisher model on the financial analysis of three sounding and profitable projects for Apple while incorporating a constant discount rate at given year offered by the capital market, concluding result of optimum investment decision has been formulated, which states that Apple should invest on the project of AI techniques and Design make over, two projects that have a higher potential rate of return than the interest rate over one year. This approach marked a remarkable and valuable insight for Apple. Their decisions for investment are determined by multiple shareholders, by which now the optimized operation is clearer and independent from the personal preference toward the risk of any individual shareholder [11].

Therefore, this investigation will analyse the general financial conditions and information for Apple, incorporating the utilization and the implementation of both the SWOT Analysis Model and Fisher Separation Model to derive demonstrations of financial operation that should be applied based on the concrete analysis by the two approaches correspondingly.

2. FIRM DESCRIPTION

In 1976, Apple was founded by Steve Jobs, Ronald Wayne, and Steve Wozniak. The company is now led by Tim Cook due to the retirement and death of Steve Jobs. They have their headquarters in Cupertino, California. Apple has their businesses in a series of personal computers, portable media players, computer software, and computer hardware accessories by developing, selling, and supporting them; Apple has recently devoted themselves to the R&D of new technology products, for example, the iPhone, Apple TV, and many of its new operating system, Mac OS X “Leopard” [12].

Apple also offers stores for hardware and software purchases, such as the iTunes store, a digital media store offering digital books, music, games, movies, and so on. The company’s most famous hardware products are the Mac series of personal computers and related peripherals, the iPod series of portable media players, and the iPhone, Apple’s best-selling smartphones; Apple’s best-known software products are the Mac OS computer system and the iLife software suite. Both Mac OS and iLife accompanied the sales of Macs. Based on the Mac OS system, IOS is invented. IOS operating system is adapted in the series of iPhones, iPads, and other Apple mobile devices [12].

Table1 and Figure 1 below show the total revenue and net revenue of Apple Inc. from 2000-2020. According to Figure 1, we find that Apple Inc.'s revenue and net revenue earned rocketed about 50 times in 20 years with a few fluctuations. The net revenue is now taking larger and larger proportions of the revenue.

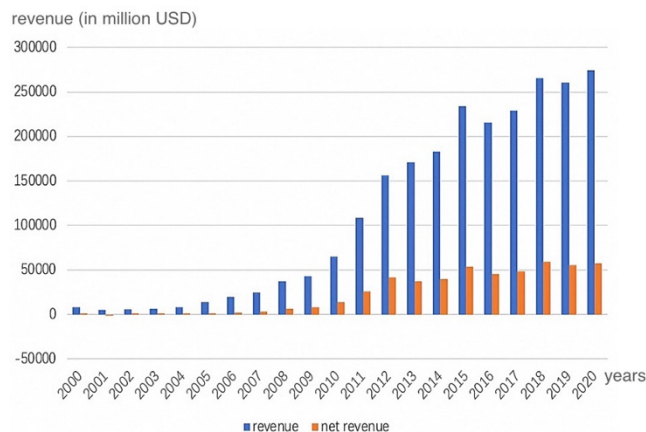


Figure 1 Apple Inc. total revenue and net revenue 2000-2020. (In Mil USD) (data from Apple Inc. annual report)

Profitability ratios are the financial metrics used to assess a business's ability to generate earnings relative to its revenue, operating costs, balance sheet assets, or shareholders' equity over time [13]. The adjusted net profit margin is an indicator of profitability, calculated as adjusted net income divided by revenue; The adjusted ROE is a profitability ratio calculated as adjusted net income divided by shareholders' equity; The adjusted ROA is a profitability ratio calculated as adjusted net income divided by total assets. Table1 below shows the adjusted

profitability ratios of Apple Inc. over the past four years. We can see that almost all the ratios grow through the years except for the net profit margin [14].

