Retailing Industry Investment Analysis Based on Indicators: Evidence from Costco, Walmart and Target

Jiyuan Ran [1,*,†], Jiadai Zhao [2,†]

[1] Department of Computer Science and Technology, Huazhong University of Science and Technology, Wuhan, China

[2] Henan Experimental High School, Zhengzhou, China

* Corresponding Author Email: u202215572@hust.edu.cn

† These authors contributed equally.

Abstract. With the development of big data, internet of things artificial intelligent and other high-tech, the retail industry has witnessed the upgrading of industrial structure. Updating our methods to manifest and predict the performances of retail companies is becoming an urge. This research focuses on using indicators to analyze retailing industry, and exemplifying the method with the examples of Costco, Walmart and Target. The data includes return on equity, asset beta, equity beta, WACC, liquidity ratio, profitability ratio and solvency ratio. By analyzing the data, this study conducts further reason analysis to find out the inherent reasons why these companies display the specific data. Some differences of the three enterprises are found from the ratio perspectives and reveals the intrinsic differences of their management and sales model and policies. We also provide an investment guideline of the three companies based on our analysis and comparison of the three companies. These results may shed a new light on the analysis of the retail industry, and the analyzing process may be extended to other investment field.

Keywords: Indicator, Investment Analysis, Retailing Industry.

1. Introduction

With the development of artificial intelligent, internet of things, big data and e-commerce, omni-channel retailing and automation have become the trend for the retail industry reform [1]. The concepts of new retail are repeatedly emphasized by more and more experts in different places, and has retail been focused unprecedentedly [2]. Many new and interesting things have emerged during this period, such as the smart membership registration system, intelligent commodity description and promotion system. At the same time, there are greater challenges underlying those opportunities as well. Firstly, competition in retail industry is developing rapidly in the context of the spread of western retail chains to the global market, the improvement of electronic commerce, and the transformation of consumer behavior patterns [3]. In addition, with the normalization of COVID-19 prevention and control work, the global retail industry is facing a lot of uncertainties and turbulence [1]. These two factors make domestic market more complicated and unpredictable. Therefore, it is necessary to give some indicators to the investors to show if a company is worth investing in order to minimize the risk. Among all those different indicators and a large amount of data available on the internet, focusing on specific indicators and using their rise and falls to depict the whole company's future development is time-saving and accurate.

Currently, there are several indicators and methods that is generally used in indicators analysis. Firstly, leverage is an essential indicator where the company's performance is evaluated by return of equity. According to Stryckova, there exists a negative relationship between a company's profitability and its use of debt. In particular, the debt ratio refers to short term debt and he shows that there is no evident relationship between the company's profitability and its long-term debt [4]. On the other hand, Bernanke gives a more modest opinion. Though he admits that high leverage will increase the bankruptcy risk, it is stated that a higher leverage will decrease the equity agency costs as it raises efficiency by imposing discipline on managers of the corporation [5]. Moreover, according to research, there exists certain relationship between business sector and its leverage rate. A company

will adjust its leverage in accord to the average leverage of homogeneous companies and make it higher or lower based on its own financial situation [6]. One of the reasons is that the same business sector shares the same amount of risk. Besides leverage, another important indicator used is economic value added (EVA). It is calculated by the company's net operating profit deducted by its cost of capital. Whether EVA is positive or not represents the company's efficiency to generate cash flow out of its capital. However, it also has limitations because it cannot reflect a forecast of the future cash flows [7]. At last, fuzzy comprehensive evaluation method can be used to get a general assessment [8]. This analysis is done by two steps: doing a survey by asking several professionals to rank different aspects of a company in 1-5 and calculate the weighted average of those point to get a general score to indicate the performance of the company.

In this paper, we estimate the profitability of the three retail companies: Costco, Walmart and Target. These three companies share a considerable market share in domestic or global market while having different background and focuses. Costco does both retail and wholesale which includes produced and fresh food, clothes, household supplies, electronics, most of which are packed in big portions. It charges relatively high membership fee ($60), and is most welcomed in middle class family. Costco has gained a large market share both in domestic and foreign market. Walmart's goods are mainly retail, including fresh products, food, electronics, apparel, toys and home furnishings, all of which are in relatively cheap unit price. It charges a modest membership fee ($45) and is popular among the low-income family. It is yielding its revenue from the global market. Target is doing retails, ranging from beauty and health products, bedding, clothing to accessories. Their products are sold in high unit price, and thus their dominant shoppers are of high income (earning $65k-$85k per year). Its endeavor to expand to Canada failed and thus its serve mainly the domestic market. Different with other two companies, Target don't have a membership fee.

