AvalonBay Communities: REIT Analysis and Valuation

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I. Executive Summary

AvalonBay is a highly successful REIT that owns high-end multifamily residential properties primarily in gateway markets. The company currently operates in six such markets: New England, New York, Mid-Atlantic, Pacific Northwest, North California, and South California. For thorough analysis from an investor’s perspective, the company was analyzed both qualitatively and quantitatively. The qualitative section of this report details the company’s operations and finances, as well as its current business environment and prospects. The quantitative section covers the REIT’s valuation and sensitivity analysis, with an analysis of what risks, threats, and success factors are specifically important for AvalonBay.

In the business environment analysis, significant stress is put on the competitive environment. Competition comes mainly in the form of private companies and public REITs – one of which, Equity Residential, is a very close comparable. Putting AvalonBay alongside its competitors provides a clear understanding of what the firm is currently doing well, and where it has room to improve. In terms of business environment, a large focus is on the evaluation of key markets, where I heavily relied on research by leading real estate companies including CBRE, JLL, and Colliers as well as research-oriented institutions and consultancies including the Urban Land Institute and Green Street Advisors. The analysis in this section was used as a basis for further quantitative forecasts and valuation.
A part of the quantitative analysis, the valuation chapter utilizes standard REIT valuation methodologies, as well as providing a primer on best practices in REIT valuation. First, a Funds from Operations-based valuation for stock price is considered, as is quite common in REIT valuation today. Next, the REIT is valued using its Net Asset Value, based on real estate asset valuation. REIT valuation differs from standard corporate valuation by relying on different measures of income (FFO as opposed to net income) and by valuing the company’s income-producing properties (finding the market value of real estate to calculate NAV, as opposed to Book Value or Enterprise Value). The process is done through 1-year (end of 2017) future value performance forecasts, as well as current value estimates based on a DCF up to the year 2025. The valuation process is repeated to find an expected company value by conducting a Monte-Carlo analysis of stock price in a baseline scenario as well as in a scenario that models a potential recession. Assumptions are critically examined, and a projected income statement, sensitivity analysis, as well as P90 confidence statistics are computed. To contextually evaluate the finding from this section, AvalonBay is often evaluated against competitors to identify the firm’s strengths and the potential for improvement. Lastly, drivers for both upwards and downward stock price movements are clearly listed and explored through scenario analysis. Assumptions, analysis, and methodology are supported by my interview with former AvalonBay CEO and Chairman Bryce Blair, and interviews with hedge fund REIT analyst Simon Stippig.

The last section of this paper takes an activist approach and explores a theoretical ‘Seven Market Scenario’ by evaluating a potential new market that would benefit AvalonBay through diversification and generation of further FFO growth. The purpose of such a strategy is to mitigate the threat of negative situations such as today’s: rent growth stagnation in just two markets dampening the firm’s anticipated performance. AvalonBay’s current market and customer profile are taken into
consideration and compared with a potential new market to determine portfolio strategy and specialization fit. The last part in this section weighs options for market entry through strategy suggestions and specific suggestions for comparable properties in target neighborhoods that could be acquisition targets. Entering a new market has vast potential for positive impact on the company’s long-term value by directly improving financial forecasts and growing NAV valuation. The best candidate for expansion is South Florida. Specifically recommended are certain neighborhoods in Miami, Coral Gables, Aventura, and Miami Beach, all within the Miami-Dade County. Suggestions are based on analysis of real estate fundamentals, demographics, and economic trends, as well as an interview with Miami multifamily developer David Braka and on-the-ground research in the area.

In the summary, AvalonBay Communities is given a ‘HOLD’ investment recommendation that reflects the company’s expected returns, company-specific risk, and overall upside/downside potential.
II. The Company

“REITs smell like real estate, look like bonds and walk like equity”
- Greg Whyte, Analyst, Morgan Stanley

Business Overview

AvalonBay Communities (NYSE: AVB) is a Real Estate Investment Trust (REIT) that buys, develops, renovates, and operates upscale multifamily apartments and houses in high-barrier-to-entry markets in the US. The company owns approximately 75,000 apartments across over 250 communities and has a market capitalization of around $25.5 billion. The company was formed in 1998 after a merger of Bay Communities and Avalon Properties. In 2017 it is the largest apartment REIT as measured by market capitalization, and one of the 5 largest REITs in the US overall. Being a REIT, AvalonBay is required to distribute at least 90% of its net taxable income as dividends and is limited in the ways it can make money – 75% of the company’s taxable income must come directly from real estate operation. It is also subject to the following requirements: 75% of its assets must lie in real estate, the company shall have at least 100 separate investors, and is required to adhere to a number of other rules. In relation to investment and sales timing, the safe harbor holding period for a property is minimum 2 years, with a limit of 10% Fair Market Value to dispositions in any given year. For AvalonBay, between 5% and 10% of the portfolio is ‘pruned’ in this way yearly. If all conditions are met, the REIT is taxed at the investor level instead of at the corporate level. Many equity REITs,

1 As of April 2017
2 Specifically, 75% of income must come from rents, interest on obligation secured by mortgages, gains from sale of certain assets, or income attributable to certain assets (Brueggeman, & Fisher, 2016)
3 (PwC, 2017)
4 ("Bryce Blair, AvalonBay Communities Former CEO & Chairman", 2017)
5 With the exception of Taxable REIT Subsidiaries (TRS); AvalonBay has paid between $305,000 and $9,368,000 in state/federal/local income taxes primarily due to activity from TRS between years 2014 and 2016
including AvalonBay, are vertically integrated and actively managed – their business extends from land acquisition to in-house tenant services. Due to high capital intensity, depreciation is a large and very significant item on the company income statements. GAAP financial reporting guidelines place this depreciation among expenses, so in order to better represent a company's profitability, as a result, Funds From Operations (FFO) is used. This account primarily adjusts for gains on sales and depreciation and is used as an industry-standard measure of REIT performance. It should also be noted that due to the significance of the depreciation item is, the payout ratio as a share of FFO is much less than 90% even while meeting or exceeding the 90% of taxable income requirement.

Generally, the payout represents around 60% to 70% of Funds From Operations for AvalonBay. This leaves a company with disciplined financial controls a significant positive cash inflow every year, in effect reducing the need for debt financing of projects. Due to the lack of corporate tax and very little depreciation expenditure, the ending FFO has a margin of approximately 55% to 60% of Gross Revenue Income.

The company operates in the following six markets: the New England area (Greater Boston, New Haven, CT), the area surrounding New York City and northern New Jersey, the Mid-Atlantic (Washington D.C. and Baltimore), the Pacific Northwest (around Seattle), the Northern California Bay Area, and Southern California (Los Angeles, Orange County, San Diego). The company operates its properties under three brands: AVA targets young professionals in their 20s and early 30s who want to live in a good location and in a more social setting, the Eaves brand offers high-quality apartments for a reasonable price often in a suburban setting, and the core Avalon brand, which can be both in an urban or suburban setting but will always have luxury features and a high-quality build. AvalonBay's
properties are generally of Class B+ and higher\textsuperscript{6}. Companywide, the average monthly rent is $2450, of which rents at AVA and Avalon communities are comparable and 15-20\% higher than rents at Eaves properties.

**Qualitative Analysis**

AVB is a market leader among multifamily REITs. The company directly competes with individuals selling or renting out single family properties, private and public developers, apartment building owners, and other residential REITs. Notable competitor REITs include Equity Residential (comparable size, market strategy, and target customer), Essex Property Trust (concentrated on the west coast), Apartment Investment and Management Company (a.k.a. Aimco, direct competitor in multiple markets). Private competing companies include National Development (based in New England), Northland Investment (nationwide; mostly in New England and the southern US), and dozens of smaller local competitors across various markets. This project does not focus on private developers, as they are less transparent and less comparable to AvalonBay than other REITs. Nevertheless, it should be noted that a handful of larger private companies does present competition to AvalonBay and experience similar economies of scale.

Being a large public REIT entails advantages with regards to financing: it allows for financing through a combination of cheap debt and equity. The access to capital markets, gives access to less expensive capital, creating an advantage over many private competitors. A disadvantage of being public is volatility in stock price that is often based on the vagaries of investor perception. With a low exposure to the market (beta coefficient) of approximately 0.50, this effect is less troubling for AVB

\textsuperscript{6} (Green Street Advisors, 2016)
due to its sophisticated ownership – over 99% of the company is held by insiders or large institutional investors.

AvalonBay is a leader in residential real estate and among the most valuable real estate companies in the US. AvalonBay’s market, multifamily residences, is relatively stable and predictable in comparison to other real estate types, which is also reflected in its properties’ lower cap rates\(^7\) [refer to Appendix A for detailed discussion of cap rates]. The quantity of for rental apartments demanded is a function of demographics (income levels, household formation, population growth), specific economic indicators (local unemployment, rent growth, home affordability), the financing environment, and the supply of new units in the market. In the last five to ten years, the number of rental apartments in the country has increased by approximately 2% yearly. Rents have grown at a rate of between 3.5% and 4.0% yearly, with stable occupancy levels. The growth is attributable to the steady recovery of gateway markets in combination with household formation numbers higher than the volume of deliveries to market.\(^8\)

Gateway markets are the most stable markets with highest rents and relatively limited space, and high barriers to entry, which comes in the form of difficulty of developing competing, comparable, apartments to market. Traditionally, New York City, Washington DC, Boston, Chicago, Los Angeles, and San Francisco have been in this category\(^9\). AvalonBay is well-positioned to benefit from yearly market rent increases by offering short lease terms of 1 year, as opposed to long-term leases that are more common among other asset classes. A secondary source of AvalonBay’s success has been the

\(^7\) (CBRE, 2017)  
\(^8\) See Exhibit 4  
\(^9\) (Axford, 2017)
nationwide decrease in home affordability, with homeownership at a 50-year low as of 2016\textsuperscript{10}. The decrease in affordability occurs despite the simultaneous increase in wages and lower unemployment rates – all factors that have positive effects on demand for AvalonBay’s product. Home prices have increased faster than rents have grown. Owing to these circumstances, AvalonBay has historically outperformed the S&P 500 index as well as other REITs and Real Estate indices. The company has managed to keep its market position by maintaining a very healthy balance sheet. This was achieved largely by rent increases, high profitable development and redevelopment of own communities, successful property swaps, and purchases, a notable one being the $16 billion takeover of Archstone together with Equity Residential, in 2013.

