

A Value Investment Analysis on Soft Drink Stocks from Hybrid Perspective

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Abstract: To meet the increasing number of amateur investors and their needs for investment strategy, value investment strategies should be delivered in a more easy-understandable way given that amateur investors are not as experienced and lack of professional knowledge and educational background as well as training. This paper aims to display a value investment strategy in a more comprehensive way such that non-professional investors can easily grasp and understand. In this study, F-Score values of three groups of ratios are compared and further analyzed to select the best stock. The process of value investing analysis in order to pick a superior long-term investment stock from PepsiCo, Monster Beverage Inc and Coca-Cola is examined in this paper. We ranked these three companies based on pricing ratios, capital structure and margin ratios. The result shows that Pepsi is better than others in terms of pricing ratios; while Coca-Cola appears to be the best investment option in terms of capital structure and profitability. After further examination and comparison, we reach the conclusion that Coca-Cola is the best choice to invest among the three sample companies.

1. Introduction

Markets are not fully efficient to reflect as much information as investors hope to collect, but it doesn't mean the market is inefficient. Pedersen and Heje believed that the performance of the markets lies somewhere in between inefficient and efficient, but not just in some arbitrary middle ground, which means markets are efficiently inefficient.[1] In this case, investors cannot draw conclusions or decisions only through collecting valuable information from market price. Moreover, ascribed to the development of the stock market, the diversity across types of investment products and investment focus of products provide individual investors plenty of choices to manage their saving accounts and mitigate risks in a manner that fits their investment objectives and needs. These various investment choices have different risks and potentials to profit. Thus, it is vital for individual investors who use financial information less frequently than institutional investors to find a useful and less time-consuming approach to obtain relevant information in time.

Successful performance of a stock relies on an excellent financial condition, which is reflected by the company's financial statement. Each indicator from financial statement is a snapshot. Thus figuring out the relationship between these indicators and financial condition or performance is an essential step. In previous studies, The capital asset pricing model (CAPM) focuses on exploring the quantitative relationship between the return of risky assets and the risk, in order to compensate for a certain degree of risk and how much return should investors get.[2] It has been the most influential model since its introduction. Later, the Arbitrage pricing theory (APT) provided by Ross was proposed as an alternative to CAPM, which uses fewer assumptions[3]. Despite the seemingly obvious benefits of using those models for investment, both of these two models are based on assumptions which are opposed to real investment condition; thus, they could not be a useful method for individual investors in real stock investment. Furthermore, Joe confirmed that the common stock of high E/P firms earns, on average, higher risk-adjusted returns than the common stock of low E/P firms[4]. Also, in 1996, Richard demonstrated that stock price could not fully

reflect information in accruals and cash flows about future earnings.[5] These sorts of studies make the relationship between these indicators and financial condition or performance more clearly. The performance of a company, however, is not affected by the factors individually, it is the result of interaction.

Considering the interaction, Jane A. Ou and Stephen H. Penman used a financial statement analysis that combines a broad set of financial statement items into one summary measure to indicate the one-year-ahead earnings changes[6]. Moreover, Joseph provided a simple accounting-based fundamental analysis strategy named value investment strategy, which can shift the distribution of returns earned by an investor[7]. In 2000, Piotroski composed the F_SCORE ('F' stands for Financially sound) to differentiate strong and weak firms, which consists of nine financial signals. Furthermore, in 2014, Cho and Seong-Soon et al. using a two-dimensional value investment strategy to select stocks in the Korea stock market, which was based upon the characteristics of CV(Composite measure of Value) and F_SCORE.[8] Surprisingly, Tikkanen and Jarno et al. (2018) showed that not only has the F_SCORE screening method improved the performances on Korea and the United States these two countries' stock market, but also has been shown to improve the performance of all investigated investment strategies in Europe.[9] In 2020, Walkshaeusl and Christian, furthermore, indicated that high-F_SCORE firms significantly outperform low-F_SCORE firms by about 10% percent per year in developed non-US countries as well as emerging countries.[10]

Meanwhile, there is another form of the value investment strategy named Magic Formula, which uses EV/EBIT, ROIC and CF/P ratios to form portfolios. In 2016, Davydov and Denis et al. tested the magic formula(MF) and compared their performance against the traditional value investment strategies, which are based on the B/P, E/P and CF/P ratios. [11] They concluded these two methods' performance on the Finnish Stock Market. indicating that both of these two value investment strategies consistently beat the market, and Magic Formula yields the highest excess return on average compared with the traditional value investment strategies. Previous researches have tested various forms of value investment strategies all over the world, and these methods, surprisingly, can statistically generate a higher return above the market, no matter how small or big the market.