TABLE I. APPLE INC. ADJUSTED PROFITABILITY RATIOS

	Sep26 2020	Sep28 2019	Sep29 2018	Sep30 2017
Reported net profit margin	20.91%	21.24%	22.41%	21.09%
Adjusted net profit margin	21.33%	22.71%	21.13%	20.72%
Reported ROE	87.87%	61.06%	55.56%	36.07%
Adjusted ROE	89.61%	65.29%	52.38%	35.44%
Reported ROA	17.73%	16.32%	16.28%	12.88%
Adjusted ROA	18.08%	17.45%	15.35%	12.66%

Apple announced its financial results for its fiscal 2021 second quarter ended March 27, 2021. The Company posted a March quarter record revenue of \$89.6 billion, which increased 54 percent year over year, and quarterly earnings per diluted share of \$1.40. The international sales took 67 percent of the quarter's revenue [15]. The current stock price of Apple Inc. is about 147 USD (NASDAQ ticker symbol: AAPL), the change in the price of the stock of Apple Inc. from 2020 June to 2021 August is illustrated in the chart below.

It shows a general trend of increasing through the period for about 60 USD with a continuous fluctuation.



Figure 2 Apple Inc. stock price (in USD)2020 Jun. -2021

3. BUSINESS ANALYSIS

In this section, we mainly research three aspects. Firstly, we use SWOT to analyze the situation of Apple Inc, including its strengths, weakness, opportunities, and threats. Secondly, the economic environment is considered, which has a huge change these years. According to these two parts above and the market tendency nowadays, we've chiefly gained three future

investment fields at the end of this part.

3.1 SWOT Analysis

SWOT analysis is an effective tool to help businesses or products analyze their internal and external development conditions and prospects. Strengths and weaknesses are regarded as internal business environments, while opportunities and threats are part of the external business environment.

TABLE II. SWOT ANALYSIS OF APPLE INC

<p>Strengths</p> <ul style="list-style-type: none"> · A popular and trendy brand image · Leader of design and innovation · A strong financial support · A sustainable and eco-friendly development 	<p>Weaknesses</p> <ul style="list-style-type: none"> · A recent slow down in innovation · Incompatibility with other software · Limitations caused by the high price · Risk of commercial disputes · Risk of entry the new fields
<p>Opportunities</p> <ul style="list-style-type: none"> · High dependence of consumers · Bargaining chips against suppliers · Development potential of the business, e.g., automotive and mobility industries · Application of AI 	<p>Threats</p> <ul style="list-style-type: none"> · Risk of economic recession · Uncertainty caused by international conflicts or trade wars, etc. · Loads of competitors · Existence of cheap imitations

3.2 Immanent Factors

3.2.1 Strength

a. As an internationally renowned brand, Apple Inc has a large number of loyal consumers and a constant increase in the number of consumers. Every new product is also strongly concerned and actively purchased. Besides, Apple's retail footprint is very widespread, and its decoration style is mostly succinct and wide, emphasizing its high-end and trendy brand image. These have made a great guarantee for its sales.

b. Apple Inc has always been a leader in design and innovation, and its advantages of development have created greater competitiveness and in the market. Moreover, consumers are more willing to buy multiple Apple products due to the convenient connection between each product.

c. Apple Inc has strong financial support, which motivates the company to continue research and development. In addition, this strong financial position helps mitigate risks in the period of economic uncertainty.

d. Design of Apple's product is conducive to its sustainable development and recycling. Liam, an iPhone recycling robot, reduces the cost of Apple's raw materials and is more eco-friendly [5].

3.2.2 Weakness

- a. Research by Brandon has shown that “Apple spends only 2.2% of its sales revenue on innovation, where its competitors are spending up to 10% of their sales revenues on innovation (Dow Jones & Company, Inc.)” [6]. So, it is noted that Apple has slowed down the pace of innovation. In the past few years, its innovations have often been reflected in camera functions and product materials. However, there is no attractive innovation for a long time, which will create an opportunity for competitors.
- b. The incompatibility with other software and systems makes it difficult for consumers who have become accustomed to other electronic device systems to become Apple’s clients. Meanwhile, those who have already bought Apple’s products have to purchase Apple apps or accessories to continue using their products.’
- c. High price of Apple’s product prevents part of consumers in the market. Apple is usually regarded as a luxury, so many people cannot afford it, which led to some limitations.
- d. As a recognized company global, Apple sometimes faces commercial disputes. And there have been allegations of user tracking, patent infringement, etc. This information will lose the trust of consumers in the brand.
- e. In the process of expanding new service areas, Apple is also likely to enter the fields that it is not good at, such as video, game streaming, credit cards, and so on, which will mainly compete with Netflix, Disney, Citi, Chase, Paypal, etc. [4].

