

# Forecasting: Comparing Stock Price Valuations from Different Sources of Information

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## ABSTRACT

*Students are usually taught the “percentage of sales” approach to forecast financial statements. We develop a class exercise that will give them a deeper understanding of the different sources of information they can use to build the pro forma income statement. We then extend the application to valuation.*

## INTRODUCTION

Forecasting financial statements underpins many activities in corporate finance. It is used in corporate financial planning and capital budgeting. It is also necessary for valuation and security analysis. The “percentage of sales” approach is usually the first forecasting methodology that is taught at the undergraduate level. We enjoy teaching this topic because it allows us to revisit and reinforce knowledge of financial statements and financial ratios and build on this knowledge.

In developing the exercise, we were guided by some of the undergraduate learning objectives at CSUMB’s College of Business. The learning objectives (listed verbatim below) aim for students to:

- Demonstrate competence in critical thinking, information literacy
- Apply knowledge, theories, methods, and practices in a chosen field of study to address real-world challenges and opportunities

Forecasting, as a topic, lends itself well to class activities that use real-world information. In this exercise we ask students to consider three sources that can be used to forecast revenue. The first method is to use the simple average growth rate of the company’s sales from the last several years. The second method is to consider the company’s relative position within its industry and use industry forecasts. And the third method is to use company-issued guidance for analysts. In each of the three cases, the students also then must complete the rest of the income statement. The students use a P/E multiple to calculate a stock price. We end the exercise by leading a class discussion that lets the students reflect on what they learned from the exercise.

## THE ACTIVITY

We use The Williams Companies, Inc. (Ticker:WMB), a publicly-traded gas pipeline company. The company operates in the Pacific Northwest, the Rockies, Gulf of Mexico, and the Eastern Seaboard.<sup>1</sup> It is the second-largest company in the industry<sup>2</sup> with a market capitalization of \$25.99B.<sup>3</sup> It is also a company that regularly issues earnings guidance to analysts.

Before coming to class, we ask the students to:

1. Go to SEC Edgar and download the 10-Ks from 2009 through 2019.
2. Download and read industry reports from IbisWorld or a similar database from the library. IbisWorld industry reports also include revenue growth forecasts for the next five years. For this activity, since we are only doing a one-year out forecast, any industry report that provides at least a one-year ahead forecast will be sufficient.
3. Go to the company's investor relations page and download the following:
  - 2019 full year earnings presentation or press release
  - 1Q and 2Q 2020 full year earnings presentation or press release

We ask the students to go over these documents and look for the guidance on net income for FY 2020. For many, if not all, students, this would be the first time that they learn about guidance issued by a company. Asking them to look at a few earnings presentations gives them a better idea about how the company reports it, and the notion that the guidance could change if there are material changes to the firm's operations.

Students are familiar with using firm-specific and industry level data to analyze firm performance by the time they take their finance classes. However, very few of them would know that some companies also issue guidance for analysts covering their firm. To bridge this gap, we also ask them to read section 4.5 on earnings guidance and section 6 on voluntary disclosures from Graham, Harvey, and Rajgopal's (2005) survey of CFOs.

In class, we ask the students to work in teams of five. Occasionally we have more advanced students who prefer to work alone or with fewer members in their group. We leave it to the discretion of the instructor to determine group membership. Once the students are organized into groups, we first ask them to pull up the 10-Ks and fill in the key elements from the income statement from 2009 through 2019 as illustrated in Exhibit 1.

### Exhibit 1. Historical income statement information

|  |  | 2019 | 2018 | ... | 2010 | 2009 |
|--|--|------|------|-----|------|------|
| Total Revenues                                   |  |      |      |     |      |      |
| Operating Income (Loss)                          |  |      |      |     |      |      |
| Net income (loss)                                |  |      |      |     |      |      |
| Less: Net income (loss) attributable to:         |  |      |      |     |      |      |
| Non-controlling interest                         |  |      |      |     |      |      |
| Preferred dividends                              |  |      |      |     |      |      |
| Sub-total  |  |      |      |     |      |      |
| Net income (loss) attributable to                |  |      |      |     |      |      |
| The Williams Companies, Inc. common stockholders |  |      |      |     |      |      |
| Weighted-average shares - diluted (millions)     |  |      |      |     |      |      |
| Diluted earnings (loss) per common share:        |  |      |      |     |      |      |

Next, we ask them to calculate the annual growth rates in revenue, the operating margin, and the net profit margin. Once they have these figures, we ask them to calculate the five-year and ten-year average for each item. Exhibit 2 shows how the data is organized. We also ask the students to fill in the industry revenue growth forecast for 2020 from IbisWorld. And from the company's 2Q 2020 presentation, we ask them to find the fiscal year-end guidance for net income (loss) from non-controlling interest, preferred dividends, and the diluted weighted-average shares.