Both value investment strategy and F_SCORE method have shown their high performances in stocks investment process. Moreover, they are easy to operate without considering the complex correlation between each financial indicator. Thus, we use value investment strategy and F_SCORE screening method as the primary approach in our research. The three soft drink companies, COCO-COLA CO., PEPSICO INC, and MONSTER BEVERAGE CORP are selected as the case to illustrate our study.

There are a few reasons why we select soft drinks industry. Soft drinks were recommended as a substitute in the effort to change the hard-drinking habits of early Americans, and indeed, various soft beverages have now become mainstream. Furthermore, there is a report demonstrating that the soft drinks market will grow by USD 316 billion during 2019-2023, and the market's growth momentum will accelerate during the forecast period because of the increase in year-over-year growth.[12]. The reason why we choose the COCO-COLA CO., PEPSICO INC and MONSTER BEVERAGE CORP. is that both of them have different prior fields in peer comparison, and this kind of situation is a puzzle for individual investors that which company is better to invest and when to invest.

In order to find a superior stock among Coca-Cola (KO), Pepsi (PEP), and Monster beverage (MNST), the data of financial reports should be collected. Additionally, several tests must be done, such as price ratios analysis, capital structure analysis, and margin analysis. The first part is price ratios analysis for which we collect financial data of three selected companies from financial reports showed in SEC.GOV, then calculate their price-earnings ratio, price-sales ratio and enterprise value for comparison. The second part is capital structure analysis, where the market value of equity, short-term and long-term debt and market leverage ratio are included. The last part is margin analysis. We can also collect the revenue, net income, cost of sales, and earnings before interest and tax from financial reports and then calculate three substantial margins: gross margin, EBIT margin,

and net profit margin. Margin analysis is one of the most effective methods to find the best company. A more profitable company is a better investment than a less profitable one. What we need to do is to find the best profitable one and analyze the profit structure to determine which one is the best. Additionally, in order to compare each company's prior fields and draw a conclusion logically and quantitatively, we use the likeness F_SCORE method, which consists of three groups of ratios mentioned above.

The rest of this article is arranged as follows: Section 2 describes the investment methods, the financial indicators and sample selection. The analysis and results are presented and discussed in section 3. Finally, the conclusion is provided in section 4.

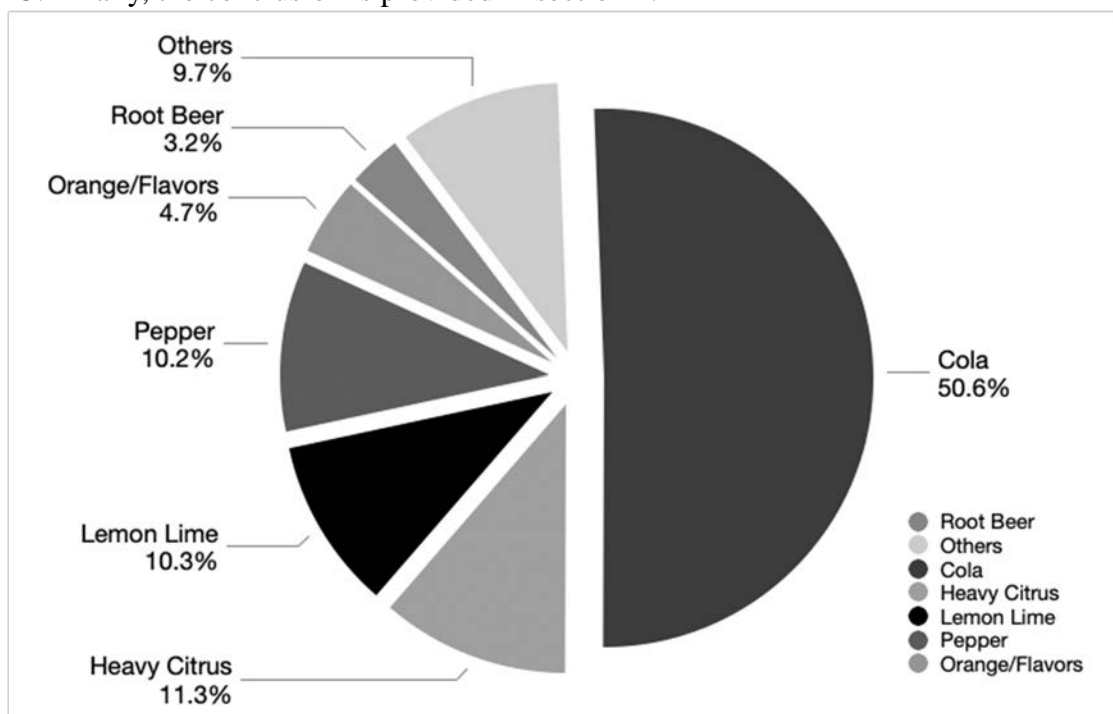


Figure 1. 2018 CSD Volume Flavored Segments vs. Cola[13]

