Journal of Sociology and Ethnology (2022)
Clausius Scientific Press, Canada

DOI: 10.23977/jsoce.2022.040104
ISSN 2616-2318 Vol. 4 Num. 1

TJX'S Stock Valuation: a Comparison between DDM and DCF

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Keywords: Stock valuation, TJX, Dividend discount model, Fcff method

Abstract: TJX, the leading off-price retailer worldwide, has been overperforming in the American stock market compared to other competitors for many years; however, whether investors should increase or reduce positions post COVID-19 is still under debate. This paper aims to find the company's most recent intrinsic value. Specifically, it values the company's stock with the Gordan Growth Model and Discount Free Cash Flow Method respectively. The two methods jointly suggest that the TJX's stock has been relatively overvalued.

1. Introduction

1.1 Strength: Increasing Revenue from Both Comparable Stores and Successful Investment

TJX reported a steady growth in its sales revenue. It could be partly attributed to their successful expansion strategies. The company has maintained a higher-than-industry return on investment ratio. TJX's expertise at opening up new markets has boosted its sales revenue by approximately 4% annually, while comparable stores contributed around 4% as well[1]. The wise management of existing stores and superb performance in new markets could generate sustainable sales after COVID-19.

1.2 Strength: High Leverage and Good Liquidity Position during COVID-19

TJX has increased its borrowing of long-term debts by 4 billion dollars in April 2020. Albeit a riskier capital structure, the company does not need to repay 40% of these loans until FY2026. The company's ability to refinance existing debts as well as borrowing new debts represents creditors' confidence in the company's long-run performance. The cash inflow enables the company to maintain a good liquidity position and therefore to capture potential opportunities arising in the market.

1.2.1 Weakness: Stagnating Profitability Margin

Even the company is able to generate more sales, it is not that likely for TJX to increase different profitability margins primarily due to its aggressive off-pricing strategy. The homogenous

competition within the discounted retail industry is mostly based on prices, which could negatively impact the business' gross margin. TJX's gross margin has dropped by 0.5% from FY18 to FY20. The operating margin, similarly, has steadily declined from 12% to 10.6% from FY16 to FY20[2].

1.2.2 Weakness: Declining Inventory Turnover and Deficiency in Product Demand Forecasting

The success of TJX's business model is mostly based on the rapid turning of its inventory, which could decrease the company's fixed costs and improve customers' shopping experience. However, the company needs 60 days in average to sell inventories while other general retailers would only need 46.3 days. The inconsistency between TJX's business strategy and financial performance could indicate that the company is not performing well in identifying customer preferences.

1.3 Opportunity: Online Retail Channel in the U.S.

E-commerce in the U.S. grows 44.0% in 2020 and is expected to further skyrocket by more than 15% annually in the five years subsequent to the pandemic[3]. TJX stands to benefit from the rising proportion of businesses conducted online if the company could properly manage its online platforms.

1.4 Threat: High Transportation Costs during and Post COVID-19

Affected by some government restrictions during COVID-19, the extreme shortage of container drives up the freight rates and various transportation costs. High transportation expenses are integrated in TJX's price markups, which could adversely impact the company's performance and severely challenge the company's off-pricing business model.

2. DDM: Gordan Growth Model

$$P = \frac{D_1}{k_e - g}$$

, where D_1 is the value of the company's forward dividend, k_e is the constant cost of equity capital for TJX, and g is the constant growth rate expected for dividends.

$$k_e = \text{Required Return} = R_f + \beta \cdot \text{MRP}$$

, where R_f is the risk-free rate of return, β is the volatility coefficient of the company, and MRP stands for the market risk premium index.

The current 30-year treasury yield as of May 27, 2021 is 2.29%, that is, $R_f = 2.29\%$.

If we use the current 5Y monthly beta of TJX, we can then derive $\beta = 0.98$; if we would like to prevent the influence of stock market fluctuations during COVID-19 in order to find the long-run trends of the company's prices, we can also use $\beta = 0.68$, which has remained relatively consistent for around three years until the recent coronavirus outbreak.

While referring to the academic consensus, the long-run MRP should be approximately 6%; however, if we use Goldman Sachs Stock Market Return of 9.2% during past ten years[4] as an indicator of the current market yield (ϵ_r), we find that investors could expect a higher figure:

$$MRP = \epsilon_r - R_f = 9.2\% - 2.29\% \approx 7\%$$

With different beta and MRP assumptions, we also get various cost of equity constants, ranging from 6.37% to 9.15%. The estimated forward dividend of TJX is $1.04 per share. The current stock price of TJX as of June 1st, 2021 is $67.19 per share.

