

# REIT Financial Modeling – Certification Quiz Questions

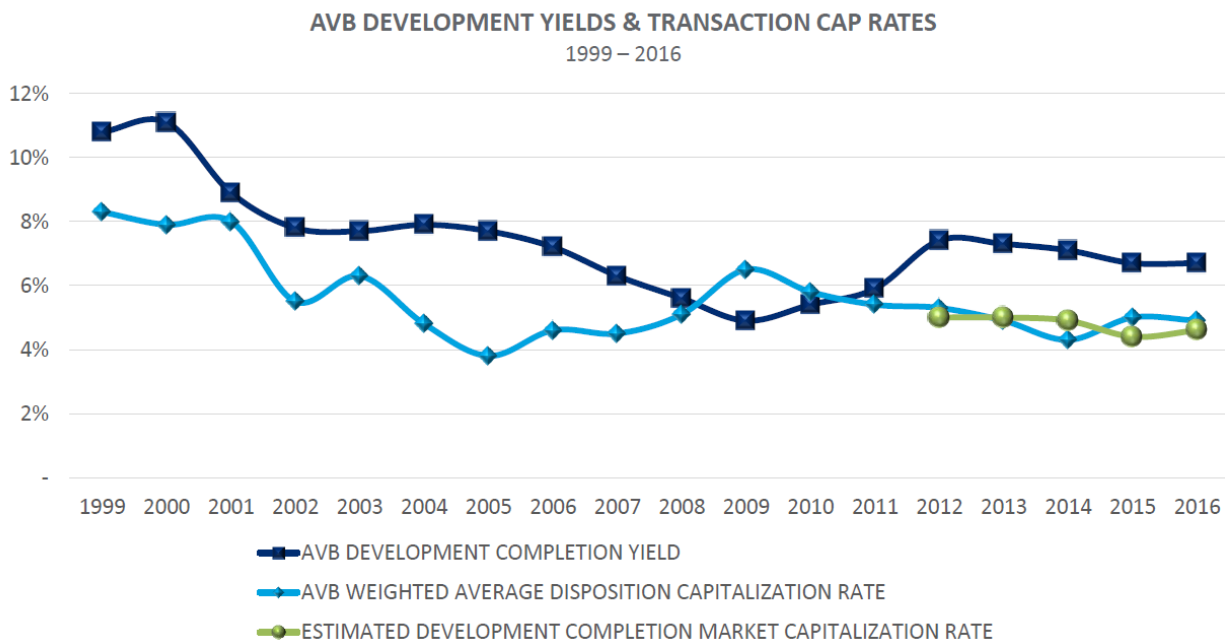
## Module 2 – 4-Hour (or 1-Week) REIT Valuation Modeling Test (AvalonBay)

1. You are completing a 3-statement projection model and valuation of AvalonBay, a multifamily REIT based in the U.S., so that you can make an investment recommendation on the company.

As part of this exercise, you have reviewed industry research, investor presentations, company reports, filings, and other documents to build the model, which includes a segment-by-segment buildup, NAV Model, DCF, Public Comps, and Precedent Transactions.

The company’s historical Development Yields, Acquisition Cap Rates, and financial performance are shown below:

### DEVELOPMENT HAS PROVIDED CONSISTENTLY PROFITABLE EXTERNAL GROWTH FOR AVB...



| <b>Income Statement</b>                  |   |   |   |   |   |   |   |   |   |  |
|--|---|---|---|---|---|---|---|---|---|--|
| <b>For the Fiscal Period Ending</b>      | <b>Restated<br/>12 months<br/>Dec-31-1997</b> | <b>Restated<br/>12 months<br/>Dec-31-1998</b> | <b>Reclassified<br/>12 months<br/>Dec-31-1999</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2000</b> | <b>Restated<br/>12 months<br/>Dec-31-2001</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2002</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2003</b> | <b>Restated<br/>12 months<br/>Dec-31-2004</b> | <b>Restated<br/>12 months<br/>Dec-31-2005</b> |  |
| Rental Revenue                           | 169.4   | 369.9   | 504.6   | 539.3   | 581.8   | 568.4   | 556.6   | 613.2   | 650.9   |  |
| Tenant Reimbursements                    | -   | -   | -   | -   | -   | -   | -   | -   | -   |  |
| Property Management Fee                  | 1.0   | 1.4   | 1.2   | 1.1   | 1.4   | 2.1   | 0.9   | 0.6   | 4.3   |  |
| Interest and Invest. Income, Total (Rev) | 1.3   | 3.5   | 7.4   | 4.8   | 6.8   | -   | -   | -   | -   |  |
| Other Revenue                            | 6.3   | 2.7   | 3.1   | 2.8   | 0.9   | 0.1   | 25.5  | 1.1   | 7.2   |  |
| <b>Total Revenue</b>                     | <b>178.1</b>                                  | <b>377.5</b>                                  | <b>516.2</b>                                      | <b>547.9</b>                                      | <b>590.9</b>                                  | <b>570.6</b>                                      | <b>583.0</b>                                      | <b>614.9</b>                                  | <b>662.4</b>                                  |  |
| Property Exp.                            | 61.7  | 136.1   | 178.2   | 177.5   | 192.1   | 206.6   | 216.3   | 249.8   | 261.1   |  |
| Selling General & Admin Exp.             | 5.1   | 9.1   | 9.6   | 13.0  | 14.7  | 13.4  | 14.8  | 18.1  | 22.2  |  |
| Depreciation & Amort.                    | 29.1  | 77.4  | 109.8   | 115.3   | 119.9   | 130.5   | 138.7   | 153.2   | 156.5   |  |
| Amort. of Goodwill and Intangibles       | -   | -   | -   | -   | -   | -   | -   | -   | -   |  |
| Other Operating Exp.                     | -   | -   | -   | -   | -   | -   | -   | -   | -   |  |
| <b>Total Operating Exp.</b>              | <b>95.9</b>                                   | <b>222.6</b>                                  | <b>297.6</b>                                      | <b>305.8</b>                                      | <b>326.7</b>                                  | <b>350.5</b>                                      | <b>369.9</b>                                      | <b>421.1</b>                                  | <b>439.8</b>                                  |  |
| <i>Rental Revenue Growth Rate:</i>       | <i>N/A</i>                                    | <i>118.3%</i>                                 | <i>36.4%</i>                                      | <i>6.9%</i>                                       | <i>7.9%</i>                                   | <i>(2.3%)</i>                                     | <i>(2.1%)</i>                                     | <i>10.2%</i>                                  | <i>6.1%</i>                                   |  |
| <i>NOI Margin:</i>                       | <i>63.6%</i>                                  | <i>63.2%</i>                                  | <i>64.7%</i>                                      | <i>67.1%</i>                                      | <i>67.0%</i>                                  | <i>63.7%</i>                                      | <i>61.1%</i>                                      | <i>59.3%</i>                                  | <i>59.9%</i>                                  |  |

