

Stock Selection in Context of Ratio Analysis from Perspectives of Valuation, Growth, Profitability and Payout

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Abstract. Stock selection has always been a heated topic in both daily discussion and academic research. There were already plenty of researches that provided deep insights into the catalysts of stock performances, e.g., CAPM and Fama-French Three Factor Model. Among previous literatures, four dimensions that can best predict the return of stocks are identified, i.e., valuation, growth, profitability and payout, respectively. This paper intends to analyze stocks performances in the US stock market from 2016 to 2021 based on these four perspectives and provide an ideal investment target to concerned investors. In order to quantify the selection process, two indicators that most closely related to the return of stocks are selected for each dimension to measure the performance of stock. An ideal investment target is also presented in section 3 of this paper together with its financial highlights and competition analysis. Finally, the limitations of this methodology and the risk factors in the contemporary capital market are also outlined. Overall, these results offer a guideline for ratio analysis approach of stock selection.

Keywords: Stock selection; valuation; profitability; growth; payout.

1. Introduction

US stock market's robust performance from 2019 to 2021 has brought great confidence to investors. According to Baird et.al, S&P 500 index returned about 29%, 18% and 31% for 2021, 2020 and 2019 respectively, which was much higher than the average annual return of 12.6% over the past 50 years [1]. However, it seems to enter the bear and exit from the bull in 2022. The exceptionally high inflation rate, the turbulent international political environment as well as the repercussion of post-pandemic period has dragged the stock market into the mire. This is clearly embodied by a -20.58% YTD return of the S&P 500 index [2]. In such a period with uncertainty but also opportunity, investors' strategy and choice become much more significant than ever. Therefore, this paper intends to comprehensively analyse the performance of UK listed stocks over the past six years in order to provide an insightful investment target to investors.

Historically, there were plenty of attempts to predict the return of stocks. In 1960s, Sharpe [3] and Lintner [4] introduced the famous Capital Asset Pricing Model (CAPM), which described the relationship between return of an asset and the risk associated with it. Although this pioneer theory by the time provided a more convincing and practical interpretation of the financial market than previous theories such as the dividend discount model (DDM), this model was later on criticized for its oversimplified assumptions on risk-free rate and the only factor involved: market systematic risk.

Realizing the limitations of CAPM, a new asset pricing model was developed by Fama and French in 1993, i.e., the Fama and French three-factor model [5]. Building on the basis of CAPM, Fama and French used time series regression and proved that there are two factors other than the risk premium that can be used to predict the return of a stock, which are the size premium (SMB) and the value premium (HML). Its explanatory power has once again been confirmed by Basiewicz and Auret in their research on the feasibility of this model in construing returns of stocks in the Johannesburg Stock Exchange (JSE) 's stock market [6]. However, there are still some abnormal returns that cannot be explained by either Fama and French three-factor model or CAPM [7]. In 2000, Shen pointed out the relationship between price-earnings(P/E) ratios and stock returns [8]. There is strong historical evidence that high P/E ratios is correlated with depressing stock market performance both in the short run and in the long term. Specifically, high P/E ratios have been followed by slow long-run growth

in stock prices. Moreover, when high price-earnings ratios have reduced the earnings yield on stocks relative to returns on other investments, short-run stock market performance has suffered as well. As another metrics of assessing a company's fundamental profile, dividend yield has long been considered to be positively correlated with the return of a stock, which could explain more than 25% of variation of two-to-four-year returns [9]. In 2013, Novy-Marx introduced the significance of profitability, measure by gross profits-to-assets ratio, in predicting the returns of stocks [10]. He discovered that the performance of traditional value investment strategies can be best enhanced by controlling for profitability.

Therefore, among all these great studies, there are four dimensions that can be summarized to best predict the performance of stocks, which are valuation, growth, profitability and payout respectively. This paper will carefully assess stocks listed in the US market based on these four factors and propose an attractive investment target. The next section will introduce the main methodology adopted as well as the key indicators used to evaluate the performance of stocks. Section 3 will present an ideal investment target based on the evaluation in section 2. Section 4 will outline some of the risks factors and limitations to the stock selection process.