3.3 External Factors

3.3.1 Opportunities

- a. The electronics market is considerably huge. Consumer Electronics Association (CEA) has predicted that global consumer electronics revenue will continue to grow steadily. Consumers in modern society are highly dependent on electronic products. Once consumers and a good market strategy accept Apple's products, Apple Inc will have a great opportunity to expand its market share.
- b. The rapid development of the device manufacturing industry leads to more choices for Apple to find suitable suppliers. Competition among suppliers on price, quality, and service gives it more negotiation chips to lower its production costs and boost profits.
- c. Strong consumer and financial base of Apple Inc lead to huge support in its future development in the self-driving car market [6]. According to the report, the company is currently looking for strategic partners to develop autonomous vehicles to enter the automotive and mobility industries [6]. According to the Wall Street Journal, Apple Inc has cooperated with Kia Motors (parent company – Hyundai), and Kia plans to begin production by 2024. People also believe that Apple will have a strong potential for development in the future due to such conditions and trends.
- d. Application of Artificial intelligence will become a major development aspect for Apple Inc in the future. In 2017, a French AI company, Regain, and the AI tool DeskConnect was acquired by Apple, putting Apple ahead of other competitors [4].

3.3.2 Threats

- a. Affected by the COVID-19 pandemic, global economic development has been severely impaired, increasing inflationary pressures. Such economic background has also threatened the quality of life of amount of people, which causes a decline in consumers' confidence. So there is also a negative impact on businesses.
- b. International conflicts, policy changes, and trade wars may pose significant uncertainty to Apple's overseas markets. For example, the conflicts between China and America have caused Apple's products to be rejected in the Chinese market to a certain extent, and similar situations cannot be guaranteed in the future.
- c. While the electronics market presents opportunities for Apple Inc, it's also a hugely competitive market. Apple Inc faces more competitors because it has diverse kinds of products. In the mobile phone market, there are Samsung, Huawei, OPPO, and other competitors. As for notebooks, there are HP, Lenovo, etc. The IOS system also has to compete with the Android system.
- d. The increase in the quantity of low-cost high-imitation products has occupied part of the market share. The price of such products is much lower than that of the genuine products of Apple Inc, so they will quickly seize the low-end market and create losses to Apple.

3.4 Recommendations for Apple Inc.

According to the SWOT analysis of Apple, it is recommended that Apple should work with cost minimization and price minimization to maximize their profit. Constantly innovation and consolidation can increase the loyalty of consumer groups. More investment can reduce its future threats. And pay more attention to other competitors, especially the price change in the market. In addition, Apple needs to improve corporate governance. As an internationally renowned company, Apple must take more social responsibility, not just verbal, but more communication between management and investors.

3.5 Economic Environmental Analysis

Various factors affect Apple through the economic background, involving macroeconomic situation, inflation rate, interest rate, and exchange rate. And the influences from labour cost and consumer preference need to be considered as well.

3.5.1 Inflation Rate

In 2021, pandemic and economic recession cause a negative impact on all businesses around the world, and consumers are not willing to pay too much for high-priced products. And an approximately 3.5% global inflation rate appears, which affects Apple Inc to some extent. The major sales markets of Apple Inc are the United States, Europe, Greater China, Japan, and the Rest of Asia Pacific. The US is its local market, as well as the largest market. According to the CPI and HICP index, the U.S. inflation rate until June this year was about 5.39%, which is more serious than other regions. The inflation rates in Europe, China, and Japan are about 1.902%, 1.745%, and 0.197%, respectively.

