



Company How to Keep Cash Flow Stable Under the Epidemic Starbucks as an Example

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ABSTRACT

In an economic environment hit by the epidemic, corporate cash flow is likewise subject to great volatility. This study uses Starbucks as an example to show how the company's cash flow is affected by the epidemic and to identify ways in which the company can maintain the stability of current and future cash flows by expanding international markets and controlling costs. By referring to Starbucks' 2016-2020 annual financial reports, we find that the epidemic has hit the cash flow situation significantly, and we study the future cash flow situation of the company through a series of initiatives through autoregression, weighted average and linear regression model. This study serves as an addition to the literature for future research and provides a reference for other companies dealing with the blow of the epidemic.

Keywords: epidemic; cash flow; international markets; cost

1. INTRODUCTION

According to statistics provided by Worldometer, since the outbreak of coronavirus in 2020 in China, the pandemic has infected more than 476 million people all over the world and over 6 million cases of the disease can be witnessed worldwide. To protect the population from the virus and release the load on the local medical system, governments of a large number of countries chose to conduct a lockdown policy [1]. However, the lockdown policy can be a disaster to the global economy [2]. Social isolation prohibited people from going out on the street, which lowers the number of transactions [3]. Besides, the scheduled acquisition of the labor force of firms was bound by the lockdown policy [4]. The pandemic also increases the uncertainty in the global market, which may cause doubt to international investors [5], therefore reducing the cash flow from financing activities. For the food and beverage industry, the impact caused by COVID 19 can be more severe than other industries due to the regulation the government posted on restaurants [6] and the perceived risk of dining in of customers [7]. Therefore, it is crucial for companies in the food and

beverage industry to adopt a proper strategy to pass through the hard period of the pandemic.

This article uses Starbucks as an example, Starbucks Corporation is a multinational coffee shop chain in the United States and the largest chain coffee shop in the world. Originally only sold coffee beans, after the transformation into the current business model [8], it began to quickly expand its stores and became one of the symbols of American life. The overall cash float through the 2016-2020 Starbucks annual financial statements is rising on the curve. However, with the arrival of COVID-19, the global economic environment has suffered a shock. Starbucks has made certain projections to observe cash flows in response to the epidemic and on future global market conditions. In this research, three areas are selected for study: the epidemic, international market expansion, and cost of goods sold and aims at finding a predicted direction for how the current pandemic, international extension, and cost control affect the cash flow and future development of Starbucks.

There is limited research on how companies can survive under COVID-19, and this study provides additional insight into how companies can maintain this aspect of cash flow stability currently and in the future

under an epidemic. Several mathematic methods will be used to construct models to estimate the future business running situation of Starbucks. The autoregression model will be applied to predict the change in revenue under COVID-19. The study found that the epidemic had a positive impact on the level of cash held by companies, which were more willing to increase their cash flow to ensure smooth operations [9]. Two of the most direct factors regulating cash flow are costs and revenue. A weighted-average method will be used to evaluate how the internal extension strategy may influence the salary expense of the company. A linear regression model will be adopted to evaluate the net earnings in five years based on the revenue predicted. In the article, we will take the revenue of Starbucks from 2016 to 2020 to analyze to what extent the pandemic influenced the running of the company negatively. The autoregression model will be applied to estimate the revenue in 2020 without the impact of the pandemic and also the revenue in the future five years.

We will also discuss two measures, which are the global extension strategy and cost management strategy, that Starbucks used to alleviate the negative influence and use the weighted-average model to evaluate the feasibility of this strategy in the following five years. Then, a high level of the company's cash situation considering these factors will be predicted by linear regulation to evaluate the effect of these solutions.

2. COVID-19 HAS HAD A SIGNIFICANT IMPACT ON STARBUCKS' CURRENT AND FUTURE CASH FLOW

As a company in the food and beverage industry, it cannot be denied that Starbucks faced huge challenges during the pandemic. This can be reflected in the dramatic fall in revenue.

