frontier economics

THE REQUIRED RETURN FOR AGED CARE SERVICE PROVIDERS

REPORT PREPARED FOR AGED CARE ROYAL COMMISSION

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1 EXECUTIVE SUMMARY

1. Frontier Economics has been engaged by the Aged Care Royal Commission to:

   a. Estimate the weighted-average cost of capital (WACC) for the provision of accommodation in the residential aged care sector;

   b. Advise on how the WACC may vary under different reform scenarios; and

   c. Demonstrate how the WACC may be used as a component of a 'building block' model to determine an appropriate allowance for the return on capital and return of capital (depreciation) for providers of aged care accommodation services.

2. In this setting, the WACC is an estimate of a fair rate of return for the providers of investment capital, reflective of the risk borne by those investors. We have followed standard commercial and regulatory practice in estimating the WACC with reference to data from suitable comparator businesses. We note that there is no perfect set of comparator firms which provide only accommodation services in the residential aged care sector. For this reason, we have regard to two sets of comparators:

   a. Aged care providers – which provide accommodation, but also other services in the residential aged care sector; and

   b. Residential real estate investment trusts – which provide accommodation, but in sectors extending beyond residential aged care.

3. The WACC is computed as the aggregation of a number of parameters. We set out a set of current WACC parameter estimates and we explain how those parameter estimates would be re-estimated on an annual basis.

4. We also develop a 'building block' model that determines the total annual revenue that would be required to ensure that the accommodation provider is able to pay an appropriate return on, and of, capital to its investors each year. That is, investors will provide capital to fund the purchase or construction of a residential aged care facility. That capital will have to be repaid to the investors over time and the investors will require a rate of return on their capital investment where the WACC is an estimate of the rate of return that would be fair and reasonable given the risks involved. The building block model is a structured way of determining the total revenue that would be required each year for a residential aged care accommodation provider to cover its operating costs and depreciation, pay its taxes, and provide a fair return on capital to its investors.

5. Our building block model is based on similar models that are used in the regulated infrastructure sector to determine required revenues for businesses such as electricity and gas networks, water utilities, and some port, rail and telecommunication infrastructure.

6. These building block models are commonly used to determine price or revenue caps – the amount that each beneficiary of the service would have to pay each year to ensure that the service provider is able to cover its costs each year, including the provision of a fair return on capital.

7. We also consider how different reform scenarios might affect the required return on capital, and consequently the amount of any price or revenue cap or government subsidy, that might be applied to the provision of residential aged care accommodation services. Our general conclusions are that:

   a. There are a range of explicit and implicit subsidies that vary between types of provider and between different reform scenarios. For example, some entities are required to

pay less tax than others, some entities have shareholders who require lower rates of return than others, and some entities have financing structures that benefit more from implicit government subsidies than others. It is important to properly identify all subsidies and to analyse the incentive effects that are driven by these subsidies.

b. Some reform scenarios result in different degrees of competition being faced by residential aged care accommodation providers. The effect of increased competition is:

i. Reduced opportunity for providers to charge prices above the efficient cost – because such excess profits are less sustainable under higher levels of competition; and

ii. No obvious impact on WACC parameters or required returns. Whereas there are some conceptual arguments relating to the potential impact on WACC parameters of increased competition, such effects are notoriously difficult to document and impossible to reliably quantify. Rather than making what are inevitably arbitrary adjustments to WACC parameters, our preferred approach is to test whether changes are empirically warranted after the relevant reforms are enacted. For example, aged care accommodation providers may be able to adduce evidence that they are unable to raise debt finance to the extent assumed in our building block model. Or there may be evidence that actual borrowing costs (interest rates) are higher than the rates assumed in our building block model.

8. The final section of our report considers the Maximum Permissible Interest Rate (MPIR) for equating Refundable Accommodation Deposits (RADs) with equivalent Daily Accommodation Payments (DAPs). We conclude that the MPIR is set at an arbitrary level that does not properly equate RAD and DAP payments. If the policy intention is to economically equate the two payment methods from the perspective of the provider, the appropriate interest rate would be the provider's commercial borrowing rate.

2   THE WEIGHTED AVERAGE COST OF CAPITAL (WACC)

2.1   The standard CAPM/WACC framework

9.   When determining the reasonable efficient cost of providing residential aged care services, one important component is the cost of capital. The provision of residential aged care services requires the investment of substantial amounts of capital for the purchase or construction of a facility and for equipment. A commercial operator obtains this capital from investors, who require a return on those funds that is commensurate with the risk of their investment.

10.   There are broadly two types of investment capital:

    a.   **Debt capital**. Some investment capital will be provided in the form of debt. This includes bank and commercial loans and the issuance of bonds. Debt finance involves periodic interest payments and the return of the capital at the end of a fixed term. The cost of debt capital is transparent in the sense that interest payments are made in accordance with the terms of a contract with the lender.

    b.   **Equity capital**. Some investment capital will be provided in the form of equity. Equity holders take a residual ownership interest in the assets in the sense that obligations to debt holders must be paid before equity holders are entitled to payment. Unlike debt, there is no agreed set of payments to be made to equity holders – they have a residual claim. Equity holders invest because they expect to receive a return that is at least equal to the return they might receive from an investment of comparable risk. In this sense the cost of equity capital is an opportunity cost so cannot be observed directly but must be estimated using an economic model of the kind set out below.

11.   It is common in practice to compute the weighted-average cost of capital (**WACC**). This is a straightforward weighted average of the costs of debt and equity capital, weighted by the relative proportions of each:

$$WACC = \frac{E}{V} r_e + \frac{D}{V} r_d$$

where:

    a. r_e represents the cost of equity capital – the return that investors must expect to receive in order to commit equity capital to the firm;

    b. r_d represents the cost of debt capital – the return that investors must receive in order to lend debt capital to the firm;

    c. E/V represents the relative proportion of equity finance; and

    d. D/V represents the relative proportion of debt finance.

12.   Thus, if a firm had a total of $1,000 of capital invested and the WACC was estimated to be 7%, that firm would need to generate sufficient revenues to cover other expenses and to provide $70 to be used to pay as a return to its capital investors.

13.   In practice, the most common approach to estimating the required return on equity is the Capital Asset Pricing Model (**CAPM**):

$$r_e = r_f + \beta \times MRP$$

where:

    a. r_f represents the 'risk-free rate of return.' This is the return that is available to investors on an investment that is completely free of risk. Commonwealth government bonds are usually assumed to be such a risk-free investment;

    b. MRP represents the 'market risk premium,' which is the amount of extra return (over and above the return on a risk-free asset) that investors would require for investing in the average asset; and

    c. β represents the 'equity beta,' which indicates the extent to which the particular investment has more or less risk than average. For example, an equity beta of 1.2 indicates that the investment is 20% more risky than average, in which case it would require a risk premium that is 20% more than would be required for an investment of average risk.

14.   The approach set out above, whereby the WACC is estimated using the CAPM to estimate the required return on equity, is a standard approach that is well-accepted in practice. In particular, this approach is adopted by all of the economic regulatory agencies in Australia when setting allowed revenues for regulated infrastructure assets. The standard approach to infrastructure regulation is to estimate the WACC as set out above, and to then set allowed revenues such that the regulated firm is able to provide that WACC return to its capital investors.

15.   This approach requires the estimation of the parameters set out in **Table 1** below.

Table 1: Parameters to be estimated

PARAMETER	NOTATION
Risk-free rate	r_f
Market risk premium	MRP
Equity beta	β
Required return on debt	r_d
Gearing	D/V

Source: Standard CAPM WACC parameters

16.   In the remainder of this section, we turn to the estimation of each of these parameters in turn.

2.2   Market-wide and industry-specific parameters

17.   The WACC parameters set out above can be divided into market-wide and industry-specific parameters.

18.   The risk-free rate and market risk premium are market-wide comparators in the sense that they take the same value for all firms in the market – they do not vary across different industries.

19.   By contrast, the equity beta, gearing and return on debt parameters do vary across different industries. These industry-specific parameters essentially seek to capture the extent to which different risk profiles apply to different industries. For example, other things being equal, an industry with more risk would be characterised by a higher beta and would support relatively less gearing than an industry with less risk.

20.   It is important to note that it is possible for industry-specific parameters to vary over time as events occur to change the risk of operating in that industry. For example, if a protected industry is deregulated such that fixed prices are abandoned in favour of prices that vary according to market conditions, the level of risk may change with potential implications for the beta and gearing parameters.

21.   The usual procedure for estimating industry-specific parameters is to first assemble a sample of 'comparator' businesses that have similar risk characteristics to that of the firm (or activity) for which we seek to estimate a WACC. The relevant parameters (e.g., beta, gearing, etc.) are estimated for each of these comparator firms and then the estimates are combined across all comparators (e.g., by averaging) to derive a point estimate of the parameter for the firm (or activity) of interest.

22.   The remainder of this section sets out an approach for using the currently available data to estimate the WACC for the set of comparator firms. The resulting WACC should therefore be interpreted as the cost of capital for a generic provider of residential aged care accommodation services that reflects the current regulatory and policy arrangements for that service. In later sections of this report, we consider potential changes to the current regulatory arrangements and we discuss how those changes are likely to affect the risk of providing residential aged care services and the consequential effect on WACC parameter estimates.

2.3   Risk-free rate

23.   The risk-free rate represents the rate of return that is available on an investment that involves no risk. In practice, it is standard to use Commonwealth government bonds as a proxy for a risk-free asset given that there is a negligible chance of the Commonwealth government defaulting on its bond obligations.

24.   It is standard practice to take the yield on 10-year government bonds as the estimate of the risk-free rate of interest. A 10-year term is used because the WACC is usually used to assess long-term capital investments and the longest term for which there is consistent and reliable data is 10 years.

25.   Because there can be some day-to-day volatility in government bond yields, it is common to take an average over a period of 20-40 days when estimating the risk-free rate. This reduces the probability of adopting an estimate that is affected by a short-term order imbalance or lack of liquidity in the government bond market.

26.   In summary, the best practice approach to estimating the risk-free rate is to take a 20-40 day average of the yield on 10-year Commonwealth government bonds measured as close as possible to the valuation date.

2.4   Market risk premium

The role of the market risk premium

27.   The market risk premium (**MRP**) represents the additional return, over and above the risk-free rate, that investors require in order to commit equity capital to an investment of average risk. Within the context of the CAPM, the MRP is defined to be the difference between the expected return on the market portfolio and the risk-free rate:

$$MRP = E[r_m] - r_f$$

28.   In this context, $E[r_m]$ represents the expected return on the 'market portfolio' which is taken to be a very broadly diversified portfolio of assets. This plays the role of an asset of average risk as the diversified portfolio contains assets of all different risk levels.

29. It is standard practice to use a broad stock market index as a proxy for the market portfolio. In the Australian context, the All Ordinaries or ASX 200 stock market indices are usually used.

30. Consequently, when estimating the MRP, we are seeking an estimate of the expected return on a broad stock market index over and above the return that could be obtained on 10-year government bonds.

Approaches to estimating the market risk premium

31. In practice, there are four approaches that are used to estimate the MRP. Those approaches are described in turn below.

Ibbotson / historical excess returns approach

32. The Ibbotson (or historical excess returns) approach requires historical data on stock returns and government bond yields over a period of 50 or more years. For each year, the market return is computed as the return on a broad stock market index. From this, we subtract the yield on government bonds that was available at the beginning of the year. The difference is known as the 'excess return' – the additional return that an investor would have obtained that year, over and above what could have been obtained from a risk-free investment. The mean excess return over a long period is used as an estimate of the average MRP over that period.

33. Mathematically, the Ibbotson estimate is constructed as follows:

$$MRP_{Ibbotson} = \frac{1}{N} \sum_{t=1}^{N} (r_{m,t} - r_{f,t}).$$

34. Because excess returns are volatile from year to year, a long historical period of 50 or more years is required to obtain statistically reliable estimates.

35. It is important to note that, by construction, the Ibbotson approach produces an estimate of the MRP that reflects the average market conditions over the historical period used to construct the estimate. Consequently, use of this approach assumes that the prevailing market conditions are in line with the historical average market conditions.

Wright / historical real returns approach

36. The Wright (or historical real returns) approach requires the same historical stock return data. For each year, we take the observed return on the broad stock market and remove the effect of observed inflation over the course of that year to provide an estimate of the real return for that year. The mean of that series is adopted as an estimate of the average real return on equity. That figure is then converted back to a nominal figure using a current forecast of inflation. The current risk-free rate is then deducted to obtain an estimate of the MRP.

37. Mathematically, the Wright estimate is constructed as follows:

    a. Compute real return for each historical year:

$$r_{m,t}^{real} = \frac{1 + r_{m,t}^{nominal}}{1 + inflation_t} - 1$$

    b. Compute average real return:

$$\overline{r_m^{real}} = \frac{1}{N} \sum_{t=1}^{N} r_{m,t}^{real}.$$

    c. Add back current expected inflation:

$$E[r_m] = \left(1 + \overline{r_m^{real}}\right)(1 + E[inflation]) - 1.$$

    d. Subtract current risk-free rate:

$$MRP_{Wright} = E[r_m] - r_f.$$

38. The Wright approach assumes that investors require a constant real return on equity – that the same real return is required in all market conditions.

Dividend growth models

39. The dividend growth model (DGM) approach estimates the required return that is implied from current dividend forecasts and current stock prices. Specifically, this approach estimates the required return on the market to equate the current price of a broad stock market index with the present value of the future dividends that an investor who holds that market portfolio would expect to receive.

40. Mathematically, the approach is to solve the following equation for the return on the market:

$$P_0 = \frac{d_1}{(1 + r_m)^1} + \frac{d_2}{(1 + r_m)^2} + \frac{d_3}{(1 + r_m)^3} + \cdots$$

where:

    a. P_0 is the current level of a broad stock market index; and

    b. d_i represents forecast dividends, typically obtained as consensus forecasts from equity research analysts. These forecasts are available for two or three years, after which it is common to assume that dividends grow at the rate of the broad economy.

41. Having obtained an estimate of the required return on the market, the contemporaneous risk-free rate is subtracted to produce an estimate of the MRP.

42. This method produces a contemporaneous forward-looking estimate of the MRP that does not require any historical data.

Survey responses

43. The final approach for estimating the MRP is based on responses to surveys about future risk premiums that might be observed in the market.

44. In our view, these estimates are wholly unreliable and should receive no weight because:

    a. The sample sizes tend to be very small;

    b. Respondents tend to have little expertise or practical experience, or the survey does not report the level of expertise or experience of the respondents; and

    c. The questions posed tend to be vague and unclear.

The need for internally consistent estimates

45. The final MRP estimate will be used in the CAPM to produce an estimate of the required return on equity. It is important that the various CAPM parameters are estimated in an internally consistent manner. For example, if the risk-free rate is estimated as the contemporaneous yield on government bonds, which properly reflects the prevailing conditions in the market, it is important that the MRP also properly reflects the prevailing conditions in the market.

46. It would be internally inconsistent to pair a contemporaneous estimate of the risk-free rate, which reflects the fact that the economy is currently in a state of crisis, with a long-run historical average MRP, which reflects average economic conditions over the last 50 years. Such an inconsistency is likely to produce unreliable and unsafe estimates of the required return on equity.

47. IPART (the NSW economic regulator) has made precisely this point, noting that the risk-free rate and MRP must be estimated on the same basis:

> *We consider it would be invalid to combine a current risk-free rate with a historic MRP, because the result of that calculation would not represent the state of the equity market at any point of time. By combining a current estimate of the risk-free rate with a current MRP estimate, we can approximate the current market price of equity.*

> *Likewise, by combining a historic estimate of the risk-free rate with a historic MRP estimate, we can approximate the historic average market price of equity. Either of these benchmarks would be a valid point of reference. When we combine the risk-free rates and MRP estimates in this time-consistent way, the current cost of equity is closer to the historic average cost of equity than either of them is to the time-inconsistent sum.* [1]

Implications of using a fixed MRP

48.   Although some regulatory agencies in Australia adopt the approach of pairing a fixed constant MRP with the prevailing government bond yield, we recommend against that approach because it produces implausible outcomes in some market conditions.

49.   For example, during the peak of the global financial crisis (**GFC**) in late 2008, the yield on 10-year government bonds rapidly fell from over 6.5% to less than 4.0%. This occurred due to a 'flight to quality,' whereby investors liquidated risky assets and sought to park funds in safe-haven assets such as government bonds. The spike in demand for government bonds resulted in a material decline in yields. In those circumstances, the approach of adding a fixed MRP to the prevailing government bond yield would suggest that the required return on equity *fell* during the peak of the GFC. It is, of course, implausible that equity capital becomes materially *cheaper* during a financial crisis.

50.   The need for internally consistent parameter estimates is particularly important in the current market conditions. Government bond yields are currently at historically low levels as illustrated in **Figure 1** below. The current historically low government bond yields reflect the fact that Australia is currently in the midst of a severe economic crisis in which a flight to quality (such as that observed during the GFC) is expected to occur. In the current circumstances, government bond yields have been further depressed by a coordinated bond buying program being conducted by the Reserve Bank of Australia (RBA) that has the express objective of lowering government bond yields as a means of injecting liquidity into the Australian financial system. Pairing a risk-free rate that reflects these extraordinary market conditions with an estimate of the MRP that reflects average market conditions over the past 50-plus years is not an approach that is likely to produce reliable estimates of the required return on equity.

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[1] IPART 2018 WACC methodology, pp. 51-52.

Figure 1: Australian10-year government bond yields
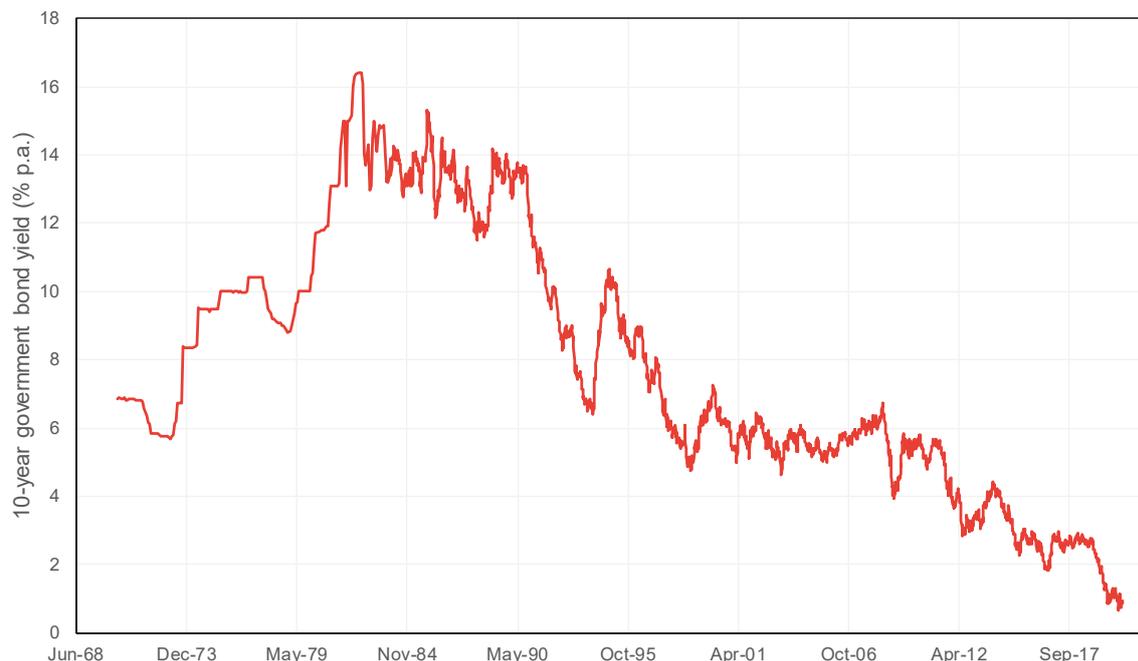
Source: Bloomberg.