### Exhibit 2. Historical averages and industry revenue forecast

|                            |  | 2019 | 2018 | ... | 2010 |
|----------------------------|--|------|------|-----|------|
| Total Revenues             |  |      |      |     |      |
| <i>growth rate</i>         |  |      |      |     |      |
| Operating Margin           |  |      |      |     |      |
| Net margin                 |  |      |      |     |      |
| Average growth in revenues |  |      |      |     |      |
| 5-year                     |  |      |      |     |      |
| stdev                      |  |      |      |     |      |
| Average operating margin   |  |      |      |     |      |
| 5-year                     |  |      |      |     |      |
| 10-year                    |  |      |      |     |      |
| Average profit margin      |  |      |      |     |      |
| 5-year                     |  |      |      |     |      |
| 10-year                    |  |      |      |     |      |
| Industry Forecast          |  |      |      |     |      |
| Average                    |  |      |      |     |      |

Using the information that they gathered we ask them to make three forecasts for the earnings per share (EPS) for FY 2020. The first set of forecasts uses the five-year and ten-year average revenue growth rates. The students are asked to use the percentage of sales approach to forecast revenues and use the average margins they computed to forecast operating income and net income. They should also use the guidance from the company on non-controlling interest, preferred dividends, and diluted weighted average shares to complete the income statement and compute diluted EPS. The second set of forecasts follows all the steps from the first set, only this time they will use the industry forecast for the growth rate in revenue. And the last set of forecasts uses company guidance. In this example, the company gives guidance for net income so that can be starting point. They can use the same information as before to complete the rest of the income statement. The template is shown in Exhibit 3.

### Exhibit 3. Income statement forecasts

|  | <i>5-year</i> | <i>10-year</i> | <i>Industry</i> | <i>Company guidance</i> |  |
|--|---------------|----------------|-----------------|-------------------------|--|
| Total Revenues                                   |               |                |                 |                         |  |
| Operating Income (Loss)                          |               |                |                 |                         |  |
| Net income (loss)                                |               |                |                 |                         |  |
| Less: Net income (loss) attributable to          |               |                |                 |                         |  |
| Non-controlling interest                         |               |                |                 |                         |  |
| Preferred dividends                              |               |                |                 |                         |  |
| Sub-total  |               |                |                 |                         |  |
| Net income (loss) attributable to                |               |                |                 |                         |  |
| The Williams Companies, Inc. common stockholders |               |                |                 |                         |  |
| Weighted-average shares - diluted (millions)     |               |                |                 |                         |  |
| Diluted earnings (loss) per common share:        |               |                |                 |                         |  |

The last step in the exercise is to come up with stock price estimates for the 2020 fiscal year end. Despite its simplicity, many analysts still use some form of a P/E valuation model (Demirakos, et al, 2004). We ask the students to obtain P/E multiples from ycharts.com. Exhibit 4 shows a screen snip of the range of P/E ratios for WMB on September 16, 2020. We observe that the range is quite wide between 8.232 and 372.35; and the average is 92.29. Using Exhibit 5 as a template, we ask the students to come up with price estimates by using P/E multiples from the range of P/Es and applying it to the diluted EPS that they have calculated. Completed spreadsheets are shown in Tables 1 through 3 at the end of the paper.

### Exhibit 4. P/E multiples

| <b>PE Ratio Range, Past 5 Years</b> |        |             |
|-------------------------------------|--------|-------------|
| Minimum                             | 8.232  | Dec 24 2018 |
| Maximum                             | 373.35 | Jul 12 2019 |
| Average                             | 92.29  |             |

*Source: ycharts.com*

## Exhibit 5. Stock price estimates

|   | <i>5-year</i> | <i>10-year</i> | <i>Industry</i> | <i>Company guidance</i> |             |             |
|---|---------------|----------------|-----------------|-------------------------|-------------|-------------|
| Diluted earnings (loss) per common share: | <i>0.29</i>   | <i>0.50</i>    | <i>0.27</i>     | <i>0.27</i>             | <i>0.39</i> | <i>0.52</i> |
| Stock price estimate (assuming P/E = )    |               |                |                 |                         |             |             |
| ....                                      |               |                |                 |                         |             |             |
| Stock price estimate (assuming P/E = )    |               |                |                 |                         |             |             |

## DISCUSSION

At the end of the activity, we ask each group to give a brief presentation for one set of price estimates using one of the P/E ratios that they used. Many of the groups will either use the average P/E or choose a multiple that gives a price range close to the current stock price. We use this opportunity to have a broader discussion about valuation, and the difference between the stock price and intrinsic value. We also guide the students to a discussion of historical ratios for the company versus using industry P/Es.

We conclude the discussion by asking the students what they learned about forecasting using real-world data. Some students will point out that it's easy if the company gives guidance. This gives us an opportunity to steer the discussion towards what they learned from Graham, Harvey, and Rajgopal (2005) and the reasons why some companies give guidance, while some don't. We also highlight the importance of knowing the company and the industry in forecasting and valuation.

## CONCLUSION

We developed an activity that reinforces students' understanding of forecasting and showed one example of how it is used in the real world. The exercise can be used at the end of an undergraduate class in corporate finance, or as a beginning exercise in a valuation class as a review of concepts and preview of what is ahead. The exercise reinforces some key lessons in a corporate finance class:

1. The students get to apply the methodology to a real company using real-world data and see how the assumptions they make in building the income statement can lead to different valuation results and conclusions they make about the company.
2. The students learn about sources of data.
3. The students get to see another application for financial ratios in finance.
4. The students get to practice their Excel skills.