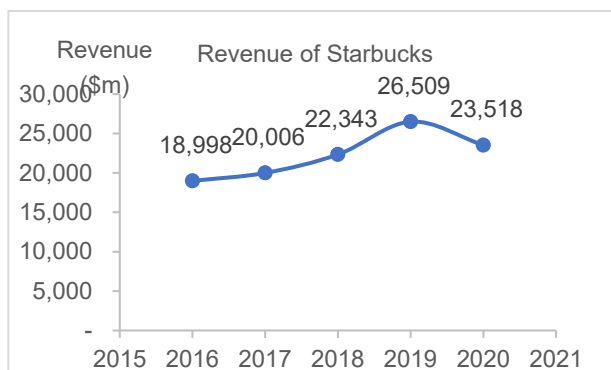


Figure 1 Revenue of Starbucks from 2016 to 2020

Figure 1 shows the revenue of the company from 2016 to 2020 retrieved from the company's annual report. It can be witnessed that there is a fall on sales in 2020. Applying autoregression on the data in 2016-2019 as the formulas:

$$x_k = y_{k-1} \tag{1}$$

$$s = \sum_{k=1}^4 (y_k - ax_k - b)^2 \tag{2}$$

$$\frac{\partial s}{\partial a} = 0 \tag{3}$$

$$\frac{\partial s}{\partial b} = 0 \tag{4}$$

$$y = ax + b \tag{5}$$

In these formulas, y_k refers to the yearly revenue from 2016 to 2019, a and b refer to factors in the prediction function and s refers to the sum of the squares of the differences between the actual numbers and the predicted ones. Through this method, the predicted amount in 2020 can be computed and the result is shown in Figure 2.

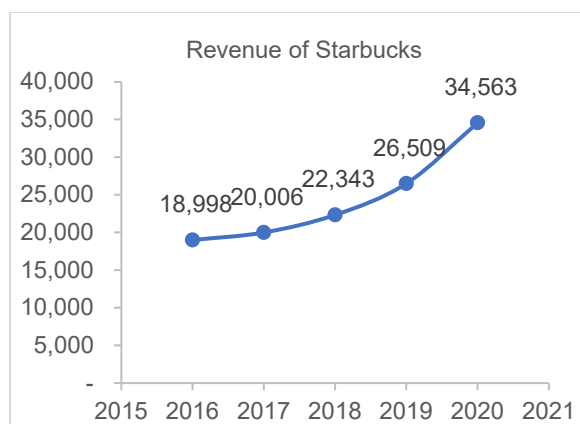


Figure 2 Revenue of Starbucks from 2016 to 2019 and predicted revenue by autoregression for 2020

From Figure 1 and Figure 2 it can be observed that the actual sale of 2020 is about 32% lower than the predicted sale by linear autoregression. This is mainly attributed to the lack of customers caused by people's fear of Coronavirus and strict anti-pandemic policies such as lockdowns. However, Starbucks also has taken some measures to alleviate the negative influence. For example, the company allocates the 'partners', i.e., the staff, between different stores in reaction to temporary store closures required by the government and sets up strict cleaning and vaccination guidance for the partners to safeguard customers' health. Besides, the world is becoming more and more experienced in dealing with COVID-19 and also quite a number of governments loosen the anti-pandemic policy. In this situation, our group estimates that the negative impacts caused by the pandemic will be smaller and smaller with time passing. Therefore, we build this model to forecast the future revenue:

$$y' = y * [1 - 32\% / (t + 1)] \tag{6}$$

In formula (6), y' refers to the estimated future revenue considering influence from the pandemic from 2021 to 2025 while t refers to the time from 2020 to the

chosen year. By formula (1) to (6), the sales in 2021-2025 can be predicted.

Figure 3 shows the trend of how the company’s revenue may grow under this model.