2. Methodology

In order to compare the return of stocks, the basic data such as price, EPS and revenue of all stocks from 2016 to 2021 are collected from the Security Exchange Commission (SEC) website. Then, the main metrics are calculated through excel. To fully evaluate the performance of stocks, the four dimensions mentioned above were used, which are valuation, growth, profitability and payout respectively.

2.1 Valuation

The first metric for valuation is price-earnings (P/E) ratio. As one of most famous indicators, it measures the ratio between the price per share of a stock and its earnings per share, which is defined by the following equation:

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

Stocks can be classified into two categories based on their P/E ratios, i.e., value and growth stocks. Typically, growth stocks are those with high P/E ratios while value stocks are those with low P/E ratios. By breaking average returns into dividends and three other sources of capital gain, Fama and French discovered that value stocks can provide higher returns than growth stocks in the long run [11]. This idea was again confirmed by Capaul et.al in their paper which discussed the returns of value and growth stocks [12]. Intuitively, a high P/E ratio suggests that the share price is high relatively to the earnings of a company, which indicates that the stock is more expensive and is more difficult to continue growing in price. Another index used is price/earnings-to-growth (PEG) ratio:

$$\text{PEG ratio} = \frac{\text{P/E ratio}}{\text{EPS growth rate}} \quad (2)$$

Since data in this paper are all collected between 2016 and 2021, EPS growth rate is calculated by the cumulative annual growth rate (CAGR) from 2016 to 2021. According to Peter Lynch's famous book *One Up on Wall Street*, the P/E ratio of any company that's fairly priced will equal its growth rate, which indicates a fairly valued company will have its PEG equal to 1 [13]. A stock with a low PEG ratio would show that it either has a low P/E ratio, which means it is cheap, or it has a high EPS growth rate with respect to its P/E ratio. Therefore, stocks with low PEG ratios are more favorable to investors.

2.2 Growth rate

There are a great number of metrics that measure growth rate of a company. Among them, the two most successful ones in predicting future returns of stocks are EPS growth rate and revenue growth rate. This paper adopts both measurements of growth rate. EPS growth rate is defined by:

$$EPS \text{ growth rate} = \frac{EPS \text{ year } 2}{EPS \text{ year } 1} - 1 \quad (3)$$

Revenue growth rate is defined by:

$$Revenue \text{ growth rate} = \frac{Revenue \text{ in year } 2}{Revenue \text{ in year } 1} - 1 \quad (4)$$

Typically, higher EPS and revenue growth rates would lead to better performance of the stock because it suggests the company is on the right track.

2.3 Profitability

According to Novy-Marx [10], gross profit-to-asset ratio is the best profitability index that predict the return of stocks. Stocks with high gross profit-to-asset ratio significantly outperformed those with low gross profit-to-asset ratio. The formula for computing this ratio is the following:

$$Gross \text{ profit} - to - asset \text{ ratio} = \frac{Gross \text{ profit}}{Asset} \quad (5)$$

Another index adopted is the gross profit margin. Gross profit equals revenue deducted by cost of goods sold, which measures the money left from the sales of goods after subtracting the cost of production. Gross profit margin effectively indicates the earning power of a company, which has significant impact on the return of stocks. The formula for gross margin is as follows:

$$Gross \text{ profit margin} = \frac{Gross \text{ profit}}{Revenue} \quad (6)$$

2.4 Payout

Payout of a company refers to the amount of money paid back to the shareholders to reward their investment in the firm. The most common form of payout is dividend. Therefore, the first metric used to benchmark payout is dividend per share, which can be computed by the equation:

$$Dividend \text{ per share} = \frac{Total \text{ dividend payout}}{Number \text{ of shares outstanding}} \quad (7)$$