| <b>Income Statement</b>                  |   |   |   |   |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|---|---|---|---|
| <b>For the Fiscal Period Ending</b>      | <b>Restated<br/>12 months<br/>Dec-31-2006</b> | <b>Restated<br/>12 months<br/>Dec-31-2007</b> | <b>Restated<br/>12 months<br/>Dec-31-2008</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2009</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2010</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2011</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2012</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2013</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2014</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2015</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2016</b> | <b>Reclassified<br/>12 months<br/>Dec-31-2017</b> |
| Rental Revenue                           | 671.4   | 721.6   | 807.2   | 822.6   | 835.5   | 890.4   | 990.4   | 1,451.4   | 1,674.0   | 1,846.1   | 2,039.7   | 2,154.5   |
| Tenant Reimbursements                    | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| Property Management Fee                  | 6.3   | 6.1   | 6.6   | 7.3   | 7.4   | 9.7   | 10.3  | 11.5  | 11.1  | 9.9   | 5.6   | 4.1   |
| Interest and Invest. Income, Total (Rev) | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| Other Revenue                            | 7.5   | 59.2  | 4.6   | 1.4   | 0.8   | 5.1   | (37.5)  | (25.8)  | 73.8  | 39.4  | 6.8   | 30.6  |
| <b>Total Revenue</b>                     | <b>685.1</b>                                  | <b>787.0</b>                                  | <b>818.3</b>                                  | <b>831.4</b>                                      | <b>843.6</b>                                      | <b>905.2</b>                                      | <b>963.1</b>                                      | <b>1,437.1</b>                                    | <b>1,758.8</b>                                    | <b>1,895.4</b>                                    | <b>2,052.1</b>                                    | <b>2,189.3</b>                                    |
| Property Exp.                            | 268.7   | 286.1   | 312.8   | 325.3   | 331.4   | 336.8   | 356.9   | 511.0   | 581.6   | 642.2   | 683.9   | 725.7   |
| Selling General & Admin Exp.             | 24.8  | 28.5  | 42.8  | 28.7  | 26.8  | 29.4  | 34.1  | 39.6  | 43.4  | 42.8  | 45.8  | 50.7  |
| Depreciation & Amort.                    | 149.4   | 157.9   | 183.3   | 204.5   | 220.6   | 226.7   | 243.7   | 560.2   | 442.7   | 477.9   | 531.4   | 584.2   |
| Amort. of Goodwill and Intangibles       | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| Other Operating Exp.                     | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| <b>Total Operating Exp.</b>              | <b>442.8</b>                                  | <b>472.5</b>                                  | <b>538.9</b>                                  | <b>558.5</b>                                      | <b>578.8</b>                                      | <b>592.9</b>                                      | <b>634.7</b>                                      | <b>1,110.8</b>                                    | <b>1,067.7</b>                                    | <b>1,162.9</b>                                    | <b>1,261.1</b>                                    | <b>1,360.5</b>                                    |
| <i>Rental Revenue Growth Rate:</i>       | <i>3.1%</i>                                   | <i>7.5%</i>                                   | <i>11.9%</i>                                  | <i>1.9%</i>                                       | <i>1.6%</i>                                       | <i>6.6%</i>                                       | <i>11.2%</i>                                      | <i>46.6%</i>                                      | <i>15.3%</i>                                      | <i>10.3%</i>                                      | <i>10.5%</i>                                      | <i>5.6%</i>                                       |
| <i>NOI Margin:</i>                       | <i>60.0%</i>                                  | <i>60.3%</i>                                  | <i>61.2%</i>                                  | <i>60.5%</i>                                      | <i>60.3%</i>                                      | <i>62.2%</i>                                      | <i>64.0%</i>                                      | <i>64.8%</i>                                      | <i>65.3%</i>                                      | <i>65.2%</i>                                      | <i>66.5%</i>                                      | <i>66.3%</i>                                      |

| <b>Selected Cash Flow Statement Line Items</b>  |         |           |         |         |         |         |         |           |           |           |           |         |
|---|---------|-----------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|---------|
| Acquisitions of Real Estate Assets              | (74.9)  | (13.8)    | -       | -       | -       | (46.3)  | (155.8) | (839.5)   | (47.0)    | -         | (393.3)   | (462.3) |
| Development/Redevelopment of Real Estate Assets | (735.2) | (1,112.6) | (881.5) | (560.2) | (429.9) | (640.8) | (755.4) | (1,285.7) | (1,241.8) | (1,569.3) | (1,201.0) | (979.9) |
| Sale of Real Estate Assets                      | 272.2   | 261.1     | 529.8   | 189.4   | 194.0   | 310.2   | 274.0   | 919.7     | 297.5     | 282.2     | 532.7     | 503.0   |

**Based on this data, which of the following conclusions might you draw about this company?**

- Development Spending seems to decline in recessions and rise in growth periods.
- Spending shifts consistently from Developments/Redevelopments to Acquisitions in downturns.
- The Disposition Cap Rate tends to rise in recessions and fall in recoveries, while the Development Completion Yield does the opposite.

- d. While NOI margins and rental revenue growth rates decline in recessions, they do not become completely disastrous for the company.
  - e. It seems like the 2001 – 2003 decline and the 2008 – 2009 decline made similar financial impacts on the company.
  - f. All the statements above are true.
  - g. Only statements A, C, and D are true.
  - h. Only statements A, B, C, and D are true.
  - i. Only statements A, C, D, and E are true.
- 2. Your model assumes that Developments take an average of 3 years to complete and 1 year to stabilize. After stabilizing, the Development Assets are re-classified to the “Other Stabilized Communities” segment, and the Yields and NOI Margins change. The setup is shown below:**

| Development Properties:                                      | Units:      | Projected:     |              |              |              |              |
|--|-------------|----------------|--------------|--------------|--------------|--------------|
|  |             | FY18           | FY19         | FY20         | FY21         | FY22         |
| Average # of Development Years:                              | # Years     | 3.0            |              |              |              |              |
| Development Starts (Capitalized Spending):                   | \$ M        | \$ 950.0       | \$ 940.0     | \$ 930.0     | \$ 920.0     | \$ 910.0     |
| Upside   | \$ M        | 1,300.0        | 1,250.0      | 1,200.0      | 1,150.0      | 1,100.0      |
| Base   | \$ M        | 950.0          | 940.0        | 930.0        | 920.0        | 910.0        |
| Downside   | \$ M        | 500.0          | 650.0        | 750.0        | 800.0        | 850.0        |
| <b>Annual Development Spending (Amortization of Starts):</b> |             |                |              |              |              |              |
| Year 1:  | \$ M        | -              | -            | -            | -            | -            |
| Year 2:  | \$ M        | 529.3          | -            | -            | -            | -            |
| Year 3:  | \$ M        | 269.3          | 269.3        | -            | -            | -            |
| Year 4:  | \$ M        | 316.7          | 316.7        | 316.7        | -            | -            |
| Year 5:  | \$ M        |                | 313.3        | 313.3        | 313.3        | -            |
| Year 6:  | \$ M        |                |              | 310.0        | 310.0        | 310.0        |
| Year 7:  | \$ M        |                |              |              | 306.7        | 306.7        |
| Year 8:  | \$ M        |                |              |              |              | 303.3        |
| <b>Total Annual Development Spending:</b>                    | <b>\$ M</b> | <b>1,115.3</b> | <b>899.3</b> | <b>940.0</b> | <b>930.0</b> | <b>920.0</b> |
| Cost of Completed Deliveries:                                | \$ M        | 700.0          | 808.0        | 950.0        | 940.0        | 930.0        |
| NOI from Completed Deliveries Before Stabilization:          | \$ M        | 52.0           | 40.4         | 48.5         | 48.9         | 49.3         |
| Pre-Stabilized Yield on Cost of Completed Deliveries:        | %           | 7.4%           | 5.0%         | 5.1%         | 5.2%         | 5.3%         |
| Upside   | %           |                | 6.5%         | 6.1%         | 5.7%         | 5.5%         |
| Base   | %           |                | 5.0%         | 5.1%         | 5.2%         | 5.3%         |
| Downside   | %           |                | 4.0%         | 4.3%         | 4.7%         | 5.0%         |
| Baseline NOI Margin:   | %           | 64.3%          | 64.3%        | 64.3%        | 64.3%        | 64.3%        |
| Actual NOI Margin in Selected Scenario:                      | %           | 64.3%          | 64.3%        | 64.3%        | 64.3%        | 64.3%        |
| Revenue from Completed Deliveries Before Stabilization:      | \$ M        | \$ 80.8        | \$ 62.8      | \$ 75.3      | \$ 76.0      | \$ 76.6      |