2. Research Design

2.1 Value investment strategy

Value investing is an investment strategy that involves picking underestimated stocks and tend to be neglected by analysts and investors. Due to the efficiently inefficient markets, the price of the stocks could not precisely reflect their financial condition. Moreover, to some extent, investors' reactions will also lag behind the disclosure of the companies' financial statements. Value investors pick stocks that appear to be trading for less than their intrinsic or book value, so-called value stocks. This kind of low P/B(price-to-book) ratio is the so-called Value Stock and Growth Stock in contrast. The effectiveness of the fundamental analysis strategy contained in this study to differentiate value firms is based on the signals blow in Table.1, which can be easily obtained from quarterly financial statements disclosed in *SEC.GOV* the official website of U.S. Securities and Exchange Commission.

Eugene F.Fama and Keneth R.French indicate that value stocks outperform growth stocks in twelve of thirteen major markets[14]. Based on the updated and expanded sample, Chan and Lakonishok draw concluded value investing generates superior returns even after taking into account the experience of the late 1990s. [15]. Paiboon Sareewiwatthana tested 15-year Thailand markets sample and found that formed portfolios selected from Thailand markets by value investing strategy significantly outperformed the market (Paiboon Sareewiwatthana, 2011). Cho and Shin examined the efficacy of two-dimensional value investing strategy in the Korean stock market, which led to a result that this two-dimensional strategy is efficient not only in the U.S stock market

but also in Korean.[8].

Table.1. Definition and Measurement of Financial Fundamental Signals in this study for value investment strategy

Signal	Measured as:
1 Valuation Ratio	<p>*<i>TTM EPS</i> Trailing twelve months earning per share *<i>TTM SPS</i> Trailing twelve months sales per share</p> $TTM P/E = \frac{Price}{Forward EPS}$ $TTM P/S = \frac{Price}{Forward SPS}$ $Forward P/E = \frac{Price}{Forward SPS}$ $Forward P/S = \frac{Price}{Forward SPS} zhiho$
2 Growth Ratio	$EPS \text{ growth rate} = \frac{Forward EPS - TTM EPS}{TTM EPS}$ $PEG = \frac{TTM P/E}{EPS \text{ growth rate} \times 100}$
3 Leverage Ratio & Enterprise Value (EV)	$Leverage \text{ ratio}(D/E) = \frac{Debt}{Market \text{ value of equity}}$ $Enterprise \text{ Value}(EV) = Market \text{ value of equity} + Debt - Cash$
4 Gross Margin Data	$Gross \text{ Margin} = \frac{Growth \text{ profit}}{Sales}$ $EBIT \text{ Margin} = \frac{EBIT}{Sales}$ $Net \text{ profit Margin} = \frac{Net \text{ profit}}{Sales}$

^aPE = Price Earnings Ratio

^bPS = Price Sales Ratio

^cTTM = Trailing twelve months

^dEV/Sales = Enterprise Value/Sales

^eD/E = Debt over Equity Ratio

^gMV = Market Value

^fEV = Enterprise Value

^hEBIT = Earnings Before Interest and Tax

2.2 F_SCORE Method

Financial reports are likely to represent the best and most relevant source of current information about future performance prospects of high BM firms[7], Piotroski composed the F_SCORE('F' stands for Financially sound) to differentiate strong and weak firms. It consists of nine financial signals: four related to profitability, three related to financial leverage/liquidity, and two reflect operational efficiency. Specifically, the value of F_SCORE is an aggregate signal of nine financial signals mentioned above, thus it ranges from 0-9. Specifically, these nine signals are only divided into good or bad based on their relevance to future profitability and cash flow. For instance, if the firm's ROA is positive, Piotroski defines the indicator variable F_ROA equal to one, zero otherwise. A low(high) F_SCORE represents a firm with very few(mostly) good signals. As Piotroski did, in this soft drink market study, we compose F_SCORE of three groups of ratios to choose a relatively optimistic stock between MNST, PEP, and KO to invest.

