# Research on Capital Structure and Investment Value of Supermarket Industry

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***Abstract:*** This paper focuses on researching the capital structure and investment value of the supermarket industry, specifically examining the impact of epidemiological events on value investment within this sector. The objective is to explore the factors that influence capital structure decisions and their implications for investment value. The analysis employs the Weighted Average Cost of Capital (WACC) method to evaluate the relationship between capital structure and investment performance in the context of the supermarket industry. The study aims to investigate the influence of epidemiological events, such as COVID-19, on the capital structure decisions of supermarket companies and their subsequent effects on investment value. The research considers factors such as the size and maturity of the companies, risk profiles, regulatory environments, and cost of capital considerations to assess their impact on capital structure choices. By utilizing the WACC method, A study of supermarket investment value and capital structure decisions is presented in this paper. The WACC approach allows for a comprehensive evaluation of the cost of debt and equity financing, incorporating factors such as interest rates, tax implications, and market conditions.

***Keywords:*** supermarket, investment, COVID-19

## 1.    Introduction

### 1.1.    Background

The supermarket industry, a key player in the retail sector, has experienced significant growth and transformation in recent years. As investors seek opportunities to maximize returns, understanding the relationship between capital structure and value investment in this industry becomes paramount. This paper explores the research on capital structure and its impact on value investment within the supermarket industry, examining the factors that influence capital structure decisions and their implications for investment value. Capital structure refers to the mix of debt and equity financing utilized by a company to support its operations. Decisions regarding capital structure can greatly affect a company's value and investment attractiveness. Understanding the optimal capital structure for the supermarket industry is crucial for informed investment decisions and maximizing returns. In the supermarket industry, various factors influence capital structure decisions. Size and maturity of the company play a role, with larger and more established chains having access to a broader range of financing options. Risk profile is also a consideration, as supermarkets generally have stable cash

flows, but economic downturns and competition can impact profitability and financial risks. Additionally, regulatory environments and cost of capital considerations further shape capital structure decisions. By examining the relationship between capital structure and value investment in the supermarket industry, investors can make informed decisions based on the unique dynamics of this sector. Optimal capital structure choices can lead to enhanced financial performance and increased investment value, while the wrong balance of debt and equity financing may introduce risks and hinder investment potential.

## 1.2. Related Research

Iskandar Muda has conducted an in-depth analysis and study of the ownership and capital structure of Walmart's uncertainty model in 2021. The analysis was made through a field survey using a questionnaire. The results show that the capital structure variable has a significant impact on Wal Mart's business success, while the equity structure variable does not [1]. Herciu and Ogrean mainly discussed whether the capital structure influence company profitability in 2018. The DuPont returns such as return on assets and return on equity will be used to measure the profitability of the firm, while the debt to equity ratio will be used to measure the capital structure. The profitability of a company can be improved by using an optimal structure of debt and equity [2]. Matthew did research about debt, investment, and product market competition in 2009, using several resources from supermarket industry to identify the result. This paper shows that in the limited liability model, leverage leads to reduced competition in the product market when firms also have investment options. Moreover, in this model, non-zero leverage is still optimal based on the limited liability effect alone [3]. In 2011, Matsa was thinking about the topic of financial leverage and product quality in the supermarket industry. The paper examined whether debt financing undermines supermarket firms' incentives to provide product quality. The conclusion is that highly leveraged firms are reducing the quality of their products in order to maintain current cash flow for debt repayment [4]. Amat and Manini conducted research in 2017 to answer which ratios can better distinguish companies according to the relative importance of the company's Solvency or bankruptcy ratio [5]. Kabuye inspected the supermarket's internal control system, Working capital management and financial performance in 2019. Working capital management is an important predictor of financial performance [6]. The authors examine how a firm's financial leverage affects marketing outcomes and, in turn, firm value. The paper finds that leverage has a dual impact: it reduces customer satisfying and leverage has a negative impact on the relationship between customer satisfaction and firm value [7]. Using data on local supermarket competition in 1995, Chevalier establishes a link between firm capital structure and market competition. First, an event study analysis of supermarket leveraged buyouts suggests that the announcement of an LBO increases the chain's market value to local competitors. A supermarket chain is more likely to enter and expand its local market if an incumbent with a large share of the local market makes a leveraged buyout [8]. The passage explains that the retail industry involves the selling of goods and services directly to consumers. The retail industry is considered the largest industry globally in terms of finance and manpower. The retail industry has been in existence for thousands of years, with evidence of markets and shops dating back to around 6000 BC. Additionally, the passage mentions that the retailing industry provides employment to approximately 4.6 million people worldwide [9]. Nikolaos et al. found a significant impact relationship between the efficiency and returns of the main participants [10].