However, even though large companies tend to payout more, their share prices are also much higher. Therefore, in order to make adjustment for share price, another ratio called the dividend yield is used. Dividend yield considers the relative dividend payout with respect to its share price, which provides a more comprehensive assessment on the value of the stock. Dividend yield is measure by:

$$Dividend \text{ yield} = \frac{Dividend \text{ per share}}{Share \text{ price}} \quad (8)$$

Among thousands of stocks listed in the US stock market, there should be a screening process that first narrows down the range of stocks that are more superior in these four aspects. According to the rationale of Novy-Marx [10], cheap and profitable stocks remarkably outperformed expensive and non-profitable stocks. Therefore, by targeting primarily on value stocks with a relatively high profitability, measured by gross profit/asset ratio, all stocks that are in the lowest quintile of P/E ratio and in the highest quintile of profitability each year from 2016 to 2021 that are also paying dividends each year are selected. After cross comparison, only 4 stocks are in the selection criterion with similar profiles. One of them called Ocean Bio Chem Inc is chosen as a target for case study and the following parts will show why it is a good investment target.

3. Results & Discussion

This part is going to carefully analyze the company Ocean Bio Chem Inc and its key competitors in order to justify that Ocean Bio Chem Inc is a good investment target. Similar to the aforementioned structure, the company is going to be assessed by the same four dimensions: valuation, growth, profitability and payout.

According to its website and prospectus, "Ocean Bio-Chem Inc (OBCI) leads the way in the manufacturing, distribution, and marketing of appearance, performance, and maintenance chemicals and accessories for the marine, automotive, RV, and home care markets. With corporate headquarters located in sunny Fort Lauderdale, Florida, the company's manufacturing and distribution facility in

Montgomery, Alabama and retailers around the world, OBCI is ready to tackle everything outdoors with outstanding results.” [14] The Table. 1 gives its main financial highlights.

Table. 1 Financial Highlights - OBCI

	2021	2020	2019	2018	2017	2016
Net Sales	\$64.30	\$55.60	\$42.30	\$41.80	\$37.90	\$36.20
Operating Income	\$10.90	\$12.20	\$4.60	\$3.70	\$3.70	\$3.10
Gross profit/Asset	42.58%	51.69%	43.78%	43.67%	48.30%	57.84%
Net Income	\$8.40	\$9.60	\$3.50	\$2.80	\$2.60	\$2.10
EBITDA	\$12.33	\$13.52	\$5.88	\$4.90	\$4.81	\$4.07
Earnings Per Share (Diluted)	\$0.89	\$1.02	\$0.37	\$0.30	\$0.28	\$0.23
P/E ratio	9.78	13.1	8.95	10.93	15.5	16.35
Dividends Per Common Share	\$0.12	\$0.08	\$0.05	\$0.06	\$0.06	\$0.06
Dividend yield	13.47%	7.83%	13.39%	19.81%	21.19%	25.72%
Operating Cash Flow	\$5.50	\$6.20	\$6.00	\$1.20	\$2.90	\$3.00

3.1 Valuation

Ocean Bio-Chem Inc has a relatively low P/E ratio from 2016 to 2021 which are 16.35, 15.50, 10.93, 8.95, 13.10, 9.78 respectively. These are all in the bottom quintile of P/E ratio each year, suggesting that OBCI fits the criterion of a value stock, which means its shares are relatively cheap. Similarly, its P/B ratio is in the bottom quintile each year as well, confirming that this is an inexpensive stock. Another merit of this stock is its low PEG ratio. In 2016, its EPS was 0.23, which has grown steadily for 5 years and reached 1.02 in 2020. Although its EPS has fallen to 0.89 in 2021, this was still the second highest EPS in the company’s history. It has an EPS CAGR of 25.3% and a low PEG ratio of 38.6 in 2021, illustrating that it is a cheaper stock with relatively high growth rate.

