

## Final Project Company Analysis

### Instructions

This project will serve as your final for the semester. As such, it will be due during your class's final exam period. In this project, you will analyze a real company using the tools and theories we have developed over the course of the semester. The purpose of this project is to allow you to apply what we have learned to real-world data.

To start off, pick an S&P 500 company that has paid a dividend in the last year<sup>1</sup>. For your chosen company, proceed to answer the questions below. The questions are a mix of qualitative and quantitative questions. For questions requiring calculations, be sure to show your work. If you do not show your work you will not get full credit. Please let me know if you have any questions.

### Section 1: Getting to Know Your Company

1. What is your company, and what is its ticker symbol? **Waste Management Inc.**
2. What industry is your company in? What are two or three of its biggest competitors?  
**Waste Management Inc is in the waste management environmental service sector and it's two biggest competitors are Republic Services Inc and Clean Harbors Inc.**
3. Briefly describe what the company does. **Waste Management serves its customers by managing and reducing waste from collection to disposal, simultaneously, the company collects valuable resources and creates clean, renewable energy.**
4. Compare your company's stock performance to the performance of the overall stock market (i.e. S&P 500). **Waste Management has outperformed the overall stock market (S&P 500 Index) in the past 5 years. Since December 1 of 2018, the stock price of Waste Management grew from 112.72 per share to 171.21, an increase of 151.88%. The S&P 500 grew from 3143.85 per share to 4559.43, an increase of 145.03% using data from Yahoo Finance!**
5. Did your company under-perform or over-perform the overall stock market? Why do you think this happened?  
**Waste Management Inc has only under-performed the market once in the week of July 15, 2018, to July 21, 2018. According to Portfolios Lab, Waste Management grew by 2.05%, but the overall market grew by 3.00%. Ever since then, Waste Management had always outperformed the market even during the unprecedented quarantine and COVID-19 pandemic. The reason Waste Management has always over-performed the market is due to being in the waste management industry, investing in new ways to create clean, renewable energy. If there are living things, there will always be a need for trash collectors. In addition, there is a strong public and governmental push for ecofriendly, sustainable, and renewable energy resources.**

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<sup>1</sup> While some of the largest companies (e.g. Amazon, Tesla, Berkshire Hathaway) on the S&P 500 don't pay a dividend, over 80% do pay regular dividends. Further, it will be much easier to analyze dividend payers.

## Section 2: Your Company's Future

6. Look for recent news stories about your company. What are some major projects or initiatives your company is considering? Why do you think your company is considering these projects? **Some of Waste Management's major initiatives include the environmental stewardship that encourages inclusion of diversity and equity and bring awareness to communities, promote the reduction of GHG emissions, and increased recovery of recyclable materials. In addition, the company has a solar initiative to turn closed landfills into solar energy fields. Furthermore, the company is researching new methods to capture clean-burning natural gas from landfills. These two energies are being used to power hundreds of thousands of homes.**
7. Do you think these potential investments would make sense for your company? Why or why not? *(Note: For this question, you don't need to do any calculations. You just need to discuss the project(s) from a business perspective.)* **I do believe these potential investments make sense for Waste Management because the company promoted "always working for a sustainable tomorrow." In addition, is a leader in waste management in North America granting it resources and ability to conduct studies. Since there is a migration to renewable and sustainable energy sources to protect the planet, the company will attract a lot of supporters akin to Tesla's electric cars. Furthermore, the cause is morally right by many because the company is putting efforts to preserve the planet and protect numerous communities.**
8. How do you think the overall stock market will perform over the next year? Be sure to provide evidence to support your answer. **With the introduction of numerous electric vehicles from many prominent automakers, I do believe support for Waste Management will continue. Furthermore, I do believe the company will experience slower growth. Many companies in the S&P 500 saw a huge jump in stock price during the pandemic and many speculate that rapid growth is slowing down. In the past five years, Waste Management started at 88.10 in 2019, 112.72 in 2020, 118.00 in 2021, 161.98 in 2022, and 157.41 in 2023. Currently, Waste Management has a stock price of 176.59 and I do believe it will increase by 4%-7% by year's end. From the start of 2019 to 2020, the stock price jumped by 27.95%, 2020 to 2021 increased by 4.68%, 2021 to 2022 increased by 37.27%, and from 2022 to the start of 2023, it has decreased by 2.82%.**
9. How do you think your company will perform compared to the overall stock market over the next year? Be sure to provide evidence to support your answer. **In the next year, I do believe Waste Management Inc will outperform the overall stock market because it has that since 2019. Since 2019, Waste Management grew by 151.88%. and the overall stock market has increased by 145.03% with data from Yahoo Finance! I do believe this trend will continue in the following year with the company's projects, initiatives, and current public and governmental opinion of renewable energy and waste management.**

