

# *Securities Investment Analysis: Case of Lululemon*

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**Abstract:** Methods of securities investment analysis methods are numerous, mainly divided into three categories: basic analysis, technical analysis, quantitative analysis. As a widely accepted method of enterprise valuation, DCF (discount cash flow method) analysis is also often used in the analysis of security investment. The paper takes Lululemon Athletica Inc. as an example to conduct the basic components of security investment analysis combined with DCF analysis. The first part includes the presentation of company's basic information, such as brief introduction, fundamentals and financial ratios. Then it uses application of CAPM (capital asset pricing model) and DCF analysis to compute expected stock price of company. In the end, the paper offers strengths and opportunities of the company, and also investment advice for potential investors. In conclusion, Lululemon is a young and developing company, and its stock is underpriced.

## 1. Introduction

There are three main types of securities investment analysis methods: basic analysis, technical analysis and quantitative analysis [1]. The two assumptions of the basic analysis are: the value of a stock determines its price and the price of a stock fluctuates around its value. Therefore, value becomes an important factor to measure whether the price is reasonable or not [2]. The basic analysis method embodies the basic characteristics of the value analysis theory as the foundation, and the statistical method and the present value calculation method as the main analysis means [3]. Technical analysis is a method to analyze the future trend of stock price only from the market behavior of stock. Quantitative analysis method is the use of statistics, data simulation, and other quantitative models of the securities market research as a kind of method. It is widely used in solving securities valuation, portfolio construction and optimization, performance evaluation, risk measurement and management, and other investment related issues [4].

One of the most widely-accepted methods is DCF (discount cash flow method) analysis [5]. DCF analysis is to restore the expected cash flow of an enterprise in a specific period in the future to the current present value [6]. Because the essence of enterprise value is its ability to make profits in the future, only when the enterprise has this ability, its value will be recognized by the market [7]. The mainstream literatures usually take the DCF analysis [8] as the preferred method of enterprise value evaluation, and it has also been widely used in the evaluation practice, and has become increasingly perfect and mature. The application of DCF analysis to the security investment analysis of Lululemon

is shown in the following paper.

## 2. Methods

This part includes the presentation of company's basic information, fundamentals, CAPM (capital asset pricing model) and price and price expectations.

### 2.1. Basic Information of the Company

Lululemon was founded in 1998 by Chip Wilson. It mainly designs, distributes, and retails athletic apparel and accessories. The company offer a comprehensive line of apparel and accessories for women and men. The apparel assortment includes items such as pants, shorts, tops, jackets and athletic wear for female youth designed for a healthy lifestyle including athletic activities such as yoga, running, training, and most other sweaty pursuits. It also provides fitness-related accessories, including bags, socks, underwear, yoga mats and equipment, and water bottles.

The company primarily conduct business through two channels: company-operated stores and direct to consumer. As of February 2, 2020, the retail footprint included 491 company-operated stores. While most of company-operated stores are branded lululemon, five of them are branded ivivva and specialize in athletic wear for female youth. The retail stores are located primarily on street locations, in lifestyle centers, and in malls. Direct to consumer is also a substantial part of business, representing 28.6% of net revenue in fiscal 2019. The direct-to-consumer segment includes the net revenue which generated from e-commerce website [www.lululemon.com](http://www.lululemon.com), other country and region-specific websites, and mobile apps, including mobile apps on in-store devices that allow demand to be fulfilled via the distribution centers or other retail locations.

The company also generates net revenue from outlets, sales from temporary locations, sales to wholesale accounts, through license and supply arrangements, and warehouse sales. The net revenue it generates from these sources is combined in other segments. It operates in both the physical and digital space to better cater to the shopping desires of guest. At the end of fiscal 2019, it had 491 stores in 17 countries across the globe.

Lululemon is in apparel retail industry and main competitors include Adidas, Nike, puma, Under Armour, new balance and other sportswear brands.

The CEO and also director is Mr. Calvin McDonald and CFO is Mr. Patrick J. Guido. 94.16% of shares is held by institutions and the largest holder is FMR, LLC which operates as a financial services corporation.