Due to the nature of its business as a high-end apartment developer and operator, AvalonBay (and its stock) is liable to be affected by long-term downturns of the business cycle. This is especially so if the market itself is slowing down, as opposed to just the real estate industry. AvalonBay’s low beta reflects low correlation to short-term market fluctuations. During the last recession, between years 2007 and 2010, AVB stock traded at a significant discount to its Net Asset Value (NAV) for an extended period of time\textsuperscript{11}. The company’s stock tracks the NAREIT index closely, and that index specifically was discounted between 10\% and 40\% in 2009 and 2010\textsuperscript{12}. This downward pressure on the stock price was likely exacerbated by the fact that during that recession real estate as a sector was particularly hard-hit.\textsuperscript{13} During the 2007 to 2012 period, the US REIT indices had an extremely high correlation. See Exhibit 2 for AVB stock performance as compared to indices. The Apartment REIT

\textsuperscript{10} (Gopal, 2017)  
\textsuperscript{11} (Schnure, 2017)  
\textsuperscript{12} ("Market Currents March 2017", 2017)  
\textsuperscript{13} (Bohjalian, n.d.)
subsector (shown in black) experienced both higher volatility and a stronger effect of recession than the S&P 500 (orange color). AvalonBay also benefits from the business cycle to some degree – it becomes easier to find undervalued acquisition targets after economic downturns. In the past, AvalonBay has been able to take advantage of such a situation in 2013 when it maintained a strong balance sheet through the crisis and was able to acquire 40% of Archstone’s 40,000 properties from what remained of Lehman Brothers. While the company’s survival in terms of solvency wasn’t clearly threatened during the recession, its stock price historically was strongly affected, dropping from $146.79 in January 2007, to $42.14 in March of 2009 – a drop of over 70%. This was in line with its comparable industry peers’ performance. In the foreseeable future, the market appears to be heading in a direction that is more positive for AvalonBay: incomes are increasing, the economy is nearing natural unemployment, rents growth is positive (although limited by high supply in some markets), consumer and business confidence are at a high. Household formation is a direct determinant of demand and is currently at attractively high levels.

Below: historic Household Formation (source: AVB presentation).
Young adults represent AvalonBay’s target customer, and household formation growth among that cohort, in particular, has been more than double that of all age groups\textsuperscript{14} (see Exhibit 4). Demographic trends are also favorable; young adults are delaying family formation\textsuperscript{15} (getting married, having children, see Exhibit 5) and simultaneously are experiencing higher earnings growth. Increases in interest rate in 2017 and beyond are expected to further decrease home affordability, which is already extremely low in AvalonBay’s markets as compared to the nationwide average\textsuperscript{16} (see Exhibit 3). The sole factor causing flattening rents in the foreseeable future is a temporary increase in supply of comparable high-end apartments in AvalonBay’s markets, causing rent growth to slow down but remain positive.

AvalonBay’s management team is led by Timothy Naughton, who has been with the company and its predecessors since 1989. He is the firm’s Director since 2005, CEO since 2012, and Chairman since 2013. He is also director of two other real estate companies, chairman of NAREIT, and past chairman of ULI multifamily council. He has completed education at Harvard Business School (MBA) and the University of Virginia (undergraduate). The company’s CFO is Kevin O’Shea, who has been with the company since 2003. Earlier he was in investment banking with UBS, and before that working as a real estate and banking lawyer. His education includes a J.D. from Southern Methodist University and an MBA from Harvard University. Matthew Birenbaum is also very important for the company, as the Chief Investment Officer. He founded multi-family development firm Abbey Road Property Group before joining AvalonBay in 2011. Many of the top managers in the company have

\textsuperscript{14} (Equity Residential, 2017)\textsuperscript{15} (AvalonBay Investor Teleconference Presentation (Q3 2016), 2016)\textsuperscript{16} (Equity Residential, 2017)
been with the firm for over 20 years, have extensive industry experience, and hold degrees from prestigious universities. A large part of the company's success so far can be attributed to upper management's industry expertise and long history with the company. Insiders own a small percentage of the company shares – approximately $94 million worth (less than 1%).

The company has an almost bulletproof balance sheet, efficient financial controls, a good credit rating, an underused revolving credit facility of $1.5 billion at a low interest rate, and the ability to generate strong free cash flow yearly. Cash from retained earnings is generally funneled towards future development, and thus AvalonBay relies on debt financing less than peer REITs. The company's debt-to-equity ratio is 0.69, while for competitors it is 0.88 (EQR), 0.90 (ESS), and 1.96 (AIV). As of year-end 2016, liabilities represented 43% of assets and equity around 57%. This ratio has been quite steady over the last 5 years, and over the same period the company has paid on average 2.63% interest on their liabilities. In terms of protection from interest rate increases, AvalonBay has entered into $1.2 billion of forward interest rate swap agreements to reduce the impact of interest rate increases on debt issued between 2016 and 2017. Out of the currently planned $4 billion in development activities, between $500 and $600 million was funded by own cash and cash from last quarter's operations, resulting in the low debt levels. This fund redeployment trend is an important contributor to AVB's success. In combination with the company's strong margins (56% FFO margin, 68% Net Operating margin), the ability to pay out dividends without burdening itself makes AvalonBay a safe long-term investment. The company is well positioned for continued dividend growth, and having much lower leverage than during the recession makes it unlikely there will be future liquidity issues.
**Market Trends**

AvalonBay’s portfolio is unevenly distributed among the 6 regions in which it operates. According to former AvalonBay CEO and Chairman Bryce Blair, markets chosen have high barriers to entry, certain supply constraints, and are sizeable enough that AvalonBay is able to build critical mass and make use of economies of scale. It is worthwhile to forecast performance of each region independently due to significant differences among regions in terms of rent growth, operating expense growth, occupancy, and demand/supply equilibriums. This is exactly the approach used for valuation and forecasting.

![Net Operating Income Chart](source: AVB 10-K)

Job growth has been relatively stable nationwide, and wage growth has also started improving in every market. The resultant personal income growth is therefore expected to be little under 1.5%.

For AvalonBay, the more worrying trend is an above-average wave of deliveries in 2017\(^7\).

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\(^7\) Deliveries (units delivered) is a measure of how many new properties are being brought to market
Two of AvalonBay’s more significant regions, New York (24% of NOI) and San Francisco (21% of NOI), have a particularly large volume of upcoming high-end apartment deliveries that are expected to compete with AvalonBay properties and cause a slowdown in rent growth due to overcapacity.\(^{18}\) In New York, deliveries are concentrated in the most walkable parts of the city, particularly Manhattan. CBRE predicts that in 2016 and 2017 completions will outnumber net absorption by up to 100,000 units yearly, nationwide, and this new capacity isn’t expected to be absorbed until 2018.

\[\text{U.S. \textbf{MULTIFAMILY OUTLOOK}}\]

The effect is most detrimental in Manhattan and San Francisco. In fact, the only region where deliveries have already peaked is New England, and even here there are enough apartments available that rent growth remains low. The regions with highest projected Established Community\(^{19}\) revenue

\(^{18}\) Overcapacity in the real estate market occurs when the volume of new properties coming to market is higher than household formation – there is an oversupply of apartments in this case, which will decrease occupancy and in turn put pressure on rents.

\(^{19}\) Established communities: communities that have long-term stabilized occupancy and aren’t held for sale or planned to be sold within a year; also referred to as Same Store Communities.
growth are the Pacific Northwest (4.0-6.0% growth) and Southern California (3.5-5.5% growth). The overall companywide same store-revenue growth is calculated to be in the neighborhood of 2% and 3% in 2017.

An increase in construction costs due to a shortage of skilled labor and an increase in Operating Expenses are also forecasted for 2017. As a result, the company-wide Same-Store FFO growth is expected to be relatively low, at little under 2%. An above-average share of the FFO growth this year will instead come from new development and redevelopment (see Exhibit 11). Development activity was at 4% of total enterprise value in Q4 2016, which is a record high\(^\text{20}\), and the new properties will be reflected in FFO as they start coming online this year, next year, and in 2019. Almost half of total development rights (46.1%) as of year-end 2016 were concentrated in New York City and surrounding area\(^\text{21}\), with another 15.9% in New England, and 15.1% in Northern California. Since both

\(^{20}\) This is partially due to the start of development of AVA Hollywood and 11 West 61st St. in New York, both very large projects.

\(^{21}\) This area includes Northern New Jersey, small part of New York state, and a small part of Connecticut, up to New Haven
New York and San Francisco (together 44.4% of existing property portfolio) are experiencing slowdowns in rental growth, this is a less than optimal geographic distribution of development. On a more positive note, it is likely that the supply in North California will peak in the middle of 2017, and that household incomes will continue to grow – as they have last year – at around 6% yearly.

If the trend continues, then the peak deliveries will pass by 2018 and rents will again grow at a faster pace despite perceived affordability issues. Some factors that could increase development of future (competing) properties in AvalonBay’s markets include decreasing construction costs, flattening or decreasing borrowing costs, and market inefficiencies leading to unusually attractive investment opportunities. Research into current market trends doesn’t indicate a probability for any one of these situations. Furthermore, the current oversupply of properties is itself a deterrent for investment in the near-term. It is noteworthy that AvalonBay started developing a unique new trophy asset in New York that is much more high-end (with rents of over $10,000) than any other Avalon property. At a $600 million expected capital cost the one high-rise building alone represents 20% of the $3 billion in development capital costs. This property, named 11 West 61st Street will stand near Central Park in Midtown Manhattan, and will probably not be branded using any of the 3 current brands. This property will most likely not compete with most of the upcoming supply, due to its higher rents and 2019 delivery date, by which time the oversupply will likely be lower. It is also unlikely to become a 4th ultra-premium brand. Instead, it is to be a singular opportunity for the company.

The bottom line is, that AvalonBay is a well-run company with a competitive edge and strong financials. However, it is likely to experience worsened performance in the coming years due to poor

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22 ("AvalonBay Communities (AVB) Q4 2016 Results - Earnings Call Transcript", 2017)
conditions in two of its particularly important markets. It is crucial that the sizeable development portfolio is brought to market and leased out without hiccups if AvalonBay is to maintain its FFO growth. In the last few years, FFO has increased for the most part as a result of development and acquisitions. This is as opposed to Established Community rental rate growth or property redevelopment. This is going to be doubly true in the next year as deliveries are increased and more pressure is put on rents. Specifically, in 2016 approximately 60% of FFO growth came from ‘New Investment’ – a percentage which in 2017 is expected to grow to around 75%. AvalonBay’s competitors in the high-end residential market are also expected to experience difficulties growing their bottom lines (refer to Exhibit 11).
III. Valuation

Preamble to REIT Valuation Practices

When evaluating a REIT, traditional metrics and methodology of stock valuation do not properly represent a company. Values of EPS, revenue growth, and P/E multiple are replaced by real-estate specific and REIT-specific counterparts. As mentioned in an earlier section, depreciation expense is simultaneously more important and less reflective of reality among real estate companies, than it is with other companies. Assuming they are properly maintained, real estate properties (in this case apartment buildings) are much more likely to appreciate than to lose value. The depreciation line item represents little more than a non-cash charge to the company. Consequently, Funds from Operations (FFO) and Net Operating Income (NOI) – both without depreciation – are used at a company level and at a micro level, respectively. FFO is a gauge of company-wide performance and the replacement of Net Income, while NOI focuses on income and expenses directly attributable to specific real estate assets. NOI also adjusts for interest expense and all other line items that happen at a company level as opposed to at a property level.