Table. 2 P/E ratio

	OBCI	WDFC	CLX	ODC	CENTA
2016	16.35	32.51	28.13	20.03	28.51
2017	15.50	29.29	24.90	28.14	24.47
2018	10.93	38.24	21.61	38.16	14.28
2019	8.95	45.35	24.23	21.22	17.22
2020	13.10	46.45	29.81	14.13	16.43
2021	9.78	47.08	32.24	24.20	15.64

Table 3. Valuation 2021

	OBCI	WDFC	CLX	ODC	CENTA
P/E	9.78	47.08	32.24	24.20	15.64
EPS CAGR	25.30%	5.75%	2.12%	-3.93%	21.14%
PEG	38.64	808.20	1405.82	-359.48	77.69

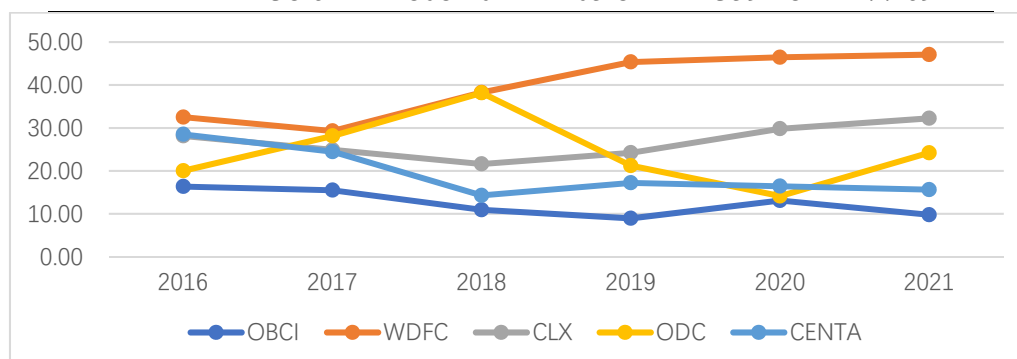


Fig. 1 P/E ratio of five comparable companies

There are four competitors that can be compared to Ocean Bio-Chem Inc, which are WD-40 CO, Clorox CO, Oil-Dri Corp America and Central Garden & Pet CO respectively. Table. 2, Table. 3 and Fig. 1 show the comparison of their valuation matrices. The main advantage Ocean Bio-Chem Inc has against its competing stocks is its low P/E ratio. As shown by the line chart, OBCI had the lowest P/E ratio every year from 2016 to 2021. However, it has the highest EPS CAGR of 25.3%, which is the highest among the five companies. This results in its exceptionally low PEG ratio of 38.64, which is also lower than all its competitors. Consequently, the fact that it is a relatively cheap stock, and its potential of continuously growing EPS together makes Ocean Bio-Chem Inc an attractive investment.

3.2 Growth

Growth rate is an extremely important parameter in assessing the performance of a company. Ocean Bio Chem Inc also has a stable growth over the past 6 years. As shown in Table. 5, its net revenue(sales) is steadily growing at a CAGR of 13% and is expected to double its net revenue in 2016 by the end of 2022. Although the growth rate is not huge, its stability throughout the years indicates that the company has a very stable source of income and hence is less risky to invest in, which particularly appeals to risk averse investors. Its net income is also increasing from 2016, which allows it to have higher EPS and dividend payment. As mentioned above and shown in Table. 4, it also has a growing EPS at an annual rate of 25.3%. In 2016, its EPS was 0.23, which has grown steadily for 5 years and reached 1.02 in 2020. Although its EPS has fallen to 0.89 in 2021, this was still the second highest EPS in the company's history. Apart from revenue and EPS growth, it also has a growing operating cash flow, from 3 million dollars in 2016 to 5.5 million dollars in 2021. As the most crucial indicator of financial health, a positively growing cash flow illustrates that the company is in a good shape.