Following indicators are utilized in this study: return on equity, asset beta, equity beta, WACC, liquidity ratio, profitability ratio and solvency ratio. By exemplifying the three different business model and the methods to using indicators to analyze them, we will provide an investment suggestion of the retail industry. We will first introduce the data and methods that we use, followed by analyzing the three companies' data individually and exemplify our analyzing methods, and at last make a comparison and give some suggestions.

Table 1. Summary of three companies

	Costco	Walmart - as of Jan 31, 2022	Target
MV of equity	$221,059,000,000	$390,349,520,000.00	$76,818,000,000
MV of debt	$10,910,000,000	$157,683,000,000.00	$13,720,000,000
V	$231,969,000,000	$548,032,520,000.00	$2,421,577
Tc marginal	27%	25.40%	25.04%
β_E	0.72	0.51	1.02
r_f	4.04%	2.17%	4.04%
r_D	1.65%	2.44%	2.59%

2. Data & Method

2.1. Data

The Market value of equity (E) and debt (D), marginal cooperate tax rate, equity beta (β_E), expected cost of equity capital (r_E) and debt capital (r_D) are collected from the official website. Most of the data are from Yahoo Finance, and other three websites also helped to find the data [9-11]. The summary of the data is shown in Table. 1 and the visualization of the stock prices for the three companies is shown in Fig. 1, Fig. 2, and Fig. 3. Afterwards, liquidity ratio, profitability ratio and solvency ratio are found as summarized in Table. 2.

Table 2. Ration Data of Three Companies

Ratio Analyses		**Costco**	**Walmart**	**Target**
Liquidity ratio	current ratio	1.07	0.93	1.03
	quick ratio	1.03	0.91	0.5
	Inv. turnover	11.9	8.46	6.74
	AP turnover	10.36	8.22	5.81
	Days Inventory outstanding	30.67	43.16	53.43
	Days AP outstanding	35.23	44.41	62.82
Profitability ratio	operating profit margin	2.50%	5%	7.08%
	ROA	8%	5%	9.29%
	ROE	25.60%	17%	33.25%
	EPS-basic	$13.20	$4.90	$8.72
	P/E	37.9	28.55	17.93
	Payout ratio	32%	45%	22%
Solvency ratio	Interest coverage ratio	34.8	14.13	14.7

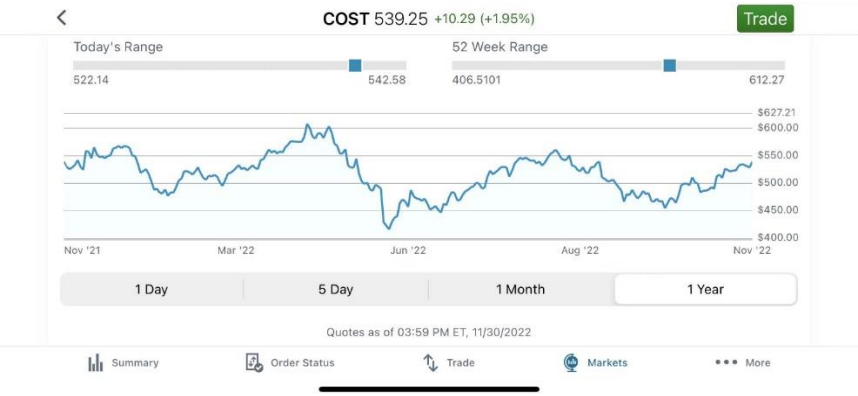

Figure 1. Stock price visualization of Costco



Figure 2. Stock price visualization of Walmart



Figure 3. Stock price visualization of Target

2.2. Indicators

According to the data mentioned above, leverage, r_E, WACC, βA and r_A are calculated as given in Table. 3. The data mainly used in the analysis are β_A, β_E and the three kinds of ratio. Equity beta includes assumptions on expected risk-free rate and market risk premium. Business risk (β_A) and all-equity expected return on assets (r_A) implied by delivering equity beta. While the three kinds of ratio are found from Yahoo Finance and Snowball. The bigger β_A and β_E are, the more risk the company must take. As shown in the first and third table, the two betas of Target were the biggest among the three companies, as a result, the risk of Target was the biggest in 2021. As for the three kinds of ratio, first is the liquidity ratio. The higher the ratio is, the stronger the ability to realize the assets of the company has. Second is the profitability. This is the foundation of an enterprise's survival and development. The better the data is, the stronger the company is. Last but not the least is the solvency ratio. This ratio can reflect the degree of risk when the company operating. The analysis follows the steps: first, we calculate those indicators and find if those indicators reflect inherent character in the companies' operating system; next, based on the characters, we draw on a conclusion of whether the company is worth investing.