Evidence of stability in the required return on equity

51.   When selecting estimates of the risk-free rate and MRP it is important to note the evidence that suggests that these two variables tend to move in opposite directions, so that when the risk-free rate falls, the MRP tends to rise, and vice versa. This manifests in a relatively stable required return on equity as movements in one parameter tend to be somewhat offset by movements in the other.

52.   For example, IPART has recognised that:

> *…estimated risk premiums are not stable through time.* **Risk premiums tend to move in the opposite direction to the risk free rate**. *As investors may respond to recent losses on riskier assets by shifting to safer assets, prices of those assets are likely to fall, increasing the expected rate of return for a given flow of future dividends. In periods of high risk aversion there is a flight from risky assets to safe assets (such as the risk free rate). This tends to push up the price of safe assets, thereby pushing down their yields. Thus, in these circumstances,* **a falling risk free rate tends to be associated with rising equity risk premiums (and vice versa)**.

> *To the extent there is a negative relationship between the risk free rate and the risk premiums on listed equities*, **the required return of the equity market (being the sum of risk free rate and the market risk premium) is relatively more stable than its individual components**.[2]

53.   And more recently that:

> *Frontier Economics recommended that,* **because there is an inverse relationship between the MRP and risk-free rate, it is important to adopt an approach to**

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[2] IPART discussion paper, pp. 57-58. Emphasis added.

> *estimating the required return on equity that pairs the risk-free rate consistently with the MRP. We agree with Frontier on this point.*[3]

54. The same point has recently been made by the Governor of the RBA:

> *In this context, it is worth noting that despite the marked decline in global interest rates (and some decline in the cost of equity), average hurdle rates of return for new investments in many countries have not changed much...It seems that there is a global norm for hurdle rates somewhere around the 13 to 14 per cent mark and it is hard to shift this norm, even at record low interest rates.*
>
> *There are a couple of possible explanations for this.*
>
> *The first is that **the reduction in the cost of borrowing has been offset by a rise in the required risk premium** due to the uncertainties that I spoke about. If this were so**, the hurdle rate would be unchanged, with lower interest rates just compensating for the riskier environment**.*
>
> *The second possibility is that some firms have been slow to adjust to the new reality of low interest rates. We hear reports that a hurdle rate of return of 13 to 14 per cent has been hardwired into the corporate culture in some companies. Changing this hard-wiring is difficult and time consuming. However, from our liaison with Australian companies, we do know that some companies have lowered their hurdle rates and this is opening up new opportunities for them. It would be good to hear more such reports.*
>
> *My view is that there is an element of truth to both explanations: risk premiums have gone up and, in some cases, hurdle rates of return are too sticky.*[4]

55. The previous governor of the RBA has made the same point:

> *…post-crisis, the earnings yield on listed companies seems to have remained where it has historically been for a long time, even as the return on safe assets has collapsed to be close to zero (Graph 2). **This seems to imply that the equity risk premium observed ex post has risen even as the risk-free rate has fallen and by about an offsetting amount.***[5]

56. Consistent with the above evidence, the Australian Energy Regulator's (AER's) DGM estimates of the contemporaneous MRP exhibit a strong inverse relationship with the risk-free rate. **Figure 2** below shows that a decline in the risk-free rate is associated with a largely (but not entirely) offsetting increase in the MRP estimate. This relationship is entirely consistent with the conclusions of other regulators and RBA Governors set out above.

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[3] IPART, Submission on Draft Report, SA Water Regulatory Determination 2020, 3 April 2020, pp. 2-3. Emphasis added.

[4] Philip Lowe, October 2019, "Some echoes of Melville," Sir Leslie Melville Lecture, Canberra, pp. 11-12. Emphasis added

[5] Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015. Emphasis added.

Figure 2: Relationship between AER estimates of contemporaneous MRP and risk-free rate
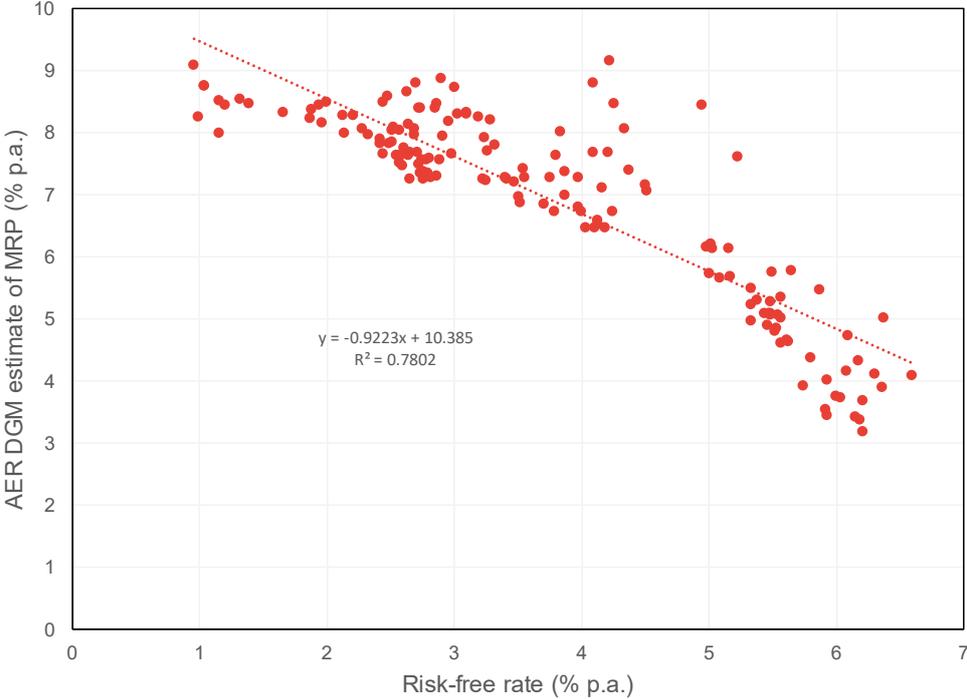
Source: Australian Energy Regulator DGM estimates of MRP, Bloomberg.

57.   Our view is that the available evidence supports the following conclusions:

   a.   Although some regulators pair a contemporaneous risk-free rate with a long-term average MRP, such an approach is unlikely to produce a reliable estimate of the required return on equity;

   b.   The risk-free rate and MRP parameters must be estimated and combined in an internally consistent manner; and

   c.   There is a negative relationship between the contemporaneous risk-free rate and the contemporaneous forward-looking MRP. A decline in the risk-free rate tends to be associated with a partially offsetting increase in the MRP.

   Proposed approach to setting the MRP

58.   In our view, the following approach has the benefits of being transparent, easy to implement, and consistent with the key features of the evidence set out above:

   a.   The first step is to estimate the required return on equity in 'average' or 'normal' market conditions. This can be done by noting that:

      i.   The Ibbotson approach produces an estimate of the MRP in average market conditions of approximately 6.5%. The yield on 10-year government bonds was in the order of 5% for many years between the RBA being given the task of stabilising inflation in the early 1990s through to the GFC in 2008. This implies a risk-free rate of 5% in normal market conditions and a total required return on equity (for a firm with average risk) of 11.5%.

      ii.   The Wright approach produces an estimate of the average real required return on equity of approximately 9%. In normal market conditions, it is reasonable to expect inflation of 2.5%, that being the mid-point of the RBA target band. This too implies a total required return on equity (for a firm of average risk) of 11.5%.

b. The second step is to observe the contemporaneous risk-free rate. For example. A contemporaneous risk-free rate of 1% is 4% below the 'average' level of 5%.

c. The final step is to adjust the MRP to reflect half of the change in the risk-free rate. In the above example, the risk-free rate is 4% below the normal level, so the MRP would be increased by 2% above its normal level to 8.5%. This would produce a total required return on equity of 9.5%. In this scenario, the total required return on equity has fallen, but by only half of the decline in the risk-free rate.

2.5 Equity beta

Comparator firms

59. The first task when estimating equity beta is to select a set of comparator firms. This is a set of firms that operate in the same industry and are considered to have broadly similar risk characteristics to the firm (or activity) in question.

60. Some level of judgment is required when selecting comparators. However, we advise using a process that is as objective and systematic as possible so as to avoid inadvertently introducing irrelevant comparators or excluding relevant comparators. Such inclusions or omissions could introduce bias into the beta estimates.

61. When selecting comparator firms, we considered two industry segments:

a. Firms that provide residential aged care services. This segment consists of firms that provide a place of residence; it excludes firms that provide only home care and nursing and other medical services.

b. Firms that are engaged in the ownership, management and leasing of residential facilities. This segment includes firms that lease residential facilities to students, seniors and families. The firms in this segment operate as real estate investment trusts (REITs).

62. We note that the estimated WACC will be used for the purpose of setting accommodation charges for residential aged care facilities. Consequently, we have also identified firms that are engaged in the provision of accommodation in the residential aged care and other settings. Neither of our comparator segments is perfect in that:

a. The residential aged care service firms provide a bundled product – accommodation as well as nursing and medical care and what is known as 'hotel services' including the provision of meals and laundry services. To the extent that these different activities involve different degrees of risk, the beta estimate of the firm will reflect a blend of the risks pertaining to these different activities.

b. The real estate investment trusts provide accommodation to a range of lessees including students, seniors and families. To the extent that the provision of accommodation to funded aged care residents involves a different level of risk, these firms will also be less than perfect comparators.

63. When selecting comparator firms, there is always a tension between trying to find a set of very close comparators and having a large enough set of comparators to obtain statistically reliable estimates. In our view, the two industry segments set out above provide the closest available comparators for the purpose of estimating the risk of providing accommodation in the aged care setting.

'Aged care' comparators

64. Our specific approach to selecting our set of aged care comparator firms is as follows:

a. We first identified all firms assigned by Thomson-Reuters to the 'Healthcare Facilities and Services' sector and all firms assigned by Datastream to the 'Health Care

Equipment and Services' sector. Thomson-Reuters and Datastream are major commercial data service providers.

b. We then reduced the sample to retain only those firms that were also in the Industry Classification Benchmark (ICB) subsector called 'Health Care Facilities.' The ICB classification scheme was developed by Dow Jones and FTSE, which publish major stock market indices for the US and UK markets, respectively.

c. We then eliminated any firm that did not have a valid ISIN (International Securities Identification Number) to indicate that it was a currently active firm.

d. We then reviewed the company descriptions published by Bloomberg and Thomson-Reuters and recent financial reports of each company and to remove firms that are not largely engaged in the provision of residential care services. This step involved the elimination of three types of firms:

   i. Firms that primarily provide in-home care services and which do not provide residential places. These firms tend to have very low capital intensity, relatively few tangible assets, and relatively little debt finance. In these respects, the business operations (and associated risks) are materially different from the provision of residential aged care service;

   ii. Firms that primarily provide short-term hospital inpatient services; and

   iii. Firms that are essentially investment holding companies.

65. The final step involved the application of the Amihud illiquidity filter. The Amihud measure[6] is designed to quantify the price impact of illiquidity – when a stock is thinly traded, a large transaction can have a material temporary effect on prices as it is absorbed by the market. The Amihud filter seeks to identify observations where the price change is large relative to the liquidity in the market at the time – such observations being more likely to reflect price dislocation from an order being absorbed into a relatively illiquid market. We calculate, on a calendar month basis, the Amihud measure which determines the average absolute return relative to turnover (in USD). A stock is deemed to be illiquid during a month if this ratio is greater than some threshold (i.e., where turnover is low relative to percentage returns). Using the Amihud measure as a screening tool, we removed an observation if it occurred during a calendar month in which the calculated Amihud measure for the stock exceeded the threshold of 25. This threshold value is the same as applied by IPART, the NSW economic regulator.[7] It was selected on the basis of an analysis of historical equity returns data for the Australian stock market.[8]

66. Any firms with less than 60 weekly observations available, after application of the Amihud filter, are removed from the comparator set.

67. We then divided the remaining firms into two sets:

a. A primary comparator set consisting of firms from Australia and New Zealand (on the grounds that such firms are likely to be the most relevant comparators to aged care service providers in Australia); and

b. A supplementary comparator set that consists of all other firms.

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[6] Amihud, Y., 2002, "Illiquidity and stock returns: cross-section and time-series effects," *Journal of Financial Markets*, 5, 1, 31-56.

[7] IPART, March 2020, Draft Report - Estimating Equity beta, p. 5. https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Reviews/WACC/WACC-Methodology-2017/27-Mar-2020-Draft-Report-Estimating-Equity-Beta/Draft-Report-Estimating-Equity-Beta-March-2020.

[8] IPART, April 2019, Fact Sheet - Estimating Equity beta, p. 6. https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Reviews/WACC/WACC-Methodology-2017/01-Apr-2019-Fact-Sheet-on-Estimate-equity-beta/Fact-Sheet-Estimate-equity-beta-1-April-2019.

68. These two comparator sets are documented in **Table 2** and **Table 3** below.

Table 2: Primary 'Aged Care' comparator set

COMPARATOR	COUNTRY
Estia Health Ltd	Australia
Aveo Group	Australia
Japara Healthcare Ltd	Australia
Regis Healthcare Ltd	Australia
Arvida Group Ltd	New Zealand
Metlifecare Ltd	New Zealand
Ryman Healthcare Ltd	New Zealand
Summerset Group Holdings Ltd	New Zealand

Source: Frontier Economics analysis.

Table 3: Supplementary 'Aged Care' comparator set

COMPARATOR	COUNTRY
Extendicare Inc	Canada
Sienna Senior Living Inc	Canada
Brookdale Senior Living Inc	USA
Capital Senior Living Corp	USA
Orpea	France
LNA Sante SA	France
Korian SA	France
Attendo AB	Sweden

Source: Frontier Economics analysis.

'Residential REIT' comparators

69. When developing our set of 'Residential REIT' comparators, we began by identifying all firms assigned by Thomson-Reuters to the 'Residential REITs' sector and all firms assigned by Datastream to the 'REITs' sector.

70. We then refined this set to the comparators that had a valid ISIN, were active as at May 2020, and were assigned to the with the "Residential REITs" TRBC industry.

71. We then reviewed the company descriptions published by Bloomberg and Thomson-Reuters and recent financial reports of each company and we removed firms that were not largely

engaged in the provision of residential accommodation. This step involved the elimination of three types of firms:

      a.   Firms that were engaged in commercial real estate sector;

      b.   Firms that were diversified across multiple sectors; and

      c.   Firms that construct/develop rather than operate housing.

72.   We applied the same Amihud liquidity filter as for the Aged Care comparators above.

73.   The resulting set of Residential REIT comparators is set out in **Table 4** below.

Table 4: Residential REIT comparator set

COMPARATOR	COUNTRY
Ingenia Communities Group	Australia
GCP Student Living PLC	UK
Civitas Social Housing PLC	UK
PRS REIT Plc	UK
Triple Point Social Housing	UK
Target Healthcare REIT PLC	UK
KCR Residential Reit PLC	UK
American Campus Communities Inc	USA
American Homes 4 Rent	USA
Apartment Investment and Management	USA
Bluerock Residential Growth RE	USA
Camden Property Trust	USA
Equity LifeStyle Properties Inc	USA
Equity Residential	USA
Essex Property Trust Inc	USA
Front Yard Residential Corp	USA
Independence Realty Trust Inc	USA
Investors Real Estate Trust	USA
Invitation Homes Inc	USA
Mid-America Apartment Community	USA
New Senior Investment Group Inc	USA

COMPARATOR	COUNTRY
NexPoint Residential Trust Inc	USA
Sun Communities Inc	USA
UDR Inc	USA
UMH Properties Inc	USA

Source: Frontier Economics analysis.

74.   Summary descriptions of the activities of all firms in our comparator sets are set out in the data appendix to this report.

Regression analysis

75.   The standard approach for estimating equity betas is via a regression analysis of stock returns on market returns. A standard Ordinary Least Squares regression analysis is conducted with the returns of a particular stock as the dependent variable and the returns on a broad stock market index as the independent variable. The slope coefficient from this regression analysis is used as an estimate of beta.

76.   When performing this regression analysis, a number of econometric decisions must be made relating to the period and frequency of data. The approach that we have adopted for the estimates in this report is to:

   a. **Use 10 years of historical stock return data.** We consider that this period best balances statistical precision and reliability against the risk that the nature of the firm being analysed has changed materially over the sample period;

   b. **Use weekly data**. Weekly data provides a greater number of data points than monthly data which improves the statistical precision of estimates. And weekly data does not suffer from the problems of non-trading periods that can affect daily data (e.g., if a company does not trade one afternoon, 50% of the daily return is missing but only 10% of the weekly return is missing);

   c. **Use every weekday as the reference day**. Weekly returns can be defined as Monday-to-Monday or Tuesday-to-Tuesday and so on. Estimates can vary materially depending on which reference day is used, so our approach is to perform five estimates for every firm, pertaining to all five reference days, and to take the mean over those five estimates.

Re-levering

77.   The equity beta is an estimate of the risk of owning equity (shares) in the relevant firm. There are two components of this risk:

   a. **Asset risk**: This is the idea that some types of businesses are inherently riskier than others. For example, retailing whitegoods such as fridges and washing machines is inherently riskier than selling soft drinks. Whereas whitegoods sales decline materially during economic recessions and financial crises, soft drink demand tends to stay quite stable over time.

   b. **Financial risk**: This reflects the risk that equity ranks behind debt and therefore provides a residual return – at the end of each year the debt holders must first be paid what they are due and any residual is then available for the equity holders. In this regard, consider two firms that operate in the same industry and therefore have the same asset risk, but where one has relatively more debt finance than the other. The firm with more debt would be described as having higher gearing or leverage.

Shareholders in the more highly geared firm are subject to more risk because there are relatively more debt holders with a claim that ranks ahead of equity. Consequently, any equity beta estimates will have to account for differences in gearing or leverage.

78.   The set of comparator firms is drawn from the same industry to ensure that the comparators all have broadly similar asset risk. However, the firms in the comparator set may have different proportions of debt finance and therefore different levels of financial risk. In this case, a 're-levering' adjustment is required to correct for any differences in financial risk.