| Other Stabilized Communities:                | Units:      | Projected:     |                |                |                |                |
|--|-------------|----------------|----------------|----------------|----------------|----------------|
|  |             | FY18           | FY19           | FY20           | FY21           | FY22           |
| Beginning Stabilized Development Assets:     | \$ M        | -              | 1,900.0        | 2,600.0        | 3,408.0        | 4,358.0        |
| (+) Additions from Development Properties:   | \$ M        | 1,900.0        | 700.0          | 808.0          | 950.0          | 940.0          |
| <b>Ending Stabilized Development Assets:</b> | <b>\$ M</b> | <b>1,900.0</b> | <b>2,600.0</b> | <b>3,408.0</b> | <b>4,358.0</b> | <b>5,298.0</b> |
| Revenue:                                     | \$ M        | 170.2          | 236.6          | 315.1          | 409.2          | 497.5          |
| Net Operating Income (NOI):                  | \$ M        | 117.8          | 163.8          | 218.1          | 283.3          | 344.4          |
| Yield on Stabilized Development Assets:      | %           | 6.2%           | 6.3%           | 6.4%           | 6.5%           | 6.5%           |
| Upside                                       | %           | 7.5%           | 7.2%           | 6.9%           | 6.8%           | 6.7%           |
| Base   | %           | 6.2%           | 6.3%           | 6.4%           | 6.5%           | 6.5%           |
| Downside                                     | %           | 5.0%           | 5.3%           | 5.7%           | 6.0%           | 6.3%           |
| Baseline NOI Margin:                         | %           | 69.2%          | 69.2%          | 69.2%          | 69.2%          | 69.2%          |
| Actual NOI Margin in Selected Scenario:      | %           | 69.2%          | 69.2%          | 69.2%          | 69.2%          | 69.2%          |

Which of the following represents the biggest PROBLEM with these assumptions?

- We should not be re-classifying Assets, Revenue, and NOI like this because doing so means that it's more difficult to make historical comparisons.
- The Pre-Stabilized Yields are significantly lower than the Stabilized Yields; they should be much closer.

- c. A 3-year average Development period for multifamily properties is too long, resulting in a lag between Spending and Yields; a 1-year average would be better.
- d. It does not make sense for BOTH the NOI Margins and the Yields to increase once the Developments have stabilized – it should be one or the other.
- e. None of the above – these assumptions seem fine based on the descriptions and graphs above, and nothing above represents a serious problem.

**3. You are now reviewing the NAV Model for this same company. The setup and adjustments are fairly standard, but you have split up the company’s Forward NOI by segment and divided the NOI in each segment by a different Cap Rate to estimate the Implied Values. A portion of the model is shown below:**

**AvalonBay Communities, Inc. - Net Asset Value (NAV) Model - Base Case**

(\$ USD in Millions Except Per Share and Per Unit Amounts in USD as Stated)

| ASSETS:                                |      |                      |   |                       |                    |                      |                |         |
|--|------|----------------------|---|-----------------------|--------------------|----------------------|----------------|---------|
| Operating Real Estate & Other Income:  |      |                      |   |                       |                    |                      |                |         |
| Selected Scenario:                     | Name | Base                 | <--- Cut and paste scenario drop-down box here if required for sensitivity table. |                       |                    |                      |                |         |
| Cap Rate Adjustment for Sensitivities: | %    | -                    |   |                       |                    |                      |                |         |
| Replacement Reserves % NOI:            | %    | 5.0%                 |   |                       |                    |                      |                |         |
| Established Properties by Region:      |      | Nominal Forward NOI: | Repl. Reserve Deduction:  | Economic Forward NOI: | Economic Cap Rate: | Sensitized Cap Rate: | Implied Value: |         |
| New England:                           | \$ M | \$ 154.8             | \$ (7.7)  | \$ 147.1              | 5.0%               | 5.0%                 | \$             | 2,941.6 |
| Metro NY/NJ:                           | \$ M | 253.7                | (12.7)  | 241.1                 | 4.0%               | 4.0%                 |                | 6,026.4 |
| Mid-Atlantic:                          | \$ M | 156.7                | (7.8)   | 148.9                 | 5.3%               | 5.3%                 |                | 2,809.0 |
| Pacific Northwest:                     | \$ M | 64.2                 | (3.2)   | 61.0                  | 4.3%               | 4.3%                 |                | 1,417.9 |
| Northern California:                   | \$ M | 264.0                | (13.2)  | 250.8                 | 4.5%               | 4.5%                 |                | 5,572.9 |
| Southern California:                   | \$ M | 253.2                | (12.7)  | 240.5                 | 4.2%               | 4.2%                 |                | 5,726.2 |
| Other Business Segments:               |      |                      |   |                       |                    |                      |                |         |
| Other Stabilized Properties:           | \$ M | 317.6                | (15.9)  | 301.7                 | 6.1%               | 6.1%                 |                | 4,946.0 |
| Development Properties:                | \$ M | 52.0                 | (2.6)   | 49.4                  | 7.0%               | 7.0%                 |                | 705.7   |
| Redevelopment Properties:              | \$ M | 88.8                 | (4.4)   | 84.3                  | 5.0%               | 5.0%                 |                | 1,686.6 |
| Acquired Properties:                   | \$ M | 23.1                 | (1.2)   | 22.0                  | 5.0%               | 5.0%                 |                | 439.2   |
| Disposed Properties:                   | \$ M | (25.2)               | 1.3   | (23.9)                | 5.3%               | 5.3%                 |                | (451.7) |

**Your co-worker argues that this approach is flawed for various reasons, such as the fact that the Cap Rates you have selected are too high – for example, the Metro NY/NJ Cap Rate is 4.0% here, but local brokerage data indicates the proper range is 3.3% – 4.3%.**

**Is your co-worker correct?**

- a. No, but there are other problems, such as the fact that the Cap Rates stay the same regardless of the selected scenario.
- b. No – slightly higher Cap Rates may be justified if this REIT’s properties in each region are slightly lower quality than the ones in brokerage data.
- c. Yes – the Cap Rates should be slightly lower, and we should not deduct Replacement Reserves from NOI in each segment.
- d. No – as a general practice, it is best to assume slightly higher Cap Rates to create a more conservative valuation.
- e. No, but there are other problems, such as the fact that we should not include NOI from Developments, Redevelopments, and Acquisitions at all.