### 2.2. Fundamentals of the Company

First, company's financial condition is analyzed by looking at asset and stockholders' equity, then compare it to the main competitors, Nike and Adidas, as shown in Figure 1. According to balance sheet, the total asset of the company is 3,281 million in 2020, and total stockholders' equity is 1,952 million. The total asset of its main competitor Adidas is 20,792 million on 2020, and total stockholder's equity is 6,929 million. And the total asset of another main competitor Nike is 26,220 million, and total stockholders' equity is 9,045 million. The total asset of company is around one-tenth of Adidas. It is concluded that compared to its competitors which take up most market share of sportswear retail industry, the size of company is relatively small. From 2018 to 2020, the total asset of Lululemon increased from 1,998 million to 3,281 million and the increase rate is 64.2%. In the same period, the total asset of Adidas increased from 22,536 million to 26,220 million and the increase rate is 16.3%. Although the size of Lululemon is much smaller than that of Adidas, the growth rate is higher. So, if the company could keep growth rate at a high level in the following years,

it is possible that its size will surpass those of other competitors.

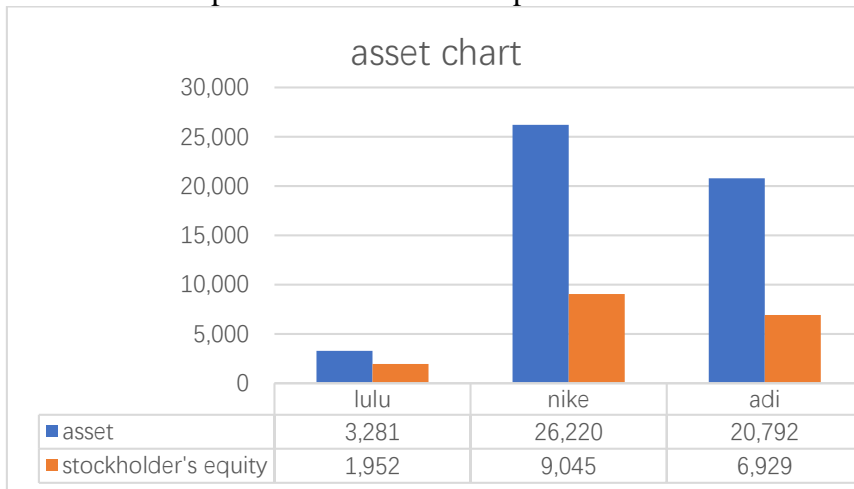


Figure 1: Asset chart of Lululemon and competitors

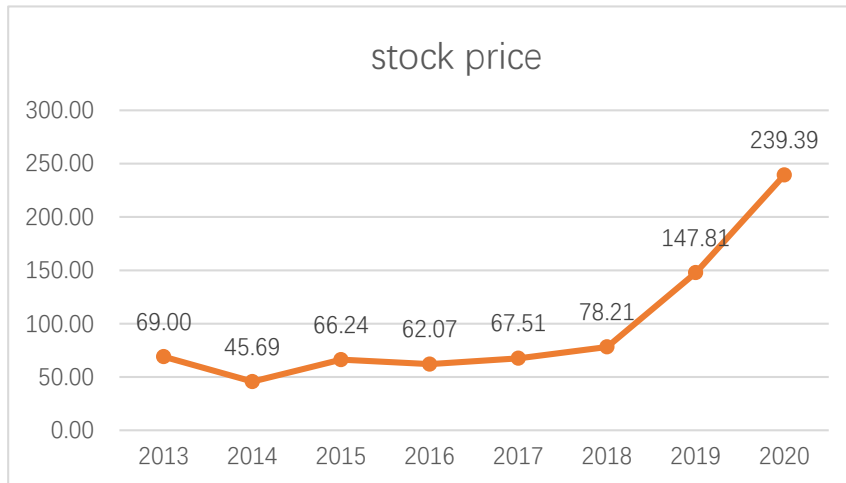


Figure 2: Stock price

From 2013-2017, stock price kept basically unchanged. In 2017, price started increase and in 2018 and 2019, it increased accurately, as shown in Figure 2.

Then look at company's revenue and earnings from 2012-2020, as shown in Table 1 and Figure 3. In order to observe the long-term development, search data in 2012,2014,2016,2018 and 2020 and then calculate growth rate every two years.