### Section 3: Your Company's Capital Structure

10. Find the amount of long-term debt for your company based upon its latest 10Q filing.  
According to Waste Management's latest 10Q filed October 27, 2023, the company had a long-term debt amount of \$15,133 million. An increase of 563 million since December 31. The one of the originates of Waste Management's long-term debt originates from their operating lease liabilities. In addition, changes to landfill and environmental remediation.
11. Find the book value of equity based on the company's latest 10Q filing. The book value of equity is \$6.966 billion.
12. Find the current market value (i.e. market capitalization) of your company. According to Yahoo! Finance, Waste Management has capitalization is \$71.126B.
13. Why might the book value and market value of equity differ? The book value can differ from the market value because the stock price can be influenced by public opinion. During the pandemic, GameStop's stock price soared high due to Wall Street Bets shortening the stock despite going bankrupt. Benjamin Graham always makes a point to check a company's financial statement to determine if a company is over or undervalued. In addition, investors can be optimistic about the future of a company's revenue and earnings.
14. What is the weight of debt and equity in your company's capital structure?

$$\text{Debt weight} = \text{total debt} / (\text{debt} + \text{equity}) = 15,133 \text{ M} / (15,133 \text{ M} + 6,966 \text{ M}) = 68.48\%$$

$$\text{Equity weight} = \text{total equity} / (\text{debt} + \text{equity}) = 6,966 \text{ M} / (15,133 \text{ M} + 6,966 \text{ M}) = 31.52\%$$

#### Section 4: Your Company's Debt Profile

15. What is your company's long-term credit rating? According to Fitch Ratings, Waste Management has a long-term credit rating of BBB+.
16. What does the company's credit rating tell you about the company's risk of default? A score of BBB indicates good credit quality. Waste Management rate to default on its payment is low.
17. How many different bonds does the company currently have outstanding? According to Markets Insider, Waste Management has a total of six different outstanding bond obligations.
18. Pick 3 bonds. What is the maturity date of each bond?  
For bond US94106LBA61, it has a maturity date of March 1, 2025 with a coupon of 3.125% and yield 5.4744%.  
For bond US94106LBP31, it has a maturity date of March 15, 2031 with a coupon of 1.5000 % and yield of 4.9992%.  
For bond US94106LBQ14, it has a maturity date of June 1, 2029 with a coupon of 1.5000 % and yield of 5.0932%. The information for the three bonds was gathered from Markets Business Insider
19. Do any of the company's bonds have any special features (e.g. call provisions, sinking fund requirements, conversions, etc.)? Markets Business Insider does not list any special features for any of the bonds listed.
20. What is the current yield-to-maturity for the most recently issued bond? The current yield-to-maturity is 2031 according to Market Business Insider.

## Section 5: Your Company's Dividend History

21. What is your company's current annual dividend? *(Note: Most companies pay dividends quarterly. You will need to add up the prior four dividends to get the annual amount.)* According to Yahoo Finance, the company has a current annual dividend of \$2.8. On November 30 2023, Waste Management announced that will be pay 0.7 in dividends in this year.

22. Determine the annual dividend for the past five years.

In 2019, the annual dividend payment was \$2.052.

In 2020, the annual dividend payment was \$2.18.

In 2021, the annual dividend payment was \$2.30.

In 2022, the annual dividend payment was \$2.60.

In 2023, the annual dividend payment was \$2.80.

23. Is there a pattern to the dividends? Are the dividends constant, growing, or uneven? The dividends of Waste Management are growing year over year. From 2019 to 2023, the percentage increase are not constant in annual dividend was 6.24%, 5.50%, 13.04%, and 7.69%. From 2019 to 2023, the quarterly dividend pay increased from 0.513 to 0.545 to 0.575 to 0.65 to 0.7.