79.   For example, if we are seeking to estimate the equity beta for a firm that has 30% debt financing, and one of the comparator firms has 50% debt financing, that comparator firm matches on asset risk, but its equity beta estimate will reflect its 50% gearing instead of the 30% gearing that is required. What is required is an adjustment to produce an estimate of what the comparator firm's equity beta would have been if it had 30% gearing. This is done via a process of re-levering which involves multiplying the equity beta estimate by the ratio of actual to target equity financing:

$$\beta_{Re-levered} = \beta_{Original} \frac{(E/V)_{Comparator}}{(E/V)_{Target}}$$

80.   In the above example, the comparator firm's beta estimate would be re-levered by multiplying by 50% / 70%.

Current estimates

81.   We have computed re-levered equity betas for comparator firms using the approach set out above. For each comparator firm, we have used the longest period of data available, up to a maximum of 10 years. Firms with a full 10-year history available have 521 weekly observations and firms that have not been listed for the full 10-year period will have fewer observations. The results are summarised in **Table 5** for Aged Care comparators that operate in Australia and New Zealand and in **Table 6** for aged care comparators that operate in other countries.

82.   All beta estimates have been re-levered to 45% debt financing for reasons explained in the subsequent section on gearing.

Table 5: Beta estimates for Australia and New Zealand Aged care comparators

COMPANY	NUMBER OF OBSERVATIONS	AVERAGE GEARING	RE-LEVERED EQUITY BETA
Estia Health Ltd	273	49%	0.72
Aveo Group	467	70%	0.53
Japara Healthcare Ltd	223	51%	0.84
Regis Healthcare Ltd	233	49%	0.61
Arvida Group Ltd	62	47%	0.48
Metlifecare Ltd	217	60%	0.59
Ryman Healthcare Ltd	508	38%	1.64
Summerset Group Holdings Ltd	359	49%	1.07
Mean	**293**	**52%**	**0.81**
Median	**253**	**49%**	**0.67**

Source: Bloomberg data; Frontier Economics calculations.

Table 6: Beta estimates for supplementary Aged Care comparators

COMPANY	NUMBER OF OBSERVATIONS	AVERAGE GEARING	RE-LEVERED EQUITY BETA
Extendicare Inc	521	51%	0.72
Sienna Senior Living Inc	521	53%	0.68
Brookdale Senior Living Inc	521	59%	1.52
Capital Senior Living Corp	469	59%	1.05
Orpea	521	51%	0.57
LNA Sante SA	95	55%	0.59
Korian SA	317	54%	0.59
Attendo AB	230	37%	0.67
Mean	**399**	**52%**	**0.80**
Median	**495**	**53%**	**0.68**

Source: Bloomberg data; Frontier Economics calculations.

83. The results in **Table 5** and **Table 6** are remarkably similar. Both comparator sets support a beta estimate in the range of 0.7 to 0.8. In both cases the mean estimate is higher than the median due to the inclusion of a firm with a relatively high beta estimate. We note that neither theory nor practice provides any clear guidance about whether the mean or median estimate should be preferred. Rather, both inform the exercise of judgment when selecting the appropriate beta. At this stage, we conclude that the evidence from Aged Care comparators generally supports a range of 0.7 to 0.8, with a mid-point of 0.75.

84. We now turn to our set of Residential REIT comparators. The beta estimates for these firms are set out in **Table 7** below. Relative to the Aged Care comparators, the mean beta estimate is slightly lower and the median estimate is somewhat higher. For the Residential REIT sample, the mean is lower than the median due to the inclusion of a small number of firms with very low beta estimates. Again, we consider there is relevant evidence in both figures that can be used to inform the exercise of judgment in relation to the selection of an appropriate equity beta. At this stage, we conclude that the evidence from Residential REIT comparators generally supports a range of 0.75 to 0.85, with a mid-point of 0.8.

Table 7: Beta estimates for Residential REIT comparators

COMPARATOR	NUMBER OF OBSERVATIONS	AVERAGE GEARING	RE-LEVERED EQUITY BETA
Ingenia Communities Group	Australia	34%	1.22
GCP Student Living PLC	UK	30%	0.81
Civitas Social Housing PLC	UK	25%	0.59
PRS REIT Plc	UK	8%	0.36
Triple Point Social Housing	UK	14%	0.11
Target Healthcare REIT PLC	UK	15%	0.25
KCR Residential Reit PLC	UK	46%	0.01
American Campus Communities Inc	USA	35%	1.12
American Homes 4 Rent	USA	30%	0.96
Apartment Investment and Management	USA	47%	1.01
Bluerock Residential Growth RE	USA	74%	0.29
Camden Property Trust	USA	27%	1.15
Equity LifeStyle Properties Inc	USA	33%	0.98
Equity Residential	USA	31%	1.00
Essex Property Trust Inc	USA	30%	1.06
Front Yard Residential Corp	USA	55%	0.69
Independence Realty Trust Inc	USA	56%	0.76
Investors Real Estate Trust	USA	53%	0.59

COMPARATOR	NUMBER OF OBSERVATIONS	AVERAGE GEARING	RE-LEVERED EQUITY BETA
Invitation Homes Inc	USA	43%	1.10
Mid-America Apartment Community	USA	35%	0.96
New Senior Investment Group Inc	USA	72%	0.45
NexPoint Residential Trust Inc	USA	61%	0.64
Sun Communities Inc	USA	42%	0.89
UDR Inc	USA	33%	1.08
UMH Properties Inc	USA	46%	0.85
Mean	**356**	**39%**	**0.76**
Median	**351**	**35%**	**0.85**

Source: Bloomberg data; Frontier Economics calculations.

85.   We have noted above that neither the Aged Care nor the Residential REIT set represent perfect comparators for the case at hand – the Aged Care comparators involve services other than accommodation and the Residential REITs involve accommodation in sectors other than Aged Care. Consequently, we consider that both sectors provide relevant evidence to inform the exercise of judgment. A summary of the relevant evidence is set out in **Table 8** below.

Table 8: Summary of equity beta estimates

COMPARATOR SET	NUMBER OF COMPANIES	MEAN EQUITY BETA	MEDIAN EQUITY BETA
Australia Aged Care comparators	4	0.68	0.67
New Zealand Aged Care comparators	4	0.94	0.83
Australia + New Zealand Aged Care comparators	8	0.81	0.67
Supplementary Aged Care comparators	8	0.80	0.68
Total Aged Care comparators	16	0.80	0.68
Residential REIT comparators	25	0.76	0.85
All comparators	**41**	**0.78**	**0.72**

Source: Bloomberg data; Frontier Economics calculations.

86.   Having regard to all of the evidence in **Table 8**, we adopt an equity beta point estimate of 0.75, noting that:

a. 0.75 lies between the overall mean and median estimates of 0.78 and 0.72, respectively; and

b. 0.75 lies within the range that we have adopted for each set of comparators separately – 0.7 – 0.8 for Aged Care comparators and 0.75 – 0.85 for Residential REITs.

87.   We note that the 0.75 equity beta estimate reflects the assumption of 45% gearing. Our reasons for adopting 45% debt financing are set out in the following section.

88.   The Royal Commission has asked us to consider whether:

a. the mean equity beta for Australian aged care providers presented **Table 8** (i.e., 0.68) could be interpreted as an appropriate estimate for aged care providers in Australia under the existing regulatory arrangements; and

b. the median estimate for REIT comparators presented in **Table 8** (i.e., 0.85) could be infer the impact on systematic risk of deregulating the industry.

89.   We do not think it would be appropriate to interpret the estimates in that way.

90.   What is required is a beta estimate for a residential aged care provider of *accommodation services only*, since proposed regulatory arrangements would set caps on accommodation charges. Those price caps must be set in such a way as to allow providers with a sufficient rate of return to compensate them for the risks and opportunity costs of capital involved in providing accommodation services. However, as explained at paragraph 62, the Australian comparators used to derive the beta estimate of 0.68 presented in **Table 8** offer a bundle of services—including accommodation, nursing and medical care, the provision of meals and laundry services.

91.   Hence, while the beta estimate of 0.68 reported in **Table 8** reflects the current regulatory arrangements that relate to the provision of residential care accommodation services, that is not the *only* thing that estimate reflects; it also reflects all the other activities that residential aged care providers in Australia offer.

92.   Furthermore, as **Table 8** shows, the estimate of 0.68 that relates to the Australian set of aged care providers is based on a sample of just four firms. In our view, a sample of only four firms is too small to obtain statistically-reliable beta estimates. That is one of our rationales for expanding the sample to include aged care providers in other countries.

93.   The Royal Commission also asks whether the beta estimate of 0.85 for REITs could be used to infer the impact on systematic risk of deregulating the industry. In our view, it would not be appropriate to do so. It is true that the estimate for REITs does not reflect the regulatory arrangements that apply to aged care providers in Australia at present. However, we note that:

a. there may be factors that affect the systematic risk of REITs that are not relevant to the systematic risk of aged care providers; and

b. there are likely to be factors that affect the systematic risk of aged care providers that do not affect the systematic risk of REITs.

94.   Therefore, it is unlikely that the median estimate of beta for REITs, on its own, would be a good estimate of beta for deregulated residential aged care accommodation providers.

95.   In our view, the samples of aged care firms and REIT comparators each contribute different information that is relevant to the task of estimating the systematic risk of residential aged care accommodation providers. Combining the estimates from these different samples of comparators is likely to produce a more reliable estimate than relying on one group to the exclusion of others. Moreover, weighting one group more heavily is unlikely to provide estimates of systematic risk under different regulatory arrangements.

2.6 Gearing

General approach to estimating gearing

96.   'Gearing' refers to the proportion of debt financing. The standard approach in practice is to estimate gearing for each comparator firm as:

$$\frac{D}{V} = \frac{Book\ value\ of\ debt}{Market\ value\ of\ equity + Book\ value\ of\ debt}$$

97.   In theory, the value of equity and the value of debt would both be estimated in market value terms. However, the market value of debt cannot be observed (as it includes bank and corporate loans that are not publicly traded) so the book value is used as a reasonable proxy.

98.   Because the market value of equity changes as the firm's stock price changes, the estimate of gearing will also vary over time. For this reason, gearing is usually estimated as an average over 5-10 years.

99.   Our approach is to estimate gearing by considering estimates for the same set of comparator firms that was used to estimate beta and by taking an average figure over the same 10-year period that was used to estimate beta.

Role of refundable accommodation deposits (RADs)

100.   For the Australian and New Zealand firms in our set of Aged Care comparators, we include refundable accommodation deposits (**RADs**) as debt.[9] These RADs are essentially refundable interest-free loans that are made by residents in lieu of making monthly fee-for-service payments.

101.   Economically, the RAD arrangement is equivalent to the resident making a loan to the service provider, whereby the resident receives interest payments on the loan and then immediately pays that same amount back to the service provider by way of a fee for the provision of accommodation. Because the RAD payments are, in economic substance, a form of debt finance, we include them as debt when computing gearing for the Australian firms in our comparator set.

Current estimates

102.   The gearing figures for the comparator firms are set out in **Table 4** to **Table 8** above. Mean gearing for the Aged Care and Residential REIT comparator sets is in the order of 50% and 40%, respectively.

103.   We have noted above that the Aged Care comparator set is not perfect in that those firms provide services other than accommodation such as care and hotel services. To the extent that funding for these services is provided by fixed government funding schemes, those other activities may support relatively higher levels of debt funding. Consequently, we take the 50% gearing figure from our Aged Care comparators as the upper bound for our gearing estimate.

104.   We have also noted that the Residential REIT comparator set includes firms that provide accommodation in sectors other than aged care. To the extent that the provision of accommodation services to students, younger individuals and families involves less stability, higher turnover, and more volatility in revenues, exposure to those activities may support relatively less debt. Consequently, we take the 40% gearing figure from our Residential REIT comparators as the lower bound for our gearing estimate.

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[9] The firms in our comparator set use different terms for RADs, including "Resident Loans," Refundable Occupation Right Advances" and "Occupancy Advances."

105.   In summary, our view is that the evidence from our analysis of comparator firms supports a gearing range of 40% to 50%, and we have adopted the mid-point of 45% as our point estimate for the gearing parameter.

2.7   Required return on debt

Characteristics to be determined

106.   When estimating the required return on debt, the first task is to determine the characteristics of the debt to be issued. The relevant characteristics, and our analysis of each in relation to the provision of residential aged care services, is as follows:

   a.   **Type of debt: Corporate bonds**. It is common in regulatory settings to assume that the regulated firm acquires debt capital via the public issuance of corporate bonds. This is because infrastructure asset owners commonly issue corporate bonds, and because the relevant pricing information is publicly available from independent third-party data sources.

   b.   **Credit rating: BBB**. It has become standard for Australian regulators to adopt a benchmark credit rating in the BBB range[10] for infrastructure service providers. This is based on the observation that service providers tend to have 'investment grade' credit ratings in the BBB range.

   c.   **Term: 10 years**. It has also become standard for Australian regulators to adopt a 10-year debt term for infrastructure service providers, based on the observation that service providers tend to issue long-term debt with an average term (at issuance) of approximately 10 years.

107.   In summary, the benchmark efficient firm is assumed to raise debt capital by issuing 10-year corporate bonds with a BBB investment grade credit rating.

Prudent and efficient debt financing approach

108.   Having determined the type of debt to be issued, the next task is to determine the most prudent and efficient means of issuing that debt. It is well recognised in practice that it would be imprudent and inefficient for a firm to issue all of its debt finance at a single point in time, so that it all matures at a single point in the future. Such an approach would expose the firm to material refinancing risk – the risk that the firm would be unable to refinance when its debt matures, or that it would be able to do so only on onerous terms. During financial and economic crises, for example, it is difficult for firms to refinance debt on similar terms to the maturing debt.

109.   To manage refinancing risk, it is common in practice for firms to issue debt on a staggered maturity basis so that only a portion of the debt would mature at any one time. In this regard, it is common for economic regulators to assume that a prudent and efficient infrastructure firm would issue debt on a 10-year staggered maturity basis. The firm is assumed to issue 10% of its debt financing requirements each year in the form of 10-year corporate bonds. Thus, in each year, one of the ten tranches of debt would mature and require refinancing. This mitigates refinancing risk because only 10% of the firm's debt requires refinancing in any one year.

110.   Our view is that the required return on debt should be estimated on the basis that a prudent and efficient firm would issue 10-year BBB-rated corporate bonds on a staggered maturity basis.

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[10] This range includes ratings of BBB-, BBB and BBB+.

111.   In the Australian regulatory setting, it is common for the return on debt to be estimated using data published by an independent third-party data service. Three services are commonly used: The Reserve Bank of Australia, Bloomberg and Thomson-Reuters. These three organisations publish, among other things, estimates of the yield on 10-year BBB corporate bonds issued by Australian companies.

112.   Our recommended approach is to set the allowed return on debt by taking an average of the available estimates as at the end of each month and then averaging over the prior ten years.

113.   From time to time, a data service may consider that the available data is insufficient to produce a reliable estimate of the 10-year BBB bond yield, in which case there can be gaps in the data. For example, in months where one provider does not supply an estimate, an average would be taken over the remaining two estimates.

114.   Taking a 10-year trailing average is consistent with the view that an efficient and prudent firm would issue debt on a staggered maturity basis. Thus, at any pointy in time, 10% of the firm's debt would have been issued more than 9 years ago, 10% would have been issued more than 8 years ago, and so on. In the regulatory setting, it is common to set a 20-40 day 'averaging period' in each year, rather than to take an average over the entire year. This is done to enable regulated firms to more precisely match the regulatory allowance – it would be feasible for firms to issue a single 10% tranche of debt once per year, whereas transactions costs would make it infeasible for a firm to issue a very small amount of debt every single month. However, this approach adds complexity as different firms will nominate different averaging periods, in which case a separate return on debt calculation will be required for every firm, and potentially for every aged care facility. In addition, aged care facilities are less capital intensive that monopoly infrastructure assets. For these reasons, we consider that the allowed return on debt for all residential aged care providers should be set using a simple 10-year trailing average.

2.8   Current generic WACC estimate

115.   The **Inputs** tab of the building block model that accompanies this report sets out the current data and WACC parameter estimates, which are summarised in **Table 9** below.

Table 9: WACC estimation

PARAMETER	ESTIMATE	SOURCE
Long-run average risk-free rate	5%	Average 10-year government bond yield since 1995.
Long-run average MRP	6.50%	Ibbotson estimate of MRP using long run historical excess returns.
MRP risk-free rate offset	50%	Extent to which MRP changes to offset changes in risk-free rate.
Current risk-free rate	1.40%	Current 10-year government bond yield.
Equity beta	0.75	Regression analysis from comparator firms.
Current MRP	8.30%	Formulaic approach.
Return on equity	7.63%	CAPM.
Gearing	45%	Analysis from comparator firms.
Return on debt	5.90%	10-year trailing average yield on 10-year BBB-rate corporate bonds.
Vanilla WACC	**6.85%**	**WACC formula.**

Source: Frontier Economics calculations. Note: Estimates presented in this Table use rounded market date up to the end of June 2020.

2.9   Annual updates

116.   It is common for WACC estimates to be updated on a regular basis. We recommend that such an update would occur annually.

117.   We note that the return on debt is set on the basis that a prudent and efficient operator would issue 10-year debt on a staggered maturity basis. Under this benchmark approach, each year 10% of the debt portfolio would mature and have to be refinanced. An annual update would capture the extent to which this refinancing changes the overall cost of debt – the maturing debt would drop out of the calculation and would be replaced by the refinanced debt.

118.   Whereas debt is a contractual arrangement under which the operator locks in terms for ten years for each tranche, there is no such arrangement for equity. Rather, equity holders are free to withdraw their capital at any time. Consequently, the relevant benchmark for equity capital is the return that investors would be able to obtain, from time to time, on an alternative investment of similar risk. That is, the relevant return on equity capital is an opportunity cost – it should be set such that the equity holder is just willing to leave their capital invested in the firm rather than preferring to withdraw it in favour of an alternative investment.

119.   An alternative approach would be to fix the return on equity at the time the facility was constructed or purchased. That approach would be based on the notion that that was the return on equity that investors would need to expect to receive at the time the equity capital was committed – thus, the allowed return on equity should be fixed to ensure that investors do indeed receive that return over the life of the investment. However, our view is that there are several problems with that analysis:

a. The required return on equity is an <u>expected</u> return. Investors realise that the actual return they will obtain may be higher or lower than what was expected. This risk is one of the reasons that there is a risk premium – if investors are effectively guaranteed a particular rate of return, the risk-free rate would be appropriate.

b. In the case at hand, what is required is a return each year that is sufficient to keep the equity capital invested, rather than being withdrawn to be redeployed elsewhere. Consider an aged care facility ten years after construction. What is required in that year is a return on equity that is comparable to the return that could otherwise be earned on an investment of similar risk – at that time. Such a return would be sufficient to keep the equity invested in the facility at that time.

c. The return that equity investors require will vary from time to time. For example, suppose inflation was expected to be 3% p.a. at the time a facility was constructed. Investors would need a return that compensates them for that level of inflation. But if, at a later point in time, inflation expectations had fallen to 1%, investors would require a lower return that is sufficient to compensate them for that lower level of inflation.