## ENDNOTES

<sup>1</sup> Per the company's website: <https://www.williams.com/our-company/operations/>

<sup>2</sup> Per the IbisWorld industry report.

<sup>3</sup> As of Sept. 16, 2020 per Yahoo!Finance

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**Table 1. Income statement, 2009 - 2019**

|  | 2019     | 2018    | 2017    | 2016   | 2015    | 2014  | 2013  | 2012  | 2011  | 2010    | 2009  |
|--|----------|---------|---------|--------|---------|-------|-------|-------|-------|---------|-------|
| Total Revenues                                   | 8,201    | 8,686   | 8,031   | 7,499  | 7,360   | 7,637 | 6,860 | 7,486 | 7,930 | 6,638   | 5,278 |
| Operating Income (Loss)                          | 1,921    | 768     | 927     | 689    | 226     | 1,569 | 1,375 | 1,612 | 1,867 | 1,407   | 1,106 |
| Net income (loss)                                | 714      | 193     | 2,509   | (350)  | (1,314) | 2,339 | 668   | 1,065 | 661   | (922)   | 361   |
| Less: Net income (loss) attributable to          |          |         |         |        |         |       |       |       |       |         |       |
| Non-controlling interest                         | (136)    | 348     | 335     | 74     | (743)   | 225   | 238   | 206   | 285   | 175     | 76    |
| Preferred dividends                              | 3        | 1       | -       | -      | -       | -     | -     | -     | -     | -       | -     |
| Sub-total  | (133)    | 349     | 335     | 74     | (743)   | 225   | 238   | 206   | 285   | 175     | 76    |
| Net income (loss) attributable to                |          |         |         |        |         |       |       |       |       |         |       |
| The Williams Companies, Inc. common stockholders | 847      | (156)   | 2,174   | (424)  | (571)   | 2,114 | 430   | 859   | 376   | (1,097) | 285   |
| Weighted-average shares - diluted (millions)     | 1214.011 | 973.626 | 828.518 | 751    | 749     | 724   | 687   | 625   | 598   | 591     | 586   |
| Diluted earnings (loss) per common share:        | 0.70     | (0.16)  | 2.62    | (0.56) | (0.76)  | 2.92  | 0.63  | 1.37  | 0.63  | (1.86)  | 0.49  |



**Table 3. FY 2020 forecast income statement and stock price estimates**

|  | <i>5-year</i>   | <i>10-year</i>  | <i>Industry</i> | <i>Company guidance</i> |               |               |
|--|-----------------|-----------------|-----------------|-------------------------|---------------|---------------|
| Total Revenues                                       | <i>8,378.53</i> | <i>8,525.94</i> | <i>7,816.37</i> |                         |               |               |
| <i>growth rate</i>                                   |                 |                 |                 |                         |               |               |
| Operating Income (Loss)                              | <i>939.52</i>   | <i>1,389.12</i> | <i>876.48</i>   |                         |               |               |
| Net income (loss)                                    | <i>329.26</i>   | <i>585.61</i>   | <i>307.17</i>   | <i>304</i>              | <i>454</i>    | <i>604</i>    |
| Less: Net income (loss) attributable to              |                 |                 |                 |                         |               |               |
| Non-controlling interest                             |                 |                 |                 |                         |               |               |
| Preferred dividends                                  |                 |                 |                 |                         |               |               |
| Sub-total  | <i>-25</i>      | <i>-25</i>      | <i>-25</i>      | <i>-25</i>              | <i>-25</i>    | <i>-25</i>    |
| Net income (loss) attributable to                    |                 |                 |                 |                         |               |               |
| The Williams Companies, Inc. common stockholders     | <i>354</i>      | <i>611</i>      | <i>332</i>      | <i>329</i>              | <i>479</i>    | <i>629</i>    |
| Weighted-average shares - diluted (millions)         | <i>1218</i>     | <i>1218</i>     | <i>1218</i>     | <i>1218</i>             | <i>1218</i>   | <i>1218</i>   |
| Diluted earnings (loss) per common share:            | <i>0.29</i>     | <i>0.50</i>     | <i>0.27</i>     | <i>0.27</i>             | <i>0.39</i>   | <i>0.52</i>   |
| Stock price estimate (assuming average P/E = 92.29)  | <i>26.84</i>    | <i>46.27</i>    | <i>25.17</i>    | <i>24.93</i>            | <i>36.29</i>  | <i>47.66</i>  |
| Stock price estimate (assuming minimum P/E = 8.232)  | <i>2.39</i>     | <i>4.13</i>     | <i>2.25</i>     | <i>2.22</i>             | <i>3.24</i>   | <i>4.25</i>   |
| Stock price estimate (assuming maximum P/E = 375.35) | <i>109.17</i>   | <i>188.17</i>   | <i>102.36</i>   | <i>101.39</i>           | <i>147.61</i> | <i>193.84</i> |