**4. Continuing with the same analysis, the company lists ~\$164 million as the book value of Equity Investments (Joint Ventures or JVs) on its Balance Sheet.**

**In the NAV Model, however, you have split out the Assets and Liabilities from these JVs, re-valued them, and multiplied by AvalonBay’s ownership percentage to count them on each side:**

|  |      | Nominal<br>Forward NOI: | Repl. Reserve<br>Deduction: | Economic<br>Forward NOI: | Economic<br>Cap Rate: | Sensitized<br>Cap Rate: | Implied<br>Value: |
|--|------|-------------------------|-----------------------------|--------------------------|-----------------------|-------------------------|-------------------|
| Equity Investments (Unconsolidated Real Estate):         | \$ M | 65.0                    | (3.3)                       | 61.8                     | 5.0%                  | 5.0%                    | 1,235.3           |
| (x) Pro-Rata Allocation Percentage:                      | %    |                         |                             |                          |                       |                         | 25.1%             |
| <b>Market Value of Pro-Rata Portion of Unconsol. RE:</b> | \$ M |                         |                             |                          |                       |                         | <b>310.4</b>      |
| Other JV Assets:   | \$ M |                         |                             |                          |                       |                         | 40.0              |
| (x) Pro-Rata Allocation Percentage:                      | %    |                         |                             |                          |                       |                         | 25.1%             |
| <b>Market Value of Pro-Rata Portion of Unconsol. RE:</b> | \$ M |                         |                             |                          |                       |                         | <b>10.0</b>       |
| <b>LIABILITIES &amp; EQUITY:</b>                         |      |                         |                             |                          |                       |                         |                   |
| Pro-Rata Portion of JV Debt:                             | \$ M |                         |                             |                          |                       |                         | (523.8)           |
| (x) Market Value Adjustment:                             | %    |                         |                             |                          |                       |                         | 104.8%            |
| (x) Pro-Rata Allocation Percentage:                      | %    |                         |                             |                          |                       |                         | 25.1%             |
| <b>Market Value of Pro-Rata Portion of JV Debt:</b>      | \$ M |                         |                             |                          |                       |                         | <b>(138.0)</b>    |
| Pro-Rata Portion of Other JV Liabilities:                | \$ M |                         |                             |                          |                       |                         | (10.5)            |
| (x) Pro-Rata Allocation Percentage:                      | %    |                         |                             |                          |                       |                         | 25.1%             |
| <b>Pro-Rata Portion of Other JV Liabilities:</b>         | \$ M |                         |                             |                          |                       |                         | <b>(2.6)</b>      |

**This same co-worker argues that this exercise is pointless because the Net Market Value of Equity Investments is \$180 million, which is only 10% different from the book value.**

### Is he correct?

- a. Yes – splitting out Assets and Liabilities like this adds very little because the book value of Equity Investments already reflects these components.
- b. Yes – there’s rarely a point in doing this unless interest rates have changed dramatically, or the entire real estate market has just experienced a correction.
- c. No – the difference is small in this case, but the book value of Unconsolidated Real Estate could be far different than its fair market value, even without a major market correction.
- d. No – in this case, the company’s Accumulated Depreciation on Unconsolidated Real Estate may be quite high, producing this result, but that doesn’t happen all the time.
- e. No – in this case, the company’s average ownership percentage may have changed significantly over time, producing this result, but that is not a common occurrence.

5. In your Unlevered DCF for AvalonBay, you have forecast the usual items (Revenue, Operating Expenses, Depreciation, the Change in Working Capital, and Capital Costs), but you have also assumed that the company continues to issue Debt and Equity indefinitely into the future, with Stock Issuances at approximately ~26% of its Capital Costs.

You have also taken the Present Value of these future issuances and the PV of their Terminal Value, divided the sum by the current share price, and added the total future shares to the current share count.

The setup is shown below:

| Free Cash Flow Projections:                  | Units: | Projected: |         |       |        |        |        |        |        |        |       |
|--|--------|------------|---------|-------|--------|--------|--------|--------|--------|--------|-------|
|  |        | FY18       | FY19    | FY20  | FY21   | FY22   | FY23   | FY24   | FY25   | FY26   | FY27  |
| Stock Issuances:                             | \$ M   | 364.2      | 209.1   | 260.5 | 256.9  | 251.7  | 241.5  | 231.3  | 218.5  | 211.4  | 217.7 |
| % Total Capital Costs:                       | %      | 31.5%      | 22.6%   | 27.2% | 26.2%  | 25.2%  | 25.7%  | 25.5%  | 25.3%  | 25.1%  | 25.1% |
| Growth Rate:                                 | %      | N/A        | (42.6%) | 24.6% | (1.4%) | (2.0%) | (4.1%) | (4.2%) | (5.5%) | (3.2%) | 3.0%  |
| Cost of Equity:                              | %      | 4.89%      | 4.89%   | 4.89% | 4.89%  | 4.89%  | 4.89%  | 4.89%  | 4.89%  | 4.89%  | 4.89% |
| Cost of Equity - Cumulative Discount Factor: | #      | 0.976      | 0.931   | 0.888 | 0.846  | 0.807  | 0.769  | 0.733  | 0.699  | 0.667  | 0.636 |
| PV of Future Stock Issuances:                | \$ M   | 355.6      | 194.7   | 231.2 | 217.4  | 203.1  | 185.8  | 169.6  | 152.8  | 140.9  | 138.4 |

|  |            |            |
|--|------------|------------|
| Cost of Equity:                            | %          | 4.89%      |
| Discount Rate (WACC):                      | %          | 4.61%      |
| PV of Future Stock Issuances:              | \$ M       | \$ 1,989.4 |
| PV of Terminal Value of Stock Issuances:   | \$ M       | 4,276.6    |
| Estimated # of Future Shares to Be Issued: | # Millions | 37.955     |
| Total Shares Outstanding:                  | # Millions | 176.350    |

**The Cost of Equity and WACC here have been calculated based on the standard methods.**

**What is the BIGGEST potential problem with the full approach described above?**

- a. These Stock Issuances should be discounted to Present Value based on WACC, not the Cost of Equity, since they relate to the company’s core-business operations.
  - b. This approach is not valid in an Unlevered DCF because “Unlevered” means “capital structure-neutral”; nothing in the analysis should depend on the company’s capital structure.
  - c. It does not make sense to divide (PV of Future Stock Issuances + PV of Their Terminal Value) by the current share price because that share price will change in the future.
  - d. We’re assuming that the Cost of Equity and WACC stay the same each year, but since the capital structure changes, these could easily change over time.
  - e. All of the above are equally serious potential problems.
- 6. This DCF for AvalonBay reflects the Base, Upside, and Downside cases used throughout the rest of the model, with differing assumptions for the Revenue Growth, Operating Expenses, and Capital Costs from Year 6 through Year 10 (Years 1 – 5 are linked to the 3-statement model, which already includes these scenarios).**