Table 1: Revenue and earnings of Lululemon

|                  | 2012  | 2014   | 2016   | 2018   | 2020    |
|------------------|-------|--------|--------|--------|---------|
| revenue          | 1,001 | 1,592  | 2,061  | 2,649  | 3,979   |
| growth           |       | 59.04% | 29.46% | 28.53% | 50.21%  |
| operating income | 287   | 391    | 369    | 456    | 889     |
| growth           |       | 36.24% | -5.63% | 23.58% | 94.96%  |
| net income       | 185   | 280    | 266    | 259    | 646     |
| growth           |       | 51.35% | -5.00% | -2.63% | 149.42% |
| EPS              | 1.29  | 1.93   | 1.90   | 1.90   | 4.95    |
| growth           |       | 49.61% | -1.55% | 0.00%  | 160.53% |

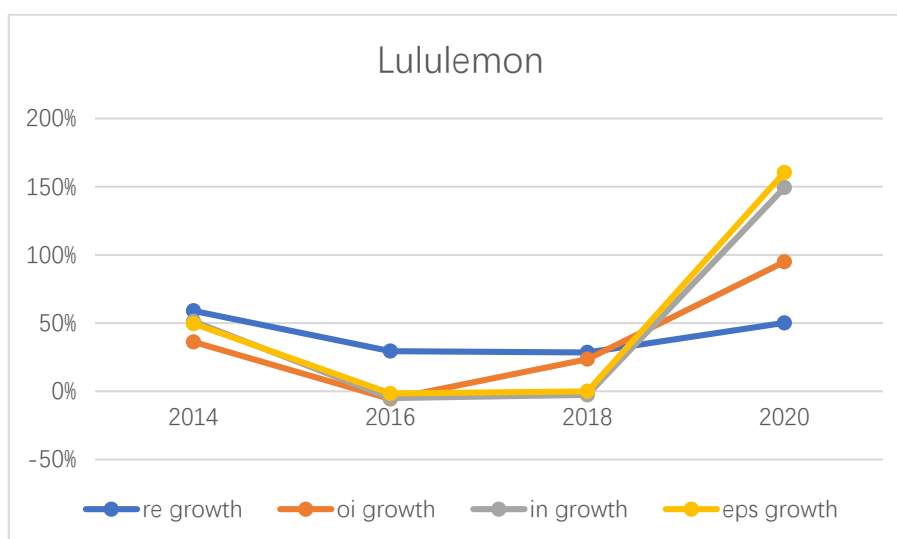


Figure 3: Revenue, earnings and growth rates of Lululemon

In order to locate the company in the industry, it is recommended to compare the financial data to its main competitor, Nike. Nike's data is shown below in Table 2 and Figure 4.

Table 2: Revenue and earnings of Nike

|                  | 2012   | 2014   | 2016    | 2018    | 2020    |
|------------------|--------|--------|---------|---------|---------|
| revenue          | 23,331 | 27,799 | 32,376  | 36,397  | 39,829  |
| growth           |        | 19.15% | 16.46%  | 12.42%  | 9.43%   |
| operating income | 3,011  | 3,544  | 4,623   | 4,325   | 4,981   |
| growth           |        | 17.70% | 30.45%  | -6.45%  | 15.17%  |
| net income       | 2,211  | 2,693  | 3,760   | 1,933   | 4,304   |
| growth           |        | 21.80% | 39.62%  | -48.59% | 122.66% |
| EPS              | 2.45   | 3.05   | 2.21    | 1.19    | 2.13    |
| growth           |        | 24.49% | -27.54% | -46.15% | 78.99%  |

