Project

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1 Outline

(1) Background
(1.1) State of field
(1.2) Who we are and why do we want to do the project

(2) Introduction of DCF models, MCS and BS model
What is each model/what are each model usually used for/ what variables are contained in each model
(2.1) DCF models and variation of DCF model
(2.2) Monte Carlo Simulation
(2.3) random walk
(2.4) BS model

(3) Data collection and sensitivity analysis
(3.1) Data collection for each variables for DCF with formulas provided blow
(3.1.1) The fundamental growth rate in EBIT
(3.1.2) Weighted Average cost of capital(WACC)
(3.1.3) Free Cash Flows to firm
(3.1.4) The estimation of each variable through 2022 to 2026
(3.1.5) Sensitive analysis for stock price (Vary the high growth rate and terminal growth rate)

(4) Technique process
(4.1) Monte Carlo simulation for the firm value and stock price respectively
(4.2) Use the result from MCS to get BS model result
(4.3) Compare and contrast for all three methods

(5) Prediction on the stock price
(5.1) Stock price prediction
(5.2) Stock price prediction analysis and explanations
(5.3) Compare with other Retail large companies to evaluate the result

(6) Conclusion
(6.1) Distribution of stock price

(6.2) Scope and limitation of the project
(6.3) Conclusion and reflection

2 Formula

$V_0 = \sum_{t=1}^{n} \frac{CF_t}{(1+WACC)^t} + \frac{CF_{n+1}}{(WACC-g)(1+WACC)^n}$

$CF_t = EBIT_t(1-t) + Dep_t - CapEX_t - \delta NWC_t$

$ReInvesRate = \frac{-CapEX-Dep+\delta NWC}{EBIT(1-TaxRate}$

$ReturnOnCap = \frac{EBIT(1-TaxRate)}{BookValueOfEquity+BookValueOfDebt-CashCashEquivalent}$

$ExpectGrowthRate = ReInvesRate \times ReturnOnCap$

$DebtRatio = \frac{BookValueOfDebt}{BookValueOfDebt+MarketCapitalization}$

$WACC = (1-t)K_dW_d + K_eW_e$

$K_e = R_f + (\beta \times ERP)$

$_L =_U (1 + (1-t)\frac{D}{E}$

$ERP = R_m - R_f$

$K_d = R_f + DS$

$InterestConverageRatio = \frac{EBIT}{InterestExpense}$

$d_1 = \frac{ln(\frac{S}{K})+(r+\frac{\sigma^2}{2})t}{\sigma\sqrt{t}}$

$C = SN(d_1) - Ke^{-rt}N(d_2)$

3 Reference

Black, Fischer, and Myron Scholes. "The Valuation of Option Contracts and a Test of Market Efficiency." The Journal of Finance, vol. 27, no. 2, [American Finance Association, Wiley], 1972, pp. 399–417, https://doi.org/10.2307/2978484.

Black, Fischer, and Myron Scholes. "The Pricing of Options and Corporate Liabilities." Journal of Political Economy, vol. 81, no. 3, University of Chicago

Press, 1973, pp. 637–54, http://www.jstor.org/stable/1831029.

Florian Steiger "The Validity of Company Valuation Using Discounted Cash Flow Methods".arXiv:1003.4881 [q-fin.GN]

Boyle, Phelim, Mark Broadie, and Paul Glasserman. "Monte Carlo Methods for Security Pricing." Journal of Economic Dynamics and Control 21, no. 8-9 (1997): 1267-1321.

Yahoo! (2021, October 29). Amazon.com, Inc. (AMZN) income statement. Yahoo! Finance. Retrieved October 29, 2021, from https://finance.yahoo.com/quote/JD/financials?p=JD.

Duffie, Darrell. "Black, Merton and Scholes: Their Central Contributions to Economics." The Scandinavian Journal of Economics, vol. 100, no. 2, [Wiley, The Scandinavian Journal of Economics], 1998, pp. 411–23, http://www.jstor.org/stable/3440890.

Palmer, B. (2021, October 25). How to evaluate firms using present value of free cash flows. Investopedia. Retrieved November 2, 2021, from https://www.investopedia.com/articles/fu analysis/11/present-value-free-cash-flow.asp.