**These differing assumptions in Years 6 – 10, as well as the Terminal Value calculations, are shown below:**



| Free Cash Flow Projections:              | Units: | Projected: |            |            |            |            |            |            |            |            |            |
|--|--------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|  |        | FY18       | FY19       | FY20       | FY21       | FY22       | FY23       | FY24       | FY25       | FY26       | FY27       |
| <b>Revenue:</b>                          | \$ M   | \$ 2,286.9 | \$ 2,682.3 | \$ 2,536.6 | \$ 2,712.2 | \$ 2,883.0 | \$ 3,041.5 | \$ 3,193.6 | \$ 3,321.4 | \$ 3,437.6 | \$ 3,540.7 |
| Revenue Growth Rate:                     | %      | 5.9%       | 17.3%      | (5.4%)     | 6.9%       | 6.3%       | 5.5%       | 5.0%       | 4.0%       | 3.5%       | 3.0%       |
| Upside                                   | %      |            |            |            |            |            | 6.5%       | 5.5%       | 4.5%       | 4.0%       | 3.5%       |
| Base                                     | %      |            |            |            |            |            | 5.5%       | 5.0%       | 4.0%       | 3.5%       | 3.0%       |
| Downside                                 | %      |            |            |            |            |            | 5.0%       | 4.0%       | 3.5%       | 3.0%       | 2.5%       |
| (-) Normalized Operating Expenses:       | \$ M   | (1,365.4)  | (1,615.0)  | (1,533.0)  | (1,651.2)  | (1,768.2)  | (1,861.4)  | (1,957.7)  | (2,042.6)  | (2,114.1)  | (2,177.6)  |
| % Revenue:                               | %      | 59.7%      | 60.2%      | 60.4%      | 60.9%      | 61.3%      | 61.2%      | 61.3%      | 61.5%      | 61.5%      | 61.5%      |
| Upside                                   | %      |            |            |            |            |            | 61.3%      | 61.5%      | 61.7%      | 62.0%      | 62.0%      |
| Base                                     | %      |            |            |            |            |            | 61.2%      | 61.3%      | 61.5%      | 61.5%      | 61.5%      |
| Downside                                 | %      |            |            |            |            |            | 61.1%      | 61.2%      | 61.3%      | 61.4%      | 61.5%      |
| <b>Operating Income (EBIT):</b>          | \$ M   | 921.5      | 1,067.3    | 1,003.5    | 1,061.0    | 1,114.8    | 1,180.1    | 1,235.9    | 1,278.7    | 1,323.5    | 1,363.2    |
| Operating Margin:                        | %      | 40.3%      | 39.8%      | 39.6%      | 39.1%      | 38.7%      | 38.8%      | 38.7%      | 38.5%      | 38.5%      | 38.5%      |
| Growth Rate:                             | %      | 20.6%      | 15.8%      | (6.0%)     | 5.7%       | 5.1%       | 5.9%       | 4.7%       | 3.5%       | 3.5%       | 3.0%       |
| <b>Adjustments for Non-Cash Charges:</b> |        |            |            |            |            |            |            |            |            |            |            |
| (+) Depreciation:                        | \$ M   | 628.9      | 751.0      | 722.9      | 786.5      | 850.5      | 912.5      | 958.1      | 996.4      | 1,031.3    | 1,062.2    |
| % Revenue:                               | %      | 27.5%      | 28.0%      | 28.5%      | 29.0%      | 29.5%      | 30.0%      | 30.0%      | 30.0%      | 30.0%      | 30.0%      |
| (+/-) Change in Working Capital:         | \$ M   | (49.6)     | 44.9       | (12.8)     | 17.8       | 13.7       | 11.1       | 9.1        | 6.4        | 5.8        | 5.2        |
| % Change in Revenue:                     | %      | (38.7%)    | 11.4%      | 8.8%       | 10.2%      | 8.0%       | 7.0%       | 6.0%       | 5.0%       | 5.0%       | 5.0%       |
| % Revenue:                               | %      | (2.2%)     | 1.7%       | (0.5%)     | 0.7%       | 0.5%       | 0.4%       | 0.3%       | 0.2%       | 0.2%       | 0.1%       |
| (-) Recurring Maintenance CapEx:         | \$ M   | (77.5)     | (83.8)     | (89.0)     | (94.4)     | (99.8)     | (103.4)    | (108.6)    | (116.2)    | (120.3)    | (123.9)    |
| % Revenue:                               | %      | 3.4%       | 3.1%       | 3.5%       | 3.5%       | 3.5%       | 3.4%       | 3.4%       | 3.5%       | 3.5%       | 3.5%       |
| Upside                                   |        |            |            |            |            |            | 3.2%       | 3.2%       | 3.2%       | 3.2%       | 3.2%       |
| Base                                     |        |            |            |            |            |            | 3.4%       | 3.4%       | 3.5%       | 3.5%       | 3.5%       |
| Downside                                 |        |            |            |            |            |            | 3.6%       | 3.6%       | 3.7%       | 3.7%       | 3.7%       |
| (-) Acquisitions, Net of Cash Acquired:  | \$ M   | (150.0)    | (160.0)    | (170.0)    | (180.0)    | (190.0)    | (182.5)    | (159.7)    | (132.9)    | (103.1)    | (106.2)    |
| % Revenue:                               | %      | 6.6%       | 6.0%       | 6.7%       | 6.6%       | 6.6%       | 6.0%       | 5.0%       | 4.0%       | 3.0%       | 3.0%       |
| Upside                                   |        |            |            |            |            |            | 5.0%       | 4.0%       | 3.0%       | 3.0%       | 3.0%       |
| Base                                     |        |            |            |            |            |            | 6.0%       | 5.0%       | 4.0%       | 3.0%       | 3.0%       |
| Downside                                 |        |            |            |            |            |            | 7.0%       | 6.0%       | 5.0%       | 4.0%       | 3.0%       |
| (-) Developments & Redevelopments:       | \$ M   | (1,279.1)  | (1,043.1)  | (1,070.0)  | (1,085.0)  | (1,100.0)  | (1,064.5)  | (1,053.9)  | (1,029.6)  | (1,031.3)  | (1,062.2)  |
| % Revenue:                               | %      | 55.9%      | 38.9%      | 42.2%      | 40.0%      | 38.2%      | 35.0%      | 33.0%      | 31.0%      | 30.0%      | 30.0%      |
| Upside                                   |        |            |            |            |            |            | 38.0%      | 36.0%      | 34.0%      | 32.0%      | 32.0%      |
| Base                                     |        |            |            |            |            |            | 35.0%      | 33.0%      | 31.0%      | 30.0%      | 30.0%      |
| Downside                                 |        |            |            |            |            |            | 33.0%      | 30.0%      | 27.0%      | 25.0%      | 25.0%      |
| (-) Proceeds from Asset Dispositions:    | \$ M   | 350.0      | 360.0      | 370.0      | 380.0      | 390.0      | 410.6      | 415.2      | 415.2      | 412.5      | 424.9      |
| % Revenue:                               | %      | 15.3%      | 13.4%      | 14.6%      | 14.0%      | 13.5%      | 13.5%      | 13.0%      | 12.5%      | 12.0%      | 12.0%      |
| Upside                                   |        |            |            |            |            |            | 13.0%      | 12.0%      | 11.0%      | 11.0%      | 11.0%      |
| Base                                     |        |            |            |            |            |            | 13.5%      | 13.0%      | 12.5%      | 12.0%      | 12.0%      |
| Downside                                 |        |            |            |            |            |            | 13.5%      | 13.0%      | 12.0%      | 11.0%      | 10.0%      |
| <b>Unlevered Free Cash Flow:</b>         | \$ M   | \$ 343.4   | \$ 935.5   | \$ 753.8   | \$ 885.1   | \$ 978.2   | \$ 1,162.9 | \$ 1,295.1 | \$ 1,416.9 | \$ 1,517.3 | \$ 1,562.0 |
| Growth Rate:                             | %      | (7.2%)     | 172.4%     | (19.4%)    | 17.4%      | 10.5%      | 18.9%      | 11.4%      | 9.4%       | 7.1%       | 2.9%       |