In short:

\[ FFO = \text{Net Income} + \text{Depreciation Expense} - \text{Gain (loss) on sale of Assets} \]

Unlike with stocks, traditional pricing models such as the dividend discount model are not used. The main reason is, that REITs often have bond-like properties in the sense that they pay out very predictable dividends mainly to satisfy the 90% payout rule. The dividend amount is often planned far ahead of time and generally a poor representation of the company’s financial well-being and value. Due to the relative youth of REITs, there are no clear ‘best practices’ concerning the
methodology that should be used for the valuation. One reason for this is issues with low quality, inconsistency, and lack of data. The fault here partially lies in complex corporate structure (dozens of joint ventures, partnerships, and subsidiaries) and differences between operating structures between REIT types\textsuperscript{23}. To adjust for the inconsistencies, analysts modify existing valuation approaches and come up with their own. As a result, seemingly every firm has a slightly different methodology, and sometimes a weighted combination of multiple methods is used. These are two prevalent frameworks for REIT valuation, which are usually adjusted and personalized:

A) FFO Multiple approach

This method is comparable to looking at a company’s P/E or EV/EBITDA multiple. The future (often 12-months ahead) FFO is forecasted and calculated using the equation on the previous page, after which an adjusted multiple is applied. The multiple is based on the valuation of comparable companies in the sub-sector or industry. One way of verifying that the chosen multiple is appropriate is by comparing its inverse (the FFO yield) to the market’s going capitalization rate [refer to Appendix A for a detailed discussion of cap rates]. These two numbers should be relatively similar. An investor’s total returns are a result of increasing FFO at a constant multiple, or an increasing multiple at an unchanging FFO. A higher Price/FFO multiple most likely represents the market’s expectation that the company’s FFO will grow in the future. Some analysts and some REITs further adjust the FFO calculation and use AFFO (adjusted FFO) or, as in the case of AvalonBay, Core FFO. Core FFO includes adjustments for joint venture gains, casualty/impairment losses, gains/losses associated with

\textsuperscript{23} (Bank of America ML, 2013)
extinguishing debt, business interruption, proceeds from insurance/settlements, and several other
items that generally have little impact.

B) NAV approach

Net Asset Value (NAV) in REITs is calculated similarly to how it would be in a mutual fund or ETF, but the process adjusted to real estate property using a cap rate, and is highly customized by individual firms.

\[
NAV = \frac{(assets - liabilities)}{number \ of \ outstanding \ shares}
\]

The method attempts to find the company’s theoretical liquidation value, based on the value of the underlying real estate. For this purpose, knowing the company’s properties’ average cap rate is instrumental [refer to Appendix A for detailed discussion of cap rates]. An income producing real estate property’s NOI is divided by its cap rate to find the value of the building. NOI for this purpose is calculated by AvalonBay as such:

\[
\begin{align*}
\text{Effective Gross Income} & \quad - \quad \text{Total Operating Expenses} \\
\text{+ Indirect Operating Expenses, net corporate income} & \quad - \quad \text{NOI from real estate assets sold or held for sale} \\
= \text{Net Operating Income} &
\end{align*}
\]

When the Market Value of Assets is determined, the other income streams for the company are valued and summed. If the present value of the company is being calculated based on forecasted FFO, a
discount rate is applied to this value. Next, the company’s remaining assets are added and the liabilities are subtracted. In the case of AvalonBay, the calculation looks so:

\[
\frac{\text{Net Operating Income}}{\text{cap rate } A} + \frac{\text{3rd Party Income}}{\text{cap rate } B} + \text{Cash and equivalents} + \text{Other Assets} + \text{Land} + \text{Construction} + \text{Real Estate held for Sale} = \text{Gross Assets} - \text{Gross Liabilities} = \text{Net Asset Value}
\]

The resulting value is then divided by the number of shares outstanding to retain the per-share NAV of the stock. Very often, shares of a REIT will trade at either a premium or discount to their Net Asset Value. This effect can be quite significant (see Exhibit 6), but over a long period of time the positive and negative deviations cancel each other out\(^{24}\). Some variation between NAV and stock price is attributable to investor sentiment, but the observed difference is usually disproportionately great. At the time of its valuation, AvalonBay was valued by the market slightly below its NAV.

**Projected Performance**

In this valuation, I use the NAV approach for the bulk of the valuation, by applying a cap rate to the last year’s NOI and obtaining a terminal value. This process is more likely to yield a

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\(^{24}\) Examining historical trends of the Price/NAV ratio, there is a strong mean-reversal effect resulting in an alpha of between 0.9% and 1.8% monthly if shorting REITs that trade above NAV and buying REITs that lay below NAV, as quantified by Gentry et al. of Williams College and Columbia University (Gentry, Jones, & Mayer, 2017)
representative long-term valuation since it is easier to obtain accurate estimates for cap rates than it is to find accurate comparable future cash flow multiples. Basing the target stock price on the market value of the REIT’s real estate assets, which in turn is based on profitability, is the most accurate approach to determining the company value, even despite fluctuations in the spread between NAV and stock price. While the NAV valuation methodology is more valuable, the following section includes an FFO multiple-based valuation for comparison. Both methods were calculated using year-end 2017 values, and also using a DCF approach based on year 2025 financials.

In my model, I forecast AvalonBay’s income statement up to the year 2025. I view the company as a long-term investment and quantify its ability to grow and maintain its performance over the coming 9 years. Alternatively, I have found the future value of the stock at the end of 2017 using the current multiples, to evaluate whether AvalonBay would be able to outperform the market this year.

Neither of the following valuations accounts for a potential recession or other extraordinary market events. These possibilities, as well as the effects of other variables, are explored and quantified in the Sensitivity Analysis section of the report.

A) 12-month Forecast [Future Value]

By the end of 2017, AVB stock is expected to be valued at $199.08 using the NAV-based model. This would represent a 12-month price appreciation of 12.5%, and a further 3.2% returns from dividends, for a total 15.7% 12-month return that is expected to outperform the market. This valuation is contingent on the NAV-stock price gap closing. This valuation is reached by using a cap rate of 4.7%, which is relatively conservative in regards to AVB’s markets and other analysts’ estimates but adequately reflects an environment of rising interest rates. The value also assumes a 3.7% growth in
NOI over the year – relatively low from a historic perspective. Same-store growth is expected to be limited in 2017 due to slowing rent growth in AVB’s biggest markets due to apartment oversupply. This is likely temporary, and same-store NOI will increase more significantly starting in 2018. The effect of NAV catching up to stock price is included in the valuation here.

Alternatively, if a 22.0x Price/FFO multiple is used to determine the price of the stock at the end of the year 2017, a price target of $189.42 is reached. This would represent a total return of 10.2%; 7.0% return from stock price appreciation, and a 3.2% return from dividends paid. The FFO yield implied here is 4.55%, which is lower than the calculated cap rate, but justified if seen as representative of future growth expectations. The 22.0x multiple is an increase from 21.4x at the end of 2016 and is closer to both industry average and to AVB’s average since 2010 of 24.4x. The FFO is expected to increase 4.21% during this 12-month period, which is in line with AvalonBay’s guidance.

B) Valuation to 2025 [Present Value]

The present value of the company’s stock was calculated using a discount rate of 6.5% - AvalonBay’s weighted average cost of capital of 6.7%, adjusted to current market conditions.25

In the base case scenario, AvalonBay’s Funds from Operations will see a 7.11% Compound Annual Growth Rate from 2017 to 2025. In effect, this will reduce the present value of the NAV/share stock price to $191.53 at a 4.7% cap rate, and to $187.35 if calculating the value using a Price/FFO multiple. It is important to note that this value is reached under the assumption that AVB’s FFO multiple will approach its long-term multiple of 24.4x – a Price/FFO of 22.5x was used, as compared to

25 (Stippig, 2017)
21.4x in 2016 and 23.5x in 2015. The discount rate, derived from the company’s WACC, can be lower than 6.5, as professional REIT valuation analysts would work in the range of 5.9 to 6.7% and 6.5% is at the higher end of that range.\textsuperscript{26} The valuation in that situation would increase slightly.

Cap rates for AvalonBay’s markets on the other hand also vary depending on source; between 4.2% and 5.0%. Based on current market conditions, those most familiar with the company assign a valuation cap rate between 4.5% and 5.25% for the long-term valuation. It will be a challenge for AvalonBay to continue growing at the current pace in a business-as-usual manner. Most growth comes from development and activity and purchases, as opposed to same-store income growth. In the last five years, AvalonBay has successfully integrated almost half of Archstone’s properties into its portfolio\textsuperscript{27}, and in that way significantly grew its portfolio in a way that would normally not be possible. If the opportunity arises, a similar deal could be very valuable to the company. Lastly, there is a possibility of AvalonBay merging with a different REIT, much like Avalon Properties once merged with Bay Communities, and increasing value in that way. Unlike the rest of the stock market and private equity market in the recent years, REIT merger levels have been very low. As of October, the total value of REIT mergers in 2016 in Canada and the US was little over $9 billion – the lowest since 2012 – until Regency Center merged with Equity One at year-end. That transaction alone raised the figure to $17 billion. All in all, REIT mergers and acquisitions will both continue to be low in 2017: around the levels of 2016 or below. On the other hand, it is more likely that REIT dispositions will rise this year, as they have in 2015 and 2016 (up to $57.2 billion and $52.2 billion,\textsuperscript{28}

\textsuperscript{26} (Stippig, 2017)
\textsuperscript{27} The company partnered with Equity Residential to buy the REIT from Lehman Brothers for $16 billion; 40% of the apartments went to AvalonBay.
\textsuperscript{28} (Estrella, 2017)
The next section discusses the assumptions and predictions used for valuation and for forecasting the income statement leading up to 2025.