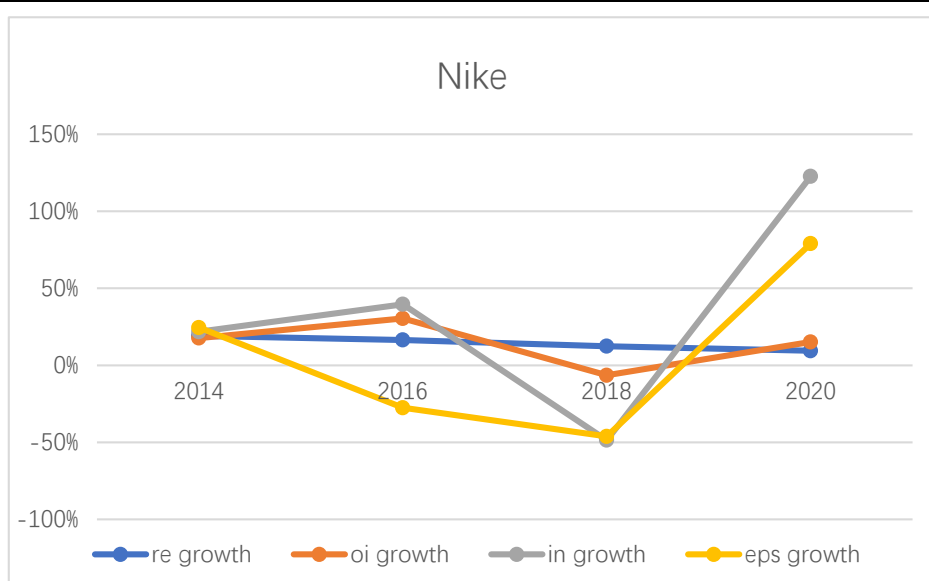


Figure 4: Revenue, earnings and growth rates of Nike

Compared to Nike, Lululemon's revenue and operating income growth rates are much higher, mainly because it was keeping growing fast in past few years. Nevertheless, it didn't grow stably. In 2016 and 2018, company's net income growth rate dropped accurately and became negative. But from 2018 to 2020, it increased 149%. Nike's net income grows relatively more stable and also reach high point in 2020.

Then analyze financial ratios of the company and Nike shown in Table 3.

Table 3: Financial ratios of Lululemon and Nike

| Lululemon                 |        | Nike                      |       |
|---------------------------|--------|---------------------------|-------|
| leverage                  |        |                           |       |
| interest coverage         | 152.03 | interest coverage         | 98.98 |
| leverage                  | 1.68   | leverage                  | 2.62  |
| asset utilization         |        | asset utilization         |       |
| total asset turnover      | 1.48   | total asset turnover      | 1.69  |
| inventory turnover        | 3.80   | inventory turnover        | 3.98  |
| days sales in receivables |        | days sales in receivables | 35    |
| liquidity                 |        | liquidity                 |       |
| current ratio             | 2.91   | current ratio             | 2.10  |
| quick ratio               | 1.83   | quick ratio               | 1.14  |
| cash ratio                | 1.76   | cash ratio                | 0.59  |
| profitability             |        | profitability             |       |
| return on assets          | 0.33   | return on assets          | 0.21  |
| return on sales           | 0.23   | return on sales           | 0.12  |
| market price              |        | market price              |       |
| market-to-book            | 13.21  | market-to-book            | 14.73 |
| price-earnings ratio      | 42.01  | price-earnings ratio      | 33.35 |
| earnings yield            | 0.02   | earnings yield            | 0.03  |

For leverage, Lululemon's interest coverage is high maybe because it paid less interest expense. It has less debt. And leverage is low means that it has less debt than Nike. Nike's days sales in receivables are almost ten times larger than Lululemon's. It means that the portion of accounts receivable in sales is much larger in Nike than the other. The bad debt risk for Nike is increasing. In general, the company's asset is more liquid than Nike's. The possible reason is Nike has more noncurrent asset (fixed asset) such as plant, equipment, property and intangible asset because of its big market share. In profitability, Lululemon's return on asset and return on sales ratios are a little higher than Nike's. Maybe because it is fast growing. For price ratio, Lululemon has higher price-earnings ratio than Nike, because it is growing and its market share is expanding. Investor would like to pay more for Lululemon's stock because they believe that it will keep growing and give them high returns.

### 2.3. CAPM Model

CAPM model [9] is needed to find expected excess return when the market excess return is zero( $\alpha$ ) and the sensitivity of Lululemon stock's return to changes in the return of the market ( $\beta$ ) [10]. Search adjusted close price from January 2015 to February 2020 in yahoo finance and market excess return on Damodaran website. Then run the regression of excess return on market excess return and get results shown in Table 4.