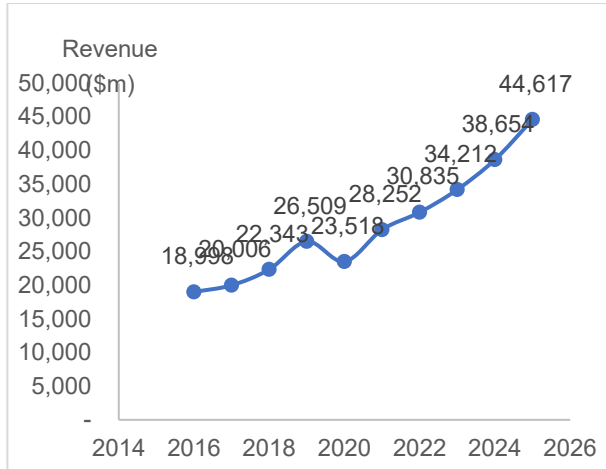


Figure 3: Actual revenue of Starbucks from 2016 to 2020 and predicted revenue from 2021 to 2025 under the model illustrated

From Figure 3, it can be concluded that the sales may return to the normal level before the pandemic in 2021 and keep increasing stably onwards.

3. STARBUCKS’S INTERNATIONAL EXTENSION STRATEGY TO INCREASE FUTURE CASH FLOW

It can be witnessed from the annual report of Starbucks that in the past five years, the growth rate of the number of stores outside the USA is much greater than the figure for stores in the USA (Figure 4).

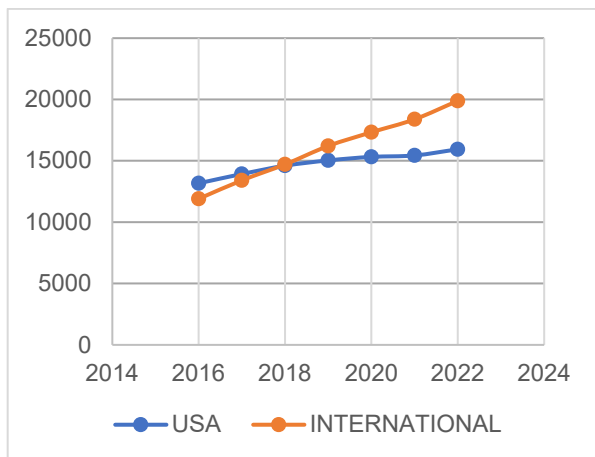


Figure 4: Numbers of Starbucks stores in and outside the USA (the data for 2022 is from Starbucks’s expectation)

It is probably because of Starbucks’ internal extension strategy. In the USA stores, the labor cost takes

up about 6% more of the revenue compared to the stores outside the USA, which may result from the difference in average salaries between different countries. Although there is no figure in Starbucks’s financial statements showing how much the company spends on salaries every year, the overall level of the food and beverage industry, which is 22% - 40% (by Statistics done by Chron), to estimate the labor cost internationally for Starbucks. We estimate that the labor costs are about 30% of the revenue in the USA stores and about 24% in other international stores and use the weighted average method to calculate the average salary expense ratio:

$$R = (30\% * N.A + 24\% * N.I) / (N.A + N.I) \quad (7)$$

In this model, R refers to the average salary expense ratio, N.A refers to the number of stores in the USA while N.I. refers to the number of stores in other countries.

It can be told from Figure 4 that the numbers of both American stores and international stores increase steadily, so it is reasonable to assume that in the next five years the growth may remain unchanged and thus use the average growth to calculate the salary expense ratio in the following period. The results are shown in Figures 5 and 6.