Shown: Excerpt from financial forecasts to 2025 [See Exhibit 1 for full forecast]

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rental Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Established</td>
<td>$ 1,541,034</td>
<td>$ 1,596,000</td>
<td>$ 1,788,827</td>
<td>$ 1,909,594</td>
<td>$ 2,848,774</td>
</tr>
<tr>
<td>Non-established</td>
<td>$ 498,622</td>
<td>$ 535,490</td>
<td>$ 568,667</td>
<td>$ 603,910</td>
<td>$ 866,631</td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td>$ 2,045,255</td>
<td>$ 2,137,325</td>
<td>$ 2,363,947</td>
<td>$ 2,520,385</td>
<td>$ 3,725,577</td>
</tr>
<tr>
<td><strong>Operating Expenses</strong></td>
<td>$ 678,452</td>
<td>$ 722,592</td>
<td>$ 769,754</td>
<td>$ 820,150</td>
<td>$ 1,204,176</td>
</tr>
<tr>
<td><strong>NOI</strong></td>
<td>$ 1,410,807</td>
<td>$ 1,414,733</td>
<td>$ 1,664,193</td>
<td>$ 1,700,235</td>
<td>$ 2,521,401</td>
</tr>
<tr>
<td>Interest expense, net</td>
<td>$(187,510)</td>
<td>$(201,386)</td>
<td>$(216,288)</td>
<td>$(232,294)</td>
<td>$(356,503)</td>
</tr>
<tr>
<td>Depreciation expense</td>
<td>$(531,434)</td>
<td>$(531,799)</td>
<td>$(579,660)</td>
<td>$(626,033)</td>
<td>$(935,015)</td>
</tr>
<tr>
<td>Gain on sale of communities</td>
<td>$ 374,623</td>
<td>$ 203,607</td>
<td>$ 219,200</td>
<td>$ 234,793</td>
<td>$ 328,348</td>
</tr>
<tr>
<td><strong>NI attributable to common stockholders</strong></td>
<td>$ 1,034,002</td>
<td>$ 897,111</td>
<td>$ 1,030,246</td>
<td>$ 1,092,253</td>
<td>$ 1,567,201</td>
</tr>
<tr>
<td>Income per common share</td>
<td>$7.53</td>
<td>$6.50</td>
<td>$7.43</td>
<td>$7.84</td>
<td>$10.92</td>
</tr>
<tr>
<td>Dividends declared - common</td>
<td>$ 741,318</td>
<td>$ 784,764</td>
<td>$ 832,149</td>
<td>$ 882,394</td>
<td>$ 1,254,391</td>
</tr>
<tr>
<td>Per common share</td>
<td>$5.40</td>
<td>$5.68</td>
<td>$5.99</td>
<td>$6.32</td>
<td>$8.72</td>
</tr>
<tr>
<td>Funds from Operations (5)</td>
<td>$ 1,135,762</td>
<td>$ 1,183,535</td>
<td>$ 1,345,821</td>
<td>$ 1,435,490</td>
<td>$ 2,107,152</td>
</tr>
<tr>
<td>Per common share - diluted</td>
<td>$8.26</td>
<td>$8.57</td>
<td>$9.69</td>
<td>$10.28</td>
<td>$14.64</td>
</tr>
<tr>
<td><strong>Core FFO</strong></td>
<td>$ 1,125,341</td>
<td>$ 1,144,800</td>
<td>$ 1,307,086</td>
<td>$ 1,396,755</td>
<td>$ 2,068,417</td>
</tr>
<tr>
<td>Per common share - diluted</td>
<td>$8.19</td>
<td>$8.29</td>
<td>$9.41</td>
<td>$10.01</td>
<td>$14.37</td>
</tr>
</tbody>
</table>
## Underwriting Assumptions and Practices

### Income Statement

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>Divided into regions; 2016 value grown yearly by occupancy and rental rate growth, as well as dispositions and acquisitions</td>
</tr>
<tr>
<td>Revenue from non-Established communities</td>
<td>Forecasted on a company-wide basis, as done by AvalonBay – communities are added to a region when it is established; grown at the pace of new development activity</td>
</tr>
<tr>
<td>Operating Expenses</td>
<td>By regions; 2016 value modified by growth rate, and proportionately adjusted to dispositions and acquisitions – operating margins are calculated for each region separately based on historic values</td>
</tr>
<tr>
<td>Depreciation Expense</td>
<td>Calculated as a percentage of Real Estate Assets on a company level. The percentage is based on an average from last 8 years’ income statements, and comes to 2.37% of Real Estate assets yearly</td>
</tr>
<tr>
<td>Property Taxes and other operating expenses</td>
<td>Yearly increase based on historic trend, as proportional to FFO growth, maintaining historic margins – sensitivity analysis tests effect of a various increase from approx. -1% to 2%. Increases in tax rate on top of tax expense increases attributable to owning more properties brings the yearly increases to approx. 6% to 9%.</td>
</tr>
<tr>
<td>Loss/gain on extinguishment of debt</td>
<td>This value has been completely unpredictable and random, with no trend in the historic data. Average is near $0, so the account is disregarded for future.</td>
</tr>
<tr>
<td>General and Admin. expenses</td>
<td>Increased at average historic CAGR of 4.5%</td>
</tr>
<tr>
<td>Gain on sale of communities</td>
<td>This account is continued at historic trends, taking into account average gain margin on sales, trend of year-over-year increases in the last decade, and expected future property sale levels. Sensitivity analysis directly modified this account, as real estate disposition volumes changed. Gain on sale fluctuated significantly between years. My forecast is linear, since it is not possible accurately predict sale opportunities.</td>
</tr>
<tr>
<td>Gain on sale of unconsolidated entities holding previously depreciated real estate</td>
<td>This account has historically been correlated with gain on sale of communities, so here it is forecasted as 20% of the same year’s gain on sale of communities.</td>
</tr>
</tbody>
</table>

---

29 Refer to Exhibit 1 [company-wide Income Statement]
<table>
<thead>
<tr>
<th>Capital Expenditure</th>
<th>Cap ex has been linked to a year’s depreciation due to the strong correlation; in my forecasts, it is calculated as 11% of a given year’s depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third party (JV) income</td>
<td>Joint Venture income is forecasted up to 2019 to represent completions of specific identified Joint Venture projects, and after that time are increased at just 2%, due to a trend of decreased JV use. This account is significant for NAV valuation, and the relatively low growth rate pulls down NAV valuation, since it is lower than discount rate</td>
</tr>
<tr>
<td>Other small accounts</td>
<td>Unless significant, expenses and revenues that are smaller than 1% of revenue are averaged and increased/decreased at the 8-year trend. This category includes income taxes, expensed acquisition and development costs, casualty and impairment loss, investments and others</td>
</tr>
</tbody>
</table>

**Trends**

<table>
<thead>
<tr>
<th>Occupancy Growth Rate</th>
<th>Occupancy is adjusted in each region separately based on the market outlook as far ahead as it is available. After that, it is fixed between 95% and 96%, which is a strong target occupancy range for multifamily apartments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent Growth Rate</td>
<td>Based on Market Outlook for upcoming 2-4 years, then averages out below a long-term growth rate</td>
</tr>
<tr>
<td>Cap Rate[^30]</td>
<td>Entry cap rate for newly developed buildings is based on the yield of existing properties in that region (2016 NOI/real estate assets). Exit cap rates are fairly uniform across AVB markets, so assets are disposed of at the same cap in every region. Exit cap rate up to 2025 is projected to remain around 4.7%, a level supported by multiple sources of market research [CBRE/Green Street Advisors]. This cap rate is also used for future valuation in the NAV model, and effect of its variation (range of approx. 40 bps.) was tested by sensitivity analysis.</td>
</tr>
<tr>
<td>Volume of Additions</td>
<td>Divided by region; based on cost of projects currently in development, historic share-of-NOI percentage, and management’s outlook for each region.</td>
</tr>
<tr>
<td>Dispositions Volume</td>
<td>Divided by region; Dispositions for years up to 2025 equal approximately one third of acquisitions volume (between 24% and 48% depending on region), and varies depending on whether AVB management stated that they plan to expand their portfolio there or not. Markets which experience slowdown in rents have higher disposition volumes, in general.</td>
</tr>
<tr>
<td>Discount Rate</td>
<td>An adjusted WACC discount rate is used for up-to-2025 valuation. The company WACC is 6.69%, adjusted to 6.50% based on market conditions[^31]</td>
</tr>
</tbody>
</table>

[^30]: See Appendix A for more detailed discussion of cap rates
[^31]: (Stippig, 2017)
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Distribution and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Expenses Growth</td>
<td>Maximum Extreme Distribution; Likeliest 7% increase; scale 0.005</td>
</tr>
<tr>
<td>Rental Revenue Growth</td>
<td>Normal Distribution; mean 1; standard deviation 0.25 [multiplied by x% increase]</td>
</tr>
<tr>
<td>Change in Occupancy</td>
<td>Normal Distribution; mean 1; standard deviation 0.50 [multiplied by x% change]</td>
</tr>
<tr>
<td>Dispositions</td>
<td>Normal Distribution; mean 1; standard deviation 0.50 [multiplied by revenue lost due to sales; gain from sales] The standard deviation in larger here than in Acquisitions, since dispositions are significantly the smaller of the two, but have a large potential to increase – a reasonable scenario worth testing</td>
</tr>
<tr>
<td>Acquisitions</td>
<td>Normal Distribution; mean 1; standard deviation 0.20 [multiplied by revenue from additions]</td>
</tr>
<tr>
<td>Exit Cap Rate for valuation</td>
<td>Normal Distribution; Mean: 4.7%, Standard Deviation 0.2%. This value is correlated with the Recession variable (correlation 0.70); as a recession happens, cap rates in the market increase [90% values between 4.37% and 5.03%]</td>
</tr>
<tr>
<td>Recession</td>
<td>Maximum Extreme Distribution; Likeliest 2.0; Scale 2.0; This number determines the strength of the overall ‘recession effect’ and is then multiplied by each year’s individual chance of recession to create a trial with random ‘recession’ effects of varying strength spread through years 2017 to 2025. The mean effect of this is a 5.2% reduction in total revenues between 2017 and 2025 – under 90% certainty, revenues will be affected between -15.5% and +4.3%.</td>
</tr>
<tr>
<td>Crisis Timing [year x]</td>
<td>Maximum Extreme Distribution; Likeliest 0.3; Scale 0.3; This value is multiplied by the overall recession effect to find the % effect of the recession on revenue in that given year. This number is then applied to the year’s revenue from each region,</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>This was not included in the sensitivity analysis, since AVB covers their interest rate risk for several years in advance using interest rate futures.</td>
</tr>
</tbody>
</table>