**Terminal Value - Multiples Method:**

|   |                 |
|---|-----------------|
| Median Forward EV / EBITDA of Comps:        | 18.4 x          |
| Baseline Terminal EBITDA Multiple:          | 21.7 x          |
| Upside                                      | 24.4 x          |
| Base  | 21.7 x          |
| Downside                                    | 17.2 x          |
| Baseline Terminal Value:                    | \$ 52,640.8     |
| Implied Terminal FCF Growth Rate:           | 1.6%            |
| (+) PV of Terminal Value:                   | \$ 34,292.0     |
| (+) Sum of PV of Free Cash Flows:           | 8,372.7         |
| <b>Implied Enterprise Value:</b>            | <b>42,664.7</b> |
| <i>% of Implied EV from Terminal Value:</i> | <i>80.4%</i>    |
| (+) Cash & Cash-Equivalents:                | 201.9           |
| (+) Equity Investments & Non-Core Assets:   | 163.5           |
| (-) Total Debt:                             | (7,290.1)       |
| (-) Preferred Stock:                        | -               |
| (-) Noncontrolling Interests:               | -               |
| <b>Implied Equity Value:</b>                | <b>35,740.0</b> |

**Terminal Value - Perpetuity Growth Method:**

|   |                 |
|---|-----------------|
| Expected Long-Term GDP Growth:              | 2.5%            |
| Baseline Terminal FCF Growth Rate:          | 1.6%            |
| Upside                                      | 2.1%            |
| Base  | 1.6%            |
| Downside                                    | 0.6%            |
| Baseline Terminal Value:                    | \$ 52,640.8     |
| Implied Terminal EBITDA Multiple:           | 21.7 x          |
| (+) PV of Terminal Value:                   | \$ 34,292.0     |
| (+) Sum of PV of Free Cash Flows:           | 8,372.7         |
| <b>Implied Enterprise Value:</b>            | <b>42,664.7</b> |
| <i>% of Implied EV from Terminal Value:</i> | <i>80.4%</i>    |
| (+) Cash & Cash-Equivalents:                | 201.9           |
| (+) Equity Investments & Non-Core Assets:   | 163.5           |
| (-) Total Debt:                             | (7,290.1)       |
| (-) Preferred Stock:                        | -               |
| (-) Noncontrolling Interests:               | -               |
| <b>Implied Equity Value:</b>                | <b>35,740.0</b> |

**Do these operational and Terminal Value assumptions seem reasonable?**

- No – it does not make sense that Acquisition Spending and Asset Dispositions as percentages of revenue are lowest in the Upside Case, while Development/Redevelopment Spending is highest in the Upside Case.
- No – the company does not move close enough to “stabilization” by the end of the explicit forecast period since its Unlevered FCF Growth in the last 3 years is 9.4%, 7.1%, and 2.9% vs. Terminal FCF Growth of 1.6% in the Base Case.
- Yes – the growth rates and margins change appropriately, the Terminal Value assumptions seem in-line with the comparables and economic growth, and the company’s FCF growth stabilizes by the end of the explicit forecast period.
- Yes – revenue growth slows down by the end, margins stay in the same range, and the capital costs also decrease by the end.
- No – too much of the company’s Implied Enterprise Value comes from the PV of its Terminal Value (~80%); this should be 50% or less for the analysis to be meaningful.

**7. The Public Comps for AvalonBay, including the screening criteria, are shown below:**

**Comparable Companies - U.S.-Based Multifamily, Single-Family, and Student Housing REITs with Gross Real Estate Assets Above \$5 Billion**

(\$ USD in Millions Except Per Share and Per Unit Amounts in USD as Stated)

| Operating Statistics:                       |                    |                    |                          |                              |                                 |                   |                   |                   |                             |                   |                   |                         |                      |
|---|--------------------|--------------------|--------------------------|------------------------------|---------------------------------|-------------------|-------------------|-------------------|-----------------------------|-------------------|-------------------|-------------------------|----------------------|
| Company Name                                | Equity Value       | Enterprise Value   | Gross Real Estate Assets | Portfolio Yield (Hist. Cost) | Leverage (Debt to Total Assets) | LTM               | EBITDA            |                   | Funds from Operations (FFO) |                   |                   | Projected EBITDA Growth | Projected FFO Growth |
|   |                    |                    |                          |                              |                                 |                   | FY18              | FY19              | LTM                         | FY18              | FY19              |                         |                      |
| Equity Residential                          | \$ 23,131.7        | \$ 32,249.8        | \$ 26,026.9              | 6.8%                         | 44.9%                           | \$ 1,596.7        | \$ 1,634.4        | \$ 1,689.3        | \$ 1,204.9                  | \$ 1,238.2        | \$ 1,291.8        | 3.4%                    | 4.3%                 |
| Essex Property Trust, Inc.                  | 16,820.6           | 21,296.5           | 13,704.6                 | 7.7%                         | 46.1%                           | 915.4             | 1,018.5           | 1,062.2           | 812.1                       | 851.4             | 890.7             | 4.3%                    | 4.6%                 |
| Mid-America Apartment Communities, Inc.     | 10,732.6           | 15,124.3           | 13,292.0                 | 7.6%                         | 40.0%                           | 849.3             | 897.6             | 940.4             | 699.6                       | 712.3             | 755.5             | 4.8%                    | 6.1%                 |
| UDR, Inc.                                   | 10,591.6           | 13,506.3           | 10,177.2                 | 7.2%                         | 48.4%                           | 621.0             | 658.5             | 709.4             | 538.9                       | 574.2             | 615.6             | 7.7%                    | 7.2%                 |
| American Homes 4 Rent                       | 6,279.5            | 8,672.3            | 8,968.9                  | 6.6%                         | 30.0%                           | 491.3             | 544.3             | 616.9             | 260.5                       | 379.7             | 434.5             | 13.3%                   | 14.5%                |
| Apartment Investment and Management Company | 6,682.5            | 10,634.0           | 7,927.8                  | 7.5%                         | 69.6%                           | 596.0             | 600.2             | 614.9             | 384.2                       | 392.8             | 408.1             | 2.4%                    | 3.9%                 |
| Camden Property Trust                       | 7,991.9            | 9,946.4            | 7,667.7                  | 8.0%                         | 36.9%                           | 500.1             | 539.7             | 580.6             | 424.1                       | 460.0             | 491.5             | 7.6%                    | 6.8%                 |
| American Campus Communities, Inc.           | 5,131.1            | 7,741.2            | 7,159.8                  | 6.4%                         | 44.9%                           | 392.8             | 445.5             | 474.0             | 317.4                       | 331.5             | 355.7             | 6.4%                    | 7.3%                 |
| Sun Communities, Inc.                       | 7,616.2            | 10,558.5           | 6,882.9                  | 9.6%                         | 48.1%                           | 453.1             | 539.8             | 574.2             | 320.1                       | 384.9             | 425.4             | 6.4%                    | 10.5%                |
| Maximum                                     | \$ 23,131.7        | \$ 32,249.8        | \$ 26,026.9              | 9.6%                         | 69.6%                           | \$ 1,596.7        | \$ 1,634.4        | \$ 1,689.3        | \$ 1,204.9                  | \$ 1,238.2        | \$ 1,291.8        | 13.3%                   | 14.5%                |
| 75th Percentile                             | 10,732.6           | 15,124.3           | 13,292.0                 | 7.7%                         | 48.1%                           | 849.3             | 897.6             | 940.4             | 699.6                       | 712.3             | 755.5             | 7.6%                    | 7.3%                 |
| <b>Median</b>                               | <b>\$ 7,991.9</b>  | <b>\$ 10,634.0</b> | <b>\$ 8,968.9</b>        | <b>7.5%</b>                  | <b>44.9%</b>                    | <b>\$ 596.0</b>   | <b>\$ 600.2</b>   | <b>\$ 616.9</b>   | <b>\$ 424.1</b>             | <b>\$ 460.0</b>   | <b>\$ 491.5</b>   | <b>6.4%</b>             | <b>6.8%</b>          |
| 25th Percentile                             | 6,682.5            | 9,946.4            | 7,667.7                  | 6.8%                         | 40.0%                           | 491.3             | 539.8             | 580.6             | 320.1                       | 384.9             | 425               | 4.3%                    | 4.6%                 |
| Minimum                                     | 5,131.1            | 7,741.2            | 6,882.9                  | 6.4%                         | 30.0%                           | 392.8             | 445.5             | 474.0             | 260.5                       | 331.5             | 356               | 2.4%                    | 3.9%                 |
| <b>AvalonBay Communities, Inc.</b>          | <b>\$ 22,847.6</b> | <b>\$ 29,772.3</b> | <b>\$ 21,935.9</b>       | <b>7.3%</b>                  | <b>39.6%</b>                    | <b>\$ 1,348.2</b> | <b>\$ 1,550.4</b> | <b>\$ 1,818.3</b> | <b>\$ 1,167.2</b>           | <b>\$ 1,337.4</b> | <b>\$ 1,579.0</b> | <b>17.3%</b>            | <b>18.1%</b>         |