Table 1: Cost Of Equity Constant under Different Beta and Market Risk Premium Assumptions

k_e	$\beta = 0.68$	$\beta = 0.98$
MRP = 6%	$k_e = 6.37\%$	$k_e = 8.17\%$
MRP = 7%	$k_e = 7.05\%$	$k_e = 9.15\%$

TJX does not have an explicit public dividend policy. Our model uses EPS estimates and past dividend pay-out ratio to compute an estimated annual dividend growth rate. TJX does not have a public target growth rate or pay-out ratio; however, by using the formula:

$$\text{Dividend Payout Ratio} = 1 - \text{Retention Ratio} = 1 - \frac{\text{EPS} - \text{DPS}}{\text{EPS}} = \frac{\text{DPS}}{\text{EPS}}$$

, where DPS stands for dividend per share, and EPS stands for earnings per share. TJX's DPS has important cyclical characteristics: it experiences a high growth within each cycle of four years and then declines as the new cycle starts. Hence, it is reasonable to assume that the company has targeted its dividend pay-out ratio between 28% and 35% since FY2017 (Fig. 1).

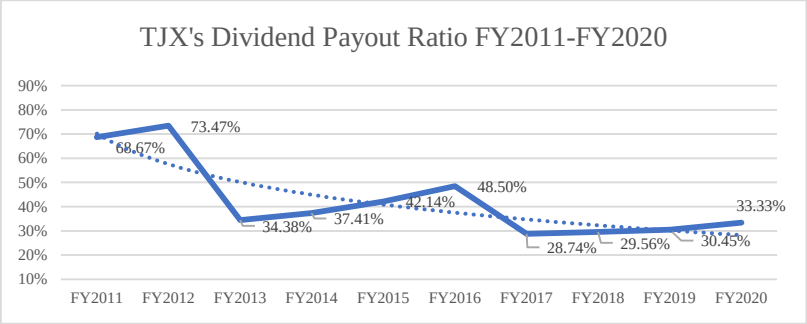

Fig.1: TJX's Dividend Pay-out Ratio Fy2011-2020

Table 2: Dividend Pay-out Ratio and Target Ratio Estimate Overview

	As of FY20	4Y Average	8Y Average
Dividend Pay-out Ratio	33.33%	30.52%	35.56%
Target Ratio Estimate	28%-35%		

Estimated DPS in τ years can be expressed with the function:

$$\epsilon(\text{DPS})_\tau = \text{Dividend Payout Ratio} \cdot \epsilon(\text{EPS})_\tau$$

We then calculate TJX's 5Y annualized EPS growth from FY13 to FY20 by using the formula:

$$\%\Delta EPS_\tau^T = \left(\frac{EPS_T}{EPS_{T-\tau}}\right)^{\frac{1}{\tau}} - 1$$

, where T represents the current fiscal year, while τ represents the number of years back from now, and in this case, $\tau = 5$. The company's annualized EPS growth rate steadily decreases from FY13 to FY16, and then maintains 5-10% until FY2020. Based on our understanding of the business' nature, it is reasonable to assume that the company is at the turning point from growth to mature. Therefore, we use data from the most recent dividend cycle (FY17-FY20) in our calculations of the estimated EPS growth rate in order to appropriately reflect the company's future profitability:

$$\epsilon(\%\Delta\text{EPS}) = \frac{\sum_{i=17}^{20} \%\Delta\text{EPS}}{4} = 8\%$$

We expect TJX's earnings per share grows annually by 8% in the five years subsequent to FY20, amounting to:

$$\epsilon(\text{EPS})_{\text{FY25}} = \text{EPS}_{\text{FY20}} \cdot (1 + 8\%)^5 = \$3.923$$

Based on that, by plugging in our estimated dividend pay-out ratio, we derive the company's estimated dividend per share and dividend growth rate, which can be given as:

$$\epsilon(\%\Delta EPS)_5^{FY25} = (\frac{\epsilon(DPS)_{FY25}}{DPS_{FY20}})^{\frac{1}{5}} - 1$$

Table 3 Shows the Correlation between Estimated Dividend Per Share, Estimated Dividend Growth Rate, and Different Dividend Pay-out Ratio within Our Estimated Range.