32 See Exhibit 7 for visual representation of each sensitivity test
Comparables & Competition

<table>
<thead>
<tr>
<th>as of 04/2017</th>
<th>Ticker</th>
<th>Market Cap</th>
<th>Estimated Cap Rate</th>
<th>Estimated FFO Multiple</th>
<th>Region(s) of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essex Property Trust</td>
<td>ESS</td>
<td>$15.3 billion</td>
<td>4.7%</td>
<td>20.9x</td>
<td>Northern California, Southern California, Northwest</td>
</tr>
<tr>
<td>Equity Residential</td>
<td>EQR</td>
<td>$23.0 billion</td>
<td>5.0%</td>
<td>22.9x</td>
<td>New England, New York, California, Northwest, Mid-Atlantic</td>
</tr>
<tr>
<td>Apartment Investment Management Company (Aimco)</td>
<td>AIV</td>
<td>$7.0 billion</td>
<td>5.8%</td>
<td>21.0x</td>
<td>Northeast Sunbelt, Miami, Chicago, Coastal California, Mid-Atlantic</td>
</tr>
<tr>
<td>AvalonBay Communities</td>
<td>AVB</td>
<td>$25.3 billion</td>
<td>4.7%</td>
<td>22.2x</td>
<td>New England, New York, California, Northwest, Mid-Atlantic</td>
</tr>
</tbody>
</table>

A) Equity Residential [EQR]

Equity Residential has a very similar portfolio to AvalonBay, targeting the same demographics and same geographic markets. Apart from the last quarter, EQR's stock performance has been very highly correlated to AVB's mostly because they are similarly affected by the market trends. Although EQR has more long-term debt outstanding and less cash on hand, the two REITs both have strong balance sheets and very similar income statement margins. EQR owns around 77,000 apartment units and is AvalonBay's most direct comparable company. It has a $23 billion market cap and is expected to be valued at around a 23x FFO multiple.
EQR’s expects to add approximately $2 billion of newly developed properties to its portfolio between 2016 and 2017. After that, unless new projects are added to the pipeline, development drops off sharply with just $88 million worth of apartments to be completed in 2018. The firm is experiencing problems due to its Manhattan portfolio, with a guidance of -1.5% revenue growth for 2017. The property AvalonBay is developing in the area, 11 W 61st St (also referred to as Columbus Circle), is not due to be delivered until the end of 2019, by which time the temporary glut will hopefully no longer be an issue. Even then, it is unclear to what degree it would be affected by the new supply, being significantly more expensive. Competing deliveries in the city directly target the Equity Residential existing portfolio, which is purposefully all concentrated in high-walkability areas. The increased competition is motivating Equity Residential to plan $4 million in incentives and concessions for 2017. Also, as a result, the company management has decreased guidance 3 times in a span of three months, to a point where there is consensus among analysts that current guidance is likely to be overly conservative.

Other than inferior results in New York (that are partially caused by rents being significantly higher than those of the competition), EQR has similar performance expectations as AVB for each of the six regions the two firms operate in. In the last 13 months, EQR has underperformed AVB by over 23% despite historically being extremely closely correlated. (see Exhibit 16), due to the abovementioned portfolio concerns and decreasing guidance. The two REITs’ strategies in New York City have differed enough that one is affected by deliveries much more than the other. AvalonBay’s New York properties are less concentrated in Manhattan than those of Equity Residential, the latter of which explicitly optimizes its acquisitions by maximizing ‘walkability score’, resulting in apartment
buildings clustered around Midtown Manhattan. See Exhibit 8 for a map comparison of the two REITs’ property locations

B) Essex Property Trust [ESS]

This REIT is entirely focused on the US West Coast, where it targets the same customers as AVB in California and the Northwest. It is a smaller company, with a market cap of around $7 billion, but tends to outperform its competitors in FFO growth and investor returns. As of December 31st, 2016, the firm operated over 59,000 apartments. While its financials are not as strong as those of AVB, Essex is only somewhat more levered than Equity Residential, with better margins. Essex has a very optimistic FFO guidance, with a 3.8% increase in average rents and a 13.8% FFO per share growth — significantly higher than either of the larger REITs with properties in New York. Most of the increase in NOI is due to high rent growth in Northern California and Seattle — trends which AVB and EQR are also exploiting, to some degree. AvalonBay only has approximately 5% of its portfolio in the Seattle area, and the effect of this growth (as well as the expected slowdown) are both limited. Southern California, which represents a growing 20.1% share of the portfolio, is expected to continue to be a fantastic market for investors in the coming years. AvalonBay will be exposed to the growth via its large development projects in Hollywood.33

Essex’s performance is correlated to how well technology firms are doing by way of significant exposure in the Bay Area and Seattle. Specifically, jobs count at companies such as Apple, Google, Microsoft, Facebook, Amazon affect demand for high-end housing in San Francisco, Silicon Valley, and Seattle. If these firms do well, the increased income of their employees is reflected on Essex’s income

statements. This correlation alone is a contributor to the company’s particularly high NOI and rent growth in 2015. This exposure to the tech sector represents a lack of diversification and could prove to be detrimental. As of Q1 2017, a significant volume of deliveries is expected to come to market throughout the year and well into 2018 in Seattle.\textsuperscript{34} As a result, rental rates are not only slowing in growth but falling.\textsuperscript{35} Furthermore, rents in some of ESS’s markets have grown faster than incomes, which could lead to rent control measures being imposed\textsuperscript{36}. This is not a likely scenario, with the abundant new apartments coming to market and the continuing growth of payroll expense at jobs tech companies, namely Amazon. Simultaneously, there is a large volume of deliveries to market in 2017 in the San Francisco area. The new supply slows rental growth and pushes ESS to offer concessions.

Overall, since its IPO, ESS has had an annualized return of 18\%, making it the #1 of all REITs in total returns. It may struggle to keep this title if the situation in Seattle changes as predicted.

\textbf{C) Apartment Investment and Management [AIV]}

Apartment Investment and Management (Aimco) operates apartments in all of AvalonBay’s market’s as well as in the South and parts of the Mid-West. The company is an earlier stage of growth, with a $7 billion market capitalization, 38,000 apartment homes, and currently more diversified both by price and geographic location. Out of its competitors, Aimco has the highest SSNOI (Same Store NOI) guidance for 2017, at 4.25\%. Currently, the firm is strengthening its balance sheet, improving its margins by cutting unnecessary costs, and simplifying its portfolio – exercises that AVB, ESS, and EQR have all undergone. More importantly, it is working to reshape itself to be more similar to AvalonBay,

\textsuperscript{34} (Rosenberg, 2016)
\textsuperscript{35} (Rosenberg, 2016)
\textsuperscript{36} (Khouri, 2017)
Essex, and Equity Residential by putting more emphasis on developing high-end properties. In the last 3 years, the company has sold about a third of its real estate – most of which was underperforming. AIV competes with AvalonBay in Los Angeles, to a smaller degree elsewhere in California, and in Seattle. This firm, due to its growth, property type, and location focus increases in resemblance to AvalonBay.

**Sensitivity Analysis**

Two separate simulations were run for the sensitivity analysis: one that disregarded the external macroeconomic environment, focusing only on the company’s internal decisions and their effects, and a second scenario that modeled (mostly adverse) economic fluctuation through changes in revenues over the period of 2017 to 2025. For each variable’s individual effect on NAV-based stock price, see Exhibit 17.

A) **Scenario A: Internal Factors**

The following variables’ effect on AVB stock price were examined, over 50,000 trials:

- Growth in operating expenses
- Growth in rental rate
- Occupancy change
- Volume of Dispositions
- Volume of Acquisitions
- Property tax rate
- Cap Rate
The specific effect of each variable on the company’s stock price is shown in the following exhibit:

In both the FFO approach and NAV approach, the level of acquisitions accounted for about two thirds of variance. The two second most important factors in the FFO approach were dispositions and rental rate growth. For the NAV valuation, cap rate, dispositions, and rental rate were important.
The following charts show the distribution of valuations testing the abovementioned variables:

**NAV Method, PV of 2025 stock price:**

**FFO Method, PV of 2025 stock price:**
B) Scenario B: All Factors

To measure the effects of economic performance fluctuation, the scenarios examined how the strength of a potential recession would affect the stock price. A measure of recession was used in addition to the variables listed above. A recession in the model has an equal chance of taking place in any year between 2017 and 2025, will vary in strength, and the performance in one year does not affect the performance in other years. The probability distribution was defined such, that it was much more likely for a recession of little significance to take place.

For each variable’s individual effect on NAV-based stock price, see Exhibit 17. For a detailed analysis of each variable’s effect on variance in the scenario with a recession happening, see below:
The following graph depicts the effect of the Maximum-Extreme distribution used to quantify the recession impact, in terms of revenue decrease:
Using both approaches, the Recession accounted for most variability. Calculating value using the FFO method, acquisitions were the second most important factor. Cap rates (correlated with recession) and the volume of dispositions were also significant. Valuation using the NAV method showed different results. Cap rates had an effect almost as large as the crisis itself, and Acquisitions followed.

Under these conditions, there is between a 0.10% and 0.15% chance of having a year with Net Income under $0 in any one given year to 2025. Below are the distributions of stock price under the recession scenario, tested by 50,000 trials.

NAV Method, PV of 2025 stock price, with recession:
FFO Method, PV of 2025 stock price, with recession:

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Forecast values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trials</td>
<td>50,000</td>
</tr>
<tr>
<td>Base Case</td>
<td>$187.35</td>
</tr>
<tr>
<td>Mean</td>
<td>$158.02</td>
</tr>
<tr>
<td>Median</td>
<td>$153.11</td>
</tr>
<tr>
<td>Mode</td>
<td>---</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>$31.85</td>
</tr>
<tr>
<td>Variance</td>
<td>$1,014.20</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.2317</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>3.24</td>
</tr>
<tr>
<td>Coeff. of Variatio</td>
<td>0.2019</td>
</tr>
<tr>
<td>Minimum</td>
<td>$9.72</td>
</tr>
<tr>
<td>Maximum</td>
<td>$277.22</td>
</tr>
<tr>
<td>Mean Std. Error</td>
<td>$0.14</td>
</tr>
</tbody>
</table>

Success Factors

If AvalonBay is to continue growing in value, it is essential that the company be successful in a few chosen areas. The following conditions are most important to AvalonBay’s performance and should be closely watched by a potential investor, potentially warranting more close attention.