| Real Estate Portfolio Statistics:           |                    |                    |                          |                              |                                 |               |                            |                             |                        |                   |                   |  |
|---|--------------------|--------------------|--------------------------|------------------------------|---------------------------------|---------------|----------------------------|-----------------------------|------------------------|-------------------|-------------------|--|
| Company Name                                | Equity Value       | Enterprise Value   | Gross Real Estate Assets | Portfolio Yield (Hist. Cost) | Leverage (Debt to Total Assets) | # Units Owned | Average Physical Occupancy | Average Monthly Rent / Unit | Property Quality Grade | Develop. Pipeline | % Gross RE Assets | Primary Market(s)                          |
| Equity Residential                          | \$ 23,131.7        | \$ 32,249.8        | \$ 26,026.9              | 6.8%                         | 44.9%                           | 78,611        | 95.0%                      | \$ 2,619.1                  | A-                     | \$ 1,451.8        | 5.6%              | Northeast, West Coast, Mid-Atlantic        |
| Essex Property Trust, Inc.                  | 16,820.6           | 21,296.5           | 13,704.6                 | 7.7%                         | 46.1%                           | 60,239        | 96.0%                      | 1,873.5                     | B / B+                 | 1,309.0           | 9.6%              | West Coast                                 |
| Mid-America Apartment Communities, Inc.     | 10,732.6           | 15,124.3           | 13,292.0                 | 7.6%                         | 40.0%                           | 99,523        | 96.2%                      | 1,280.3                     | B+                     | 214.0             | 1.6%              | Sunbelt                                    |
| UDR, Inc.                                   | 10,591.6           | 13,506.3           | 10,177.2                 | 7.2%                         | 48.4%                           | 39,698        | 96.6%                      | 2,066.2                     | B+                     | 716.5             | 7.0%              | National                                   |
| American Homes 4 Rent                       | 6,279.5            | 8,672.3            | 8,968.9                  | 6.6%                         | 30.0%                           | 50,929        | 95.1%                      | 1,348.3                     | B                      | 300.0             | 3.3%              | Sunbelt Focus; National                    |
| Apartment Investment and Management Company | 6,682.5            | 10,634.0           | 7,927.8                  | 7.5%                         | 69.6%                           | 36,904        | N/A                        | 2,073.3                     | B / B+                 | 714.6             | 9.0%              | National                                   |
| Camden Property Trust                       | 7,991.9            | 9,946.4            | 7,667.7                  | 8.0%                         | 36.9%                           | 53,033        | 95.0%                      | 1,210.8                     | B                      | 1,369.0           | 17.9%             | National                                   |
| American Campus Communities, Inc.           | 5,131.1            | 7,741.2            | 7,159.8                  | 6.4%                         | 44.9%                           | 88,741        | 95.7%                      | 693.7                       | A- / B+                | 688.0             | 9.6%              | National                                   |
| Sun Communities, Inc.                       | 7,616.2            | 10,558.5           | 6,882.9                  | 9.6%                         | 48.1%                           | 121,892       | 95.8%                      | 507.4                       | N/A                    | 265.0             | 3.9%              | National; Midwest/Sunbelt Focus            |
| Maximum                                     | \$ 23,131.7        | \$ 32,249.8        | \$ 26,026.9              | 9.6%                         | 69.6%                           | 121,892       | 96.6%                      | \$ 2,619.1                  |                        | \$ 1,451.8        | 17.9%             |  |
| 75th Percentile                             | 10,732.6           | 15,124.3           | 13,292.0                 | 7.7%                         | 48.1%                           | 88,741        | 96.1%                      | 2,066.2                     |                        | 1,309.0           | 9.6%              |  |
| <b>Median</b>                               | <b>\$ 7,991.9</b>  | <b>\$ 10,634.0</b> | <b>\$ 8,968.9</b>        | <b>7.5%</b>                  | <b>44.9%</b>                    | <b>60,239</b> | <b>95.8%</b>               | <b>\$ 1,348.3</b>           |                        | <b>\$ 714.6</b>   | <b>7.0%</b>       |  |
| 25th Percentile                             | 6,682.5            | 9,946.4            | 7,667.7                  | 6.8%                         | 40.0%                           | 50,929        | 95.1%                      | 1,210.8                     |                        | 300.0             | 3.9%              |  |
| Minimum                                     | 5,131.1            | 7,741.2            | 6,882.9                  | 6.4%                         | 30.0%                           | 36,904        | 95.0%                      | 507.4                       |                        | 214.0             | 1.6%              |  |
| <b>AvalonBay Communities, Inc.</b>          | <b>\$ 22,847.6</b> | <b>\$ 29,772.3</b> | <b>\$ 21,935.9</b>       | <b>7.3%</b>                  | <b>39.6%</b>                    | <b>77,614</b> | <b>95.5%</b>               | <b>\$ 2,313.2</b>           | <b>A-</b>              | <b>\$ 2,979.0</b> | <b>13.6%</b>      | <b>Northeast, West Coast, Mid-Atlantic</b> |