120. The approach of fixing the return on equity for the life of the investment would also have the unattractive feature of the required return on equity (and consequently the amount of any price caps) depending on when the ownership of a particular facility had last changed hands. That is, two otherwise identical facilities could have different price caps due to the return on equity being set at different points in time when the ownership of each facility last changed hands.

121. For these reasons, we consider that the preferred approach is to re-set the return on equity on an annual basis. We note that this is broadly similar to the approach adopted by economic regulators. In that setting, the return on equity is re-set every four to five years to reflect changes in the opportunity cost over that time. The only reason re-sets do not occur more frequently is that it is costly for stakeholders to make submissions and for regulators to consider them.

122. In summary, we recommend that the trailing average cost of debt would be rolled forward on an annual basis and the risk-free rate would be re-set annually, with any consequential changes to the MRP according to the formulaic approach set out above. Our view is that the beta parameter is likely to change very slowly over time as the systematic risk involved in providing aged care accommodation services is unlikely to vary materially in the short run. Consequently, we would recommend that the beta and gearing parameters be reconsidered every five years.

2.10 Tax parameters

123. Although not required to estimate the Vanilla WACC set out above, there are two additional tax-related parameters that are required in the context of a building block revenue model. The WACC represents the return that must be available to pay to investors after corporate tax has been paid by the provider. Consequently, the pre-tax revenues must reflect the corporate tax that is to be paid. This requires an estimate of two parameters: the corporate tax rate and the 'gamma' parameter that reflects the value of dividend imputation tax credits.

Corporate tax rate

124. It is standard valuation and regulatory practice to adopt the statutory tax rate, currently 30%, when evaluating projects and assets owned by a commercial corporate entity. That is, revenues must be 'grossed up' to reflect the fact that the firm's taxable income will be taxed at the statutory rate of 30%, leaving after-tax profits available to distribute to the firm's owners.

125. We note that it is common in the regulatory setting to adopt a standard 30% corporate tax rate for all service providers; even those that are not structured as corporate entities subject to that

tax rate. In that setting, regulators adopt the approach of identifying a single hypothetical 'benchmark efficient entity' and setting a rate of return allowance commensurate with the characteristics of that entity.

126. In the present setting, however, it may be appropriate to consider the *actual* tax position of the entity providing the residential aged care accommodation service. For example, a smaller business may face a corporate tax rate below 30% (e.g., currently 27.5% for entities with annual turnover of less than $25 million), and a facility that is owned and operated by a not-for-profit entity may be exempt from tax. We discuss how these different cases might be treated when computing required revenues in our building block model in subsequent sections of this report.

Gamma – the value of dividend imputation tax credits

127. In Australia's dividend imputation tax system, dividends that are paid out of profits that have been taxed in Australia have imputation tax credits (or 'franking' credits) attached to them to ensure that profits are not double-taxed at the corporate and personal levels.

128. Whenever an Australian company pays a dollar of corporate tax in Australia, it generates a $1 franking credit that can be attached to dividends distributed to shareholders.

129. Australian residents can use these franking credits to offset their personal tax payments in Australia. But these credits are of no real value to non-resident investors, who have no personal tax obligations in Australia.

130. To the extent that shareholders value these franking credits, those shareholders will require less in the form of dividends and capital gains. That is, shareholders will require a particular total return on the equity they have invested in the firm and they will receive some of this return in the form of dividends and capital gains and some in the form of franking credits. For every dollar of value that investors receive from franking credits, there is one less dollar of dividends and capital gains that the firm is required to provide in order to make the shareholder whole.

131. Gamma represents the value of franking credits relative to the value of dividends and capital gains– for every dollar of franking credits (created by the payment of corporate tax in Australia), by how much can the firm reduce dividends and capital gains while still making shareholders whole.

132. That is, gamma plays the role of determining the amount by which the allowed dividends and capital gains will be reduced to reflect the value of the imputation credits that investors will receive. It is a form of relative valuation or an 'exchange rate' – the rate at which investors would forego dividends and capital gains in order to receive imputation credits. Thus, gamma must reflect the value of credits relative to the dividends and capital gains that those credits are replacing.

133. The gamma parameter takes a value between 0 and 1. Gamma is 0 if franking credits are not valued by investors and 1 if a dollar of credits is valued equal to a dollar of dividends or capital gains. There are two main reasons why gamma must be materially less than 1:

    a. Some credits are never distributed to shareholders. On average, Australian companies distribute approximately 70% of their profits as dividends, in which case only 70% of created franking credits are distributed to shareholders. The 30% of credits that are not distributed to shareholders cannot have any value to them.

    b. Credits that are distributed to non-resident investors are not valued by those investors.

134. The ratio of the value of a dollar of franking credits to the value of a dollar of dividends or capital gains is ultimately an empirical question. That ratio is estimated via an empirical technique known as 'dividend drop-off analysis.'

135.   The most recent published dividend drop-off analysis was conducted by Cannavan and Gray (2017) who report an empirical estimate of gamma of 0.25,[11] so we have adopted that figure in the remainder of this report.

136.   We note that some regulators (e.g., IPART) adopt the interpretation of gamma and the estimate of 0.25 set out above, other regulators currently adopt a different approach. For example, the AER adopts a gamma of 0.585 based on a 'redemption' or 'utilisation' approach whereby gamma is defined as the proportion of credits that are available to be redeemed rather than in terms of the value of those credits relative to the dividends and capital gains they are replacing.

137.   In summary, two methods for interpreting and estimating gamma have been proposed in the regulatory setting:

    a. The **market value approach** posits that gamma should be estimated from the observed prices of traded securities in the same way that other WACC parameters are estimated. This approach produces an estimate of the extent to which investors value credits relative to the dividends and capital gains that those credits will replace. It is an estimate of the amount of dividends and capital gains that investors would be prepared to give up in order to receive a dollar of credits.

    b. The **redemption or utilisation approach** posits that gamma should be estimated as the proportion of credits that are available for investors to redeem. This approach has no regard to the actual redemption of credits, or to any of the reasons why investors might value credits less than the dividends and capital gains that they are replacing.

138.   The distinction between these two approaches may be illustrated using an analogy. Suppose a traveller, by means of an airline loyalty program, has accumulated 10,000 frequent flyer points. The fact that the traveller has 10,000 points available to redeem with their airline, on its own, provides no information about the economic value of those points to the traveller, since each point could be worth $1, $5 or $100. In order to determine the economic value of those points, one needs to know the amount by which the traveller is able to reduce their next fare if those 10,000 points were to be utilised. That, in turn, requires an understanding of the exchange rate between one point and one dollar of fare.

139.   The redemption or utilisation rate approach would simply count up the number of frequent flyer points available to the traveller. By contrast, the market value approach would seek to determine the amount by which the traveller may reduce their next fare by redeeming the points accumulated.

140.   In our view:

    a. It is clear that what is required is an estimate of the extent to which investors value credits relative to the dividends and capital gains that those credits will replace; and

    b. The best empirical estimate that is available is 0.25.

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[11] Gray, S. and D. Cannavan, (2017), "Dividend drop-off estimates of the value of dividend imputation tax credits," *Pacific Basin Finance Journal*, 43B, 213-226. The Pacific Basin Finance Journal (PBFJ) is an A-ranked international journal on the Australian Business Deans Journal List, the main indicator of journal quality used in Australian business schools. PBFJ has a higher citation rate than other A-ranked finance journals.

3   BUILDING BLOCK MODEL FOR REQUIRED REVENUES

3.1   Overview

141.   In the regulatory setting, it is common to derive required revenues for each year using a 'building block' approach. This approach sets the annual revenue requirement to be sufficient to cover:

  a.   A return of capital (depreciation);

  b.   A return on capital (determined using the WACC);

  c.   Operating expenses; and

  d.   Corporate taxes.

142.   An indicative building block model has been distributed with this report. That model separately considers the value of land assets (which are likely to appreciate over time) and buildings and fixtures (which will depreciate over time).

143.   In all other respects, the model is similar in its structure to the standard regulatory building block model, especially the Post Tax Revenue Model developed by the Australian Energy Regulator.[12]

3.2   Model structure

144.   Parameters pertaining to the current value of assets and the relevant economic life are set out on the **Inputs** tab, together with relevant WACC parameters.

145.   The default version of the model distributed with this report adopts the WACC parameters set out above, highlighted in the orange cells. It is straightforward for uses to change any of these parameters – for example, by changing equity beta or updating for a change in the risk-free rate.

146.   Tax exempt status can be applied by setting the relevant cell to true, similarly a non-profit scenario can be selected.[13]

147.   The funding structure can be selected, inputting the desired level of RAD funding and Commonwealth capital contributions.[14]

148.   Parameters such as operating costs, land and building costs, and number of beds are placeholder figures that are designed to illustrate the functioning of the model. Those figures are not based on any data or analysis and should be treated as illustrative placeholders only.

149.   The calculation of the annual revenue requirement, and required prices, is set out on the **Building block** tab and the remainder of this section explains the structure of the building block calculations.

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[12]   https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/electricity-post-tax-revenue-models-transmission-and-distribution-april-2019-amendment.

[13]   If either of these are selected the applicable tax rate will be zero. The required return on commercial equity will be set to zero if the non-profit scenario is selected.

[14]   These must be set in a consistent manner, for example if gearing is set to 45% then RAD funding must not exceed 45%.

Land

150.   The first panel on the **Building block** tab pertains to land. This panel shows that the value of the land is forecast to appreciate each year.

151.   In the attached example, investors provide $5 million to fund the purchase of land, which grows in value to $13.425 million after 40 years.

Buildings and fixtures

152.   The next panel on the **Building block** tab pertains to buildings and fixtures. This panel shows that:

    a. The replacement value of the assets is forecast to increase each year. That is, an asset that costs $X to buy or construct today is likely to cost more than $X next year due to inflationary effects;

    b. Buildings and fixtures will depreciate each year and investors will require compensation for this depreciation. It is common in regulatory building block models to set economic depreciation in a way that reflects the increase in the replacement cost of the assets. In other words, depreciation is held constant in real terms. In the attached example, real straight-line depreciation of $625,000 per year is computed by dividing the initial cost of $25 million by the 40-year useful life. This is increased each year to reflect the appreciation in asset values over the course of the year. For example, the regulatory depreciation figure of $641,000 in Year 1 is computed as 625×1.025^1. When capex is set to 'Nil' on the **Inputs** tab, the assets will depreciate down to a zero value at the end of the 40-year useful life;

    c. Capex may be required from time to time to restore the assets to an acceptable level of quality. The Inputs tab allows the user to select one of two options for capex:

        i. Setting capex to 'Nil' results in the assets depreciating to a zero value at the end of their useful life; and

        ii. Setting capex to 'Depn' results in capex exactly offsetting the effects of inflation so that the assets maintain their real value. This can be thought of as restoring the assets to their original condition at the end of each year. In this case, the assets would not decline in value over time – buildings and fixtures in 'as new' condition would be available at the end of the 40-year period.

Debt financing

153.   The next two panels on the **Building block** tab pertain to debt financing, both commercial debt and RAD funding. The panels shows that the opening commercial and RAD debt each year is 35% and 10% of the total value of assets (land and buildings), consistent with the gearing assumption in the **Inputs** tab.

154.   Interest is computed by multiplying the opening debt balance by the relevant return on debt from the **Inputs** tab.

155.   At the end of each year, new debt can be issued against the assumed increase in asset values. To preserve the target gearing level, for every dollar of increase in asset values, 35 cents of new commercial debt must be issued and 10 cents of RAD funding must be raised.

156.   Any new capex is assumed to be financed in the target proportions of 35% commercial debt, 10% RAD funding, 55% commercial equity and 0% Commonwealth capital contributions.

Commonwealth funding

157.   The next panel on the **Building block** tab relates to Commonwealth capital contributions. The stock of assets attributable to Commonwealth contributions changes with appreciation/depreciation, and the Commonwealth share of funding for new capex.

Commercial equity

158. The next panel on the **Building block** tab contains a number of intermediate calculations relating to equity financing. The first item in this panel is the total required return on equity, which is computed by multiplying the opening value of commercial equity each year (55% of total asset value) by the required return on equity from the **Inputs** tab.

159. Part of that required return comes from equity's share (55%) of the increase in the value of assets each year.

160. Another part of the required return comes from the issuance of new commercial debt (35%) and RAD funding (10%) in relation to the increase in the value of assets each year. This represents a cash inflow that is not required to fund any new investment, so is available to the equity holders.

161. In other words, the equity holders receive all of the benefit of the inflationary increase in the value of the assets, with the exclusion of the Commonwealth share (set to 0% in the base case). Debt holders (commercial debt and RAD funding) are paid their required return (interest) – no more and no less. The residual equity holders then benefit from the increase in the value of assets. The equity holders would not benefit from the Commonwealth share (if applicable) of the increase in the value of assets as no return on or of capital is applied to this amount; assuming perpetual regulation the equity holders will receive no value from this share of the assets if sold.

162. The difference between the total required return on equity and the benefit of the increase in the value of the assets must be provided to equity holders in the form of cash distributions and dividend imputation franking credits, as explained in more detail below.

Financial accounts

163. The next panel on the **Building block** tab contains a brief pro-forma income statement. Revenues are computed to ensure that equity investors are provided with the appropriate amount of distributions and franking credits derived in the previous section. This is computed via a complicated formula, the algebraic derivation of which is included as an appendix to this report.

164. Tax depreciation will ordinarily be set to 'SL' on the **Inputs** tab to reflect standard straight-line depreciation. There is also an option to set tax depreciation equal to regulatory depreciation for illustrative purposes explained in more detail below.

165. The remainder of the pro-forma income statement sets out the other expenses, tax paid, and net profit after tax (NPAT).

Pricing

166. The 'Pricing' panel takes the total required revenues from the previous panel and divides by the total number of beds (which are all assumed to be effectively identical) – the result is the annual fee that each resident must pay to ensure that the required revenues are funded.

167. The default version of the model that has been provided with this report assumes that all 'beds' are of identical quality such that each resident is required to pay the same fee. This calculation can be easily adjusted to accommodate different fees for different levels of quality if required.

Cash flows

168. The 'Cash flows' panel sets out the derivation of the cash distribution to equity holders, derived in two ways.

169. The first set of figures recognises that revenues must first be used to cover interest payments, operating expenses and tax payments. Any residual cash is then used to cover the equity holder's contributions to new capital expenditure (being 55% of total new capex). Remaining cash is then distributed to equity holders.

170.   The second set of figures begins with net profit after tax (from above) adds back tax depreciation (which is a non-cash item) and subtracts equity's contribution to new capex.

Return on equity

171.   The 'Return on equity' panel demonstrates that the required revenues derived above are just sufficient to provide the appropriate required return to equity holders.

172.   This panel begins with the cash distribution to equity holders out of the operations of the business, as derived above.

173.   It then recognises the residual value of the assets at the end of the 40-year period.

174.   Equity holders also benefit from the value of dividend imputation franking credits, computed as total tax paid (which is equal to total franking credits created) multiplied by gamma (which reflects the value of each credit created).

175.   As noted above, equity holders also receive an additional cash flow in the form of the additional debt that can be raised against the increase in the value of the assets.

176.   The total distributions to equity then have a net present value of $16,500, which is equal to the initial equity contribution. This is consistent with what is called the NPV=0 principle in the regulatory setting. The series of distributions available to the equity holders is just enough to provide equity holders with their required return – having provided equity capital of $16,500, the equity holders receive a series of distributions that have a present value of that same amount.

177.   The 'Return on equity' panel also demonstrates that equity holders are provided with an appropriate return every year. In addition to the cash flows set out above, equity holders also benefit from two non-cash items in each year:

   a.   Equity holders benefit from a share of the increase in the value of existing assets each year; and

   b.   Equity holders benefit from their share of the value of new capex, which was paid for out of residual cash flows from operations as set out in the Cash flows panel above.

178.   Thus, an equity holder who sought to sell their shares at the end of one year would receive the cash flows and franking credits generated in that year, and would also crystallise a capital gain that reflects the (inflationary) increase in the value of existing assets and equity's contribution to new capex.

179.   In every year, the expected return to equity equals the required return to equity derived on the **WACC** tab.

3.3   Illustrative example and sensitivity analysis

180.   In this section, we present an illustrative example of the building block model using placeholder numbers, and the results of sensitivity analysis to demonstrate how the annual fee per bed changes under different scenarios.

181.   It is important to emphasise that the results presented in this section are *illustrative only*, because they are based on 'dummy' input assumptions to the model. Hence, the results should not be interpreted as even indicative of the appropriate fee per bed. The purpose of presenting these results is to illustrate the *directional* impact on the fee per bed under different scenarios that the Royal Commission has expressed an interest in understanding. The model would need to be populated with actual data in order to obtain realistic accommodation charges.

Base case input values

182.   Under our illustrative base case scenario, we consider a hypothetical provider operating under the existing arrangements. We assume that this provider:

    a.   Is a for-profit provider that requires a return on equity capital;

    b.   Pays the full (large business) corporate tax rate of 30%;

    c.   Raises some debt finance in the form of RADs; and

    d.   Does not benefit from Commonwealth capital grants (which if available would replace some commercial equity capital that would otherwise need to be raised in the absence of such Government contributions).

183.   For the purposes of the base case scenario, we assume that the WACC of such a provider is as set out below in **Table 10** below.

Table 10: WACC estimate of hypothetical provider – base case scenario

PARAMETER	ESTIMATE	SOURCE
Long-run average risk-free rate	5.00%	Average 10-year government bond yield since 1995.
Long-run average MRP	6.50%	Ibbotson estimate of MRP using long run historical excess returns.
MRP risk-free rate offset	50%	Extent to which MRP changes to offset changes in risk-free rate.
Current risk-free rate	1.40%	Current 10-year government bond yield.
Equity beta	0.75	Regression analysis from comparator firms.
Current MRP	8.30%	Formulaic approach.
Return on commercial equity	7.63%	CAPM.
Gearing	45%	Analysis from comparator firms.
RAD funding	10%	Assumption
Commercial debt	35%	Gearing - RAD funding
Non-debt capital	55%	1 - Gearing
Commonwealth capital grants	0%	Assumption
Commercial equity	55%	(1 - Gearing) - Commonwealth capital grants
Return on commercial debt	5.90%	10-year trailing average yield on 10-year BBB-rate corporate bonds.
Notional interest rate on RAD funding	1.20%	3-year trailing average yield on 3-year Commonwealth Government bonds
Vanilla WACC	**6.38%**	**WACC formula.**

Source: Frontier Economics

184.   In **Table 10** we assume that:

a. The total gearing of the provider is 45% (consistent with **Table 9**). The debt finance used by the provider is partly commercial debt and partly RAD funding;

    i. 10% of the provider's total capital requirements are met by RAD funding (at a Government-subsidised rate of interest);

    ii. 35% of the provider's total capital requirements are met by commercial debt (on which a commercial return on debt is required);

b. The notional interest on RAD funding paid by the provider to residents is equivalent to the 3-year trailing average yield on 3-year Commonwealth bonds—on the assumption that the average resident remains in a residential care facility for a period of 3 years, and the RAD obligations (like commercial debt obligations) of the provider are staggered over time. For simplicity, we treat this 'loan' from the provider to residents as essentially risk-free since RADs are currently under-written by a Commonwealth guarantee;

c. The non-debt capital (i.e., 55% of the total capital base) used by the provider is entirely commercial equity capital;

    i. 0% of the provider's total capital requirements are met by Commonwealth capital grants (on which no return would be required);

    ii. 55% of the provider's total capital requirements are met by commercial equity (on which a commercial return on equity is required).