## 1.3. Objective

This paper aims to examine the capital structure and investment value within the supermarket industry, with a particular focus on the impact of epidemiological events, such as the COVID-19 pandemic.

Mainly depends on analysis of three prominent supermarket companies, namely Walmart, Target, and Costco, provided insights into their respective market values, debt levels, leverage ratios, and WACCs. Using the WACC method, the paper examines whether capital structure decisions have a significant impact on investment performance within this industry and whether this is the case in general. This paper examines how capital structure decisions have a significant impact on investment performance within this specific industry.

## 2. Method and Development

### 2.1. WACC

WACC -Weighted Average Cost of Capital- represents the average cost of financing for a company. It is an essential concept in corporate finance and is often used in capital budgeting, investment analysis, and valuation.
WACC takes into account the proportionate weight of each source of capital used by a company, including equity and debt, and calculates a blended average cost. The formula of WACC is:

$$WACC \ = \ \left(\frac{E}{EV}\right) * \ r_e \ + \ \left(\frac{D}{EV}\right) * \ r_d * \ (1 \ - \ Tc) \tag{1}$$

Where E/EV is the proportion of equity in the company's capital structure, $r_e$ is the cost of equity, D/EV is the proportion of debt in the company's capital structure, $r_d$ is the cost of debt, Tc is the corporate tax rate.

The cost of equity ($r_e$) represents the return required by shareholders given the risk of the company's equity. It is usually estimated by Capital Asset Pricing Model (CAPM) or the Dividend Discount Model. The cost of debt ($r_d$) represents the interest rate or yield required by lenders or bondholders. It can be estimated based on the current market interest rates for similar debt instruments issued by the company.

By incorporating both equity and debt, WACC provides a comprehensive measure of the cost of capital that considers the different risks and returns. It is used as a discount rate in discounted cash flow analysis to assess the present value of future cash flows and evaluate investment opportunities.

In summary, WACC is a fundamental concept in finance that helps companies make informed decisions about capital investments and project valuations by factoring in the overall cost of financing.

### 2.2. Impact of Covid-19

The impact of COVID-19 on the Weighted Average Cost of Capital (WACC) for the supermarket industry can vary depending on several factors. Here are some potential effects to consider:

Cost of debt: The pandemic has led to economic uncertainty, which can result in higher borrowing costs for companies, including supermarkets. Lenders may perceive higher risk and demand higher interest rates to compensate. As a result, the cost of debt ($r_d$) component of WACC may increase, raising the overall WACC.

Equity risk premium: The pandemic has introduced additional risks and uncertainties into the market, affecting investor sentiment. The equity risk premium (the additional return required by investors for holding equity) may increase due to perceived higher market risk. Consequently, the cost of equity ($r_e$) component of WACC could rise, impacting the overall WACC.

Capital structure changes: Companies in the supermarket industry may need to adjust their capital structure due to the pandemic's impact on their financials. For example, they may need to rely more

on debt financing to maintain liquidity. Changes in the capital structure will alter the relative weights of equity and debt in the WACC calculation, potentially affecting the final WACC figure.

Revenue and profitability: COVID-19 has caused shifts in consumer behavior, including increased online shopping and changes in product demand. Supermarkets have faced operational challenges, increased costs for safety measures, and potential revenue fluctuations. These factors can influence the company's financial performance, impacting its overall risk profile and, consequently, the WACC.

It's important to note that the specific impact of COVID-19 on WACC will vary among individual supermarket companies, depending on their financial health, market position, and strategies employed during the pandemic. Additionally, the duration and severity of the pandemic's effects will also play a significant role in determining the long-term impact on WACC.