Table 4: Regression results

| SUMMARY OUTPUT        |              |                |          |          |                |           |
|-----------------------|--------------|----------------|----------|----------|----------------|-----------|
| Regression Statistics |              |                |          |          |                |           |
| Multiple R            | 0.2727633    |                |          |          |                |           |
| R Square              | 0.0743998    |                |          |          |                |           |
| Adjusted R Square     | 0.0589732    |                |          |          |                |           |
| Standard Error        | 9.85069      |                |          |          |                |           |
| Observations          | 62           |                |          |          |                |           |
| ANOVA                 |              |                |          |          |                |           |
|                       | df           | SS             | MS       | F        | Significance F |           |
| Regression            | 1            | 467.986243     | 467.9862 | 4.822806 | 0.031962       |           |
| Residual              | 60           | 5822.16565     | 97.03609 |          |                |           |
| Total                 | 61           | 6290.15189     |          |          |                |           |
|                       | Coefficients | Standard Error | t Stat   | P-value  | Lower 95%      | Upper 95% |
| Intercept             | 2.0925215    | 1.27517663     | 1.640966 | 0.106037 | -0.45821       | 4.643255  |
| X Variable 1          | 0.7453364    | 0.33939265     | 2.196089 | 0.031962 | 0.06645        | 1.424223  |

Use 5.80% as excess return of market.

$$R_i = \alpha_i + \beta_i \cdot R_m + e_i \quad (1)$$

$$r_i = R_i + r_f \quad (2)$$

The expected rate of return is 6.52%.

Assume the SPY ETF as the market portfolio and use average daily return as the expected return.

$$\text{SR (sharp ratio) of market portfolio} = \frac{E(r_m) - r_f}{\sigma_m} \quad (3)$$

$$\sigma_i = \sqrt{\beta^2 \sigma_m^2 + \sigma^2(e_i)} \quad (4)$$

$$\text{SR (sharp ratio) of company} = \frac{E(r_i) - r_f}{\sigma_i} \quad (5)$$

Table 5: Calculation results of return and sharp ratios

|               |       |                                      |       |
|---------------|-------|--------------------------------------|-------|
| $\alpha$      | 2.09  | $E(r_m)$                             | 0.83  |
| $\beta$       | 0.75  | $\sigma_m$                           | 3.67  |
| $\sigma(e_i)$ | 9.85  | SR (sharp ratio) of market portfolio | 0.20  |
| $R_i$         | 6.44% | $\sigma_i$                           | 10.23 |
| $r_i$         | 6.52% | SR (sharp ratio) of company          | 0.63  |

As shown in Table 5, it is obvious that Lululemon's standard deviation is much higher than that of market portfolio, which means investors will take more risk. Meantime, the sharp ratio is higher than that of market portfolio. Investors get higher reward because they take more risk.

## 2.4. Price and Price Expectations

First step is to calculate WACC (weighted average cost of capital) in order to use it later.

The calculation process is shown in Table 6.

Table 6: Calculation of WACC

|                              |            |                         |         |
|------------------------------|------------|-------------------------|---------|
| cost of equity               | 4.99%      | cost of debt            | 0.05%   |
| $\beta$                      | 0.75       | bond yields             | 0.05%   |
| E(Rm)                        | 5.80%      | rating                  |         |
| rf                           | 0.64%      | interest coverage       |         |
| k                            | 4.99%      |                         |         |
|                              |            |                         |         |
| market value of equity       | 35,436,194 | book value of debt      | 708,574 |
| number of shares outstanding | 122,710    | non-current lease       | 692,056 |
| price per share              | 289        | non-current tax payable | 9,518   |
|                              |            | deferred tax liability  | 7,000   |

$$WACC = \frac{D}{D+E} * K_D + \frac{E}{D+E} * K_E \quad (6)$$

The company issued 122 million common stock shares, times the price per share 288.78, so market value of equity equals to 35,436,194. According to the formula  $K_E = rf + \beta * E(R_m)$ , yield of ten-year T bills is chosen as risk free rate 0.64%,  $\beta = 0.75$ , market excess return 5.80%. So,  $K_E$  equals 4.99%. Book value of debt includes non-current lease, non-current tax payable and deferred tax liability which gives the result 708,574 thousand. Although the company didn't issued bonds, it is recommended to use credit facility to replace debt. According to the company's financial statement, it had 3.0 million borrowings outstanding under the credit facility. Use 3.0 million divided by revenue and get the cost of debt 0.05%. Finally, WACC equals to 4.89%.