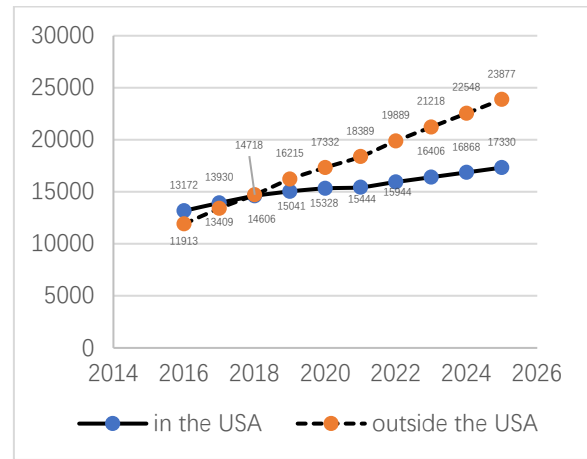


Figure 5: Actual numbers of Starbucks stores in and outside the USA from 2016 to 2021 and predicted number from 2022 to 2025

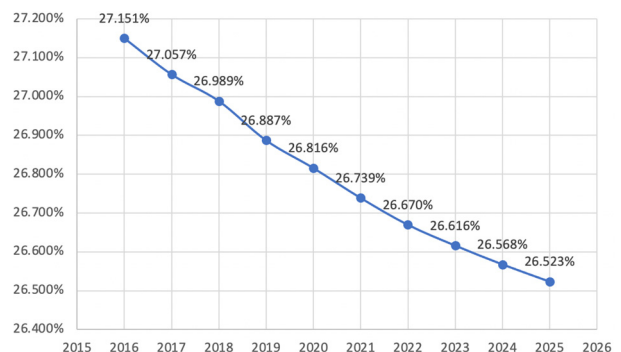


Figure 6: Estimated average ratio of salary expense over revenue in 2016-2025, computed under model (7)

Overall, the percentage of salary expense appears a decline trend and this may increase the company's net earnings.

4. REDUCING THE COST OF GOODS SOLD IS ONE WAY TO INCREASE CASH FLOW

The annual report shows since 2019 cost of goods sold by Starbucks has dropped significantly. There are three ways for them to reduce the cost which are using intelligent technology, reforming the supply chain management system, and building a new form of the storefront.

Introducing intelligent technology to improve store operational efficiency. One of the reasons for the low efficiency of Starbucks was the outdated store management system, so they use intelligent equipment to manage the stores, such as replacing the inoperable cash registers with automatic ones, preferring to use mobile payment, and using more network platforms for promotion and publicity [8]. In addition, the increase in the number of employees and training costs during the rapid store opening process led to high operating costs. Starbucks uses new workforce scheduling software to help store managers organize staff and streamline workflow to improve employee productivity and reduce operating costs.

Reform the supply chain management system from three levels:

Reorganizing the management team to divide supply chain management into four segments: planning, purchasing, manufacturing, and delivery, with each segment having its own role. For example, anyone involved in planning whether it was production planning, replenishment, or new product launches was grouped into the planning group. Sourcing activities are divided into two areas: coffee and "non-coffee" sourcing. All production, whether in-house or by contract manufacturers, is assigned to the "manufacturing" function. Finally, all personnel involved in transportation, distribution, and customer service are assigned to the "Delivery" department.

Starbucks outsources most of its transportation to third-party logistics (3PLs), and according to supply chain quarterly data, 65-70% of supply chain costs are incurred-party goods, which uses only two numbers: 0 and 1. For example, if A in transportation. Starbucks uses a "scorecard" system to manage the flow of the third supplier picks a product accurately at a warehouse or distribution center, then the supplier gets a "1". If a shipment is missing even one pallet, the third-party logistics scores a "0." As part of the scorecard program, Starbucks also began providing service data by store, delivery lane and inventory management unit (SKU) to its supply chain partners. The scorecard system is used to

select top-performing third-party logistics and improve their efficiency of them.

Develop professional talent to complement supply chain management [9]. The team recruits undergraduate and graduate students with backgrounds in logistics, engineering, and operations research. The company has developed programs covering 30 supply chain competencies and has developed training manuals for new employees to provide supply chain management competency training and enhance the management capabilities of the entire team.

Starbucks is building "Starbucks Now" stores to improve store operational efficiency.