2.3 Financial Indicator

The purpose of the first signal, Valuation Ratio, mentioned in Table.1 is to determine the relevance between the companies' current share price and its per-share earnings or revenues. They are P/E ratio and P/S ratio, respectively, which reflect the investors' desire and expectation to a specific stock. A high P/E ratio could mean that a company's stock is over-valued or else that investors are expecting high growth rates in the future, and a low P/E ratio, in contrast, means this specific stock is a relatively under-valued stock. George Athanassakos proved that a P/E based search process did a better job of identifying value stocks and arriving at a more consistent and sizeable value premium than did a search process based on P/BVs [16].

There is a slightly different between P/E ratio and P/S ratio. However, these two ratios have the same intrinsic value ascribed to the purpose of determining if a specific stock is reasonably priced.

Based on the Forward EPS of a specific stock estimated by Wall Street, we can obtain PEG ratio ('PEG' stands for Price/Earnings-to-Growth), which reflects the company's expected earnings growth. According to using the company's historical growth that we cannot stave the deviation off; the PEG ratio can be regarded as a relatively more precise one to use. When a company's PEG exceeds 1, it is considered overvalued, and its PEG less than 1, in contrast, is considered undervalued.

A leverage ratio is any one of several financial measurements that look at how much capital comes in the form of debt(loans) or assesses the ability of a company to meet its financial obligation.

In the margin field, Profit margin is a percentage measurement of profit that expresses the amount a company earns per dollar of sales. If a company makes more money per sale, it has a higher profit margin. Gross profit margin and net profit margin, on the other hand, are two different profitability ratios used to assess a company's financial stability and overall health.

2.4 Sample Selection

Considering the efficiency and data timeliness, the value investing sample selection period in this study ranges from the third fiscal quarter of 2017 to the first fiscal quarter of 2020. Furthermore, the data origin both are each company's financial statement disclosed in SEV.gov. We choose the Adjusted Closing Price of KO, MNST, PEP on May 13th, 2020, and they are \$43.94, \$65.17, \$132.96 separately.

3. Results & Discussion

3.1 Price Ratios Analysis

The first part is pricing ratios analysis. We use the stock price on May 13th,2020, which shows that KO's stock price is \$43.94, PEP's stock price is \$132.96, and MNST's stock price is \$65.17. We need to calculate the following ratios to see which company wins in this part: PE, PS, and EVS. The results are given in Table.2, which shows the apparent comparison for the three companies. Here are the explanations for each data.

Table.2. Price Ratios Analysis

	Price	TTM PE	Forward PE	TTM PS	Forward PS	TTM EV/Sales	Forward EV/Sales
KO	\$43.94	20.53	21.43	5.08	5.17	5.65	5.76
PEP	\$132.96	23.66	24.76	2.71	2.75	3.15	3.20
MNST	\$65.17	31.48	29.89	7.95	7.73	7.74	7.53

$$\text{Price Earnings Ratio} = \frac{\text{Price per share}}{\text{Earnings per share}} \quad (1)$$

$$\text{Price Sales Ratio} = \frac{\text{Price per share}}{\text{Sales per share}} \quad (2)$$

Lower PE ratio is better because the stock would have higher earnings per share or a lower stock price, which means it is undervalued. Similarly, a lower PS ratio is better because it means a higher sales per share or a lower stock price.

We can see Table.2 shows that KO has a lower TTM and Forward PE ratio. At the same time, PEP has a lower TTM PS and Forward PS ratios. In general, KO is the best in terms of TTM PE ratio and Forward PE ratio, which means, most likely, it is an undervalued stock compared with other companies we selected. PEP is the best in TTM PS ratio and Forward PS ratio, which means PEP has a lower stock price for such a revenue amount, which is, most likely, good.

$$\text{Enterprise Value} = \text{Market Value} + \text{Debt} - \text{Cash} \quad (3)$$

$$\text{EV/Sales} = \frac{\text{Enterprise Value}}{\text{Sales}} \quad (4)$$

Enterprise value is crucial when firms have different leverage ratios. When EV/Sales is lower, the company should have higher sales with relatively lower enterprise value, and higher sales are good to see. In general, a lower EV/Sales ratio means that a company is undervalued. PEP has the lowest TTM EV/Sales and Forward EV/Sales, which means PEP is the most attractive one for this part.