## 3. Comparison and Anaylsis

Target has a market value of equity of $79.24 billion, Walmart has a higher market value of equity at $388.45 billion, and Costco has the highest market value of equity at $226.81 billion. This indicates that Walmart has the largest market capitalization among the three companies. Target has a market value of debt of $19.15 billion, Walmart has a higher market value of debt at $61.03 billion, and Costco has the lowest market value of debt at $9.14 billion. This suggests that Walmart has the highest level of debt, followed by Target, while Costco has the least amount of debt. The leverage ratios for Target, Walmart, and Costco are 0.1946, 0.1358, and 0.0387, respectively. This implies that Target has the highest leverage, indicating a higher reliance on debt financing, followed by Walmart and then Costco. The debt-to-equity ratios for Target, Walmart, and Costco are 0.2417, 0.1571, and 0.0403. This means that Target has the highest debt-to-equity ratio, implying a higher proportion of debt financing compared to equity. Walmart has a moderate debt-to-equity ratio, while Costco has the lowest debt-to-equity ratio, suggesting a lower reliance on debt financing. All these three companies are located in the US, so all three companies have the same federal corporate income taxes which is 21%. Target has an equity beta of 1.02, Walmart has a lower equity beta of 0.49, and Costco has the equity beta of 0.79. This implies that Target's stock price is expected to be more volatile compared to the market, while Walmart's stock price is less volatile, and Costco's stock price is moderately volatile. All three companies have the same risk-free rate of 3.78%, which is based on the 20-year US Treasury yield. The market premium is 7%. The expected cost of equity for Target, Walmart, and Costco are 10.92%, 7.21%, and 9.31%, respectively. This indicates that Target's equity investors require the highest return, followed by Costco, while Walmart's equity investors expect a relatively lower return. The Expected cost of debt(rD) is the same as a 20 year bond yield, the rD of target is 4.16%, that of Walmart is 4.44%, and 4.21 for Costco. Finally, applying the formula $E/EV*rE+D/EV*rD*(1-Tc)$ to find out what is the WACC of these three companies. WACC of Target is 9.4342%, Walmart is 6.7073%, and Costco is 9.0782%. Then, first calculate the Beta A using $BetaE/((1-Tc*L)/(1-L))$, the answer is 0.8565 (Target), 0.4359 (Walmart), 0.7656 (Costco). And using CAPM again to find out rA, which is 9.78%, 6.83%, and 9.14%, as shown in Table 1.

Target has the highest overall beta value, the highest cost of equity and the highest weighted average weighted cost of capital, indicating that the risk of investing in the company's stock is greater. For Costco, Costco has the lowest leverage ratio among these three companies which represent the low risk. This may be due to Costco's business model, which relies on a membership-based revenue model rather than sales volume. This allows Costco to generate steady revenue streams and maintain a relatively stable cash flow, which reduces its need for debt financing. Walmart, on the other hand, has a more traditional retail model that relies heavily on sales volume. As a result, Walmart has historically had a higher debt load to support its growth and expansion. However, Walmart has been working to reduce its leverage ratio in recent years by focusing on reducing costs, improving efficiency, and investing in higher-margin businesses.

Table 1: Essentials data of target, walmart, and Costco.

| | Target | Walmart | Costco |
|---|---|---|---|
| Market value of equity (Billion) | 79.24 | 388.45 | 226.81 |
| Market value of debt (Billion) | 19.15 | 61.03 | 9.14 |
| Leverage | 0.1946 | 0.1358 | 0.0387 |
| Debt-to-equity ratio | 0.2417 | 0.1571 | 0.0403 |
| Marginal corporate tax rate | 21% | 21% | 21% |
| Equity beta | 1.02 | 0.49 | 0.79 |
| Rf (20 years US Treasury) | 3.78% | 3.78% | 3.78% |
| $r_m$ - $r_f$ | 7% | 7% | 7% |
| Expected cost of equity ($r_e$) | 10.92% | 7.21% | 9.31% |
| Expected cost of debt ($r_d$) | 4.16% | 4.44% | 4.21% |
| Weighted average cost of capital (WACC) | 9.4342% | 6.7073% | 9.0782% |
| Business risk (βA) | 0.8565 | 0.4359 | 0.7656 |
| All-Equity Expected Return on Assets ($r_A$) | 9.78% | 6.83% | 9.14% |

## 4.    Discussion

Walmart is a better investment compared to Target and Costco. It has less business risk under the influence of COVID-19 and its business strategy of diversification has brought great success.

After the calculation, we found that the business risks of Walmart, Target and Costco are quite different. The business risk of Walmart is 0.4359. Target's business risk is 0.8565, which is the highest of these three. Costco's business risk is 0.7856. The reasons for Walmart's low business risk is that the target consumers of the three supermarkets are completely different. Walmart's target audience is low to middle-class families. The price of the goods is relatively low. For Target, the products and environment are premium. The price of the merchandise is a little more expensive, so that its consumers are in the middle and high class. Therefore, a very large proportion of consumers are willing to shop at Walmart. The outbreak of the COVID-19 pandemic had a profound effect on the global economy, including the purchasing power of individuals. Lockdown measures, business closures, and job losses resulted in reduced income and financial insecurity for many people. Consequently, individuals had less capacity and willingness to spend on non-essential items and services. If the spending power of consumers has decreased, consumers will not be willing to buy more expensive goods at Target. Therefore, Walmart has the lowest business risk.