In 2019, Starbucks is launching a digital-focused "Starbucks Now" concept store in China to meet consumer demand for convenience and speed with a "pay online, pick up in store" model [10]. The stores are mainly located near office buildings, with an area of about 10 square meters. The target consumers of Starbucks Now are those who are looking for an efficient, third-space-free experience that effectively reduces costs and improves store efficiency. 2020 Starbucks global leasing cost is 9 billion, searching through the internet, a "Starbucks Now" store has about 5 staff, leasing cost is 35%, which is 350,000 less than half the cost of a general store in the same city. The cost savings in China is about 14 million a year. Also, Starbucks Now will bring additional profits to Starbucks. The epidemic of the year has boosted the growth of Starbucks Now, with 40 Starbucks Now stores in China as of 2021. Mobile order sales of Starbucks Now increased from 3% of sales to 16% between 2019 and 2021, which is 145.6 million. There are 40 Starbucks Now in China in the two years since its inception, and it is expected that there will be about 80 stores in China in the next five years. The United States and Japan are the other two countries with a large number of Starbucks stores which in 2020 Starbucks annual financial statements are reported at 8800 and 1380, respectively, so if we use the current ratio of Starbucks Now in the Chinese market (40 Starbucks Now stores divided by a total of 4700 stores) to promote the future impact of cash inflow from Starbucks Now in the United States and Japan, it will be about 666.33 million of cash inflow as calculated in (8).

$$[40/4700*(8800+1380) +80] *(14million+145.6million) =666 \text{ million} \quad (8)$$

With the above projections, opening new model stores while invoking new technologies and improving the supply chain can reduce costs and increase cash inflows to some extent.

5. THE FUTURE CASH FLOWS FROM OPERATING, INVESTING AND FINANCIAL ACTIVITIES

The cash flows of the company can be classified into three types: cash flows from operating, investing, and financial activities. In this part, cash flows from operating activities will be estimated by linear regression and the cash flows from investing and financial activities will be calculated by average.

First, to calculate the cash flow from operating activities, the rationale will be used:

$$\text{Cash Flows from Operating Activities} = \text{Net earnings} - \text{Depreciation \& Amortization} + \text{Change in Net Working Capital}$$

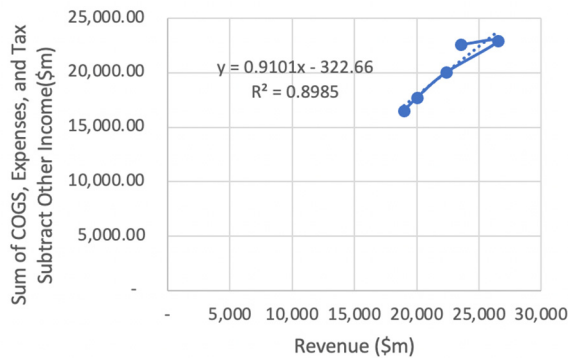


Figure 7: Revenues and sum of cost of goods sold, expenses and tax subtract other income from 2016 to 2020

From Figure 7, it can be witnessed that the sum of the cost of goods sold, expenses, and tax subtract other income is in a linear relationship with revenue. The reasons behind this may be that this amount involves several variable costs, which are in a positive relationship with the sales, such as expense on materials, and fixed costs, which are relatively stable throughout the financial period, like rent expense. Therefore, it is reasonable to use linear regression to compute this amount:

$$s = \sum_{k=1}^4 (y_k - ax_k - b)^2 \tag{9}$$

$$\frac{\partial s}{\partial a} = 0 \tag{10}$$

$$\frac{\partial s}{\partial b} = 0 \tag{11}$$

$$y = ax + b \tag{12}$$

In these formulas, y_k refers to number that sum of cost of goods sold, expenses, and tax subtracting other income from 2016 to 2020, x_k refers to the revenue from 2016 to 2020, a and b refer to factors in the prediction function and s refers to the sum of the squares of the differences between the actual numbers and the predicted ones and y

and x refers to the amount predicted from 2021 to 2025 respectively.