Firstly, their overall financial condition is an excellent asset to the company – both the value generating ability that’s reflected on its income statement by high margins and efficient cost control, and the balance sheet, which demonstrates ability to consistently expand the portfolio and operate under difficult economic circumstances. It is critical that this status quo doesn’t change for the worse. To maintain its current high-quality financials, the company needs to maintain its current responsible and diligent operating practices. To that end the company needs to maintain a high-quality management team, as is has for over two decades.37

37 ("Bryce Blair, AvalonBay Communities Former CEO & Chairman", 2017)
Actively managing vacancy rates and adapting oneself to the situations in San Francisco and Manhattan is a priority. By all appearances, the oversupply of properties in these two cities is a temporary state, and rent growth will increase again around H1 2018. In 2018, the number of new deliveries that compete with AvalonBay is significantly lower than in 2017, but Equity Residential will continue to suffer from oversupply and new deliveries in Midtown Manhattan. By minimizing the lost revenue alone, AVB will come out ahead of its competition, as it did with Equity Residential in New York. This can be done in the long-term by adapting its portfolio, often by diversifying communities into the transit-oriented suburban area, as it has done in the past. Most of AvalonBay’s properties in the New York City metro area are in fact well spread-out and clear of the Manhattan area, unlike those of Equity Residential (see Exhibit 8).

On the same note, AvalonBay can benefit from further reevaluation of its properties via comparison to competitors – all of AvalonBay’s competitors (apart from EQR) have a higher SSNOI guidance for 2017 despite operating in many overlapping regions. While AvalonBay’s strength may be in perpetuating the practices that made it successful in the past, there are benefits to diversifying away from an exclusively high-barrier, low cap-rate portfolio. To perpetuate its past success, it is necessary that AvalonBay occasionally readjusts its property portfolio in terms of positioning, and potentially positions itself to take advantage of emerging demographic or economic trends. Essex, for example, has been successful specifically by positioning itself correctly and has had a notably higher growth rate. Alternatively, AvalonBay’s lower SSNOI growth forecast is a result of more conservative estimates, which would result either in AVB overperformance or competitors’ underperformance. As

38 (Bagli, 2016)
39 (Equity Residential, 2017)
shown in the sensitivity analysis, the most significant factor for AvalonBay’s successful growth is the performance of the US economy and stock market. A decrease in wage growth, household income, household formation, or an increase in unemployment rate would all have a significant negative effect on AVB regardless of its financial strength.

**Threats and Risks**

As it has in the past, AvalonBay will undoubtedly face threats and possible opportunities both in the short term and in an undefined long-term future. This section outlines possible situations, both specific and general, that are likely to occur.

**Lack of investment opportunities**

Development and acquisition accounts for 60% to 70% of FFO growth, and with AvalonBay’s current business model, this activity is likely the only way to maintain a high FFO growth into the future. The recent level of FFO growth is priced in to continue for at least the next 3-4 years as new projects come online. Both share price and dividend growth will stop growing or slow down if it becomes overly challenging for AvalonBay to identify new potential acquisitions. According to management, this has not been a problem in the past, as AvalonBay has never controlled more than 10-15% of multifamily apartments in a given region. Due to compounding growth, nevertheless, this could turn out to be a threat to the company’s profit-generating potential. In future communication and earnings releases, look for size of future development portfolio, as a percentage of current assets. If there is a lack of investment opportunity, this account will be historically low, and planned communities will have low expected returns.
Development execution risk

AvalonBay currently has a record volume of development activity underway – $4 billion of projected capital cost, specifically. While the large portfolio of upcoming properties is encouraging for revenue forecasts (starting 2018 and 2019), it also presents AVB with a temporary execution risk – especially with the currently increased construction costs. While the company historically hasn’t had cases where development had disastrous consequences, delays in construction, redevelopment or leasing are not uncommon. At the scale of $4 billion in upcoming development, this leaves a lot of room for forecasting errors. Watch out for serious development delays and unexpected cost overruns, as they may be good indicators of future trends.

Low balance of land for future development

Due to the large construction starts, AvalonBay’s value of land held for development account is currently at a record low ($80 million vs. the average of approx. $300 million). In the next year or so there is, therefore, pressure on AvalonBay to identify new land for development opportunities, or it will face a long-term revenue growth slowdown several years in the future, around 2019 or 2020. The low balance of land is also due to current low cap rates, which result in high prices and limited availability of attractively-priced opportunities. If these conditions change, AvalonBay would be able to acquire new land with much more ease. Furthermore, at least two of AvalonBay’s markets are oversupplied with multifamily residential properties and the economy is at/around its peak in the business cycle; looking for cheap acquisitions is more challenging. If the land balance does not start growing again between the Q1 and Q3, this may foreshadow a disproportionate hit to FFO growth several years ahead. See Appendix 9 for historical data.
Loss of tax advantage and 1031 Exchanges

After the 2016 Presidential election, the REIT industry is facing new uncertainty from potential tax law changes. Some of the proposed changes would have direct effect on AvalonBay’s operations and would be reflected on the company’s income statements. It has been referred to by Tim Naughton (AvalonBay CEO and Chairman) as the “most serious efforts toward comprehensive tax reform in more than 30 years.” On one hand, the ‘Better Way for Tax Reform’ document released last year, which forms the basis for future tax reform, proposes reducing the maximum corporate tax rate from 35% to 20%, which would not affect AvalonBay as it doesn’t pay corporate taxes. On the other hand, the proposed changes hope to reduce the number of deductible and exceptions to taxation. Interest expense deductibility would be eliminated, which would have a huge impact on REITs. Elimination of interest expense would drastically reduce the value of commercial real estate, and in that way both hurt the REIT’s shareholders and undercut its lenders’ balance sheets, reducing their ability to lend money.

The repeal of 1031 exchanges would further worsen REITs’ profitability. Section 1031 of the Internal Revenue Code allows deferring the recognition of capital gains on exchanges of certain types of property, including non-simultaneous sale and purchase that happens within a year. AvalonBay aggressively takes advantage of any applicable tax benefits, and this is one of them. With proposed changes, investors pay capital gains and depreciation recapture. It is currently very unclear whether

40 (Naughton, 2017)
41 (Ryan, 2016)
42 (Thomas, 2016)
43 For example, if AvalonBay failed to qualify as a REIT in 2016, net income would have decreased by approximately $415,669,000
these tax changes will happen and certainly are not expected to be put into place until 2018, at the earliest. For now, in valuing REITs and real estate operating companies the stock market is pricing in a very low probability of this change going through.

**Increasing interest rates**

On top of the tax changes described above, interest rates are predicted to continue increasing over the next three years. In combination with the effects of repealing interest expense deduction, an increase in interest rates may affect REITs significantly. Even though AvalonBay borrows relatively little in comparison to other REITs, it would certainly be affected negatively. The trifecta of increase interest rates, repealing 1031 exchanges and the interest expense deduction would have a grave effect on all commercial real estate values, and assuming that lawmakers realize this, is unlikely to take place.

According to Jerry Ehlinger, managing director with Heitman REIT, historically interest rates and REIT stock price has been negatively correlated in the short run, as was best seen in 2013. On the bright side, rising interest rates are correlated with inflation and economic growth. A stronger economy, in general, is shown to be one the strongest determinant of AvalonBay’s performance by leading to increased wage growth, lower vacancy, and higher rent levels as demand increases. This offsets the higher financing costs – particularly for AvalonBay, with a premium product and relatively low reliance on debt financing.

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44 (Kenney, 2017)
Operating expenses and property taxes

Operating expenses for AvalonBay are very volatile and unpredictable even on a property level. Some of the determinants include costs related to: utilities, insurance, maintenance including snow removal, bad debt expense, management and other labor costs. For example; while fuel costs in New York City have decreased by over 40 percent between Q2 2015 and Q2 2016, the decrease was largely offset by increased costs of insurance, property taxes, and labor. Short-term future trends might include increased labor costs as the economy reaches natural unemployment as well as continued increases in property taxes (2.8% and 4.4% in 2015 and 2016, respectively). Long-term increases are correlated to inflation rates, but if they are higher, there will be a detrimental effect to margins. Also important for operating expenses is: average pay rate and unemployment, energy prices, and the amount of snow in a given year.

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45 (NYC Rent Guidelines Board, 2017)
IV. The ‘Seven Market’ Scenario

As was mentioned in the previous section, one of the ways in which AvalonBay can become a safer investment and potentially increase revenues is by increasing diversification. AvalonBay does quite well at hedging its bets and meeting needs by offering three separate brands – each targeted towards a slightly different type of customer – and by operating in both urban and suburban areas. Beyond that, the company divides approximately $35 billion of real estate among six markets, of which one is only about 5% of their portfolio. Having discussed the limitation of existing markets and lack of diversification, there are signs that this setup can present risk and uncertainty. The following section recommends a path for future growth that AvalonBay management can potentially choose to follow. The two regions affected by oversupply include over 45% of all established communities and over half of all projects in development. To avoid depressed company-wide performance or potential insufficiency of profitable development projects, AvalonBay has the option of entering a whole new market.

Market Profile

The market that would be the best candidate for AvalonBay’s expansion is the South Florida region Miami-Dade County. The county most notably encompasses Miami, South Beach, and Coral Gables – three areas which this section focuses on. This market has been actively considered by the management of AvalonBay as one of the top candidates for expansion\(^46\). Some of the defining features of an AVB target market is high rents, high barriers to entry, and a generally high cost of ownership

\(^{46}\) ("Bryce Blair, AvalonBay Communities Former CEO & Chairman", 2017)
leading to a low percentage of homeowners. Other factors include high household formation, relatively low completions, and favorable demographics. AvalonBay also only operates along the East Coast and West Coast, since these markets have physically limited space for development. These markets often have the lowest cap rates in the country. The scarcity of space presents an additional barrier for competition. Due to this, some inland markets such as Chicago, North Texas, or Minneapolis become less attractive alternatives. Today, AvalonBay is present in every one of the top 10 most expensive residential markets, apart from Miami – the county seat and largest city in the state47. See Exhibit 12 for comparison of home affordability.

One of the reasons that rent is so comparatively expensive in South Florida is that the area’s homeownership rate was disproportionately affected by the 2007 financial crisis and the inhabitants still haven’t fully recovered from it. It will likely take a decade for homeownership rates to return to where they were, which represents an opportunity in the long term. The following graph shows South Florida’s homeownership rate compared to that of the US since before the crisis; Exhibit 13 depicts the long-term trend in Florida.