Table. 4 EPS growth rates

	OBCI	WDFC	CLX	ODC	CENTA
2017	21.74%	2.20%	8.74%	-21.39%	74.71%
2018	7.14%	24.73%	17.01%	-24.49%	52.63%
2019	23.33%	-13.36%	0.96%	50.45%	-30.60%
2020	175.68%	9.45%	16.46%	47.31%	36.65%
2021	-12.75%	15.68%	-24.18%	-40.24%	25.00%
CAGR	25.30%	5.75%	2.12%	-3.93%	21.14%

Table. 5 revenue growth rates

	OBCI	WDFC	CLX	ODC	CENTA
2017	7.53%	-0.04%	3.68%	0.00%	12.33%
2018	7.36%	7.36%	2.53%	1.41%	7.83%
2019	1.10%	3.63%	1.47%	4.14%	7.57%
2020	31.48%	-3.51%	8.16%	2.24%	13.11%
2021	15.73%	19.49%	9.22%	7.68%	22.56%
CAGR	10.05%	4.23%	4.12%	2.54%	10.36%

The Table. 4 and 5 illustrate the EPS and revenue growth rate each year. For EPS CAGR growth rate, OBCI was significantly higher than WDFC, CLX and ODC. It indicates that Ocean Bio Chem Inc had higher earnings growth rate and performed better than its competitors. In terms of revenue growth rate, OBCI still had a higher CAGR than WDFC, CLX and ODC, only slightly lower than CENTA. Combining the high EPS and revenue growth rate with its low P/E ratio and cheap share prices, OBCI appears to be a better investment target than its competitors.

3.3 Profit

According to Novy-Marx [10], Gross profit/Asset is the best predictor of returns among all the profitability indices. After computing the gross profit to asset ratio for all the stocks each year, Ocean

Bio-Chem Inc is in the top quintile from 2016 to 2021. In 2021, it has a gross profit to asset ratio of 42.58%, which is ranked at the top 88th percentile in all listed companies. Combining its features of high profitability and low P/E ratio, the stock is expected to produce very high returns in the following years. Another ratio adopted is gross profit margin. OBCI's gross profit margin was about 40% up and down each year from 2016. This was higher than the median of the gross profit margin of all stocks each year.

Table. 6 Gross profit/Asset

	OBCI	WDFC	CLX	ODC	CENTA
2016	57.84%	64.14%	60.98%	43.60%	48.92%
2017	48.30%	58.90%	61.75%	40.68%	51.69%
2018	43.67%	72.58%	55.93%	43.54%	37.89%
2019	43.78%	78.38%	56.51%	38.49%	37.28%
2020	51.69%	63.01%	51.99%	38.05%	35.82%
2021	42.58%	62.60%	53.35%	34.90%	33.02%

Table. 7 Gross profit margin

	OBCI	WDFC	CLX	ODC	CENTA
2016	41.01%	57.23%	47.82%	34.06%	32.42%
2017	39.69%	57.23%	47.28%	32.97%	32.88%
2018	36.81%	56.33%	46.21%	31.86%	32.62%
2019	39.67%	56.04%	46.52%	28.51%	31.68%
2020	44.56%	55.94%	48.06%	31.69%	31.09%
2021	39.92%	55.17%	46.03%	26.04%	31.15%

For profitability, OBCI is in the middle of its competitors. Although Ocean Bio-Chem Inc's gross profit/asset ratio is higher than ODC and CENTA as shown in Table. 6, it is lower than WD-40 CO and Clorox CO for about 30% and 20% respectively. However, OBCI's gross profit-to-asset ratio is still in the top quintile each year from 2016 to 2021. The similar goes to gross profit margin (seen in Table. 7).