3.5.2 Exchange Rate

Risks from exchange rates also bring a huge impact. The percentage of international sales of Apple Inc is approximately 59%. As a result, in addition to the Greater China, the net sales of other major Apple sales countries have maintained growth, but the weakness of foreign exchange relative to the US dollar adversely affects the net sales of Apple Inc in these regions in 2020.

3.5.3 Labour Cost

The major manufacturing department of Apple is located in China because of lower human resource costs. However, it is noted that labour cost in China is gradually increasing and already reaches US\$6.5 per hour in 2020, and this trend is expected to continue as well [16]. Thus, the increase in labor costs will have a greater impact on Apple's profits.

3.6 Investment Prospects

According to the result of those analyses above, we plan to give a better suggestion by researching the future investment prospects in the market. It was shown that artificial intelligence, biotechnology, and environmental protection engineering would have great investment prospects in the next few years, with relatively small risks. And these investment fields are also suitable for Apple and can be supported.

3.6.1 Artificial Intelligence

The current popular AI field is mainly industrial robots. Others, such as service robots, have a smaller market, but they are relatively fast. From a global perspective, industrial robots are still in the initial stage and have a considerable development prospect.

3.6.2 Biotechnology

From the epidemic outbreak in 2019 to the current vaccine development, we can see the importance of biotechnology to human development. As people pay more and more attention to health issues, biotechnology can be an excellent aspect for future investment for the company.

3.6.3 Environmental protection engineering:

Xiong holds the view that he thinks that the most enduring impact of the pandemic would be the end of the carbon era. . . We are reaching the point where energy from renewable sources is cheaper than carbon-based sources and electric vehicles are better than cars with internal combustion engines.” [17]. The economic and market change has led to increasing demand for high-quality development and clean energy. The environmental projects will be impelled by people's requirements for a healthy living environment. Therefore, clean energy will become the trend of investment in the future.

4. DATA ANALYSIS AND DECISION MAKING

4.1 Project available

TABLE III. THE AVAILABLE PROJECTS WITH CASHFLOW IN YEAR 0 AND YEAR -1

Project Code	Project Name	Cashflow at t = 0 [C ₀]	Cashflow at t = 1 [C ₁]
A	Initiation and implementation of new recycling line for disposal electronics	\$ -25,000,000	\$ 26,000,000
B	Research and Development for AI technology for systematic upgrade	\$ -5,000,000	\$ 10,000,000
C	Incorporation of bio-technics to design “user-friendly” product modification	\$ -10,000,000	\$ 13,000,000

4.2 Net Present Value (NPV)

Basically, the NPV indicates the value of the future stream of payment in today's money value. There is a necessity to consider the net present value of a particular project for business and financial investment since the fundamental difference between the present value of cash inflow and the present value of the cash outflow is revealed at a given time period. Via the calculation of NPV, the profitability could be demonstrated by analyzing both the negativity of the value and the magnitude of the NPV. Specifically, the NPV theory thesis emphasizes that firms and individual investors should try to avoid the negative NPV, which indicates the non-profitability of a project [18].

The formula of NPV calculation relies on acknowledgment and existing information about the discount rate that may be derived from inflation and other factors that exert pressure on the variation of the money value. The general formula of NPV can be expressed as:

$$\begin{aligned}
 \text{Net Present Value (NPV)} &= \text{Cashflow at } t \\
 &= 0 + \frac{\text{Cashflow at } t = 1}{\text{Discount Rate at } t = 1} + \frac{\text{Cashflow at } t = 2}{\text{Discount Rate at } t = 2} + \dots \\
 &\quad + \frac{\text{Cashflow at } t = k}{\text{Discount Rate at } t = k} \qquad (1)
 \end{aligned}$$

Where t is the number of years/times the cashflow is measured and $k = 1, 2, 3, \dots T$. The NPV is, measured by the difference of the number of cashflows granted in the future and the initial endowment to the project when all the money has been converted into the present money value.