Table 3: TJX's Expected Annual Dividend Growth Rate in the Five Years Subsequent to Fy20

Dividend Pay-out Estimate Method	Estimated Dividend Pay-out Ratio	$\epsilon(DPS)_{FY25}$	$\epsilon(\%\Delta EPS)_5^{FY25}$
Lower End	28%	$1.10	4.33%
4Y Average	30.52%	$1.20	6.16%
Medium	33%	$1.29	7.71%
8Y Average	35.56%	$1.39	9.33%

By combining different scenarios of constant dividend growth rate with various versions of constant cost of equity through the Gordan Growth Model, we highlight our best guesses and the most probable results in Table 4. The appropriate range of the company's stock prices by using the Gordan Growth Model is between $51 and $72. In addition, since the dividend pay-out ratio has been decreasing since last two dividend cycles, it is most reasonable to assume $g = 6.16\%$ and $k_e = 8.17\%$, which provide us the best guess of $52 (italicised in Table 4).

Table 4 : TJX's Intrinsic Value by Using Gordan Growth Model under Different K_e and g

P	$k_e = 6.37\%$	$k_e = 8.17\%$	$k_e = 7.05\%$	$k_e = 9.15\%$
$g = 4.33\%$	$51	$27	$38	$22
$g = 6.16\%$	$693	$52	$117	$35
$g = 7.71\%$	DNE	$226	DNE	$72
$g = 9.33\%$	DNE	DNE	DNE	DNE

3. Fcff Method

$$EV = \frac{FCFF_1}{WACC - g}$$

, where EV represents the enterprise's value, $FCFF_1$ stands for the company's free cash flow to firm in FY22, $WACC$ is the weighted average cost of capital, and g is the growth rate of $FCFF$.

$$\text{FCFF} = \text{CFO} + \text{Cash paid Interest on debt, net of Taxes} - \text{CAPEX}$$

, where CFO represents cash flows from operating activities, and $CAPEX$ stands for the capital expenditure. In TJX's case, we assume capital expenditure is equal to the company's "property additions" section included in its cash flows from investing activities.

$$\text{Cash paid Interest on debt, net of Taxes} = \text{Cash paid Interest on debt} \times (1 - \text{EITR})$$

, where $EITR$ stands for the effective income tax rate, and can be calculated as:

$$\text{EITR} \approx \text{U. S. Federal Income Tax Rate} + \text{State Income Tax Rate}$$

Table 5: TJX's Effective Income Tax Rate from FY2016 to FY2020[5]

	FY2016	FY2017	FY2018	FY2019	FY2020
Federal	35%	35%	33.7%	21%	21%
State	3.5%	3.5%	3.6%	4.5%	4.6%
EITR	38.5%	38.5%	37.3%	25.5%	25.6%

Table 6: TJX's Free Cash Flow Firm from FY2016 to FY2020, in Millions of U.S. Dollars

	FY2016	FY2017	FY2018	FY2019	FY2020
$+CFO$	2,937.34	3601.89	3,025.62	4,088.46	4,066.54
$Cash\ paid\ Interest\ on\ debt$	64.20	72.62	64.31	64.01	56.33
$EITR$	38.5%	38.5%	37.3%	25.5%	25.6%
$+Net\ Cash\ Paid\ Interest$	39.48	44.66	40.32	47.69	41.91
$-CAPEX$	(889.38)	(1,024.75)	(1,057.62)	(1,125.14)	(1,223.12)
$FCFF$	2,087.44	2,621.8	2,008.32	3,011.01	2885.33

By applying the same method, we derive TJX's historical FCFF from FY2010 to FY2020 and try to observe the trend. In order to do a rough estimate of FCFF_1, we assume it has grown linearly at a constant rate. Under this scenario, it increases by approximately \$150 millions each year. Therefore, we assume the company's FCFF in year 1 (FY2022) is \$3,185M.

TJX's weighted average cost of capital (WACC) can be expressed with:

$$\mathrm{WACC} = \left[\mathrm{k_{DAftax}} \cdot \frac{\mathrm{D}}{\mathrm{D+E}}\right] + \left[\mathrm{k_E} \cdot \frac{\mathrm{E}}{\mathrm{D+E}}\right]$$

, where $\mathrm{k_{DAftax}}$ is the after-tax cost of debt, $\mathrm{k_E}$ is the cost of equity, D is the amount of selected long-term obligations, E is the amount of equity.