47 (Woo, & Salviati, 2017)
The homeownership rate is low due to the unwillingness of lenders to give mortgages to tenants with below-average credit ratings. As of 2017, the homeownership rate in the Miami area has stopped falling and has stalled between 58% and 60% for the last two years. It is unclear when (whether) it will start increasing again, but there currently is no evidence that would suggest such a trend. Relating to home sales, there is a large number of people in this market who defaulted on their mortgages in 2007/2008 or have permanently damaged credit ratings for other reasons. This group of people is often not poor, but not wealthy enough to pay cash, and not fortunate enough to have a mortgage for an own home. By necessity, this individual will end up renting, which drives rental rates to levels at which it would usually be more convenient for a renter to simply get a mortgage and pay down his own home instead. AvalonBay has a number of metrics by which it evaluates its markets, 3 of the most important ones are depicted below:

(source: AVB Quarterly Investor Presentation)

48 (Ten-X, 2017)
49 (Lincoff, 2017)
Due to the widespread financing difficulties, single-family home sales haven’t been active enough to push house values as high as they were in 2007. Parts of South Florida nevertheless have some of the highest costs of ownership (median home price as multiple of median income). Per the Case-Shiller Index, Miami is comparable to other AVB markets (D.C., San Francisco) in terms of home (un)affordability. As a result, approximately 41% of people choose to rent instead of buy – in particular individuals who lost their homes between 2007 and 2009.

According to Cushman and Wakefield, household formation in this area is very high largely due to the young and stably growing population (6th fastest in the US); every year approximately 9100 new renters appear. In fact, the largest age group in the population is between 25 to 49 years old, with the largest single group being aged 24-29. Conveniently, that is AvalonBay’s target customer. As long as the loan/credit/financing situation doesn’t change in the region, people will be forced to rent and the market will stay strong for an extended period. Even if homeownership rates start recovering, which is unlikely given the nationwide trend, the region still fits the profile of an AvalonBay market. A sophisticated creditworthy investor such as AvalonBay will have no issue getting financing and can potentially take advantage of the growing property and rent values before the market recovers to its 2007 levels.

Along with rent and population growth, the economy experienced a 14% job growth and a 21% wage growth between 2010 and 2015, which puts it in the top 5 performers in the metric nationwide. While average income is growing fast, there is a huge problem in the area with income

50 Particularly Miami Beach and Miami
51 ("S&P CORELOGIC CASE-SHILLER MIAMI HOME PRICE NSA INDEX", 2017)
52 (Thorpe, & Di Sant’ Albano, 2016)
53 (Thorpe, & Di Sant’ Albano, 2016)
inequality. In fact, Miami’s Gini index suggests that the city is the absolute worst in terms of inequality. There is both a large number of working class adults, many of whom work in Miami’s busy port, as well as a large number of wealthy white-collar employees with high-paying employment in service jobs. The high-income jobs are also some of the fastest growing in the area, which directly affects demand for high-end housing. See Exhibit 15 for South Florida’s employment growth statistics, by subsector.

An important fact is that even though the area’s GDP growth is one of the top 3 in the country, real estate prices haven’t returned to where they were before the crisis, which suggests rents have enough room to grow in the coming years. After having grown about 8% yearly since the recession, rents are only now slowing down due to new deliveries. On average, rents are only expected to grow about 2.4% this year in Miami, but the figure doesn’t show the vast differences between rent growth in individual areas of the city and certainly isn’t representative of the entire Miami-Dade County. To illustrate this point, several areas there are still growing at over 6%, or even 10% yearly. In the short term, multifamily deliveries in South Florida are highly concentrated around Downtown Miami and Miami Beach, limiting rental growth and completely covering absorption. Completions remain at only 1.6% of stock – one of the lowest in the Top 15 markets. Rent levels are high and expected to keep growing after supply is fully absorbed. Much like with low affordability levels, Miami represents the only market with residential cap rates below 5% in which AvalonBay doesn’t already have communities. According to CBRE, the cap rate for multifamily real estate in Miami is between 4.0%

54 ("April 2017 Miami Rent Report", 2017)
and 4.5%. Cap rates in Miami Beach and Coral Gables are only marginally higher. Vacancy levels, on average, are also very low as of 2017 – around 4% – but are expected to increase marginally in the near future. Investment in the region has picked up in the last 5 years and has been increasing over that period. In 2016, the Miami metro area (the primary investment hub in the area) saw $5.2 billion in multifamily sales – up almost 160% in 2 years. This makes Miami the 5th most active market in the US – ahead of Los Angeles, even. It now also ranks as the 4th “best-perceived market for multifamily” in the 2017 PWC Emerging Trends in Real Estate report. While much of the incoming capital is from abroad, a good amount comes from REITs, too. There currently is no large multifamily REIT with significant operations in the area, with the most active being Bluerock Residential (BRG), a REIT investing mostly in multifamily around the Southern US with a market cap of approximately $280 million and ten properties in Florida with relatively low rental rates. Others include Monogram Residential (five properties), Aimco (five properties) and Camden Property Trust (eight properties, lower quality). None of the abovementioned has a comparable focus or target customer as AvalonBay, and hence none of these is an adequate potential takeover target.

In summary, some parts of South Florida fit AvalonBay’s investment profile extremely well. Miami, Miami Beach, and parts of Coral Gables have high rents, high barriers to entry, low cap rates, and a young population. Homeownership rates are declining, even though rents and incomes are growing fast – a trend that is expected to persist for several coming years due to the high cost of home ownership and financing difficulties. Even though absorption is temporarily lower than housing starts

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55 (CBRE, 2017)  
56 (Braka, 2017)  
57 (CBRE, 2017)
in some of the target areas (particularly downtown Miami and Miami Beach), home prices have not yet recovered from the crisis despite fast growth. Household formation trends are also very attractive – particularly in AvalonBay’s target demographic of young professionals aged 24-34. Certain parts of the area are relatively unexplored by multifamily investors, leading to very high rental growth and falling vacancy. Having completions at 1.6% of stock is more reflective of the nationwide trend in 2016 and 2017, not a situation unique to Miami itself. In fact, the percentage is lower than completions in most markets in the country. South Florida warrants serious consideration to be a new AvalonBay market due to a great market-product fit and overwhelmingly positive trends. The following map summarizes my recommendation for AvalonBay’s areas of focus. Areas shaded in red fit AvalonBay’s market profile best and should be focused on primarily, while areas marked in orange also have high potential, but are inferior in terms of fit:

(source: Google My Maps)
Evaluation and Approach

“Well, we try not to be complacent about strategy, and it’s something we revisit at least annually in terms of our market footprint, as well as the various growth platforms that we’re looking to lever in a particular year. But at this point, right now, I couldn’t say that there’s a lot of interest at this point pursuing those markets.” - Tim Naughton, AvalonBay CEO (2013)

AvalonBay has not entered a new market in well over 10 years, and the idea is not mentioned on earnings calls either, other than an offhanded comment dismissing the idea in Q4 2013. Nevertheless, if the company intends to maintain its FFO growth rate, it will eventually find it harder to do so while staying in its six traditional markets. Of the cities examined Miami is the most promising area to expand to, and the most promising in South Florida due to higher liquidity and more plentiful opportunities. Miami-Dade County has conditions fitting AvalonBay’s needs. Lending support to this conclusion is the conversation I had with Bryce Blair, AvalonBay’s CEO and Chairman until 2013. He confirmed that South Florida, namely Miami, has consistently been at or near the top of the list for potential future markets, but the expansion was put off to focus on other priorities.

There are several strategies the company could undertake when entering the market, as well as options related to target demographic and geography. The firm would benefit most by continuing to target the same customers it has historically, with whom they already have significant experience. According to Blair, the strategy that makes most sense for AvalonBay is to acquire a relatively small portfolio of 1000 to 3000 units in existing communities in varying parts of South Florida and rebrand them as either AVA, Eaves, or Avalon. More specifically, it would be prudent to start in a smaller area (e.g. South Beach and central Miami) to make more efficient use of marketing necessary for developing

58 (“AvalonBay Communities Discusses Q4 2013 Results - Earnings Call Transcript”, 2014)
brand recognition and reputation in the new market. In terms of investment property characteristics, financial viability is key. There is also an argument to be made for investing in properties that are higher quality at the expense of lower returns in order to establish a similar reputation for high quality that AvalonBay has in other markets.

For a company the size of AvalonBay, the biggest obstacle would be a critical mass requirement\(^{59}\). If the company decided to enter a seventh market, it would choose to do so by acquiring a minimum of 5 to 15 communities in the area.\(^ {60}\) Seeing that no public REIT active in Florida has more than 10 properties total across the entire state, this will likely be difficult without own development or redevelopment. One alternative scenario includes the acquisition of an existing private company or non-REIT apartment operator with a portfolio of high-end communities in the area. As aforementioned, the multifamily market in Miami is one of the top 5 in the country, with $5 billion in transactions yearly. Most of the $5 billion transactions are done by private equity firms and investment management firms (AEW, Blackstone, TIAA), as opposed to dedicated multifamily developers. A very significant portion of residential development and redevelopment consists of condominiums, as opposed to multifamily rental properties owned by a single entity. Seeing the recent explosion in development, however, it may be easier to find attractive investments due to higher supply. Lastly, the region’s transactions volume doesn’t seem as large considering that a significant market entry by AvalonBay with ‘critical mass’ would entail property purchases between $500 million and $1 billion – about 10% to 20% of Miami’s total 2016 volume.

\(^{59}\) ("Bryce Blair, AvalonBay Communities Former CEO & Chairman", 2017)
\(^{60}\) ("Bryce Blair, AvalonBay Communities Former CEO & Chairman", 2017)
At this point in the business cycle, a significant risk tied to the potential new market entry also relates to timing. By the time a strategy is developed and a series of transactions completed, there is significant likelihood that the US will be going through the most significant market downturn since 2008. On the flipside, a South Florida portfolio could help diversify AvalonBay’s portfolio in the event of stagnation in existing AvalonBay markets. Market timing is critical and will determine the success of potential expansion. My recommendation is to completely fund the $4 billion in development that is already planned, then start actively evaluating high-end properties around South Florida. By the time AvalonBay has enough cash to fund further expansion, the market may be in a recession. I believe a period during the recession would be excellent timing for entering the market through acquisitions of temporarily devalued properties.