The difference between revenue and the computed number is net earnings (N is the net earnings predicted in million dollars).

$$N = x - y \tag{13}$$

Using this method, we can estimate the net earnings in five years (Figure 8).

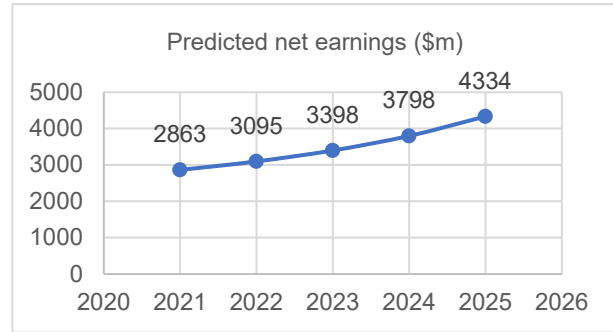


Figure 8: Predicted net earnings from 2021 to 2025 by formulas (9) – (13)

Table 1: Depreciation & amortization and change in working capital from 2016 to 2020

Year	2016	2017	2018	2019	2020
Depreciation & Amortization(\$m)	1,030	1,067	1,306	1,377	1,431
Change in Working Capital(\$m)	-1,973	706	34	-1,255	-690

Table 1 provides figures for depreciation & amortization and change in working capital of Starbucks in 2016-2020. For depreciation and amortization, a nearly fixed amount of growth can be witnessed and for change in working capital, the number fluctuated a lot in the past five years, it is probably related to the internal financial management strategy and there is little evidence for us to conduct more accurate estimation, so we just take the average of this figure and apply to future five years. After considering all factors analysed, estimation on cash flows from operating activities can be made as in Figure 9.

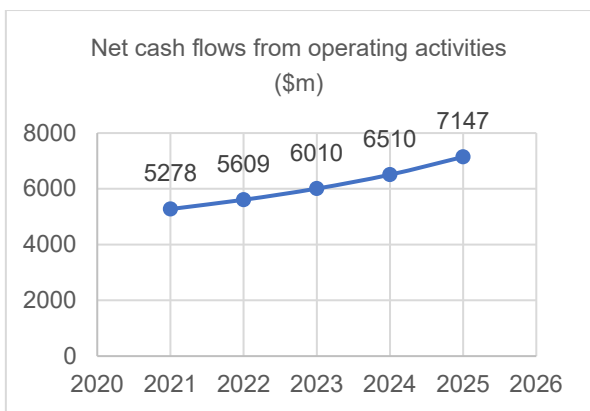


Figure 9: Estimated net cash flow from operating activities

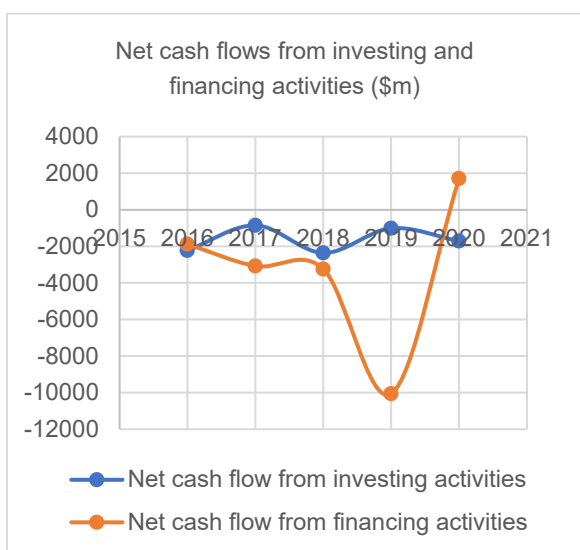


Figure 10: Net cash flows from investing and financing activities

Figure 10 shows the amount of net cash flows from investing and financing activities of Starbucks from 2016 to 2020. Since the growth rate of stores number is nearly constant, from the graphs it can be told that the numbers of cash flows from these two activities seem not quite related to the extension, the average figure will be applied to estimate total net cash flows (Figure 11).