4.3 Fisher Model

One of the models which contributes to aid the comparison and decision-making among financial projects based on available data of NPV and the interest rate of Capital Market at a given year is **Fisher Model**. The Model follows a series of sequential steps in approach to

separate the individual preferences and investment decisions that a corporation should make by providing the information of the most desirable investment decision with reference to the capital market.

The application of the fisher model can be categorized and ordered in the following major procedures:

4.3.1 Calculating the Return without Capital Market

The essence of the Fisher Model is based on the calculation of the NPV to derive a comparison among projects. With the given calculation formula, three projects available to the APPLE can be converted into one indicator of NPV. Therefore, with the further calculation by the NPV ratio to the initial endowment, all ranking of projects made be formulated in descending order according to their percentage increase of the return, shown as follows:

$$\text{Return of Project} = \text{percentage increase} = \frac{\text{NPV of a project}}{\text{Initial endowment } (C_0)} \times 100 \quad (2)$$

Implementing the above formulas projects available to APPLE would have the index as follows:

TABLE IV. THE NET PRESENT VALUE AND THE PERCENTAGE RETURN OF EACH PROJECT

Project Code	Net Present value without Capital Market	Percentage Return
A	\$ 1,000,000	4%
B	\$ 5,000,000	100%
C	\$ 3,000,000	30%

4.3.2 Construction of Transformation Curve

The transformation curve is a graphical demonstration of all the present projects available to a firm listed in ascending order (from left to right) on a graph that shows the relationship between C_0 and C_1 over a period of time (one year).

On the transformation curve for APPLE, the graph demonstrates the C_0 on the x-axis (horizontal) and C_1 on the y-axis (vertical). All the projects A, B, C, has been shown on the graph by an order from lowers profitable to the highest, for which the maximum endowment would be the sum of all C_0 , which equals \$ 40,000,000, while the highest return possible would be the sum of all the C_1 , which equals to \$ 49,000,000. The transformation curve is shown in figure 3, showing separately for projects A, B, and C, ranked by their return ratio. In the direction of right to left, the marginal return or the slope of the transformation curve is decreasing (less steep), indicating the fewer return rate of the additional investment.

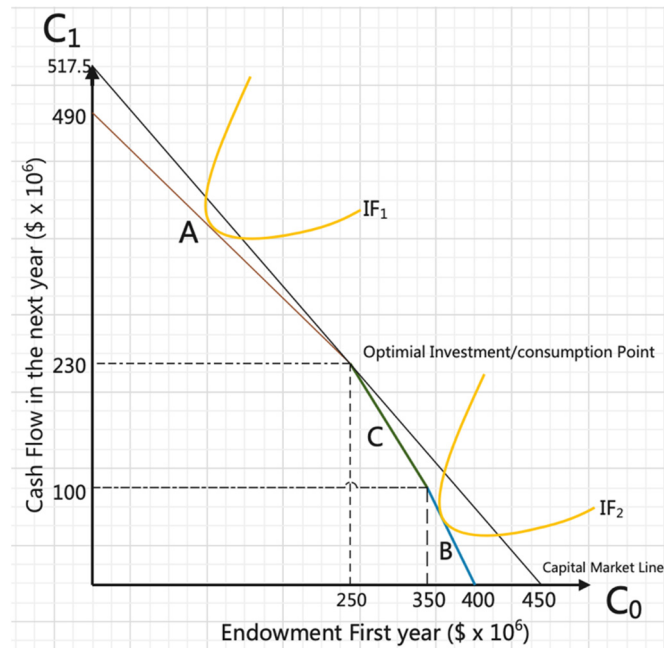


Figure 3 Fisher Model Demonstration. (Initial Endowment and return in first term)

Nevertheless, when the indifference curves that show the individual preference of a project with their personal preference to a risk and future return are added to the transformation curve, the optimal investment program is not independent of the consumption preference of the investors. Illustrated by IF_1 and IF_2 in Figure 3, the two indifference curves represent the distinctive risk preference of two shareholders, in which IF_1 are more tolerant to risk, preferring to invest more for higher C_1 and sacrifice the C_0 (less consumption); whereas IF_2 demonstrate the decisions and preference of risk-averse shareholders, who intend to acquire higher C_0 (consumption today) rather than higher C_1 in the future. Consequently, if the investment decision is decided by the influence of both types of investors, an agreement might be difficult to achieve. Both investors would rather invest at the level they prefer.