| Valuation Statistics:                       |                    |                    |                          |                              |                                 |                           |               |               |                    |               |               |  |
|---|--------------------|--------------------|--------------------------|------------------------------|---------------------------------|---------------------------|---------------|---------------|--------------------|---------------|---------------|--|
| Company Name                                | Equity Value       | Enterprise Value   | Gross Real Estate Assets | Portfolio Yield (Hist. Cost) | Leverage (Debt to Total Assets) | Enterprise Value / EBITDA |               |               | Equity Value / FFO |               |               |  |
|   |                    |                    |                          |                              |                                 | LTM                       | FY18          | FY19          | LTM                | FY18          | FY19          |  |
| Equity Residential                          | \$ 23,131.7        | \$ 32,249.8        | \$ 26,026.9              | 6.8%                         | 44.9%                           | 20.2 x                    | 19.7 x        | 19.1 x        | 19.2 x             | 18.7 x        | 17.9 x        |  |
| Essex Property Trust, Inc.                  | 16,820.6           | 21,296.5           | 13,704.6                 | 7.7%                         | 46.1%                           | 23.3 x                    | 20.9 x        | 20.0 x        | 20.7 x             | 19.8 x        | 18.9 x        |  |
| Mid-America Apartment Communities, Inc.     | 10,732.6           | 15,124.3           | 13,292.0                 | 7.6%                         | 40.0%                           | 17.8 x                    | 16.8 x        | 16.1 x        | 15.3 x             | 15.1 x        | 14.2 x        |  |
| UDR, Inc.                                   | 10,591.6           | 13,506.3           | 10,177.2                 | 7.2%                         | 48.4%                           | 21.8 x                    | 20.5 x        | 19.0 x        | 19.7 x             | 18.4 x        | 17.2 x        |  |
| American Homes 4 Rent                       | 6,279.5            | 8,672.3            | 8,968.9                  | 6.6%                         | 30.0%                           | 17.7 x                    | 15.9 x        | 14.1 x        | 24.1 x             | 16.5 x        | 14.5 x        |  |
| Apartment Investment and Management Company | 6,682.5            | 10,634.0           | 7,927.8                  | 7.5%                         | 69.6%                           | 17.8 x                    | 17.7 x        | 17.3 x        | 17.4 x             | 17.0 x        | 16.4 x        |  |
| Camden Property Trust                       | 7,991.9            | 9,946.4            | 7,667.7                  | 8.0%                         | 36.9%                           | 19.9 x                    | 18.4 x        | 17.1 x        | 18.8 x             | 17.4 x        | 16.3 x        |  |
| American Campus Communities, Inc.           | 5,131.1            | 7,741.2            | 7,159.8                  | 6.4%                         | 44.9%                           | 19.7 x                    | 17.4 x        | 16.3 x        | 16.2 x             | 15.5 x        | 14.4 x        |  |
| Sun Communities, Inc.                       | 7,616.2            | 10,558.5           | 6,882.9                  | 9.6%                         | 48.1%                           | 23.3 x                    | 19.6 x        | 18.4 x        | 23.8 x             | 19.8 x        | 17.9 x        |  |
| Maximum                                     | \$ 23,131.7        | \$ 32,249.8        | \$ 26,026.9              | 9.6%                         | 69.6%                           | 23.3 x                    | 20.9 x        | 20.0 x        | 24.1 x             | 19.8 x        | 18.9 x        |  |
| 75th Percentile                             | 10,732.6           | 15,124.3           | 13,292.0                 | 7.7%                         | 48.1%                           | 21.8 x                    | 19.7 x        | 19.0 x        | 20.7 x             | 18.7 x        | 17.9 x        |  |
| <b>Median</b>                               | <b>\$ 7,991.9</b>  | <b>\$ 10,634.0</b> | <b>\$ 8,968.9</b>        | <b>7.5%</b>                  | <b>44.9%</b>                    | <b>19.9 x</b>             | <b>18.4 x</b> | <b>17.3 x</b> | <b>19.2 x</b>      | <b>17.4 x</b> | <b>16.4 x</b> |  |
| 25th Percentile                             | 6,682.5            | 9,946.4            | 7,667.7                  | 6.8%                         | 40.0%                           | 17.8 x                    | 17.4 x        | 16.3 x        | 17.4 x             | 16.5 x        | 14.5 x        |  |
| Minimum                                     | 5,131.1            | 7,741.2            | 6,882.9                  | 6.4%                         | 30.0%                           | 17.7 x                    | 15.9 x        | 14.1 x        | 15.3 x             | 15.1 x        | 14.2 x        |  |
| <b>AvalonBay Communities, Inc.</b>          | <b>\$ 22,847.6</b> | <b>\$ 29,772.3</b> | <b>\$ 21,935.9</b>       | <b>7.3%</b>                  | <b>39.6%</b>                    | <b>22.1 x</b>             | <b>19.2 x</b> | <b>16.4 x</b> | <b>19.6 x</b>      | <b>17.1 x</b> | <b>14.5 x</b> |  |

Which of the following observations is reasonable evidence that AvalonBay is currently undervalued, according to this set of comparable public companies?

- a. The company's FFO and EBITDA growth rates far exceed those of its peer companies, but its P / FFO and EV / EBITDA multiples are in-line.
- b. The company's average property quality grade is higher than the median of the peer companies, its leverage is lower, and it is bigger in terms of Gross RE Assets, EBITDA, and FFO, but its P / FFO and EV / EBITDA multiples are in-line with those of its peers.
- c. We can't draw this kind of conclusion because the company operates in different geographies than the other companies and is much more of a Developer, judging by its Development Pipeline as a % of Gross Real Estate Assets.
- d. It's not clear from this data that the company is undervalued; while its growth rates exceed those of the peer companies, its Portfolio Yield is lower, and it's operating in more expensive coastal markets.

**8. You have finished this valuation for AvalonBay, concluded that it is undervalued by 20-30%, and made a LONG recommendation for the company, with a target price in the \$190 – \$210 range (vs. a current share price of ~\$165).**

**Which of the following points does NOT belong in your stock pitch for this company?**

- a. The market misunderstands the company because rising interest rates will have a limited impact due to its high percentage of fixed-rate, long-term Debt; a decline in coastal multifamily rents also won't make a huge impact.
- b. The DCF and NAV point to a company that is 20-25% undervalued, and perhaps 10% overvalued in a Downside Case with a recession over the next few years.
- c. One potential catalyst is the acquisition of several smaller multifamily REITs that operate in different geographies – not announced but rumored.
- d. Risk factors include a recession in the next 1-2 years, Development pipeline underperformance, and declining NOI margins due to rising concessions in key markets.
- e. We could hedge the risks with put options at \$145 – \$150, stop-loss or stop-limit orders, or by shorting a broader multifamily or real estate ETF.