185. The WACC of this hypothetical provider under the existing arrangements differs from the commercial WACC presented in **Table 9** because, in our base case scenario, the hypothetical provider benefits from a Government guarantee on RADs.

186. As we explain in section 4, this form of Government support, in addition to Commonwealth capital grants, is an examples of a subsidy that has the effect of lowering the rate of return required by providers.

187. In addition, we adopt the base case model inputs presented in **Table 11** below.

Table 11: Building block model inputs and values – illustrative base case scenario

MODEL INPUT	VALUE
Current value of land ($'000)	5,000
Expected annual appreciation in land value	2.50%
Current value of buildings and fixtures ($'000)	25,000
Remaining useful life (years)	40
Expected annual appreciation in value of buildings and fixtures	2.50%
Number of beds at facility	100
Opex ($'000 per annum)	200
Expected annual growth in costs	2.50%
Corporate tax rate	30%
Gamma	25%

Source: Frontier Economics

188. Additionally, we make the following simplifying assumptions:

    a. Ongoing capital expenditure is equal depreciation such that the quality of the assets used to deliver accommodation services is maintained at a constant level over time; and

    b. Tax depreciation is equal to annual depreciation of the assets.

189. Under these input assumptions, the annual fee per bed is calculated to be $21,518 in the first year.

    Scenarios considered

190. Our sensitivity analysis considers two sets of scenarios:

    a. Scenarios that vary some characteristics of the provider and that relate to the Government subsidies that the provider may benefit from. These scenarios are summarised in **Table 12**; and

    b. Scenarios that demonstrate the impact of varying a number of key building block inputs set out in **Table 11**. The scenarios we explore are summarised in **Table 13**.

Table 12: Scenarios that relate to characteristics of the provider and Government subsidies

SCENARIO	DESCRIPTION	IMPLEMENTED IN MODEL BY…
1	Assume provider is tax exempt rather than tax-paying	Setting corporate tax rate to 0%
2	Assume provider is a not-for-profit	Setting required return on equity to 0%[15]
3	Remove RAD subsidy	Setting RAD funding to 0% such that all debt finance is commercial debt finance
4	Add access to Commonwealth capital grants	Setting Commonwealth capital grants to 10% such that not all non-debt finance is commercial equity finance

Source: Frontier Economics

Table 13: Scenarios that involve changing building block inputs

SCENARIO	DESCRIPTION	IMPLEMENTED IN MODEL BY…
5	Increase land value	Assume initial land value of $6,000
6	Increase value of buildings and fixtures	Assume initial value of buildings and fixtures is $30,000
7	Increase expected growth rate in value of land value	Assume growth rate of 3.0% p.a.
8	Increase expected growth rate in value of buildings and fixtures	Assume growth rate of 3.0% p.a.
9	Increase expected growth rate in costs	Assume growth rate of 3.0% p.a.
10	Shorten asset lives for buildings and fixtures	Assume asset life of 30 years
11	Increase operating expenditure	Assume annual operating expenditure of $250,000

Source: Frontier Economics

Results of sensitivity analysis

191.   **Table 14** below presents the year 1 fee per bed for combinations of the scenarios summarised in **Table 12**. These results adopt and hold constant the building block inputs summarised in **Table 11**.

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[15]   The tax rate is also set to zero, and a floor of zero is applied to earnings from distributions. That is, revenue is at least equal to the sum of interest payments and opex. This can result in a positive return on equity, as equity holders benefit from appreciation of asset values.

Table 14: Fee per bed – Scenarios that relate to characteristics of the provider and Government subsidies

	BASE CASE	SCENARIO 1 – TAX EXEMPT PROVIDER	SCENARIO 2 – NOT-FOR-PROFIT PROVIDER
Base case scenario	$21,518	$20,043	$8,555
Scenario 3 – Remove RAD subsidy	$22,928	$21,453	$9,965
Scenario 4 – Add access to Commonwealth capital grants	$18,707	$17,864	$8,555
Scenarios 3 and 4 – Remove RAD subsidy *and* add access to Commonwealth capital grants	$20,117	$19,274	$9,965

Source: Frontier Economics

192.   **Table 15** presents the year 1 fee per bed for each of the scenarios summarised in **Table 11**, holding all other things constant.

Table 15: Fee per bed – Scenarios that involve changing building block inputs

SCENARIO	FEE PER BED
Base case scenario	$21,518
Scenario 5 – Increase land value	$21,955
Scenario 6 – Increase value of buildings and fixtures	$24,984
Scenario 7 – Increase expected growth rate in value of land value	$21,195
Scenario 8 – Increase expected growth rate in value of buildings and fixtures	$19,936
Scenario 9 – Increase expected growth rate in costs	$21,518
Scenario 10 – Shorten asset lives for buildings and fixtures	$23,653
Scenario 11 – Increase operating expenditure	$22,018

Source: Frontier Economics

4 THE IMPACT OF SUBSIDIES ON THE WACC AND PRICE CAPS

4.1 Overview

193.   The building block model that has been provided with this report demonstrates how to derive the annual revenue that would be required to cover the costs (including a reasonable return on capital) of providing residential aged care accommodation services. The model shows how this can be used to determine the annual price per bed that a service prover would need to charge to generate that required revenue.

194.   One application of such an annual price per bed figure is its use as a price cap that might be used to determine:

   a.   The amount that would be paid for a government-supported residential aged care accommodation charge; and/or

   b.   The maximum amount that is permitted to be charged for a non-government supported accommodation place; and/or

   c.   A published figure that would assist consumers in determining the reasonableness of a proposed residential aged care accommodation charge.

195.   In all of these cases, the idea is that the derived annual price per bed figure would be sufficient to provide the accommodation service provider with annual revenues that are sufficient to cover their costs, including the provision of a fair and reasonable return on capital for investors.

196.   In this report, we do not consider the merits of price caps or how any such price cap might be used to achieve any particular policy objectives. Rather, this report focuses on how one might perform the task of computing the annual price per bed that would be sufficient to provide the accommodation service provider with annual revenues that are sufficient to cover their costs, including the provision of a fair and reasonable return on capital for investors. To address this question, it is necessary to consider how various different forms of subsidy might be treated when performing the calculations in the building block model. In the remainder of this section, we consider a number of subsidies and how each might be treated when implementing the building block model.

4.2 Corporate tax subsidies

197.   The annual revenues received by service providers must include an allowance for corporate tax payments. That is, the service provider must be able to cover its costs, pay its taxes, and have enough remaining to provide a fair return to its investors.

198.   The rate at which corporate tax is paid varies according to the type of entity that owns the aged care facility. For example:

   a.   Large corporate owners face a corporate tax rate of 30%;

   b.   Small corporate owners (less than $25 million in annual turnover) face a corporate tax rate of 27.5%; and

   c.   Tax exempt entities (some charitable organisations) face a corporate tax rate of 0%.

199.   We note that it is straightforward to adopt a different corporate tax rate for different entities when implementing the building block model – a different figure is simply inserted on the **Inputs** tab.

200.   If the building block model is used to derive a price cap, it is necessary to consider whether a single 'benchmark' corporate tax rate should be adopted for all providers or whether the actual tax rate applying to each provider should be used.

201.   The rationale for adopting the actual tax rate is that each provider only requires compensation for the taxes they will be required to pay. For example, if a 30% 'benchmark' tax rate is applied to a tax-exempt entity, the building block model will provide that entity with an allowance for corporate tax when there is, in fact, no corporate tax obligation. This would result in that entity receiving more revenues than is required to cover their costs.

202.   Under the actual tax rate approach, the price cap for identical aged care places will differ depending on the type of operator. Other things being equal, a tax-exempt operator would have a lower price cap because they would not need compensation for corporate tax payments.

203.   Note that, for government funded accommodation charges, the net cost to government is equivalent for the commercial and not-for-profit cases:

   a.   For a commercial provider, the required revenue (and consequently the government payment) is higher as it must account for the corporate tax that must be paid on profits; and

   b.   For a not-for-profit provider, the required revenue (and government payment) is lower, but government will not receive any corporate tax payment from that entity.

204.   However, from the perspective of a resident who does not receive government support, the accommodation charge required by a commercial provider would be higher, other things being equal.

205.   Such a differential could, in theory, have the effect of driving demand towards facilities operated by tax-exempt entities. Other things being equal, residents who do not receive government support would have an incentive to seek out tax-exempt providers because accommodation charges would be relatively lower. But, of course, other things are not all equal in that facilities will differ in terms of geographic location, operating costs, and quality level. Consequently, in practice the tax-related incentive effect may only operate at the margins.

206.   It would also be possible to remove any such tax-related incentive effects by applying the same 30% corporate tax rate to all providers and by requiring those providers with lower tax rates to refund any excess tax allowance back to government. Whereas this would neutralise any incentive effects, it would involve a degree of complexity.

207.   We note that a similar arrangement applies to 'the competitive neutrality fees' that state governments charge to state-owned corporations such as electricity networks and water utilities. The government borrows on their behalf at government rates and adds a margin so that the entity pays the equivalent of a commercial rate – the interest actually incurred plus a fee to offset the benefit of the government subsidy that is implicit in that interest rate.

4.3   Return on debt subsidies

208.   Another form of subsidy provided by government relates to RADs. Where a resident uses a RAD to cover their accommodation charge, or part thereof, the federal government guarantees repayment of that RAD when the resident leaves the facility (via death or relocation). The nature of this instrument is a loan from the resident to the provider and the implicit interest rate reflects the benefits of the government guarantee.

209.   In particular, RADs are akin to a government bond, except that the length of the loan is uncertain because the length of the resident's stay at the facility is uncertain. That is, the uncertainty about the term of the loan creates some risk that is not present in a standard

government bond where the term is contractually fixed. However, the nature of the risk in this case is almost a textbook definition of a 'diversifiable risk' because it is most frequently resolved by the death of the resident, which is entirely unrelated to financial market conditions. For this reason, there is unlikely to be any risk premium priced into the rate of interest on such loans.

210. In summary, RAD loans can be viewed as a form of subsidy because the government guarantee reduces the rate of interest from a standard commercial rate to the (lower) government borrowing rate.

211. This raises a complication because different providers make different use of RAD funding, and because consideration is being given from eliminating RAD funding altogether.

212. In the case where different providers use different levels of RAD funding, consideration might be given to assuming a blanket 'benchmark' level of RAD funding, or to having regard to the actual level of RAD funding used by each provider.

213. Where the actual level of RAD funding is used, required revenues (and consequently prices) would vary across facilities that are otherwise identical. This occurs because there is a greater government subsidy provided to facilities that make more use of RAD funding. As with corporate taxes above, this has the potential to drive demand towards facilities with relatively more RAD funding and consequently relatively more government subsidy.

214. Whereas the use of a standard benchmark assumption would eliminate any such pricing differentials, it would result in some providers receiving more than sufficient funding and others receiving less than sufficient funding. For example, a provider with a lower than average proportion of RAD funding would be under-funded in the sense that they actually receive less government subsidy than is assumed in setting their allowed revenues. Moreover, the provider may not have control over the level of RAD funding – for example a facility may operate in a region where residents are relatively less likely to have capital to make a RAD payment.

215. As for the tax-related subsidy above, a competitive neutrality type fee could be used to eliminate any pricing differential while at the same time ensuring that each provider receives appropriate compensation. In this setting, such a scheme may involve a 'true-up' mechanism in which:

    a. Required revenues, and price caps, are determined on the basis of a benchmark assumed level of RAD funding; and

    b. To the extent that a particular provider has a different level of RAD funding, an ex post true-up payment is made. For example, a provider who makes more use of RADs and therefore receives a greater subsidy would make a payment *to* government. And a provider with a lower than average level of RAD funding would receive a true-up payment *from* government. These true-up payments would be sized to ensure that each provider's allowed revenues properly reflected the benefit of the actual subsidy that they received.

216. Finally, we note that it is straightforward to incorporate the level of RAD funding into the building block model, if required. This can be done by inserting a second panel of debt funding to reflect the lower (government) rate applicable to RAD funding. In this case, commercial debt would require a commercial interest rate and RAD debt would require a lower, government-subsidised interest rate.

4.4 Return on equity subsidies

217. Another type of subsidy arises in relation to not-for-profit entities that provide accommodation without requiring a commercial return on equity capital.

218. It is important to recognise that the return on equity capital is provided as compensation for the risk that is borne. That risk relates to uncertainty in the future cash flows that might be received from the provision of residential aged care accommodation facilities. The level of risk, and the amount of compensation that is appropriate in relation to that risk, is independent of the owner of the facility. Rather, it is a characteristic of the cash flows that can be generated form such a facility. Consequently, other things being equal, a not-for-profit provider is reasonably entitled to receive the same degree of compensation as a commercial provider.

219. However, some not-for-profit providers may elect to charge a discounted or subsidised price in fulfilment of their charitable objectives. In this case, there is a question about the allowed revenues and any price caps should differ as between commercial and not-for-profit providers. For example, this may be done by adopting a 0% required return on equity for not-for-profit providers.

220. The consequences of differential pricing between commercial and not-for-profit providers are:

   a. There would be an incentive for non-supported residents to seek not-for-profit providers as prices would be relatively lower;

   b. There would also be an incentive for government to prefer residents elect not-for-profit providers as the payment to be made would be relatively lower; and

   c. There would be an incentive for not-for-profit providers who cater for government-funded residents to restructure into a commercial form (e.g., creating a commercial business or subsidiary). This would enable the provider to receive relatively more government funding while still providing the same service to the same residents.

221. The alternative approach would be to set the same return on equity allowance for commercial and not-for profit providers. In this case, other things being equal, the price cap would be the same for commercial and not-for-profit providers, and:

   a. Not-for-profit providers would have the option of charging less than the price cap for non-supported residents if they chose to do so; and

   b. For government supported places, not-for-profit providers would receive appropriate compensation for the risk involved – which they would be free to use for other charitable purposes.

4.5 Capital contribution subsidies

222. A final form of subsidy relates to capital contributions. This arises where government makes a contribution in the form of a grant towards the purchase or construction of a facility. In the regulatory setting, this would be known as a 'contributed asset' that would not go into the asset base in the building block model. For example, it would be unreasonable if a rail user paid for a particular rail spur and the network owner was then able to recover a return on and of capital from that user via the annual revenue charges.

223. Similarly, there would double-counting if government made a capital contribution and the provider was also able to recover that capital cost, and a return on it, from allowed revenues. This implies that capital contributions should not be included in the asset base in the building block model. However, that would have the effect of creating a different set of prices for different facilities depending on the level of capital contribution applied.

224. This pricing differential could be neutralised via the sort of true-up mechanism set out above. That is, annual revenues and price caps could be set on the basis of no capital contributions to eliminate any pricing differential. Then any return of or on capital relating to the contributed amount would be refunded via a true-up payment back to government at the end of each year.

5 THE IMPACT OF INCREASED COMPETITION ON THE WACC AND PRICE CAPS

225. Some of the regulatory changes that are considered in the subsequent section have the potential to subject residential aged care accommodation providers to increased levels of competition. This raises the question of whether increased competition has any impact on WACC parameters, and consequently on required revenues and price caps.

226. In general, we would expect increased competition to result in greater volatility of returns to providers – that is greater risk. This was recognised in the recent StewartBrown study that considered this reform option. That report noted that: "Competition could lead to more variable vacancies for some providers (with overhead costs remaining largely fixed)."[16] Hence, greater competition would result in residential aged care providers facing increased total risk. This could be expected to reduce the capacity for borrowing (which would reduce gearing) and increase the required return on debt. That is, lenders may be prepared to provide relatively less debt finance if there is an increase in the volatility of the cash flows that would be used to service that debt and/or lenders may charge a higher interest rate on the debt that they provide.

227. The impact of a reduction in gearing on the required rate of return is ambiguous. This is because a reduction in financial leverage would push down the re-levered equity beta (all else remaining equal), thereby reducing the required return on equity. However, a reduction in gearing would mean that providers would rely on a greater proportion of equity capital, which is more expensive than debt capital. That would have the effect of pushing the required rate of return up (all else remaining equal). The net effect of these two opposing forces on the overall required rate of return is unclear.

228. However, an increase in the required return on debt (due to more variable cash flows) would unambiguously increase the overall WACC (all other things remaining equal).

229. Another question that arises is whether an increase in competition between providers would affect the fundamental systematic risk involved in operating a residential aged care accommodation facility. In paragraph 77 above, we note that a firm's equity beta reflects asset risk and financial risk. Asset risk relates to the fundamental risk of operating the assets in question. Financial risk relates to the impact of debt finance, which has a claim that ranks ahead of equity. The discussion of changes in the degree of debt finance above relates to financial risk. The discussion of changes to the risk of the operation of the assets here relates to asset risk.

230. Asset risk only changes to the extent that returns are correlated with financial market conditions. In our view, it seems unlikely that the proposed reform would result in providers facing greater competition when the overall market is 'down', and weaker competition when the overall market is 'up'.

231. Moreover, whereas it is possible to empirically differentiate between the asset betas of firms in different industries (e.g., aged care vs. airlines vs. supermarkets), it is practically impossible to differentiate between the asset betas of firms in a single industry operating under somewhat different levels of competition.

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[16] StewartBrown and UTS, *Residential aged care: Proposed alternative models for allocating places*, Discussion paper, July 2019, p. 26.

232.   In summary, our view is that any increase in competition flowing from the proposed reforms is unlikely to have an obvious material impact on required returns.

233.   We note that this could be tested empirically after the reforms are enacted. For example, aged care accommodation providers may be able to adduce evidence that they are unable to raise debt finance to the extent assumed in our building block model. Or there may be evidence that actual borrowing costs (interest rates) are higher than the rates assumed in our building block model.

234.   In that case, it is straightforward to adjust the WACC parameters in the building block model and to recompute the resulting WACC.

6 ANALYSIS OF ALTERNATIVE COMPENSATION MECHANISMS

6.1 Key features of the current arrangements for funding and allocation of aged care places

Funding

235.   The main costs that arise in provision of residential aged care services relate to:[17]

    a.   The nursing and personal care of residents;

    b.   The living expenses of residents; and

    c.   The capital costs associated with construction, maintenance and refurbishment of aged care facilities (all of which relate to residents' accommodation costs).