4.3.3 Capital Market

Capital Market is another essential factor to consider in the Fisher Model. It offers information about interest rates from the capital market for both investment return and cost of the borrowing. Therefore, investors could decide whether to borrow and invest for their project seeking a higher return or invest in the capital market instead. By reference to the capital market, the optimal investment decision can be derived. In this case, the investment decision can be separated from the consumption preferences, providing the information to facilitate and assist business decisions.

$$\text{Slope of Capital Market} = -(1 + r) \quad (3)$$

For Apple, at 2021, the capital market offers with an interest rate of 15% for the investors, assumed to be adopted in a complete and perfect capital market, where the discount/interest rate is constant over time.

According to the slope calculation of the capital market at a given discount rate of r , the capital market line is derived, where its intersection with the $C1 = E(1 + r)$, where the E presents the Endowment that can be offered and used. In this case the $C0 = \$45,000,000 = E$ and the $E1 = \$51,700,000$, while the slope of the line equals -1.15 .

By the reference of the capital market, the given interest rate available to the investors, the investment decision would be taken from the new NPV value of each project that can be shown as follows:

TABLE V. CALCULATION OF NET PRESENT VALUE FOR EACH PROJECT WHEN THE INTEREST RATE IS 15%

Project Code	Net Present Value with 15% interest rate in Capital market
A	$-250 + \frac{260}{1.15} = -23.91$ (\$)
B	$-50 + \frac{100}{1.15} = 36.96$ (\$)
C	$-100 + \frac{130}{1.15} = 13.04$ (\$)

Based upon the calculation of new NPV for each project, there is an apparent demonstration that project A derives with a negative NPV value, indicating that this project is not worthwhile to invest, which could be in term explained by the fact that the granted return of Project A is 4%, which is lower than 15% of interest rate offered by the capital market. Investors, therefore, would possibly receive a higher return if they invest funds in the capital market rather than Project A. Whereas for Project B and C, the return is 100% and 30%, respectively that is higher than 15%, which explained why the Net Present Value of them is higher than 0 and worthwhile to invest. Overall, only the project B and C should be invested in such circumstance.

4.3.4 Separation of Investment Decision

Large enterprises often consist of various and numerous shareholders who contribute to the business decision to a different extent. APPLE is not an exception. 6 top shareholders in total hold influential power to the investment decision that would be made by the company [19]. Due to their distinctive interest and preference for risk-involved projects, some of them might be risk-averse, and some could have been the opposite. Consequently, separation of investment decision and individual consumption preference must take place in the effort to achieve a consensus in terms of APPLE's business determination.

By considering the slope of the indifference curve and the intersection with the capital market, knowing the function of utility for investors, the optimal allocation of consumption and investment decision can be determined in the following function

$$\text{Utility Function} = U(C_0, C_1) = \log C_0 + \log C_1 \quad (4)$$

With the acknowledgment of the utility function for investors, it is granted that the optimum consumption level should be done at the level in which the utility is maximized. Hence, via total differentiating the function, we may derive with the slope of the indifference curve or the marginal rate of substitute (MRS) of the investors. When the slope of the function equals zero, the function may be either maximum or minimum, which provides the information that is needed to find out the optimal consumption allocation.

$$dU = \frac{\partial U}{\partial C_0} dC_0 + \frac{\partial U}{\partial C_1} dC_1 = 0 \quad (5)$$

$$\frac{1}{C_0} dC_0 + \frac{1}{C_1} dC_1 = 0 \quad (6)$$

$$\frac{dC_1}{dC_0} = -\frac{C_1}{C_0} \quad (7)$$

Implementing the above formula and the formula result from the sequential differentiation, the APPLE's optimum level of consumption and decisions for their endowment and return should be:

$$-\frac{C_1}{C_0} = -1.15$$

$$C_1 = C_1 \text{max} - 1.15C_0 = 517.15 - 1.15C_0$$

$$C_0 = \$22,500,000$$

$$C_1 = 1.15 \times 225 = \$25,875,000$$

This point, also shown by the intersection of the capital market line and the indifference curve in Figure 3, provides the optimal investment decision that the APPLE should take according to the Fisher Model by referring to both the capital market and the cashflow of each independent project.