**Specific Properties Identified**

The properties introduced are comparable to existing AvalonBay communities: high-end, low cap rate, Class B+ to A buildings in high barrier parts of Miami, Miami Beach, and Coral Gables. There are currently few suitable multifamily apartment buildings available, and none of the below are listed for sale. This suggests that if AvalonBay decided to enter the market, it would most likely choose to develop own properties or alternatively buy inferior buildings or land in prime locations for redevelopment. The following properties were identified either as potential candidates for acquisition, or as successful projects that set a standard for future multifamily development activities in Miami-Dade County.61


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V. Summary

An analysis of its financials makes it clear that the company is very well-run. AvalonBay’s debt ratio is under 0.4 and even the debt that the company has is at a relatively low interest rate. The company could finance its undertakings with a higher share of debt and even has an untapped $1.5 billion revolving credit facility available for contingencies. Having invested in forward interest rate swap agreements, the company is largely protected from increasing interest rates. Even if it didn’t have the variability protection, AvalonBay has an outstanding credit rating, allowing it to meet its financing needs with ease. Furthermore, the company has a very solid income statement, which is reflected in the degree to which the firm is able to self-fund new projects – a percentage that is uncommonly high for REITs. Even in the event of a very strong recession, the company is expected to maintain positive FFO and Net Income. The high margin and free cash are attributable in part to AvalonBay’s standing as a REIT – for the most part, exempt from income tax. Among multifamily REITs, AVB directly competes with Equity Residential [EQR], 2-3 other REITs that are local or have a significantly lower market cap, and a private real estate companies. Performance among these companies varies from year to year, with AvalonBay generally reporting performance average among its peers. In 2017, AvalonBay and (to a larger degree) Equity Residential are expected to underperform long-term expectations due to a high volume of competing deliveries in New York and San Francisco – very significant markets to both companies. Thus, expected FFO growth for AvalonBay will be low relative to its long-term trend.

Being a REIT, AvalonBay is more difficult to value due to a lack of consensus on valuation standards and many of the inputs to the valuation methods. Institutions and even individual analysts, seem to use different approaches and hence valuations can also differ materially. In this paper, the
valuation task was approached using two methods: the widespread FFO-multiple valuation approach, and the NAV-based approach that relies on cap rates. Taking a closer look at effects of a range of variables, a sensitivity analysis found the company’s expected stock price using two scenarios – in the absence of a recession, in the case of a recession. Each scenario was tested with 50,000 trials to improve statistical accuracy. The first scenario looked at the P90 confidence level to determine the likely range of stock price under ‘normal’ conditions. The second repeated the process by examining how the NAV and FFO valuations would behave in a simulated recession consisting of decreased rental revenue. The same P90 test and sensitivity analysis were used here. The result of using a Present Value-based valuation yielded a target stock price very close to what the company is being traded at today\textsuperscript{62}. This indicated that the company is close to being adequately priced, although slightly below Net Asset Value.

The qualitative market analysis found numerous advantages to entering a 7\textsuperscript{th} market that would fit in with AvalonBay’s investment profile. South Florida (specifically Miami and surrounding Miami-Dade County) was found to be the most promising market, meeting most of AvalonBay’s criteria. Despite compelling reasons in favor of entering this market, it is hard to quantify the specific effect such a decision would have on revenues, FFO, and ultimately stock price, since that would depend almost entirely on the pace of acquisitions, the combination of debt and equity used, on submarket choice, and timing. One downside to entering this market is the difficulty of establishing a presence, which is by definition true for all markets with high barriers to entry. No large multifamily REITs operate in this area, and due to the popularity of condominiums there is not an abundance of

\begin{footnotesize}\textsuperscript{62} AVB: $183.34 (as of March 31\textsuperscript{st}, 2017)\end{footnotesize}
whole apartment buildings for sale. AvalonBay would likely have to develop or redevelop their own properties. Such a project would be a challenge for other reasons: AvalonBay would want to establish a critical mass in the market before seriously starting operations there. In summary, the market is very attractive, but there would most likely need to be a change of circumstances or an unusual opportunity would need to come up for the expansion to become financially viable.

As the author of this report, I believe that AvalonBay is an excellent company and a safe investment. As of April 2017, the stock is adequately priced, and therefore gets a HOLD recommendation. In the coming year, just by operating in a business-as-usual manner with regular acquisitions, it is likely to match peer performance and possibly outperform the S&P index. Evaluating risk within AVB yields a very optimistic view of the future – there is relatively little that can go wrong. Even a significant oversupply in markets representing over 45% of the portfolio has had a limited effect on stock performance. Short of a market-wide downturn or exceptional environment change – political or regulatory – AvalonBay remains a well-run company that is likely to maintain its position as a leading multifamily apartment developer and manager.

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63 ("Bryce Blair, AvalonBay Communities Former CEO & Chairman", 2017)
Acknowledgments

This project would certainly be unrecognizable without the guidance of my primary advisor, Linda Stoller, her endless patience, and her unlimited availability as a mentor. My secondary and tertiary readers, Daniel Bergstresser and Edward Bayone, reliably and consistently gave me feedback of the highest quality – feedback upon which some of the paper’s most pivotal improvements were based.

I must also thank three persons that are not officially affiliated with this project but nevertheless provided invaluable input on it, giving me the skills and knowledge I needed to do my work. Completely voluntarily they would go above and beyond any call of duty to help: Mike McKay (Brandeis IBS), Simon Stippig (Clearance Capital), and Bryce Blair (formerly of AvalonBay Communities).

I would also like to show gratitude to Green Street Advisors, who generously provided me with exclusive material on REIT valuation and on AvalonBay, and David Braka who guided me through Miami’s multifamily real estate market. Lastly, I am immensely grateful to any other professors at Brandeis University who openly showed support for my project, notably Professors Debarshi Nandy, Hagit Weihs, Michael Harrity, and Shaw Lupton – I wish that the end product meets their high expectations.
Appendices and Exhibits

A) Appendix: The Real Estate approach to capitalization rates (cap rates)

A capitalization rate (or cap rate) is a real estate measure of first year yield by a property. Most commonly, this number is used for valuation of commercial real estate assets at acquisition or disposition. A basic formula is used to find the cap rate:

\[
cap \ rate = \frac{Initial \ Net \ Operating \ Income}{Asset \ Cost \ (or \ Market \ Value)}
\]

In the event of a transaction, the seller will want a low cap rate (higher sale price), whereas the buyer negotiates for a high cap rate (comparably high NOI and yield). Aside from its use in valuation, cap rates are useful for property comparison. The value will be approximately similar for comparable buildings or land and will be either higher or lower when a property is different. Cap rates represent the degree of risk to the property’s income stream and hence is affected by factors including location, tenant creditworthiness and lease term, property type and quality, and market volatility. A property’s cap rate can be estimated based on recent comparable transactions. Cap rates also vary throughout cycles, due to perceived risk, financing costs, and risk-free interest rates. Cap rates generally fit into the 5% to 10% range, with trophy assets and high-quality properties in the best markets being sold at cap rates as low as 3.0% during peaks (for example in 2007, 2016, 2017).

In REIT valuation cap rates are used to calculate the market value of assets, upon which the REIT’s NAV valuation is based.
<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue:</th>
<th>Per common share</th>
<th>Dividends declared - common</th>
<th>Non-established</th>
<th>Gain on sale of communities</th>
<th>Depreciation expense</th>
<th>Property tax expenses</th>
<th>Operating income</th>
<th>Gain on sale of communities</th>
<th>Core FFO attributable to common stockholders</th>
<th>Funds from Operations</th>
<th>Net income attributable to common stockholders</th>
<th>Net income attributable to common stockholders</th>
<th>Core FFO attributable to common stockholders</th>
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</thead>
<tbody>
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</tbody>
</table>
Exhibit 2: SP500 vs. NAREIT Equity Residential Index, years 2007 to 2012 [AVB shown in blue] (source: Bigcharts.com)

Exhibit 3: Affordability of Single-family housing in AVB Markets (source: EQR Market Research)
Exhibit 4: Household Formation of target age group in target markets (source: EQR Market Research)

Exhibit 5: Age at Major Lifestyle Decisions (source: AVB 2016Q3 presentation)
Exhibit 6: REIT Price vs NAV
Exhibit 7: Monte-Carlo simulation assumptions visualization, notes
Exhibit 8: New York and Surrounding area; EQR properties (top), AVB properties (bottom)
Exhibit 9: Seattle deliveries in recent years, close future (source: Seattle Times)

**NUMBER OF APARTMENT UNITS OPENED**

- 2018 projected peak: 12,543
- 2017: 9,893

Source: Dupre & Scott

**Where the apartments are going**

Most of the new apartments are slated for popular Seattle neighborhoods. Click on each area to see the number of new apartments set to open each year.

**SELECT A YEAR:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total 2016-2018</th>
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<tr>
<td>2017</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td></td>
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</tbody>
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Number of apartments opening up:

- More than 3000
- 2000-3000
- 1500-2000
- 1250-1500
- 1000-1250
- 750-1000
- 500-750
- 400-500
- 300-400
- 200-300
- 100-200
- 0-100

NOTE: Data not provided for all neighborhoods
Source: Dupre & Scott

EMILY M. ENG / THE SEATTLE TIMES
Appendix 10: AvalonBay Land Inventory (source: AVB Investor Presentation)

![Land Inventory at Lowest Level in Over a Decade](image)

Exhibit 11: Sources of FFO growth (source: AVB Investor Presentation)

![Components of Core FFO per Share Growth](image)
Exhibit 12: Miami affordability – rent as a percentage of income (source: CBRE)

Exhibit 13: Long-term Homeownership Rate, Florida (source: The Florida Legislature Office of Economic and Demographic Research)
Exhibit 14: Median Single Family home price, South Florida (source: Ten-X Market Report)

Exhibit 15: Employment growth, by subsector
Exhibit 16: AVB stock vs. EQR stock since 1/1/2016 (source: Bigcharts.com)
Exhibit 17: Effect on stock price of each variable, individually [NAV]

Acquisitions:

Cap Rates:
Dispositions:

![Dispositions Chart]

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<td>Mean Std. Error</td>
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Certainty: 50.00%

Occupyance:

![Occupyance Chart]

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Certainty: 50.00%
Operating Expense Growth:

Property Taxes:
Recession:

Rent Growth:
References


Green Street Advisors,. (2017). Apartments: What’s In Store for 2017 and Beyond?. Presentation, Online.


MIAMI - Full development pipeline to soften market fundamentals for Miami multifamily. (2017) (1st ed.).


NAREIT,. (2015). REITs: Real Estate with a Return Premium (1st ed.).