24. What has been the average dividend growth rate over the last five years. In the last five years, Waste Management's geometric dividend growth rate is 8.3%. I refer to this data because Waste Management's dividend did not grow at a constant rate. Some years it is 5-6% and other nears it 10 or higher. However, I included the arithmetic to illustrate the output difference.

Geometric :  $((10.32\% + 6.24\% + 5.50\% + 13.04\% + 7.69\%)^{1/5}) = 8.1299\%$  or 8.13%

Arithmetic :  $(10.32\% + 6.24\% + 5.50\% + 13.04\% + 7.69\%) / 5 = 8.558\%$

25. Find the company's current stock price. According to Yahoo Finance, Waste Management's current stock price is \$176.59 per share.

26. Using the information above, calculate the cost of equity using the dividend discount model (DDM).

I used the most recent annual dividend per share announced which is 0.7 in March 2023. The cost of equity using the DDM is 8.53%. I included the arithmetic to illustrate the output difference.

Geometric DDM =  $D / SP + G = (0.7 / 176.59) + 8.13\% = 8.53\%$

Arithmetic DDM =  $D / SP + G = (0.7 / 176.59) + 8.558\% = 8.95\%$

## Section 6: Systematic Risk and Your Company

27. Estimate your company's beta. (Note: You can download the historical stock return and market return from Yahoo!Finance) **0.65**

```
In [ ]: pip install yfinance

In [3]: import pandas as pd
import numpy as np
import numpy_financial as npf
import yfinance as yf

In [5]: stock_symbol = "WM"
market_index_symbol = "^GSPC" # S&P 500 index

# The stock and market index
stock_adj_data = yf.download(stock_symbol, start="2019-12-01", end="2023-12-01")["Adj Close"]
market_adj_data = yf.download(market_index_symbol, start="2019-12-01", end="2023-12-01")["Adj Close"]

# returns for selected stock
stock_returns = stock_adj_data.pct_change().dropna()

# returns for market
market_returns = market_adj_data.pct_change().dropna()

# Calculate the covariance and the variance
covariance = np.cov(stock_returns, market_returns)[0, 1]
market_variance = np.var(market_returns)

# Calculate beta
beta = covariance / market_variance

print(round(beta, 2))

[*****100%*****] 1 of 1 completed
[*****100%*****] 1 of 1 completed
0.65
```

After downloading libraries onto Python to conduct an analysis. I used the library yfinance to interact with Yahoo Finance data. Before I could access data from yfinance, I had to *pip install yfinance*. I can download historical market data like price of stocks and dividends. I used the yfinance library to get the daily stock return of Waste Management and the S&P 500 from December 1, 2019 to December 1, 2023 from Yahoo Finance. I extracted the adjusted closing price of WM and ^GSPC using yfinance. Then, create a script to calculates the percentage change between each row of WM and ^GSPC. The script finds the percentage difference between each value and the previous value in the same column. Simutaneously, it will remove any rows without a number.

28. Find the current risk-free rate. How did you estimate the risk-free rate? **2.06**

```
In [7]: import pandas as pd

# Create a dataframe daily_t_bill
daily_t_bill = pd.read_csv(r'C:\Users\redwooma\Desktop\LoveDat\daily-treasury-rates.csv')

# find the average
average_value = daily_t_bill['13 WEEKS BANK DISCOUNT'].mean()

print(round(average_value, 2))

2.06
```

This was done by gathering the 13-week coupon equivalent from the daily treasury bill rate from the U.S. Department of the Treasury website. I found the average of the 13-week coupon equivalent from 2019 to 2023. Then, I calculated their average to end up with my result.

29. Assume the market risk premium is 5.6%. Using the information above, calculate the cost of equity using the capital asset pricing model (CAPM). **2.10**

Cost of Equity (Ke) = Risk-Free Rate + Beta \* Market Risk Premium

$$K_e = 2.06 + 0.65 * 5.6\%$$

$$K_e = 2.0964$$

## Section 7: Calculating Your Company's Weighted Average Cost of Capital

30. Compare the cost of equity that you found using the DDM and the CAPM. Why might you get two different estimates using the two different models? The cost of equity found using the DDM differs from the cost of equity found using the CAPM because the DDM gathers information on a stock from its dividends. In contrast, the CAPM gathers information on a stock from its market risk observing its historical market returns and comparing it to the current risk-free rate.
31. Do you believe the DDM or the CAPM provides a better estimate of the cost of equity for your company? Why? I believe DDM provides a better estimate of the cost of equity for my company because Waste Management is outperforming the market and pays a regular dividend. The dividend has grown year over year so I do believe DDM is better for estimating the cost of equity for the company.
32. Based on your company's most recent 10Q filing, what is its tax rate? The tax rate of Waste Management was 24.1% and 24.0% for the three and nine months ended September 30, 2023.
33. What is the WACC for your company?  
The Waste Management for WACC is 0.0303 when the tax rate is 24.1%. If the tax rate is 24, then the WACC is 0.0302