Table. 8 Dividend per share

	OBCI	WDFC	CLX	ODC	CENTA
2016	0.06	1.67	3.14	0.79	0.00
2017	0.06	1.92	3.26	0.82	0.00
2018	0.06	2.14	3.65	0.86	0.00
2019	0.05	2.40	4.00	0.89	0.00
2020	0.08	2.64	4.31	0.95	0.00
2021	0.12	2.79	4.59	0.98	0.00

Table. 9 Dividend yield

	OBCI	WDFC	CLX	ODC	CENTA
2016	1.57%	1.41%	2.27%	2.10%	0.00%
2017	1.37%	1.76%	2.45%	1.99%	0.00%
2018	1.81%	1.20%	2.70%	2.03%	0.00%
2019	1.50%	1.32%	2.61%	2.52%	0.00%
2020	0.60%	1.29%	1.97%	2.73%	0.00%
2021	1.38%	1.16%	2.55%	2.75%	0.00%

3.4 Payout

Payout is how much the company gives out as dividends to its shareholders, the basic payout indices are shown in Table. 8 and Table. 9. In 2021, Ocean Bio-Chem Inc is also in the top quintile

in dividend yield, with a figure of 13.47%. As in Table. 8, the company is steadily paying out dividends to its shareholders over the past 6 years with an increasing dividends per common share, which peaked at \$0.12 in 2021. This illustrates that investors can expect a stable stream of cash flow from the stock annually, which increases the liquidity of their investment. This is the part where OBCI has a relative disadvantage over the other companies. Its dividend per share is much lower than the other two highlighted firms. However, if one looks at dividend yield, they are very close since dividend yield makes adjustments with respect to the share price.

3.5 Overall evaluation

The above analysis produces a comprehensive assessment of the stock OBCI (GVKEY: 8073) across five important dimensions: valuation, growth, profitability, payout and competitor analysis. The core thesis is that the best investment should be a cheap stock with a promising future, namely, it should have a steadily high profitability, revenue growth rate as well as dividend yield. OBCI satisfies almost all the above criterion of an attractive investment as shown above, both in figures and in text. Therefore, this is the best stock that this study will recommend investing in by assessing across these four criteria. Overall, although OBCI performs worse on dividend payout comparing to some of its competitors, it is more superior than the other four in terms of comprehensive assessment on P/E ratio, profitability and growth rate. Given the much lower PEG ratio, higher EPS growth rate as well as the top-quintile profitability over the past six years, Ocean Bio-Chem is expected to produce higher returns than its competing stocks in the future.

4. Limitation & Risks

Although Ocean Bio Chem Inc has a strong fundamental profile, there are still some risks that need to be specified. Firstly, it is worth noticing that OBCI is a relatively small firm among all listed companies. Therefore, it is impossible for mega funds to buy a large number of shares from it because of its size. It is a more suitable investment target for private investors who pursue high rate of returns.

Secondly, OBCI is not paying many dividends, which is more suitable for investors who care less about liquidity. For those who want higher liquidity out of their investments, stocks that are paying higher dividends might be more suitable for them. Stocks similar to OBCI with relatively lower dividend per share is more suitable for value investors who would like to make great profit from capital gain.

Thirdly, the uncertainty in the global economy is a major risk to the overall stock market performance. After a tentative recovery from 2021, the development of global economy becomes more gloomy in 2022. Output all around the world has contracted in the second quarter this year, owing to the downturn in China and Russia, as well as the dreadful increase in consumer price index in the United States and European countries. Several governments have announced to adopt contractionary monetary policies such as raising interest rates to slow down inflation, which could bring more negative shocks to firms and the stock market. Under such tightening global economic conditions, even the good performance of the company could be heavily offset by the uncertainty in the stock market, which generates lower or even negative returns.

5. Conclusion

In conclusion, this paper discusses the process and result of stock selection, which has long been a heated topic that raised many discussions. From the CAPM model to the Fama-French three factor model, scholars have developed more and more theories to explain and even predict the return of stocks. This paper adopts the ratio analysis method to assess stocks across four dimensions: valuation, growth, profitability and payout, and finally present an ideal investment target that is more superior than others in these aspects. According to the analysis, Ocean Bio Chem Inc is an attractive investment target by evaluating all four perspectives. The related risk factors that could muddle with

the future return of the stock are also outlined. Overall, these results shed light on guiding further exploration of ratio analysis approach for stock selection.

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