The outcome is that PEP gets four scores, F_TTM PS, F_Forward PS, F_TTM EV/Sales, and F_Forward EV/Sales. KO gets two scores, F_TTM PE and F_Forward PE. While MNST loses all ratios, so we can rank it as the last one in pricing ratios analysis. According to the F_SCORE of each company, KO gets the highest score. Moreover, in the TTM PE and Forward PE, KO is a little bit better than PEP. For other four ratios: TTM PS, Forward PS, TTM EV/Sales, and Forward EV/Sales, however, we can see that PEP wins more than a little bit. Therefore, PEP can be considered as the better choice in pricing ratios analysis part.

3.2 Capital Structure Analysis

A higher leverage ratio usually means that the company relies on a significant amount of debt to grow, which causes higher additional interest to pay. If the leverage ratio is high, which also means a high additional interest to pay, the company has a greater chance to default or even bankruptcy. However, a lower leverage ratio is not definitely a good sign due to a possibility that this company lacks plans for expansion.

Table.3. Capital Structure Analysis

	EV	MV of Equity	Short-term Debt	Long-term Debt	Market Leverage Ratio (D/E)
KO	210,180	188,718	5,642	31,094	19.5%
PEP	214,478	184,482	5,882	36,361	22.4%
MNST	33,411	34,316	5,039	25,284	0.1%

$$\text{Leverage Ratio} = \frac{\text{Debt}}{\text{Market Value of Equity}} \quad (5)$$

KO and PEP have similar capital structures. PEP has a higher market leverage ratio and a lower P/S ratio compared with KO. MNST has lower debt in short and long term. Specifically, its market leverage ratio is 0.1%, almost 0, which represents a preferable debt-paying ability. It may be because MNST borrows less from outside for the reason that it lacks expansion projects to stimulate growth, or it is maybe that the company's position in the industry is weaker than that of other companies in the same industry, it has smaller size in capital, and it cannot take up too many loans.

MNST gets three scores, F_Short-term Debt, F_Long-term Debt, and F_D/E. Thus, we can conclude that MNST wins in the debt and Market Leverage Ratio part from the sheet. However, this may be due to the fact that it does not need the debt. Also, based on the enormous difference of enterprise value between MNST and the other two giant companies, we cannot simply generate that the higher debt in KO and PEP is worse than MNST. What we can conclude is that MNST seemingly shows preferable data. However, as discussed, the low leverage ratio for MNST is not necessarily a strength. For the giants, which is unambiguous, KO is better than PEP in this part.

3.3 Margin Analysis

Profitability is one of the most critical data for a company because profitability accounts for lower possibility to be trapped into distress and more likely to have longer cashflow durations. Novy-Marx (2013) shows that in the full universe of stocks, gross profit margins predict returns better. We cannot conclude it definitely, but most likely, profitable value stocks outperform unprofitable growth stocks.

Table.4. Margin Analysis

	Revenue	NI	Gross Profit Margin	EBIT Margin	Net Profit Margin
KO	8,601	2795	60.8%	27.7%	32.5%
PEP	13,881	1,351	55.9%	13.9%	9.7%
MNST	1,062	279	60.0%	34.45%	26.3%

$$\text{Gross Profit Margin} = \frac{\text{Sales} - \text{Cost of Sales}}{\text{Sales}} \quad (6)$$

$$\text{EBIT Margin} = \frac{\text{EBIT}}{\text{Sales}} \quad (7)$$

$$\text{EBIT} = \text{Revenues} - \text{Cost of Sales} - \text{Operating Expenses} = \text{Net Income} + \text{Taxes} + \text{Interest} \quad (8)$$

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Sales}} \quad (9)$$

From the sheet, we can find that KO has more net Income with lower revenue, which definitely leads to good gross margin, EBIT margin, and net profit margin. Although MNST has a higher EBIT Margin, we cannot conclude that MNST is a more profitable one. Because tax, interest charges, and other expenses may have impacts on this. PEP has a higher revenue but lower net income, thus the lowest margin ratios. In this part, KO gets three scores, F_NI, F_Gross profit margin, and F_Net profit margin. MNST gets one score, F_EBIT margin. PEP loses all of the ratios, thus 0 score. In general, KO is the best profitable company in our selection.

Next, we look at the data from Q3 2017 to Q1 2020 to find out whether KO is always the best choice in profitability in recent years.

As seen in Figure 2-4, although the lines fluctuate, it is not hard to rank them if we ignore the particular case. We can see that the data in recent years correspond with current year data showed in Table.4. As shown in the figures, we can conclude that KO is the best, MNST is average and PEP is the worst one.