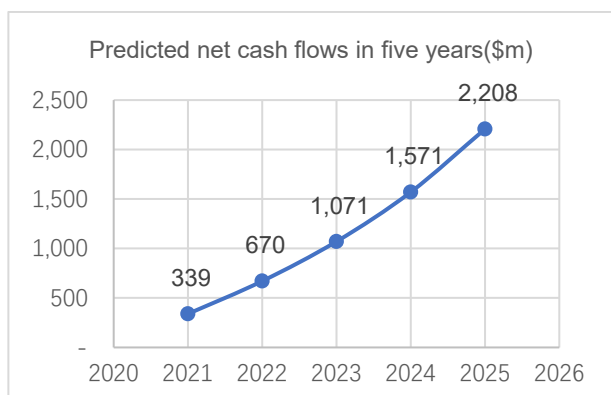


Figure 11: Estimated net cash flows in 2021-2025

Accumulate the predicted net cash flows to estimate cash balance in 2021-2025 (Figure 12).

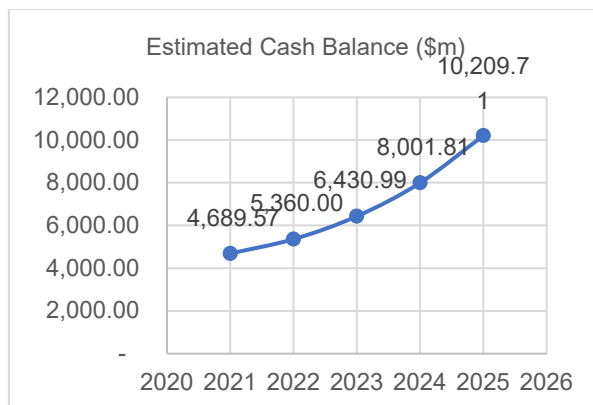


Figure12: Estimated cash balance in 2021-2025 from the accumulation of predicted net cash flows

6. ANALYZE CASH SITUATION

Based on all the above-predicted data. An estimated cash ratio with the average level in the food and beverage industry is chosen to be compared to analyze the cash situation of Starbucks in five years. Estimation of the current liabilities in the five years is needed.

As in Figure 13, since the growth between 2016 and 2020 is quite stable, autoregression is applied to predict the figure in future five years, and the forecasted cash ratios from 2021 to 2025 are computed as:

$$\text{Cash Ratio} = \text{Cash} / \text{Current Liabilities} \tag{14}$$

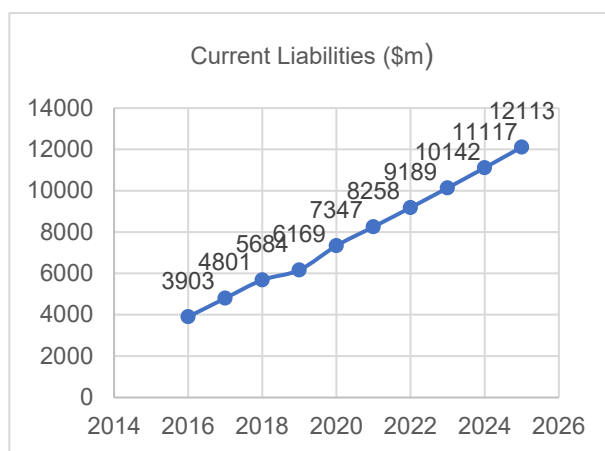


Figure 13: Actual current liabilities in 2016-2020 and estimated current liabilities in 2021-2025

The result is shown in Table 2.

Table 2: Estimated Cash Ratio of Starbucks in 2021-2025

Year	Estimated Cash Ratio
2021	0.57
2022	0.58
2023	0.63
2024	0.72
2025	0.84

The average cash ratio in 2018-2020 for the industry is between 30% and 40%, therefore, it can be held that Starbucks seems to have too much cash in the following five years. There are both advantages and disadvantages to holding cash. On one hand, holding cash can lower the risk of liquidity problems and avoid extra costs from borrowing when cash is needed. On the other hand, holding too much cash incurs both actual costs like interest expense and opportunity costs from not investing in assets with higher returns.