236.   At present, the funding of these costs is shared between the Commonwealth and residents using aged care facilities.

237.   The Commonwealth currently contributes funding towards:

    a.   A basic care subsidy for personal and nursing care;

    b.   Additional supplements to assist with the provision of care that incur higher costs to deliver (e.g., enteral feeding, oxygen and the provision of care for special needs groups) and respite care;

    c.   Accommodation supplements to support those permanent residents who do not have the means to meet all of the accommodation costs themselves; and

    d.   Capital grants to eligible residential aged care providers who are unable to fund the cost of capital works by other means.[18]

238.   Residents currently contribute funding towards the costs of aged care services in the following ways:

    a.   Fees to cover basic day-to-day living costs, which are determined by the provider;

    b.   A means-tested care fee, which are subject to annual and lifetime caps that are set by the Government;

    c.   Accommodation cost, which are set by the provider. As noted above, the Government may contribute a means-tested accommodation supplement for those residents who cannot cover the full accommodation costs themselves; and

    d.   Fees for extra and additional services, over and above a standard service level, which are set by the provider.

239*.*   Residents who need to pay in full or in part for their accommodation may do so in the form of:

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[17] An overview of the costs associated with the provision of aged care services in Australia, and how those costs are currently shared between the Commonwealth and users of aged care services, is set out in: Royal Commission into Aged Care Quality and Safety, *Navigating the maze: An overview of Australia's current aged care system*, Background Paper 1, February 2019, pp. 29-37.

[18] These capital grants are allocated through the Aged Care Approvals Round (ACAR) via the Rural, Regional and Other Special Needs Building Fund.

      a.   Lump-sum Refundable Accommodation Deposits (RADs).[19] The RADs are refunded in full when a resident leaves a facility;[20] or

      b.   Daily Accommodation Payments (DAPs).[21] The DAP is computed using a Maximum Permissible Interest Rate (which is set by the Commonwealth) and is not refundable; or

      c.   A combination of a RAD and DAP.

240.   As explained in section 2.6, the (refundable portion of the) RADs (RACs) paid by residents towards accommodation costs economically-equivalent to a loan to an aged care provider in exchange for accommodation. One way to characterise this exchange would be the following:

      a.   Residents provide a loan in the form of a RAD to the residential aged care provider in exchange for interest payments;

      b.   The residential aged care provider offers residents accommodation in exchange for rent payments; and

      c.   The interest paid by the residential aged care provider for the RAD offsets exactly the rent paid made by the residents. Because the stream of interest paid by the residential care provider equals the stream of rent paid by residents, no monies are actually exchanged between the parties—residents simply receive accommodation in exchange for the RADs they pay to the care provider.

241.   Under the existing arrangements, the RADs are underwritten by the Commonwealth under the Accommodation Payment Guarantee Scheme (Guarantee Scheme). Under the Guarantee Scheme, if a residential care provider becomes insolvent and is unable to repay RADs owed to residents, then the Commonwealth would step in and refund the RAD balance.[22]

242.   In the exchange described above, the Guarantee Scheme has the effect of lowering the interest payments owed to residents in exchange for the loan provided to residential care providers in the form of that RAD than would otherwise be the case. That is, in the absence of the Guarantee Scheme, the interest that residents would require to compensate them for the risk of the residential care provider defaulting on its obligation to refund the RAB would be higher. Hence, the effect of the Guarantee Scheme is to subsidise (i.e., lower) the cost of borrowing faced by residential care providers. This is an important consideration when thinking about the impact of any future reforms that would abolish the RADs (see section 6.3).

Allocation of aged care places

243.   Under the current arrangements, the Commonwealth regulates the supply of the residential aged care places it funds by specifying targets. These targets are known as the aged care target provision ratio.

244.   In the 2018-19 Budget, the Commonwealth decided to combine the previously separate budgets for home care and residential care, allowing greater flexibility for Government funding to be allocated between these two forms of care as required.

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[19] In instances where the Commonwealth provides some assistance to a resident for accommodation costs, the resident's lump-sum contribution for accommodation costs is referred to as the Refundable Accommodation Contribution (RAC). Like the RAD, the RAC is fully refundable when the resident leaves the aged care facility.

[20] The RAD would not be refunded in full if the resident has agreed for certain amounts to be deducted from that amount—for instance amounts relating to care contributions or fees for additional services.

[21] When the Commonwealth provides some assistance to a resident for accommodation costs, the resident's ongoing contribution to accommodation costs is referred to as the Daily Accommodation Contribution (DAC).

[22] Royal Commission into Aged Care Quality and Safety, *Navigating the maze: An overview of Australia's current aged care system*, Background Paper 1, February 2019, p. 49.

245.   The current target provision ratio is set at 125 aged care places per 1,000 people aged 70 years and over. Of this overall target provision ratio, the residential care target is to be 78 places per 1,000 people aged 70 years and over by 2022.[23]

246.   Since Commonwealth funding for residential aged care services is tied to the target provision ratio, at present, the setting of these targets effectively rations the number of residential aged care places available.

6.2   Proposed reform scenarios

247.   The Royal Commission has sought advice from us on the potential impact on the required return for residential aged care service providers under various possible reform scenarios for the industry. The scenarios that the Royal Commission has asked us to consider are the following:

     a.   Scenario 1: Business as usual (BAU);

     b.   Scenario 2: Removal of capital grants;

     c.   Scenario 3: Removal of capital grants and introduction of accommodation payment reforms; and

     d.   Scenario 4: Multiple reforms.

248.   The Royal Commission has also asked us to consider a variant on each of the scenarios above, whereby residential care subsidies are allocated directly to residents, rather than to residential care providers (as currently occurs).

249.   We elaborate below on what each of these scenarios would involve.

Scenario 1: Business as usual (BAU)

250.   The Royal Commission has asked us to consider a BAU scenario in which:

     a.   Commonwealth capital grants continue at current levels;

     b.   Lump sum residential accommodation deposits and daily accommodation payments are permitted and continue to be charged and received at current levels; and

     c.   Entitlements to residential care subsidies remain rationed at the current levels and allocated through the current regionally distributed allocation rounds (i.e., the ACAR). Under this scenario, care subsidies would be paid directly to residential care providers, as they currently are.

Scenario 2: Removal of capital grants

251.   Scenario 2 would be identical to the BAU scenario, with one exception: the Commonwealth would no longer contribute capital grants to residential care providers.

Scenario 3: Removal of capital grants and introduction of accommodation payment reforms

252.   Scenario 3 would be identical to Scenario 2, with one exception: residential care providers would no longer be permitted to collect RADs, and the DAPs would be limited to the amount permitted to earn a reasonable return on (per bed) capital investment plus depreciation.

Scenario 4: Multiple reforms

253.   Scenario 4 would adopt all of the reforms related to Scenario 3, in addition to the following:

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[23] Royal Commission into Aged Care Quality and Safety, *Navigating the maze: An overview of Australia's current aged care system*, Background Paper 1, February 2019, p. 39.

a. Commonwealth support for an expansion of home care places to delay or avoid the need for older people to enter residential care;

b. Preferential interventions by the Commonwealth to de-institutionalise large scale residential care facilities and encourage the development of smaller scale congregate living arrangements care;

c. Rationing of entitlements to residential care subsidies would be phased out over a period of time. For instance, rationing would be removed after one year, three years or five years following the introduction of the reforms.

Variant to scenarios above: Residential care subsidies are allocated directly to residents

254. The Royal Commission has asked us to consider a variation to each of four scenarios above, whereby residential care subsidies paid by the Commonwealth (and the associated number of places for residential aged care places) would no longer be allocated to providers via the ACAR. Instead, residential care subsidies would be allocated directly to each resident in the form of 'packages' of funding.[24] This means that if a resident wishes to switch between providers, they may take their funding package with them to the new provider.

255. One of the key proposed benefits of this reform is greater competition between residential aged care providers.[25] The hope is that allocating subsidies directly to residents would empower them with greater choice and reduce the difficulties associated in switching between providers. This, in turn, should incentivise residential care providers to compete more strongly with one another (on price and quality) to attract and retain residents.

Summary of reform scenarios considered

256. **Table 16** summaries the key features of the reform scenarios that the Royal Commission has asked us to consider.

Table 16: Summary of key features of possible reform scenarios we have been asked to consider

SCENARIO	SUMMARY OF BASIC SCENARIO	VARIANT ON BASIC SCENARIO
Scenario 1 (BAU)	• Commonwealth capital grants continue • Lump-sum RADs permitted • DAPs permitted at current levels • Residential care subsidies remain rationed at the current levels and allocated through the ACAR	• Commonwealth capital grants continue • Lump-sum RADs permitted • DAPs permitted at current levels • Residential care subsidies allocated directly to residents

[24] The details of this proposed reform are set out in the following report: StewartBrown and UTS, *Residential aged care: Proposed alternative models for allocating places*, Discussion paper, July 2019.

[25] Other proposed benefits include improved transparency in the way subsidies are allocated and reducing the cost burden to small providers in participating in ACAR funding rounds. See StewartBrown and UTS, *Residential aged care: Proposed alternative models for allocating places*, Discussion paper, July 2019, p. 12.

SCENARIO	SUMMARY OF BASIC SCENARIO	VARIANT ON BASIC SCENARIO
Scenario 2	• ~~Commonwealth capital grants continue~~ • Lump-sum RADs permitted • DAPs permitted at current levels • Residential care subsidies remain rationed at the current levels and allocated through the ACAR	• ~~Commonwealth capital grants continue~~ • Lump-sum RADs permitted • DAPs permitted at current levels • Residential care subsidies allocated directly to residents
Scenario 3	• ~~Commonwealth capital grants continue~~ • ~~Lump-sum RADs permitted~~ • DAPs permitted but capped • Residential care subsidies remain rationed at the current levels and allocated through the ACAR	• ~~Commonwealth capital grants continue~~ • ~~Lump-sum RADs permitted~~ • DAPs permitted but capped • Residential care subsidies allocated directly to residents
Scenario 4	• DAPs permitted but capped • Residential care subsidies remain rationed at the current levels and allocated through the ACAR • Phasing out of rationing of residential care places • Commonwealth support for an expansion of home care places • Commonwealth incentives to encourage development of smaller scale congregate living arrangements care	• DAPs permitted but capped • Residential care subsidies allocated directly to residents • Phasing out of rationing of residential care places • Commonwealth support for an expansion of home care places • Commonwealth incentives to encourage development of smaller scale congregate living arrangements care

Source: Frontier Economics analysis of reform scenarios being considered by Royal Commission.

6.3 Potential impact on the required rate of return and price caps

257. This section discusses how the various reform scenarios outlined above may affect the required rate of return for providers of residential aged care services.

258. Section 2 explained that the WACC is comprised of:

   a. firm-specific parameters (e.g., gearing, beta and return on debt); and

   b. market-wide parameters (e.g., risk-free rate, MRP).

259. Regulatory reforms to the aged care sector of the kind outlined above would have no impact on the market-wide parameters, which apply to the economy as a whole. However, particular regulatory reforms could have an impact on firm-specific factors, which in turn may result in a change in the overall required rate of return (all else remaining equal).

260. Another way in which the reforms may affect the required rate of return is by removing a source of cheap or subsidised funding, which would need to be replaced using more expensive debt and/or equity capital that has been raised under commercial terms.

261. In our view, there is no reliable way of quantifying how particular firm-specific parameters might change under different reform scenarios. This is because, in order to make any empirical assessment of how one of the firm-specific parameters might change in response to a particular reform, we would need to:

    a. identify a (sufficiently large) sample of comparator firms actually operating under the reform scenario of interest;

    b. estimate the relevant parameter for that group of firms; and

    c. compare that estimate to the estimate of that parameter under the BAU scenario. The difference between the two estimates would provide an indication of how the parameter in question might be influenced by the implementation of a particular reform.

262. In practice, there is no set of suitable comparator firms whose characteristics will allow us to isolate the effect of the reforms considered, to the exclusion of other factors. For example, we understand from Royal Commission staff that some States in the US allocate residential care subsidies directly to residents in a way similar to the proposed reform under consideration by the Royal Commission, while other States allocate Government funding for residential care directly to providers (similar to the current model in Australia). Consequently, we have considered whether differences in the required rates of return of providers in the US could be used to inform how the proposed required rate of return of providers in Australia may be affected if residential care subsidies were allocated to residents rather than providers.

263. However, there are several obstacles in analysing a 'natural experiment' of the sort outlined above to quantify the impact of proposed reforms on the required rate of return of providers in Australia.

    a. We would need to identify providers that operated *only* in States with a particular regulatory model (i.e., allocation of care subsidies to providers *or* to residents) rather than in multiple States with different subsidy models. We have not been able to identify a significant number of such 'pure' firms.

    b. We would need to identify a sufficiently large sample of listed providers in each regulatory model group—since the empirical task of rate of return estimation requires traded share price data. As the analysis in section 2 showed, there are some listed US residential aged care providers, but the entire sample is relatively small and the number of 'pure' firms (i.e., operating only under a single regulatory model) is much smaller again.

    c. We would also need to control for all other differences (other than subsidy model) that may explain differences the estimated required rate of return between groups of providers.

264. It is for the reasons set out above that Australian regulators have been unable to quantify differences in WACC parameters for:

    a. Firms in similar industry segments (e.g., the Australian energy regulator adopts identical WACC parameters for gas and electricity network businesses; and

    b. Firms that are subject to price cap regulation and firms subject to revenue cap regulation,

    even in the face of submissions that different parameters should be considered.

265. Consequently, when evaluating the potential impacts of some of the suggested reforms, it is not possible to precisely quantify the impact on required returns. In these cases, we discuss the likely directional impact of the proposed reform.

266.   One of the perceived benefits of allocating residential care subsidies directly to residents rather than care providers is that doing so may allow residents to switch between providers more readily. This, in turn, could drive greater competition between residential care providers, to the benefit of residents.

267.   Section 5 sets out the potential effects of increases in the level of competition. In particular, increased competition may result in higher volatility in cash flows, which may in turn result in lower gearing and/or a higher cost of servicing debt finance.

268.   Of course, there are a number of important benefits that are expected to arise from an increase in competition including:

   a.   More incentive for providers to innovate and to differentiate on the basis of quality; and

   b.   More constraints on the ability of providers to charge at levels above the efficient cost.

Removal of Commonwealth capital grants

269.   As set out in Section 4.5 above, capital grants are a form of capital contribution that is not required to be repaid. In our view, these grants do not affect the computation of the WACC. Rather, the question is whether or not this contributed capital is included in the asset base in the building block model.

270.   Section 4.5 considers the merits of two approaches:

   a.   Removing any contributed capital from the asset base; and

   b.   Including contributed capital in the asset base and implementing an annual true-up mechanism whereby any return of or on capital in relation to capital grants is refunded to government at the end of each year.

Removal of RADs

271.   As set out in Section 4.3 above, the RADs that some residents pay in order to fund accommodation costs are underwritten by the Commonwealth under the Accommodation Payment Guarantee Scheme (Guarantee Scheme). The effect of the Guarantee Scheme is to subsidise residential care providers' cost of debt finance.

272.   This means that the WACC of a care provider that receives RADs from residents may be formulated as follows:

$$WACC_r = \frac{E}{V}r_e + \frac{D}{V}r_d + \frac{R}{V}r_r$$

where:

   a. $r_e, r_d, E/V$ and D/V are as defined above;

   b. R/V represents the relative proportion of RAD finance;

   c. $E + D + R = V$; and

   d. r_r is the interest rate owed by providers to residents in exchange for RADs.

273.   Section 4.5 considers the merits of two approaches:

   a.   Adopting a different WACC for each provider, reflecting the actual quantum of RAD funding employed by that provider; and

   b.   Adopting a standard benchmark level of WACC funding to neutralise any price distortions, with a true-up mechanism to reflect the actual benefit of the RAB subsidy to each provider.

274.   The effect of removing RADs entirely involves the removal of a material government subsidy, which in turn flows through to a higher WACC and a higher price cap, other things being equal.

Capping of DAPs

275.   Under reform Scenarios 3 and 4 above, the charging of DAPs would continue to be permitted, but the DAPs would be limited to the amount permitted to earn a reasonable return on (per bed) capital investment plus depreciation. This is similar in principle to systems of economic regulation that is applied typically to monopoly industries in many countries (including Australia), which caps the prices that firms in those industries are allowed to charge to a level that is sufficient to recover the cost of delivering services to their customers.

276.   There is a body of economic theory that suggests that the introduction of such economic regulation can alter the required return of firms delivering the services subject to regulation, by altering the risk exposure of those firms. One example is the *Peltzman buffering hypothesis*, which postulates that economic regulation acts to "buffer" the cash flows of the business.[26] Peltzman (1976) suggests that regulation essentially "involves consumers shielding producers from some of the effects of cost increases and producers sharing some of their gains from cost reductions."[27]

277.   In principle, this proposition is correct. If regulation caps prices at a level that is set to allow the recovery of costs, then if costs increase, then so would the price limits. Incentive-based systems of regulation (which are applied widely in Australia) involve the periodic resetting of prices. This creates incentives for regulated firms to seek out opportunities to lower their actual costs (by means of efficiency gains) over each regulatory period because, by doing so, the firm is allowed to keep any efficiency savings at least until prices are reset. When the regulator resets prices, it can use information on the cost reductions achieved to set prices for the next period, effectively sharing with consumers some of the gains from cost reductions realised by the regulated business.

278.   Peltzman (1976) argues that this tends to reduce the volatility of the returns of the regulated business. Further, Peltzman asserts that "regulation will tend to be more heavily weighted toward 'producer protection' in depressions and toward 'consumer protection' in expansions."[28] That is, he suggests that not only does regulation lower the overall risk of regulated firms, it also lowers the systematic (i.e., non-diversifiable) risk that regulated firms are exposed to.

279.   If this theory holds in practice, then we might expect the introduction of regulation to:

   a. Reduce the asset beta of residential aged care providers; and

   b. Increase the creditworthiness of providers, thus lowering their required debt.

280.   However, the buffering hypothesis has been tested extensively over the last four decades, and the results have been mixed at best. Hence, there is no empirical consensus that regulation does reduce exposure to total risk or systematic risk. Indeed, many regulated firms in Australia have argued that the regulator has *increased* risk by mis-estimating WACC parameters and being influenced by political considerations.

281.   As noted above, it is standard to apply the same set of WACC parameters to firms that face different forms of regulation. For this reason, we conclude that capping DAPs does not have an obvious impact on WACC parameters or required returns.

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[26] Peltzman, S. (1976), Toward a more general theory of regulation, Journal of Law and Economics 19(2), pp. 211-240.

[27] Peltzman (1976), p. 226.

[28] Peltzman (1976), p. 227.

282. Under reform Scenario 4, the current rationing of residential care places would be phased out gradually (e.g., over one, three or five years). It seems likely that the removal of rationing of residential care places would increase competition between providers. New providers would no longer be constrained by a requirement to hold a Government allocation of places in order to offer residential care services. Instead, a provider could enter the market by building a facility with capacity, and then compete with surrounding facilities (e.g., on price and/or quality) to fill that capacity—as long as there was sufficient demand for residential care places in order to make entry worthwhile.