As of January 30th, 2021, we include the following items in the company's long-term obligations:

$$\mathrm{D} = \text{Longterm Debts} + \text{Longterm Leases} + \text{Other Longterm Liabilities} = \$14.14\mathrm{B}$$

Meanwhile, it can be easily observed that the company's market capitalization (E) is \$76.46B.

Therefore, the debt percent and equity percent of capital can be calculated as:

$$\frac{\mathrm{D}}{\mathrm{D+E}} = \frac{\$14.14\mathrm{B}}{\$14.14\mathrm{B}+\$76.46\mathrm{B}} = 16\%,\ \frac{\mathrm{E}}{\mathrm{D+E}} = 1 - 16\% = 84\%$$

Given the uncertainty of the ongoing global pandemic, it is plausible that the company could both borrow more or extinguish earlier their long-term debts. At the end of FY21, the company has extinguished \$1.4B of long-term debts that have been issued the same year, resulting in a decrease of around 2% of $\frac{\mathrm{D}}{\mathrm{D+E}}$. Therefore, we would like to allow both $\frac{\mathrm{D}}{\mathrm{D+E}}$ and $\frac{\mathrm{E}}{\mathrm{D+E}}$ to fluctuate within three percent, that is, the debt percent of capital is 13%-19%, while the equity portion is 81%-87%.

According to previous computations in Section IV, $\mathrm{k_E}$ has a range of 6.37%-9.15%.

If we look at the bond rating of TJX, which is currently A2, we can then estimate the cost of debt ($\mathrm{k_D}$) by using the formula: $\mathrm{k_D} = \mathrm{r_f} + \mathrm{Spread_{A2}}$.

In this case, we adopt the common rate of spread used for A2 bonds interest rate estimates of 1.08% and then derive a cost of debt ($\mathrm{k_D}$) of approximately 3.3%.

To find the after tax cost of debt, we must have the effective income tax rate, which is illustrated in Table 6. For simplifying reasons, we treat it as a constant and take its 5Y average:

$$\text{5Y AVR EITR} = \frac{1}{5} \cdot (38.5\% + 38.5\% + 37.3\% + 25.5\% + 25.6\%) = 33.1\%$$

Therefore, the after-tax cost of debt ($\mathrm{k_{DAftax}}$) can be calculated as:

$$\mathrm{k_{DAftax}} = \mathrm{k_D} \cdot (1 - \text{5Y AVR EITR}) = 0.67 \cdot \mathrm{k_D} = 2.2\%$$

With all of these above, WACC has an upper limit of 8.25%, a lower limit of 6.44%, and our best guess is ($\mathrm{k_D} = 3.3\%,\ \mathrm{k_E} = 8.17\%,\ \frac{\mathrm{D}}{\mathrm{D+E}} = 16\%,\ \frac{\mathrm{E}}{\mathrm{D+E}} = 84\%$) 7.20%.

Ultimately, we would like to assess the company's free cash flow growth rate (g) in the future, which can be expressed as:

$$\mathrm{g} = \mathrm{ROIC} \cdot \text{Investment Rate}$$

, where ROIC is the company's return on invested capital, and can be calculated as:

$$\text{ROIC} = \frac{\text{EBIT}_\tau \cdot (1 - \text{5Y AVR EITR})}{\text{Book Value of Invested Capital}_{\tau-1}}$$

, where EBIT stands for earnings before interests and taxes in year τ while the book value of invested capital in year $\tau - 1$ can be computed with the formula:

$$\text{Book Value of Invested Capital}_{\tau-1} = \text{Debt} + \text{Equity} - \text{Cash \& Cash Equivalents}$$

Table 7: TJX's Return on Invested Capital from FY2016 to FY2020

	FY2016	FY2017	FY2018	FY2019	FY2020
$EBIT_\tau$	\$3.705B	\$3.818B	\$3.887B	\$4.183B	\$4.415B
$5Y\ AVR\ EITR$	33.1%				
$Invested\ Capital_{\tau-1}$	\$3.187B	\$3.457B	\$3.408B	\$3.358B	\$3.407B
$ROIC$	38.48%	36.56%	37.75%	41.23%	42.89%

Likewise, Figure 2 shows the company's ROIC during the past decade. We find that this ratio fluctuates between 35% and 45% in most periods, and the average ROIC is 39%.