Overall, it is suggested by the Fisher Model that under the condition when investment projects are non-mutually exclusive and divisible, the APPLE should invest \$ 22,500,000 in total from project B to project C to receive a future return of \$ 25,875,00 after one year, despite the variation of consumption preferences.

5. CONCLUSION

In this essay, we did some investigations into the American technology company Apple Inc. about its background information, operation revenue, current stock price, etc. We found that Apple is a fast-growing company in the last decade from the data, for example, total revenue, net revenue, and profitability ratios. To give Apple Inc. some advice about future investment projects, we gave two pieces of financial analysis, including SWOT analysis and Fisher Separation Model.

According to the results of the business analysis, we first got the strengths, weaknesses, opportunities, and threats of Apple Inc through SWOT analysis. Apple has matured technology, sufficient market experience, a strong financial base, and successfully sells its products with high customer satisfaction. Moreover, Apple also tries to develop in other fields, like the video and self-driving car market. However, part of Apple's consumers cannot afford their products because of the high prices. And the new products, except for system upgrades, there is actually no attractive innovation in recent years and lack the appeal of consumers. The electronic market is still friendly for Apple that it has adequate opportunities to develop in the future. On the other hand, Apple's major suppliers are from Asian countries, so economic or political issues will bring more risks, such as increased production costs. Considering several other competitors, if Apple cannot continue to innovate or reduce prices, it will continue to lose market share. To wrap up, Apple should pay more attention to a suitable change in price and more innovations.

The uncertainty of the economic environment brings a significant challenge to Apple Inc. The loss of Apple is inevitable, but the foundation of Apple is fully capable of continuing to operate in the worse economic situation, and Apple will not be affected in its investment plans. Thus, we have also found three popular and proper investment fields for Apple: artificial Intelligence, biotechnology, and environmental protection engineering.

Another alternative approach that may aid to the financial decision in terms of investment allocation for Apple can be demonstrated by the implementation of the Fisher Separation Model, which evaluates each project available fundamentally by the Net Present Value calculation for the return rate under the assumption of perfect and visible capital market information. The result of for a demonstration on analysis three prevailing programs (A: initiation and implementation of new recycling line for disposal electronics; B: Research and development for AI technology for systematic upgrade; C: Incorporation of bio-technics to design "user-friendly" product modification) using the model shows clearly that regardless of investor preference on consumption and risk in investment, only the B and C program should be invested in an attempt for to achieving profit maximization in investment. Therefore, adopting this model may offer with an ideal investment suggestion for Apple, facilitating the formation of business consensus and determination.

Nevertheless, the investigation based merely upon these two approaches is not inclusive and comprehensive enough to make a sensible judgment and investment decision. Also, some limitations associated with each approach demand to be notified. For instance, assumptions of perfect capital market and single discount rate may be slightly inconsistent with the real-life market information. In addition, other fundamental factors and indexes which can potentially affect the project are derived from the investment required to be taken into account. For example, the risk and growth potential involved with the project and the optimal portfolio allocation

necessitate being considered for business investment, despite the fact these may not be acquired from the Fisher Model and SWOT analysis.

Therefore, further investigation should be conducted to provide cohesive and holistic financial information for assisting financial investment. Selectively adopting financial models that aim to offer and evaluate specific and diversified financial index such as Gordon Growth, Correlational analysis for minimization of portfolio risk, etc., would aid to derive necessary information needed for more detailed recognition of Apple's project both quantitatively and qualitatively, Allowing the formation of optimal investment plan to fit the contemporary market conditions and the Apple's financial capability to the greatest extent, and assisting the corporation in prospering in the future.

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