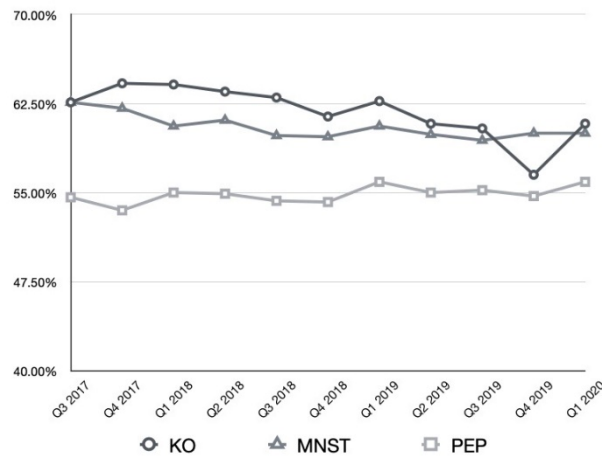


Figure 2. Growth Margin

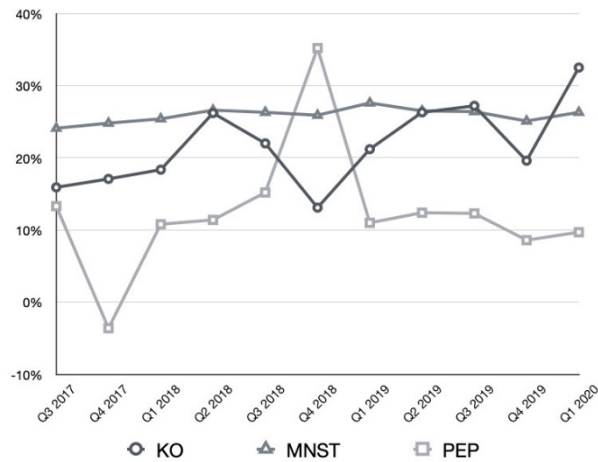


Figure 3. EBIT Margin

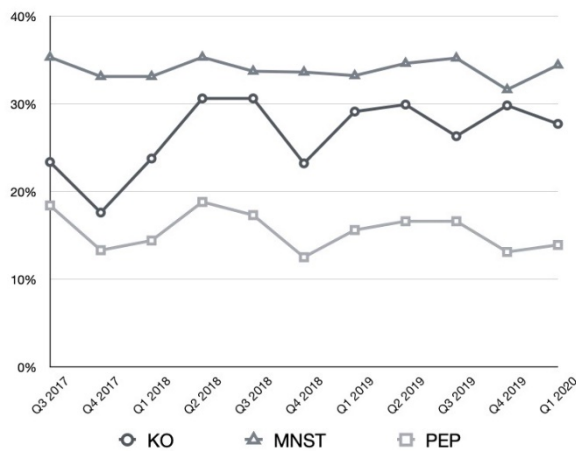


Figure 4. Net Profit Margin

In net profit margin part, KO is always higher than PEP from Q3 2017 to Q1 2020 except Q4 2018. Surprisingly, we notice that PEP has a net profit margin vertex in Q4 2018, and its driving force is that PEP got a huge tax benefit in Q4 2018, which increases its net income.

MNST demonstrates a good performance of profitability in recent years and has potential. However, KO is the best, nevertheless, its EBIT Margin is exceeded by MNST. As we discussed: tax, interest charges, and other expenses may have impacts on EBIT Margin; KO had a better performance than MNST in Gross Margin and Net Profit Margin; MNST shows enormous potential to be the most profitable company among the three, but KO has the best profitability at present.

According to the analysis above, KO keeps high and steady performance in recent years. MNST is attractive in data but cannot reach the high level of KO. PEP is not as good as others in the profitability part. Thus, KO is the best profitable one in our selected companies.

4. Conclusion

The purpose of this article is to help those investors who want to invest in soft drink industry to make the decision on which company to invest. Thus, we selected three companies for the value investing analysis: MNST, KO, and PEP, one start-up and two well-known companies. To generate a better decision, we use F_SCORE to rank them by comparing and analyzing multiple ratios, including pricing ratios, capital structure and margin ratios. We evaluated their good or bad performance and finally generated the best one among the selected three companies. The result is that PEP is the prior one in pricing ratios analysis part, yet wins KO by a narrow margin. Meanwhile, KO is prior to others in capital structure and profitability parts. According to the results, we conclude that KO is the best company to invest. In the future, we may remark the effectiveness

and practicability by comparing it with other methods.

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