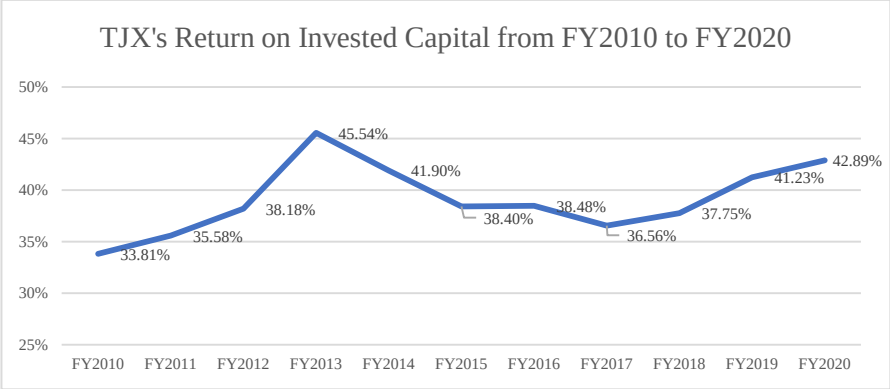

Fig.2: TJX's Roic Fy2010-Fy2020

$$\text{Investment Rate} = \frac{\text{FCFF} - \text{Cash Dividends Paid} - \text{Stock Repurchase}}{\text{FCFF}}$$

Table 8 shows the sample computation (FY16-FY20) for TJX's Investment Rate. For simplifying reasons, we use TJX's 10Y average stock buybacks as a constant value of stock repurchase that happens each year. As many other retailers, TJX does not invest new capital each year; therefore, if the sum of cash dividends and stock buybacks exceeds the company's FCFF, we write zero, suggesting that the company did not invest any capital in that specific year.

Likewise, the 10Y average rate can be calculated with the formula:

$$\overline{\text{Investment Rate}} = \frac{\sum_{i=11}^{20} \text{Investment Rate}}{10} \approx 9\%$$

Table 8: TJX's Investment Rate from FY2016 to FY2020, in Billions of U.S. Dollars

	FY2016	FY2017	FY2018	FY2019	FY2020
FCFF	2.087	2.622	2.008	3.011	2.885
Cash Dividends Paid	1.107	0.665	0.775	0.932	1.092
Stock Repurchase	1.369				
Investment Rate	0	22.43%	0	23.58%	14.70%

Therefore, by plugging in 9% as the company's investment rate, g has an upper limit of 4.05% (ROIC = 45%), a lower limit of 3.15% (ROIC = 35%), and our best guess is 3.51% (ROIC = 39%). Combined with what we get from WACC estimates, we have different EVs. We highlight our best

guesses and the most probable results in Table 9. We would like to conclude that the appropriate range of the enterprise value by using the FCFF method is between $76B and $97B. In addition, as explained earlier, it is most reasonable to assume $g = 3.51\%$ and $WACC = 7.20\%$, which provide us the best guess of $86B (italicised in Table 9).

By subtracting the net debt of $14B from the company's EV, we get an expected market capitalization ranging from $62B to $83B, and a best guess of $72B. Under these scenarios, we conclude that the reasonable range of TJX's stock is between $51 and $68, and my best guess is $59.

Table 9: TJX's Enterprise Value and Stock Price under Different $Wacc$ and g Scenarios

EV	$WACC = 6.44\%$	$\boldsymbol{WACC = 7.20\%}$	$WACC = 8.25\%$
$g = 3.15\%$	**$97B**	$78B	$62B
$\boldsymbol{g = 3.51\%}$	$109B	***$86B***	$67B
$g = 4.05\%$	$133B	$121B	**$76B**
EV	Net Debt	Shares Outstanding	Stock Price
Upper End: $97B	$14B	1.222B	$68
Best Guess: $86B			$59
Lower End: $76B			$51

4. Conclusion and Investment Decision

Based on the results from the two methods we have applied earlier, it is reasonable to conclude that TJX's stock has been slightly overvalued. Specifically, TJX's stock is mostly located within our estimated appropriate price range; however, it already approaches the upper limit and is relatively higher than our best guesses. Therefore, we suggest not buying new stocks of TJX at this moment.

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