Table 3. Indicator and Formula

	Calculation	**Costco**	**Walmart**	**Target**
leverage	=D/V	0.047	0.29	0.36
r_E	$=r_f+\beta_E*(r_m-r_f)$	11.81%	5.74%	15.05%
WACC	$=(1-L)\ r_E + L(1-T)\ r_D$	11.31%	4.61%	7.50%
β_A	$=(\beta_E*(1-L))/(1-T_c$ marginal)	0.69	0.39	0.73
r_A	$=r_f+\beta_A*(r_m-r_f)$	11.54%	4.91%	7.05%

Table 4. Costco's asset beta (beta A) and relating data

	Costco
MV of equity	221,059,000,000
MV of debt	10,910,000,000
V	231,969,000,000
D/V	0.047
D/E	0.049
T_c marginal	27%
β_E	0.72
r_f	4.04%
MRP	10.79%
r_E	11.81%
r_D	1.65%
WACC	11.31%
β_A	0.69
r_A(unlevered)	11.54%

3. Results & Discussion

3.1. Costco

As shown in Table 4, one can show that Costco has a relatively low asset beta among other industry (lower than 1) and from the relating data we can infer that the low beta results from its low leverage (debt over value), which affects the beta by lowering its bankruptcy cost, according to the trade-off theory. In addition, from Table 5, Costco has a high inventory turnover, which is also shown by the low Days Inventory outstanding, which means Costco needs just 35 days to sell all its inventory. Furthermore, Costco has a relatively high current ratio (higher than 1). These two ratios demonstrate Costco's ability to sell its merchandise in a short amount of time in order to generate short term cash

flow which further lowers its bankruptcy risk and decreasing its asset beta. So, in terms of investment, it reduces the risk of bearing significant lost. Last but not least, Costco has a high PE ratio (the average PE ratio is 15), which indicates that their equity holders tend to pay a considerable amount of money to join. It demonstrates that Costco has a good reputation among their share-holders, who tend to trust their profitability and believe their share will be revaluated. From one hand, it is good news for investors since it does prove Costco's fundamental profitability; While on the other hand, investors should be alert that the estimation is so high that may create bubbles.

Table 5. Ratio analysis for Costco

Ratio Analyses	Costco
Liquidity ratio	
current ratio	1.07
quick ratio	1.03
Inventory turnover	11.9
AP turnover	10.36
Days Inventory outstanding	30.67
Days AP outstanding	35.23
Profitability ratio	
operating profit margin	2.50%
ROA	8%
ROE	25.60%
EPS-basic	13.20
P/E	37.9
Payout ratio	32%
Solvency ratio	
Interest coverage ratio	34.8

3.2. Walmart

From the beta perspective, Walmart has extremely low asset beta (lower than 0.5) while having a modest leverage (0.29), according to Table 6. According to the relating data in the same table, the low WACC contributes to the result. It indicates that Walmart has a stable cash flow, and can be less affected by the atmosphere of the entire market. The possible reasons are: Walmart sells retail in small unit price and it locates in the near urban area where their low-income customers cluster, which makes them highly attach to Walmart. They also provide other services including Walmart Gas Station, Walmart Health (Clinic), which further increases their customer adhesiveness. Being their investors may not gain an overnight profit, but will not be severely harm by the deficit. Moreover, seen from Table 7, Walmart has 45% payout ratio, which is considered healthy compared to the average, but is higher comparing to Costco and Target. It means that Walmart gave about half of their dividends to the investors and used the other half to reinvest and grow their business. Thus, both Walmart's present value and future value are high for the investors. At last, Walmart also has a relatively high PE ratio which is about 28% (higher than average of 20%). It illustrates many people's belief in their future growth. This is possibly because Walmart has various sources of income which can ensure their stable growth and increases its resilience. Walmart have operations ranging from retail, wholesale and other units including e-commerce, and stores ranging from membership clubs like Sam's and other stores. Thus, even in the post-pandemic era, it remains growth.

Table 6. Walmart's asset beta (beta A) and relating data

	Walmart - as of Jan 31, 2022
MV of equity	$390,349,520,000.00
MV of debt	$157,683,000,000.00
V	$548,032,520,000.00
D/V	0.29
D/E	0.40
T_c marginal	25.40%
β_E	0.51
r_f	2.17%
r_E	5.74%
r_D	2.44%
WACC	4.61%
β_A	0.39
r_A(unlevered)	4.91%

Table 7. Ratio analysis for Walmart

Ratio Analyses	**Walmart - as of Jan 31, 2022**
Liquidity ratio	
current ratio	0.93
quick ratio	0.91
Inventory turnover	8.46
AP turnover	8.22
Days Inventory outstanding	43.16
Days AP outstanding	44.41
Profitability ratio	
operating profit margin	5%
ROA	5%
ROE	17%
EPS-basic	$4.90
P/E	28.55
Payout ratio	45%
Solvency ratio	
Interest coverage ratio	14.13

3.3. Target

As listed in Table 8, Target has the highest asset beta (0.73) the highest return of asset (7.05%). The possible reason is that most of its goods are in high unit price and its goods are beauty and health products, bedding, clothing, and accessories of high quality. Thus, when economic environment is good, their return is high; and when the time is down, people may not buy their products.