Moreover, international diversification of Walmart can reduce risk and achieve growth. Walmart opened its first international store in Mexico City and now operates in all 50 states, Puerto Rico, Canada, China, Mexico, Brazil, Germany, the United Kingdom, Argentina and Korea. By operating in multiple countries, Walmart can generate revenue from a variety of sources, which helps to mitigate the impact of any downturns or market disruptions in a single country. This reduces its reliance on any one market or customer base. International diversification also allows Wal-Mart to hedge its currency risk. This is because changes in exchange rates can significantly affect a company's financial performance, and by operating in multiple countries, Walmart can mitigate the impact of currency fluctuations. By operating in multiple countries, Walmart can gain valuable insights into different markets. This can help the company develop new products and services to better meet the needs of its customers and improve its operations and supply chain management.

Optimal capital structure choices have the potential to enhance a company's financial performance and increase its investment value. A well-planned capital structure provides companies with greater financial flexibility and reduces many risks.

By having an optimal capital structure, a company can increase its financial flexibility. For changing markets, a company must be able to respond to unforeseen circumstances and seize opportunities to enhance. An optimal capital structure ensures that the company has the necessary financial resources to fund its operations while having sufficient funds for growth initiatives, acquisitions, research and development, and other strategic investments.

In addition, a well-diversified capital structure can help mitigate various risks. With different sources of funding, a company can largely reduce its exposure to a single source of financing if it can effectively balance debt and equity. Different types of financing have different risk characteristics, and by diversifying the sources of financing, a company can reduce its dependence on one type of financing. This diversification can mitigate the financial risk and liquidity risk faced by the company. Conversely, if a company relies too heavily on equity financing, it has higher cost of equity. The issuance of equity to investors is usually required to provide some return, such as dividends or share price appreciation. An over-reliance on equity financing may lead to higher financing costs and reduce the company's profitability and overall financial performance.

## 5. Conclusion

This paper has examined the capital structure and investment value within the supermarket industry, with a particular focus on the impact of epidemiological events, such as the COVID-19 pandemic. In order to evaluate the relationship between capital structure decisions and investment performance in this industry, the Weighted Average Cost of Capital (WACC) model was used in the present study in order to determine the relationship between capital structure decisions and investment performance.

Through the analysis, we identified several key findings and insights. Firstly, capital structure decisions play a crucial role in determining a company's value and investment attractiveness. Factors such as company size, maturity, risk profile, regulatory environment, and cost of capital considerations all influence the choice of capital structure. Optimal capital structure choices can enhance financial performance and increase investment value, while an imbalanced mix of debt and equity financing can introduce risks and hinder investment potential.

It also founds that the COVID-19 pandemic has had significant implications for the supermarket industry's capital structure and investment value. The pandemic has led to increased economic uncertainty, affecting borrowing costs and the cost of debt. Changes in consumer behavior, such as increased online shopping and shifts in product demand, have presented operational challenges and potential revenue fluctuations for supermarkets. These factors have influenced the financial performance and risk profiles of supermarket companies, subsequently impacting their overall WACC.

Furthermore, the analysis of three prominent supermarket companies, namely Walmart, Target, and Costco, provided insights into their respective market values, debt levels, leverage ratios, and WACCs. We observed that Walmart had the largest market capitalization and the highest level of debt among the three companies. However, Walmart has been actively working to reduce its leverage ratio in recent years. Target exhibited a higher leverage ratio and debt-to-equity ratio, indicating a relatively higher reliance on debt financing. On the other hand, Costco maintained a lower leverage ratio and debt-to-equity ratio, suggesting a more conservative approach to debt financing.

Considering the business risks associated with each company, Walmart emerged as the lowest-risk investment option among the three. Its target audience, consisting of low to middle-class families, and its focus on offering lower-priced goods have contributed to its stability during the COVID-19

pandemic. Additionally, Walmart's international diversification strategy has helped mitigate risks and achieve growth.

In light of these findings, investors in the supermarket industry should carefully evaluate the capital structure decisions and risk profiles of companies to make informed investment choices. The COVID-19 pandemic has highlighted the importance of adaptability, operational efficiency, and financial resilience for supermarket companies.

However, it is important to acknowledge the limitations of this study. The analysis focused on a specific period and may not fully capture the long-term impacts of the pandemic on the supermarket industry. Additionally, the findings are based on publicly available data and may not account for all relevant factors affecting capital structure decisions and investment value.

Further research could explore the impacts of other external events, such as changes in regulatory environments or technological advancements, on capital structure decisions and investment value in the supermarket industry. Additionally, a more comprehensive analysis could include a larger sample of supermarket companies to provide a broader understanding of the industry dynamics.

Taking the findings from this study into account, it is estimated that the capital structure and investment value of supermarkets contribute significantly to the existing literature. By examining the factors influencing capital structure decisions and their implications for investment value, investors can make informed decisions and maximize their returns in this rapidly evolving sector.

## Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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