7. CONCLUSION

This article examines how cash flow changes for companies represented by Starbucks in order for the company to operate stably under an epidemic, with revenue and cost being the main factors that float the company's cash flow. The study finds that the instability and riskiness of the economic environment under COVID 19 is positively correlated with a company's cash holdings, meaning that companies respond to risk by holding more cash. The article discusses several ways to increase revenue by expanding into international markets and controlling costs. Based on data from Starbucks financial statements from 2016 to 2020, an autoregressive model, weighted-average method, and linear regression model are used to analyze the impact of two major factors on the trend of cash flow and to forecast the trend of cash flow for the next five years. The results show that Starbucks' cash flow will increase over the next five years as it expands into new markets and improves its operating model. By projecting future cash flow, the company can assess whether it has sufficient capital to sustain current operations and future growth, and how it plans its financial and investment direction.

Companies with survival issues in the current epidemic can focus more on cash flow holdings and increase capital inflows by increasing access to financing and creating diversified digital marketing approaches; they can also control costs by invoking new technologies and using online platforms and low-cost stores. In the section on predicted financing and investment due to the lack of relevant and accurate annual data, this article only predicts the general trend direction, in which the data is not entirely accurate. It is hoped that the accuracy of the impact on cash flow will be precise in the future when more relevant studies are available.

REFERENCES

- [1]. A. R. Joffe (2021). COVID-19: rethinking the lockdown groupthink. *Frontiers in public health*, 9, 98.
- [2]. M. Gupta, A. Abdelmaksoud, M. Jafferany, T. Lotti, R. Sadoughifar, & M. Goldust (2020). COVID-19 and economy. *Dermatologic therapy*, 33(4), e13329-e13329.
- [3]. A. Atalan (2020). Is the lockdown important to prevent the COVID-19 pandemic? Effects on psychology, environment and economy-perspective. *Annals of medicine and surgery*, 56, 38-42.
- [4]. C. Moser, & P. Yared (2021). Pandemic lockdown: The role of government commitment. *Review of Economic Dynamics*.
- [5]. Ö. Açıköz, & A. Günay (2020). The early impact of the Covid-19 pandemic on the global and Turkish economy. *Turkish journal of medical sciences*, 50(SI-1), 520-526.
- [6]. K. Dube, G. Nhamo, & D. Chikodzi (2021). COVID-19 cripples global restaurant and hospitality industry. *Current Issues in Tourism*, 24(11), 1487-1490.
- [7]. G. Yilmaz, & A. Şahin (2021). How does the COVID-19 outbreak affect the food and beverage industry in Turkey? Proposal of a holistic model. *Journal of Foodservice Business Research*, 24(6), 629-664.
- [8]. D. Aurélie (2011). Starbucks: an intercultural company. *Publications Pimido*.
- [9]. X. Qin, G. Huang, H. Shen, & M. Fu (2020). COVID-19 pandemic and firm-level cash holding—moderating effect of goodwill and goodwill impairment. *Emerging Markets Finance and Trade*, 56(10), 2243-2258.
- [10]. W. Li, Y. Cheng, & Q. Fang. (2020). Forecast on silver futures linked with structural breaks and day-

of-the-week effect. *The North American Journal of Economics and Finance*, 53, 101192.

- [11]. P. Gibbons (2011). Notes from the field: Transforming the Starbucks experience. *Journal of Enterprise Transformation*, 1(1), 7-13.
- [12]. Q. Xue, X. Peng, & M. Chen. (2021, April). Research on Transnational Marketing Strategies of New-Style Tea in China--Based on the Case of Overseas Marketing of Starbucks. In 2021 6th International Conference on Social Sciences and Economic Development (ICSSSED 2021) (pp. 698-701). Atlantis Press.

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