Table 7: Calculation of FCFF (Free Cash Flow to the Firm)

|   | 2021      | 2022      |
|---|-----------|-----------|
| revenue (in thousands)                          | 4,401,879 | 6,256,617 |
| cost of goods sold (COGS)                       | 1,937,888 | 2,648,052 |
| gross profit                                    | 2,463,991 | 3,608,565 |
| selling, general and administrative             | 1,609,003 | 2,225,034 |
| other expenses                                  | 35002     | 50176     |
| operating profit                                | 819,986   | 1,333,355 |
| income taxes                                    | 230,437   | 358,547   |
| EBIT (Earnings Before Interest and Taxes) (1-t) | 589,549   | 974,808   |
|   |           |           |
| current assets                                  |           |           |
| cash and cash equivalents                       | 1,150,517 | 1,259,871 |
| marketable securities                           |           |           |
| accounts receivable                             | 62,399    | 77,001    |
| inventories                                     | 647,230   | 966,481   |
| other   | 264,233   | 311,500   |
| non-cash current assets                         | 973,862   | 1,354,982 |
| current liabilities                             |           |           |
| operating portion of current liabilities        | 703732    | 1148297   |
| short term portion of current liabilities       | 179446    | 257037    |
| non-debt current liabilities                    | 703732    | 1148297   |
| NWC (net working capital)                       | 270,130   | 206,685   |
| Depreciation and amortization (D&A)             |           | 224,206   |
| change in NWC                                   |           | (63,445)  |
| Capital Expenditure (CapEx)                     |           | 394,502   |

|                                   |         |
|-----------------------------------|---------|
| FCFF (Free Cash Flow to the Firm) | 867,957 |
|-----------------------------------|---------|

To apply DCF analysis in this case, the first part is to compute FCFF (Free Cash Flow to the Firm) [11]. The calculation process [12] using data from annual report of the company is shown in Table 7.

When FCFF [13] is got, the next step is to calculate the present values of all future free cash flows, shown in Table 8.

Table 8: Calculation of present value

|  | 2022        | 2023      | 2024      | 2025       | 2026       |
|--|-------------|-----------|-----------|------------|------------|
| revenue  | 6,256,617   | 7,883,337 | 9,933,005 | 12,515,586 | 15,769,639 |
| EBITDA (EBIT plus depreciation and amortization) | 1,557,561   | 2,049,668 | 2,582,581 | 3,254,052  | 4,100,106  |
| D&A  | 224,206     | 283,800   | 357,588   | 450,561    | 567,707    |
| EBIT   | 1,333,355   | 1,765,868 | 2,224,993 | 2,803,491  | 3,532,399  |
| EBIT(1-t)  | 974,808     | 1,324,401 | 1,668,745 | 2,102,619  | 2,649,299  |
| change in NWC                                    | (63,445)    | 78,833    | 99,330    | 125,156    | 157,696    |
| CapEx  | 394,502     | 496,650   | 625,779   | 788,482    | 993,487    |
| FCFF   | 867,957     | 1,032,717 | 1,301,224 | 1,639,542  | 2,065,823  |
| PV (present value)                               |             | 984,572   | 1,182,725 | 1,420,758  | 1,706,698  |
| sum of PV  | 5,294,753   |           |           |            |            |
| terminal value in 2026                           | 118,677,904 |           |           |            |            |

In 2022, revenue increased 42% from 4,401,879 to 6,256,617, but revenue increased 10.6% from 2020-2021, so it is assumed that revenue growth rate will stay in the average of 10.6% and 42%, which results 26%. EBITDA accounts for 26% of revenue in 2019, so use 26% times revenue and get EBITDA for 2023-2026. Similarly, D&A accounts for 3.6% and capital expenditure accounts for 6.3%. International average tax rate is 25% so EBIT times 75% gives the after-tax EBIT. The change in net working capital in 2022 is negative, but it is assumed that it should not always be negative. Because the company is keep growing and it is needed to forecast its free cash flow in the future, it is recommended to use 1% as the final assumption of percentage of net working capital to revenue. Start with after-tax EBIT, add back the depreciation and amortization, subtract change in net working capital, subtract capital expenditure and get free cash flows in 2022-2026 [14]. Next step is to discount future cash flows in 2023-2026 to get present values. Weighted average cost of capital is used as the discount rate. The calculation is shown in Table 7.