283. It seems likely that the more quickly rationing is phased out, the more accelerated would be this competition effect. The effect of increased competition is discussed in Section 5 above.

Commonwealth support for an expansion of home care places

284. Another reform envisaged under Scenario 4 is the rapid expansion of the home care (package) program. If greater numbers of home care packages were available, and they were allocated more promptly, and if the level of funding accorded under those packages was increased substantially, it is reasonable to assume that there would likely be demand side substitution in favour of home care at the expense of residential care. That is, residential care providers would most likely face greater competition from the next closest alternative—namely, home care.

285. Again, the effect of increased competition is discussed in Section 5 above.

Commonwealth incentives to encourage development of smaller scale congregate living arrangements care

286. A further reform that is being considered under Scenario 4 is preferential Commonwealth intervention to de-institutionalise large-scale residential care facilities, and to encourage development of smaller-scale congregate arrangements care. For the purposes of considering this reform option, the Royal Commission has asked us to assume the following:

 a. the introduction of a ceiling on the size of new residential care facilities, with an appropriately long warning period so as not to disrupt any existing commercial commitments;

 b. the ceiling might be in the order of 100 beds, 75 beds, or 50 beds;

 c. the ceiling would form part of a good design regime, whereby (for example) a distributed accommodation model such as a 'village' layout across multiple buildings and incorporating appropriate outdoor spaces would not be subject to the ceiling; and

 d. further or alternatively, differential residential care subsidy levels may be payable, whereby positive incentives are provided for good designs and smaller communal living arrangements.

287. Assuming that these interventions are effective in incentivising the development of smaller-scale residential care facilities in future, the required rate of return to new (as opposed to existing) providers may differ from required rate of return under the BAU scenario as follows:

 a. In the case of providers that operate a single facility, we might expect the variability of total returns to increase, relative to the BAU scenario (and all else remaining equal). This is because each individual resident contributes a greater share of returns to a small facility than to a larger facility. For example, consider two facilities: one with a capacity of 50 beds, and the other with a capacity of 150 beds. Suppose also, that each of these facilities is full, and that each resident contributes an identical amount of revenue to the facility in which they live. Under these circumstances, each resident at the smaller facility would contribute 2% of the provider's total revenues, whereas each resident at the large facility would contribute just under 0.7% of the provider's

total revenues. Hence, each lost resident would have a disproportionate revenue impact on the smaller facility than on the larger facility.

In addition, if there are at least some economies of scale in the provision of residential care services (e.g., through the ability to spread overheads and common costs over a larger pool of residents), then the loss of a resident at a small facility will mean that a greater share of costs will need to be recouped from existing residents.

Greater variability of returns would likely increase the total risk faced by the provider and, therefore the total required rate of return.

b. In the case of providers that operate multiple facilities, we would expect the greater variability of returns associated with each facility to be diversified somewhat across the total portfolio of facilities owned by the provider. That is, whilst the returns from each individual facility would increase, this variability in returns might be smoothed across multiple facilities.

Summary of impact on required rate of return

288.   **Table 17** below summarises the impact on the required rate of return (relative to the BAU scenario) of each of the reforms discussed above.

Table 17: Summary of impact on required rate of return relative to BAU scenario (Scenario 1)

SCENARIO	SUMMARY OF BASIC SCENARIO Entitlements to residential care subsidies remain rationed at the current levels and allocated through	VARIANT ON BASIC SCENARIO Entitlements to residential care subsidies allocated directly to residents rather than providers
Scenario 1 (BAU)	• No change	Ambiguous. Greater competition: • May increase required return on debt and, therefore, overall WACC; • May reduce gearing. The impact of such a change on the overall WACC is unclear. Extent to which required rate of return may be affected will depend on the extent to which allocation of subsidies directly to residents actually enhances competition between providers.
Scenario 2	Increase in required rate of return: • Discontinuation of Commonwealth capital grants would mean that providers would need to replace grants with more expensive debt and/or equity capital.	Ambiguous. Greater competition: • May increase required return on debt and, therefore, overall WACC; • May reduce gearing. The impact of such a change on the overall WACC is unclear. Extent to which required rate of return may be affected will depend on the extent to which allocation of subsidies directly to residents actually enhances competition between providers.

SCENARIO	SUMMARY OF BASIC SCENARIO Entitlements to residential care subsidies remain rationed at the current levels and allocated through	VARIANT ON BASIC SCENARIO Entitlements to residential care subsidies allocated directly to residents rather than providers
Scenario 3	• Discontinuation of RADs would be expected to increase required return on capital, because this reform would remove a 'subsidy' to providers in the form of the Accommodation Payment Guarantee Scheme. In the absence of RADs underwritten by the Guarantee Scheme, providers would need to raise unsubsidised commercial debt. • Effect of capping DAPs on the required rate of return is ambiguous.	Ambiguous. Greater competition: • May increase required return on debt and, therefore, overall WACC; • May reduce gearing. The impact of such a change on the overall WACC is unclear. Extent to which required rate of return may be affected will depend on the extent to which allocation of subsidies directly to residents actually enhances competition between providers.
Scenario 4	• The likely effect of removing capital grants is described in relation to Scenario 2 above. • The effect of removing RADs and capping DAPs is described in relation to Scenario 3 above. • The removal of rationing of places and Commonwealth support for an expansion of home care places would likely increase the competition that residential aged care providers are exposed to. The overall effect of greater competition on the required rate of return is unclear. It is possible that greater competition would increase the total risk that residential care providers face, which may increase their required return on debt and, therefore, the overall WACC. • The impact of incentivising development of smaller scale congregate living arrangements care may be to expose future residential care providers to greater returns volatility and, therefore, total risk. This may increase the WACC of future residential care providers. The extent to which this may be mitigated may depend on the ability of providers to diversify this additional risk—for instance by owning a portfolio of different facilities.	Ambiguous. Greater competition: • May increase required return on debt and, therefore, overall WACC; • May reduce gearing. The impact of such a change on the overall WACC is unclear. Extent to which required rate of return may be affected will depend on the extent to which allocation of subsidies directly to residents actually enhances competition between providers.

Source: Frontier Economics analysis of reform scenarios being considered by Royal Commission.

7 THE MAXIMUM PERMISSIBLE INTEREST RATE FOR SETTING RADS

289.   The Seventh Report on the Funding and Financing of the Aged Care Industry notes that residents who are not eligible for government assistance are required to pay for their residential aged care accommodation costs. It is open to the resident to determine whether to make payment via:

   a.   A Refundable Accommodation Deposit (RAD);

   b.   A daily accommodation payment (DAP); or

   c.   Some combination of the two methods above.

290.   We have noted above that a RAD is an interest-free loan that is provided to the accommodation provider. Thus, the provider either receives:

   a.   A daily accommodation payment; or

   b.   A daily saving of the amount of interest that the provider would otherwise have to pay if the RAD amount had instead been borrowed on commercial terms in the financial markets.

291.   The Seventh Report notes the existence of a formula that is designed to ensure the equivalence of the two methods. The key component of that formula is the Maximum Permissible Interest Rate (MPIR):

   Residents who are not eligible for Commonwealth assistance with their accommodation costs pay the accommodation price they agree with their provider before they enter care and can choose (within 28 days of admission) to pay by a lump sum refundable accommodation deposit (RAD), a daily accommodation payment (DAP) or a combination of the two. The maximum permissible interest rate (MPIR) is used to maintain equivalence between daily payments and lump sums. [29]

292.   The Seventh Report goes on to explain that:

   The lump sum RAD amount, which is agreed between the provider and the resident, is multiplied by the MPIR and divided by 365 days to calculate the daily DAP. [30]

293.   For example, suppose the RAD is $200,000 and the MPIR is 7.5%. In that case, the equivalent DAP would be computed as $41.10 per day, as follows:

$$DAP = \frac{RAD \times MPIR}{365} = \frac{200,000 \times 7.5\%}{365} = \$41.10.$$

294.   The rationale for this calculation appears to be that the resident would either pay the provider a daily charge of $41.10, or provide a $200,000 interest-free loan which would save the provider $41.10 per day in interest charges.

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[29]   https://www.health.gov.au/resources/publications/seventh-report-on-the-funding-and-financing-of-the-aged-care-industry-july-2019. See p. 90.

[30]   https://www.health.gov.au/resources/publications/seventh-report-on-the-funding-and-financing-of-the-aged-care-industry-july-2019. See p. 90.

295. Note that we can rearrange the above formula to start with a given DAP and determine the equivalent RAD:

$$RAD = \frac{DAP \times 365}{MPIR}.$$

296. As to the computation of the MPIR, Section 6 of the Fees and Payments Principles 2014 (No. 2) made under section 96-1 of the Aged Care Act 1997 sets out a calculator for the Maximum Permissible Interest Rate as follows:[31]

   a. Step 1. Work out the general interest charge rate for the relevant day under section 8AAD of the Taxation Administration Act 1953.

   b. Step 2. Multiply the rate worked out at step 1 by the number of days in the calendar year in which the relevant day falls.

   c. Step 3. Subtract 3 percentage points from the amount worked out at step 2.

   d. The result is the maximum permissible interest rate for the relevant day.

297. Section 8AAD of the *Taxation Administration Act 1953* specifies that the general interest charge rate to be applied is the 90-day Bank Accepted Bill (BAB) rate plus an 'uplift factor' of 7%.[32] The base BAB rate is a market rate that varies over time, and which reflects the risk of lending to a large Australian bank – the bills have been 'accepted' meaning that a large bank guarantees payment. The margin of 7% is fixed and appears to be designed to create a strong incentive for taxpayers to avoid under-paying their tax obligations.

298. In the case where the 90-day BAB rate is 2%, the MPIR would be computed by first determining the general interest charge for tax purposes as 2% + 7% = 9%. Then the MPIR would be computed as 9% - 3% = 6%. The net result is that the MPIR is computed by taking the prevailing BAB rate and adding 4%.

299. In our view, this approach does not result in the RAD and DAP payments being economically equivalent. For the two payments to be economically equivalent, from the perspective of the provider, the MPIR would have to be set equal to the rate at which the provider would otherwise pay if the funds were borrowed on commercial terms.

300. However, the rate of BAB plus 4% appears to be arbitrary, being based on the rate that is charged on the under-payment of taxation obligations. In our view, there is no reason to consider that the current specification of the MPIR bears any resemblance at all with the commercial borrowing rate that an aged care accommodation provider is likely to pay. In particular, the margin of 4% on top of the BAB rate is materially higher than the margin that would ordinarily be paid by an investment-grade borrower.

301. Consider the case where the DAP has been set at $41.10, and where the accommodation provider pays a margin of 2% rather than 4% on top of the BAB rate (giving a total borrowing rate of 4%, being the 2% BAB plus a margin of 2%). In this case, the provider would be indifferent between receiving that DAP or a RAD of:

$$RAD = \frac{41.10 \times 365}{4\%} = \$375,000.$$

302. That is, the provider would require a RAD of $375,000 in order to forego the DAP of $41.10 per day.

303. When looking at this issue from the resident's perspective, there is another complication. The federal government guarantees repayment of the RAD. Consequently, the resident/lender

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[31] https://www.legislation.gov.au/Details/F2018C00751.

[32] https://www.ato.gov.au/Rates/General-interest-charge-(GIC)-rates/#:~:text=Section%208AAD%20of%20the%20Taxation,days%20in%20a%20calendar%20year.&text=income%20tax,-fringe%20benefits%20tax.

faces negligible risk and should therefore be prepared to accept an accordingly low rate of return. Thus, the effect of this guarantee is that, for a given DAP, the resident would be prepared to provide a higher RAD than they would in the absence of such a guarantee.

304. Consider the case where the DAP has been set at $41.10 per day, but where the resident (because of the government guarantee) requires no margin above the BAB rate:

$$RAD = \frac{41.10 \times 365}{2\%} = \$750,000.$$

305. That is, the resident would be economically indifferent between paying the DAP of $14.10 or providing a RAD of $750,000.

306. In summary, there is a distortion created by the fact that government provides a subsidy in relation to RAD payments (by guaranteeing them) but no subsidy in relation to DAP payments.

307. In the above example, for a given DAP of $41.10 per day:

    a.   The provider would require a RAD of at least $375,000; and

    b.   The resident would be prepared to pay a RAD of up to $750,000.

308. Thus, any bargain struck within this range would be mutually beneficial as the parties effectively share the value of the government subsidy.

309. Whereas the government subsidy benefits residents and providers who are able to agree on RAD terms, not all residents have sufficient capital to provide a RAD. In that case, the only option is to make daily DAP payments and there is no benefit from any government subsidy.

310. In our view, the above analysis raises two key issues for consideration by policy-makers:

    a.   The current arrangements provide a government subsidy for RAD payments and no subsidy for DAP payments. This raises questions of whether there is a conscious policy intent to favour RAD payments.

    b.   An interest rate that reflects neither the borrowing costs of a provider nor the required rate of a resident will not economically equate RAD and DAP payments. If the policy intention is to economically equate the two payment methods from the perspective of the provider, the appropriate interest rate would be the provider's commercial borrowing rate.

8 TECHNICAL APPENDIX: DERIVATION OF REQUIRED REVENUES

311. The Equity panel of the **Building block** tab shows that the amount that is required from distributions and franking credits can be written as:

$$Req = r_e A \frac{E}{V} - \Delta A \tag{1}$$

where:

    a. r_e is the required rate of return on equity;

    b. $A \frac{E}{V}$ is the value of equity at the beginning of the year, being the total value of assets multiplied by the proportion of equity finance; and

    c. ΔA is the change in the value of the existing assets over the course of the year.

312. In summary, equity holders require a particular return over the course of the year, we deduct the component of that return that pertains to capital gains, and the remainder must be paid via cash distributions and franking credits.

313. The amount that is available for the firm to pay cash distributions and franking credits can be written as:

$$Rev - Int - Opex - Tax + \gamma Tax + \Delta D \tag{2}$$

where:

    a. Rev represents total revenue;

    b. Int represents interest payments;

    c. $Opex$ represents operating expenses;

    d. Tax represents tax expense;

    e. γTax represents the value of franking credits; and

    f. ΔD represents the additional debt that can be raised against the increase in the value of existing assets over the course of the year, and which would be available to equity as a cash flow.

314. Equating the amount that equity holders require with the amount the firm is able to pay yields:

$$Rev - Int - Opex - Tax + \gamma Tax + \Delta D = Req. \tag{3}$$

315. Next, note that tax expense can be written as:

$$Tax = (Rev - Int - Opex - TaxDep)\tau \tag{4}$$

where:

    a. $TaxDep$ represents tax depreciation; and

    b. τ represents the corporate tax rate.

316. Substituting (4) into (3) yields:

$$Rev\big(1 - \tau(1 - \gamma)\big) - (Int + Opex)\big(1 - \tau(1 - \gamma)\big) + TaxDep\big(\tau(1 - \gamma)\big) = Req. \quad (5)$$

317.　　Thus:

$$
\begin{aligned}
Rev &= \frac{Req + (Int + Opex)\big(1 - \tau(1 - \gamma)\big) - TaxDep\big(\tau(1 - \gamma)\big)}{\big(1 - \tau(1 - \gamma)\big)} \\
&= Int + Opex + \frac{Req - TaxDep\big(\tau(1 - \gamma)\big)}{\big(1 - \tau(1 - \gamma)\big)}.
\end{aligned}
\quad (6)
$$

9   DATA APPENDIX: COMPARATOR FIRMS

Table 18: Primary Aged Care comparator set

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Estia Health Ltd	Australia	Estia Health Ltd is an Australia-based company that is engaged in the provision of services in residential aged care homes in Australia. It provides services across approximately 69 homes in New South Wales, Queensland, South Australia and Victoria. It offers various general activities, such as gardening, reading, movies, music, parties, cultural celebrations, art sessions or daytrips, lifestyle coordinators can also cater for specialist interests. Its clinical care services include regular reviews and includes daily medication; pain management programs; medical services, such physiotherapy, pharmacy, podiatry, optometry and dental; specialist dementia care and personal care. It operates its homes across various locations, such as Albany Creek, Albury, Aldgate, Altona Meadows, Ardeer, Bendigo, Camden, Burton, Daw Park and Figtree.
Aveo Group	Australia	Aveo Group. Aveo Group Limited is engaged in developing, operating and managing retirement communities. The principal activities of the Company include investment in, and development and management of retirement villages; development for resale of land and residential, retail, commercial and industrial property; investment in, and management of, income producing retail, commercial and industrial property; commercial, industrial and residential building and construction for the Company, and funds and asset management. The Company operates through two segments: Retirement, which develops and operates retirement villages and aged care facilities to produce rental and other income, and Non-retirement, which develops residential, commercial and retail property. Developed commercial and retail property may be sold or held to produce rental income and capital appreciation. It has over 90 senior living communities, including retirement living, freedom aged care and residential aged care communities.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Japara Healthcare Ltd	Australia	Japara Healthcare Limited is an owner, operator and developer of residential aged care facilities. The Company is a private sector residential aged care operator in Australia with over 47,000 resident places and approvals for places nationally across approximately 40 facilities located in Victoria, New South Wales, Queensland, South Australia and Tasmania. In conjunction with the business of providing aged care service, the Company also operates approximately 80 Independent Living Units (ILUs) across over five retirement villages, located adjacent to its aged care facilities. The Company cares for over 4,000 residents, offering a range of living arrangements, amenities, services, meal plans, social activities and care options. It offers independent living, low and high care, Dementia and Alzheimer care, respite and extra services care. Japara Retirement Living offers range of retirement property options, including independent living units/villas and apartments.
Regis Healthcare Ltd	Australia	Regis Healthcare Limited is an Australia-based provider of aged care services. The Company's principal activity includes the provision of residential aged care services. Its segments include Queensland, New South Wales, Victoria, South Australia/Northern Territory, Western Australia and Other. It owns and operates approximately 50 aged care facilities with over 5,880 operational places and provides services in over six states and territories. Its services include aged care facilities, retirement villages, home care, day therapy and new aged care facilities. Its aged care facilities provide various care needs, as well as specialist care requirements, including dementia care and palliative care. The Company owns and operates retirement and independent living villages in Blackburn, Nedlands and Queensland. Its home care services include personal care, registered nursing care, social support and home help. Its day therapy centers provide rehabilitation services and podiatry services.
Arvida Group Ltd	New Zealand	Arvida Group Ltd. Arvida Group Limited is engaged in the business of owning, operating and developing retirement villages and rest homes for the elderly in New Zealand. The Company's villages are located in New Zealand, with over 2,000 residents across approximately 29 locations. The Company offers three levels of care: rest home, dementia and hospital. The Company's total aged care beds include approximately 1,761 and over 1752 retirement units, including approximately 379 apartments/villa, and over 529 serviced apartments. The Company offers a range of accommodation options, including independent villas, serviced apartments, rest home and continuing care facilities, apartments and studios. The Company offers lawn and indoor bowls, a dart board, supervised exercise programs, movie afternoons, happy hours, spa pool, unisex hairdresser, music therapy, craft sessions, exercise classes, church programs, and weekly shopping trips-transport provided.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Metlifecare Ltd	New Zealand	Metlifecare Limited is a New Zealand-based company, which provides retirement villages. The Company is involved in developing, owning and operating retirement villages. Its villages provide full continuum of care from villas and apartments through to flexi-services apartments. The Company offers retirement living across Map of Villages, Northland, Auckland, Waikato, Bay Of Plenty and Lower North. It offers various levels of care and support, depending on the village and user's needs. The Company owns and operates a portfolio of approximately 25 villages in areas with local economies, demographics and median house prices, located in New Zealand's upper North Island. Its subsidiaries include Forest Lake Gardens Limited, Metlifecare Highlands Limited, Hibiscus Coast Village Holdings Limited, Metlifecare Kapiti Limited, Hillsborough Heights Village Holdings Limited, Metlifecare Oakridge Limited, Longford Park Village Holdings Limited, Metlifecare Orion Point Limited and Metlifecare 7 Saint.
Ryman Healthcare Ltd	New Zealand	Ryman Healthcare Limited develops, owns and operates integrated retirement villages, resthomes and hospitals for the elderly people. The Company offers various living and care options, including independent living, assisted living, resthome, hospital and dementia. The independent townhouses and apartments are occupied by residents wishing to retain a level of independence. The Company's Assisted Living offers a range of services, including meals, housekeeping services, morning and afternoon tea, shopping trips and the resort style facilities offered by the village. Resthome and Hospital level care in its Village offers residents in clinical care. The Company offers a specialized care unit for residents. The Company's Villages include residents requiring short-term care, respite care and day care. The Company also offers Day Care program for those just needing assistance during the day. The Company operates in New Zealand with various operations in Australia.
Summerset Group Holdings Ltd	New Zealand	Summerset Group Holdings Limited is a retirement village operator and developer of villages in New Zealand. The Company operates through the provision of integrated retirement villages in New Zealand segment. It also provides a continuum of care. It offers various care services ranging from individualized supported living services. It offers a choice of independent living options, including villas, townhouses and apartments. Its support services include housekeeping, cleaning, daily newspaper delivery, and personal laundry, ironing and bed linen services. Its on-demand services include companionship visits, personal shopping, home and spring-cleaning, car washing and grooming, and help walking or minding customer's pets. It offers a range of food services to its residents. It also offers over three in-home care and support options, including Supported Living, Supported Living Plus and Premium Care. The Company's care options include in-home care, serviced apartments and care center.