$$K_d = 4.55\%$$

$$WACC = (\text{Equity Weight} * \text{Cost of Equity}) + (\text{Debt Weight} * \text{Cost of Debt}) * (1 - \text{Tax Rate})$$

$$WACC = (31.52\% * 2.10\%) + (68.47\% * 4.55\%) * (1 - 24.1\%) = 0.0303$$



## Section 8: Capital Budgeting

Suppose your company is considering two projects (Project A & Project B)

Project A: This project is the introduction of a new product. It will require an upfront investment of 10 million dollars. At the end of year 1, the project will generate 2.5 million dollars in FCFs. At the end of year 2, the project will generate 2.6 million dollars in FCFs. At the end of year 3, the project will generate 2.7 million dollars in FCFs. At the end of year 4, the project will generate 2.8 million dollars in FCFs. At the end of year 5, the project will generate 3.0 million dollars in FCFs. The project will generate no more FCFs after year 5.

Project B: This is an expansion of the company's main office. This project will require an upfront investment of 4.5 million dollars. In year 1, the expansion will generate 0.5 million dollars in. After the first year, FCFs will grow by 2% each year forever.

34. Calculate the IRR of each project.

The IRR for project A is 20.30% and the IRR for project B is 13.31%.

```
In [41]: import numpy_financial as npf

# PROJECT A
cash_flows = [-10, 2.5, 2.6, 2.7, 2.8, 3.0] # Cash flows for each period

irr = npf.irr(cash_flows)
print(irr * 100)

20.304179244814403

In [43]: import numpy_financial as npf

cash_flows = [-4.5, 0.5] + [0.5 * 1.02 ** year for year in range(2, 100)] # Cash flows for each period

irr = npf.irr(cash_flows)
print(irr * 100)

13.310809742977781
```

35. Calculate the NPV of each project

The NPV for project A is \$-3.89 million and the NPV for project B is \$-3.29 million.

```
In [45]: import numpy_financial as npf

discount_rate = 0.438 # WACC
cash_flows = [-10, 2.5, 2.6, 2.7, 2.8, 3.0] # Cash flows for each period

npv = npf.npv(discount_rate, cash_flows)
print("NPV: {:.2f}".format(npv))

NPV: $-3.89

In [44]: import numpy_financial as npf

discount_rate = 0.438 # WACC
cash_flows = [-4.5, 0.5] + [0.5 * 1.02 ** year for year in range(2, 100)] # Cash flows for each period

npv = npf.npv(discount_rate, cash_flows)
print("NPV: {:.2f}".format(npv))

NPV: $-3.29
```

36. Calculate the Payback Period of each project.

The Payback Period for project A is 5 whole years because the summation of all five years is \$13.6 million. For project B, the payback period is 9 years.

37. Suppose the two projects are independent. Which (if any) should the company accept? Why?

If the two projects are independent, the company should accept Project A. In the energy and waste management sector, technology is rapidly changing. From 2020 to 2023, people are fortunate enough to work from home, people are more adept at utilizing software and managing AI. Waste Management is investing in projects that will innovate the way clean and renewable energies are generated and how they can be used.

38. Suppose instead the two projects are mutually exclusive, and the company can only accept one project. Which project should the company accept why?

If the two projects are mutually exclusive, the company should still select Project A because it requires less time for the team to complete the project. Waste Management is a leader in waste management in North America, but like all companies it has other competitors. To maintain that lead, Waste Management needs innovate to stay ahead to not lose it's market share.

## Citation Page

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7. Yahoo! (2023b, December 12). *Waste Management, Inc. (WM) stock historical prices & data*. Yahoo! Finance. <https://finance.yahoo.com/quote/WM/history?period1=1672531200&period2=1682899200&interval=1mo&filter=history&frequency=1mo&includeAdjustedClose=true>