According to the formula [15],

$$\text{value of firm} = \sum_{t=1}^T \frac{\text{FCFF}_t}{(1+\text{WACC})^t} \quad (7)$$

Sum of present values of future cash flows equals to 5,294,753.

$$b \text{ (retention rate)} = \frac{(\text{CapEx}-\text{D\&A}+\text{change in NWC})}{\text{EBIT}(1-t)} \quad (8)$$

$$\text{ROIC (return on invested capital)} = \frac{\text{EBIT}(1-t)}{\text{debt}+\text{equity}} \quad (9)$$

$$g \text{ (growth rate)} = b * \text{ROIC} \quad (10)$$

$$\text{terminal value} = \frac{\text{FCFF}(1+g)}{\text{WACC}-g} \quad (11)$$

And discount the terminal value in 2026 to today's dollars. US nominal GDP growth rate has been around 4-5% in recent years. Use 5%.

$$\text{discount rate} = (1-5\%) * \text{WACC} \quad (12)$$



$$\text{terminal value in today's dollar} = \frac{\text{terminal value}}{(1+\text{discount rate})^4} \quad (13)$$

enterprise value of the company = terminal value in today's dollar + sum of present values

$$\text{expected price} = \frac{\text{enterprise value of the company}}{\text{number of shares outstanding}} \quad (14)$$

Table 9: Calculation results of expected price

|                    |             |                                  |             |
|--------------------|-------------|----------------------------------|-------------|
| b (retention rate) | 10.96%      | discount rate                    | 4.65%       |
| ROIC               | 28.27%      | terminal value in today's dollar | 98,949,348  |
| g (growth rate)    | 3.21%       | enterprise value of the company  | 104,244,101 |
| terminal value     | 118,677,904 | expected price                   | 849.52      |

The calculation results are shown in Table 9. The price estimated using discount cash flow analysis is 849.52 per share, but Lululemon's stock is 288.78 per share. The stock has been underpriced. It is a good sign because it's highly possible that stock price will rise. Combined with the previous analysis that Lululemon's stock has much higher standard deviation than market portfolio, it is suggested that investors who prefer high risk and high reward could buy the stock.

### 3. Results and Discussions

It is believed that success of Lululemon depends on the ability to maintain the value and reputation of its brand. Therefore, the first risk would be limited brand recognition in new international markets may limit its expansion and cause the business and growth to suffer. The brand is famous in US and Canada, but is barely known in other countries around the world. Besides, its competitors including Adidas and Nike are mature and developed companies. They take up a big market share and enjoy a good reputation around the world. Expand the international market will be difficult for the company in future.

The revenue of an apparel retailer depends highly on consumer's shopping preferences, especially when the company's target mainly based on young women, so the products need to be fashionable and stylish to attract more customers. If the company could not build its brand image and form a unique style which differentiate it from other sportswear brand, it is in danger. Besides, it operates in a highly competitive market and the size and resources of some of competitors may allow them to compete over. In this situation company's market share may drop and net revenue and profitability may decrease.

Probably, Lululemon's opportunity is advertising. Making advertisements on kinds of media in all area where the company sells products, especially in Europe and Asia where the brand is not very famous. And more importantly, the research and development department should try to build a unique brand concept so it can come out from all the other competitors and attract customers as more as possible. From previous analysis, the net income growth rate of Nike is still increasing and stay at a high level although it already has been a mature company. Therefore, the competition will be intense and more difficult that Lululemon faces will appear in the future.

### 4. Conclusion

In conclusion, Lululemon is a young and developing company. The stock has high risk, high sharp ratio and high expected return. And the stock is underpriced. Stock price is high likely increase so it is a good investment opportunity for the investors who are willing to take some risk and obtain high return.

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