In addition, as shown in Table 9, Target has relatively high Days inventory turnover. It can also be concluded by their high unit price, which limits their ability to generate quick current. Investors should judge the appropriate time to buy their shares. At last, Target has relatively low payout ratio. It indicates that Target spends considerable amount of dividend to expand their business. However, most of Target's market share are from domestic market and its endeavor to expand their operations to Canada failed. So, the investors should judge whether Target is actually having a good opportunity before making investments.

Table 8. Target's asset beta (beta A) and relating data

	Target
MV of equity	$76,818,000,000
MV of debt	$13,720,000,000
V	$2,421,577
D/V	
D/E	0.18
T_c marginal	25.04%
β_E	1.02
r_f	4.04%
r_E	15.05%
r_D	2.59%
WACC	7.50%
β_A	0.73
r_A(unlevered)	7.05%

Table 9. Ratio analysis for Target

Ratio Analyses	**Target**
Liquidity ratio	
current ratio	1.03
quick ratio	0.5
Inventory turnover	6.74
AP turnover	5.81
Days Inventory outstanding	53.43
Days AP outstanding	62.82
Profitability ratio	
operating profit margin	7.08%
ROA	9.29%
ROE	33.25%
EPS-basic	$186.79
P/E	17.93
Payout ratio	22%
Solvency ratio	
Interest coverage ratio	14.7

3.4. Comparison & Suggestion

Among the three companies, because of low WACC, Walmart has the lowest asset beta. While this also indicate that Walmart has a stable cash flow, so that its situation is more stable. As a result, although Walmart's investors cannot get a great deal of profit, they needn't worry the deficit. Moreover, payout ratio of Walmart is also the highest, which means that half of the dividends are given to their investors. While Target has the highest asset beta and highest return of asset, so that the profit depends on the economic environment a lot. Because of its high Days inventory turnover, when buying shares, investors should judge a right time. On the other hand, Costco has a relatively high PE ratio. As a result, their profitability has more reputation to their shareholders.

When investing Costco, share-holders can trust their profitability and the share will be more valuable. However, share-holders also should take care that do not estimate too high or they would be disappointed. Talking about Walmart, for its low WACC and stable cash flow, although investors may not get a great deal of profit during a short time, there is little possibility to get severe harm by bankruptcy. Moreover, because of the highest payout ratio, half of the dividends are given to investors.

As to Target, they spend most of their dividends to the expanding. However, some failed. So, when investing, investors should judge if it's the right opportunity.

4. Limitation & Prospects

There are some limitations and defects for this study. Firstly, there were just three enterprises researched through the project, although the three companies are typical in retail industry, the sample is small, which cannot present the whole retailing industry perfectly. Secondly, the research background is during the period of epidemic, which means that after the social life returns to normal, the policies that the companies taken may be not suitable anymore. The development of retailing industry may be different from the conclusion that got now.

In the future, e-commerce rises. Physical stores will not only still exist, but also have greater commercial advantages when combined with the e-commerce. Online and offline stores can show their own advantages and integrate with each other. For example, customers can purchase online and then pickup in-store, which can save a great amount of time and improve customer's shopping experience. Customers can have more choices when shopping. Moreover, because of the covid epidemic, the retail industry closed many stores. Nowadays, the epidemic situation is slowing down, retailers are planning to expand business scale and increase customer traffic.

5. Conclusion

In summary, this paper investigates retailing industry investment analysis based on indicators: evidence comes from three famous and typical enterprises, Costco, Walmart and Target. Specially, return on equity, asset beta, equity beta, WACC, liquidity ratio, profitability ratio and solvency ratio. According to the analysis, Walmart has the lowest asset beta, resulting in that Walmart has a stable cash flow and less risk. Moreover, investors of Walmart get the most percentage of the dividends. In the meantime, the profit of Target depends most on the economic environment as Target has the highest asset beta and highest return of asset, which means that there is more risk. In addition, profitability of Costco has more reputation among their shareholders and get more fund. Nevertheless, the sample is just three companies, which is too small to represent the whole industry. On the other hand, the data is collected from the epidemic duration, so that the situation may be different when there's no epidemic. For further exploration, physical stores will combine with e-commerce and get more customer traffic and better profit. Overall, these results offer a guideline for retailing industry investment.

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