Source: Thomson-Reuters.

Table 19: Supplementary comparator set

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Extendicare Inc	Canada	Extendicare Inc. Extendicare Inc. is a Canada-based company that offers senior care across Canada. The Company's segments include long-term care (LTC); retirement living; home health care; other Canadian operations and Remaining U.S. The long-term care segment owns and operates LTC centers, inclusive of a standalone designated supportive living center and a designated supportive living wing in Alberta, and retirement wings in Ontario. The retirement living segment owns and operates retirement living communities under the Esprit Lifestyle Communities brand. The home health care segment provides home health care services through ParaMed. The Company's other Canadian operations are composed of its contract services and consulting provided by Extendicare Assist and its purchasing services. The Remaining U.S segment consists of its wholly owned Bermuda based captive insurance company, Laurier Indemnity Company, Ltd.
Sienna Senior Living Inc	Canada	Sienna Senior Living Inc. is a Canada-based seniors' living providers. The Company serves the independent living (IL), independent supportive living (ISL), assisted living (AL), memory care (MC) and long-term care (LTC) through the ownership and operation of seniors' living residences in the Provinces of British Columbia and Ontario. Its segments include Retirement and LTC. Retirement segment consists of approximately 27 retirement residences (RRs), five of which are located in the British Columbia and 22 of which are located in the Ontario, and the RR management services business. LTC segment consists of approximately 35 LTC residences located in Ontario, eight seniors' living residences located in British Columbia and the LTC management services business. The Company offers various services, including meal packages, housekeeping, transportation, laundry and long term chronic care.
Brookdale Senior Living Inc	USA	Brookdale Senior Living Inc. operates senior living communities in the United States. The Company operates independent living, assisted living and dementia-care communities, and continuing care retirement centers (CCRCs). It operates through five segments: Retirement Centers; Assisted Living; CCRCs-Rental; Brookdale Ancillary Services and Management Services. The Retirement Centers segment includes owned or leased communities for middle to upper income seniors. The Assisted Living segment includes owned or leased communities that offer housing and round the clock assistance with activities of daily life to mid-acuity frail and elderly residents. The CCRCs-Rental segment includes leased communities that offer living arrangements to accommodate physical ability and health. The Brookdale Ancillary Services segment includes outpatient therapy, home health and hospice services, as well as education and wellness programs. The Management Services segment includes communities operated by it.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Capital Senior Living Corp	USA	Capital Senior Living Corporation is an operator of senior housing communities in the United States. The Company provides senior living services to the elderly, including independent living and assisted living services, and provides home care services at one of its communities. Its continuum of care integrates independent living and assisted living and is bridged by home care through independent home care agencies or its home care agency, sustains residents' autonomy and independence based on their physical and mental abilities. As of December 31, 2016, it operated 129 senior housing communities in 23 states with an aggregate capacity of approximately 16,500 residents, including 79 senior housing communities, which it owned and 50 senior housing communities it leased. As of December 31, 2016, it also operated one home care agency. It offers assisted living care and services, including personal care services, around the clock staffing, support services and supplemental services.
Orpea	France	Orpea SA is a France-based company that is engaged in the operations of retirement homes, outpatient and rehabilitation clinics, and psychiatric care. Through its wholly owned subsidiary, Clinea, the Company also offers a range of other services, from outpatient treatment, post-operation care and physical therapy, to nursing, geriatric care, psychiatric services and long-term care homes. The Company operates a number of wholly owned subsidiaries, including Clinea, Villers Services SA, Residence La Cheneraie SAS, Carina SA, Super Aix SCI, Emcejidey SA, Maison de Retraite Paul Cezanne SA and Inoges AG, among others. It operates through Vitalis, Senevita, Dr. Dr. Wagner group and Anavita, operator of nursing homes in the Czech Republic.
LNA Sante SA	France	LNA Sante SA, formerly known as Le Noble Age SA is a France-based company that owns and operates retirement homes and complexes for elderly residents. The Company's residences provide care and assistance for elderly people with a variety of needs, from those with a high level of independence, to those who are completely dependent. LNA Sante SA is also engaged in real estate operations. The Company has residences in France and Belgium. LNA Sante SA operates through its several subsidiaries, including Le Parc de Diane Sarl, Institut Medicalise de Mar Vivo, Gerhome, Residence le Point du Jour and the home healthcare service provider ARAIR Assistance, as well as ARAIR Group's support and training services, among others.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Korian SA	France	Korian SA, formerly Korian Medica SA, is a France-based company that operates healthcare facilities and medical establishments. The Company's holdings include residential centers for the elderly, offering permanent social care and medical support; follow-up care and rehabilitation centers, including general and specialized centers. Furthermore, the Company offers hospitalization at home, which avoids or shortens the hospitalization process; and home nursing services, which allows the care prescribes by a doctor at home. Korian-Medicas' establishments are located in France, Italy and Germany via its subsidiaries, Segesta S.p.A., Phonix GmBH, Reacti Malt SAS, Sas La Normandie, Sa La Bastide de la tourne, Sas Mapadex La Roseraie, among others.
Attendo AB	Sweden	Attendo AB (publ) is a Sweden-based company, which is primarily active within care services industry. The Company offers a variety of services, such as care for older people, people with disabilities, individuals and families, and health, medical and dental care as well as staffing. Attendo AB (publ) offers care for older people in nursing homes and in home care in Sweden, Finland, Norway and Denmark. In nursing homes, clients live in their own apartments with access to common areas such as a dining hall, living room, garden and patios. Daily activities are planned by the client together with their contact person and the responsible nurse. Attendo AB (publ) operates group homes for adults, homes for children with special needs and short-term homes for adults and children. It also has day centres, personal assistants and escort services. In addition, the Company offers staffing of medical personnel with specialist competencies in Finland.

Source: Thomson-Reuters.

Table 20: Residential REIT comparators

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Ingenia Communities Group	Australia	Ingenia Communities Group owns, manages and develops a portfolio of retirement and lifestyle communities across Australia. The Company's segment includes, Ingenia Gardens and Ingenia Lifestyle and Holidays. The Ingenia Gardens segment consists of 26 rental communities across the eastern seaboard and Western Australia. The Ingenia Lifestyle and Holidays segment consists of 34 lifestyle communities comprising permanent and tourism accommodation and the development and sale of manufactured homes. The Company's communities include Ingenia Lifestyle Latitude One (NSW), Ingenia Gardens Marsden (QLD), Ingenia Holidays Cairns Coconut (QLD). The Company is focused on investing in rental properties in Australia.
GCP Student Living PLC	UK	GCP Student Living PLC is a United Kingdom-based real estate investment trusts (REIT). The Company is focused on student residential assets. It invests in properties located primarily in and around London. Its portfolio comprises of approximately 11 assets with 4,100 beds, providing modern student accommodation. Its properties include Scape Shoreditch; Scape Bloomsbury; Scape Bloomsbury; Scape Wembley; Circus Street, Brighton; Scape Greenwich; Scape Brighton; The Pad, Egham; Podium, Egham; Scape Guildford and Water Lane Apartments, Bristol. The Company's investment manager is Gravis Capital Management Limited.
Civitas Social Housing PLC	UK	Civitas Social Housing PLC is a United Kingdom-based a closed-ended investment company. The Company's investment objective is to deliver sustainable returns to its shareholders by making socially relevant investments within the regulated Social Housing sector in England and Wales. The Company also seeks to invest in social homes designed for specialist supported living, typically both for those with mid- and upper-level care needs or with other support requirements as well as general needs homes. As at 30 September 2017, the Company has built a diversified portfolio of 282 Social Homes across England and Wales providing accommodation for 1,827 tenants with 10 Registered Providers involving 83 Local Authorities. Its investment advisor is Civitas Housing Advisors Limited. Its alternative investment fund manager is G10 Capital Limited.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
PRS REIT Plc	UK	PRS REIT PLC is a closed-ended real estate investment trust. The Company intends to qualify as a real estate investment trust (REIT). The Company seeks to invest in completed private rented sector (PRS) sites and PRS development sites. The REIT Group will only invest in private rented homes and apartments located in the UK (predominately in England). The Company's properties includes Coral Mill, Newhey, Rochdale, Durban Mill, Oldham, Howe Bridge Mill, Atherton, Mackets Lane, Halewood, Liverpool, Mafeking Road, Smethwick, Birmingham, Norfolk Park, Park Grange Road, Sheffield, Silkin Park, Hinkshay Road, Telford, Our Lady's Primary School and Little Hulton. The Company's properties include two, three and four bedroom houses. The Mackets Lane, Halewood, Liverpool property includes approximately 50 houses with a mix of two, three and four bedroom houses. Sigma Capital Group plc is the investmenat advisor of the Company.
Triple Point Social Housing	UK	Triple Point Social Housing REIT PLC. Triple Point Social Housing REIT plc is a United Kingdom-based closed-ended investment company. The Company acquires and holds investment properties either directly or through special purpose vehicles (SPVs). It is focused on a portfolio of Social Housing assets in the United Kingdom with a particular focus on Supported Housing assets. Its properties include Fountain Court, Claridge Court, Cornmill House, Pioneer House, and Brunswick House. Cornmill House is a housing facility comprising 16 one bedroom flats. Pioneer House is a housing facility comprising 14 one bedroom flats and one bedroom semi-detached bungalow. Brunswick House is a housing facility comprising 16 one bedroom flats. Fountain Court is a housing facility comprising 16 one bedroom flats. Claridge Court is a housing facility comprising 16 one bedroom flats. Its portfolio also include residential mental health and substance abuse facility operators.
Target Healthcare REIT PLC	UK	Target Healthcare REIT Ltd. Target Healthcare REIT PLC is a United Kingdom-based real estate investment trust. The Trust's investment objective is to provide shareholders with an attractive level of income together with the potential for capital and income growth, from a portfolio of the United Kingdom (UK) care homes, diversified by tenant, geography, and resident payment profile. It invests in modern, purpose-built homes. Its portfolio comprises of 62 properties, including 59 modern, fit for purpose care homes with ensuite wet rooms and good public and private spaces and three forward funding development projects.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
KCR Residential Reit PLC	UK	KCR Residential REIT plc, formerly K&C REIT plc, is a residential real estate investment trust. The Company is engaged in the business of acquiring and managing residential property in the United Kingdom for letting to third parties on long and short leases. Its property acquisitions are focused on London, primarily on locations, such as Kensington & Chelsea, Westminster and the surrounding area. Its properties include Coleherne Road, London (SW10), which is a residential building, and retirement developments, such as Heathside, Finchley Road, London (NW11); Osprey Court, Finchley Road, London (NW3); Challoner Court, Bromley Road, Shortlands (Kent); Town Mill, Marlborough (Wiltshire); Chymeddan, Newquay (Cornwall); Manor House Court, Old Isleworth (Middlesex), and Millside Place, Old Isleworth (Middlesex).
American Campus Communities Inc	USA	American Campus Communities, Inc. is a self-managed and self-administered equity real estate investment trust (REIT). The Company's segments include Wholly-Owned Properties, On-Campus Participating Properties, Development Services, and Property Management Services. It is engaged in the acquisition, design, financing, development, construction management, leasing and management of student housing properties. The Wholly-Owned Properties segment consists of off-campus properties, which are located in close proximity to the school campus. The On-Campus Participating Properties segment includes on-campus properties that are operated under long-term ground/facility leases with three university systems. The Development Services segment consists of development and construction management services that it provides through one of its taxable REIT subsidiaries for third-party owners. The Property Management Services segment includes revenues generated from third-party management contracts.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
American Homes 4 Rent	USA	American Homes 4 Rent is an internally managed real estate investment trust (REIT) focused on acquiring, renovating, leasing and operating single-family homes as rental properties. The Company's primary objective is to generate attractive risk-adjusted returns for its shareholders through dividends and capital appreciation by acquiring, renovating, leasing and operating single-family homes as rental properties. As of December 31, 2016, it owned 48,422 single-family properties in 22 states, including 1,119 properties held for sale, and had an additional 47 properties in escrow that it intended to acquire. Its integrated operating platform offers property management, acquisitions, construction, marketing, leasing, financial and administrative functions. The Company may seek to invest in condominium units, townhouses and real estate-related debt investments. The Company is externally managed and advised by American Homes 4 Rent Advisor, LLC (the Advisor).
Apartment Investment and Management	USA	Apartment Investment and Management Company (Aimco) is a self-administered and self-managed real estate investment trust (REIT). Aimco, through its subsidiaries, AIMCO-GP, Inc. and AIMCO-LP Trust, holds the ownership interests in the Aimco Operating Partnership. It operates through two segments: conventional real estate and affordable real estate. As of July 25, 2018, its real estate portfolio consisted of 134 apartment communities. Aimco Operating Partnership conducts the Company's business, which is focused on the ownership, management, redevelopment and limited development of apartment communities located in the coastal and job growth markets of the United States. Its Conventional segment consists of apartment communities it classifies as Conventional Same Store and Conventional Non-Same Store. Its affordable portfolio consists primarily of apartment communities that it manages that are owned through low-income housing tax credit partnerships.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Bluerock Residential Growth RE	USA	Bluerock Residential Growth REIT, Inc. is a real estate investment trust. The Company is focused on acquiring a portfolio of residential real estate assets. As of December 31, 2016, the Company's portfolio consisted of interests in 31 properties (21 operating and 10 development properties). As of December 31, 2016, its properties contained an aggregate of 9,570 units, consisting of 6,972 operating units and 2,598 units under development. As of December 31, 2016, its operating properties included ARIUM at Palmer Ranch, Sarasota; ARIUM Grandewood, Orlando; ARIUM Gulfshore, Naples; ARIUM Palms, Orlando; ARIUM Pine Lakes, Port St. Lucie; ARIUM Westside, Atlanta; Ashton Reserve, Charlotte; Enders at Baldwin Park, Orlando; Fox Hill, Austin; Lansbrook Village, Palm Harbor; Legacy at Southpark, Austin; Nevadan, Atlanta; Roswell City Walk, Roswell; Sorrel, Frisco; Sovereign, Fort Worth; The Preserve at Henderson Beach, Destin; Village Green of Ann Arbor, Ann Arbor, and Whetstone, Durham.
Camden Property Trust	USA	Camden Property Trust is a real estate investment trust (REIT). The Company is engaged in the ownership, management, development, redevelopment, acquisition and construction of multifamily apartment communities. As of December 31, 2016, the Company owned interests in, operated, or were developing 159 multifamily properties, which consisted of 55,366 apartment homes across the United States. The Company also owns land holdings, which it may develop into multifamily communities. The Company's properties consist of mid-rise buildings or two and three story buildings in a landscaped setting and provide residents with a range of amenities common to multifamily rental properties. The 152 operating properties in which the Company owned interests and operated, as of December 31, 2016, averaged 953 square feet of living area per apartment home. As of December 31, 2016, 137 of its operating properties had over 200 apartment homes.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Equity LifeStyle Properties Inc	USA	Equity LifeStyle Properties, Inc. is a real estate investment trust (REIT). The Company is an owner and operator of lifestyle-oriented properties (properties) consisting primarily of manufactured home (MH) communities and recreational vehicle (RV) resorts and campgrounds. The Company operates through two segments: Property Operations and Home Sales and Rentals Operations. The Property Operations segment owns and operates land lease properties and the Home Sales and Rentals Operations segment purchases, sells and leases homes at the properties. It leases individual developed areas (sites) with access to utilities for placement of factory built homes, cottages, cabins or RVs. As of December 31, 2016, the Company's property portfolio included 391 properties consisted of 146,610 residential sites. Its properties are designed for home options of various sizes and designs that are produced off-site by third-party manufacturers, installed and set on designated sites within the properties.
Equity Residential	USA	Equity Residential is a real estate investment trust. The Company's primary business is the acquisition, development and management of multifamily residential properties. Its segments include Boston, New York, Washington D.C., Southern California, San Francisco, Seattle and Other Markets. Southern California includes Los Angeles, San Diego and Orange County. Other Markets includes Phoenix. It is engaged in leasing of apartment units to residents. It focuses on rental apartment properties in urban and high-density suburban coastal gateway markets. As of December 31, 2016, the Company owned 302 properties located in 10 states and the District of Columbia consisting of 77,458 apartment units. The Company's projects include The Alton, 455 Eye Street, 855 Brannan, Cascade, One Henry Adams, 340 Fremont and Vista 99. ERP Operating Limited Partnership (ERPOP) conducts the multifamily residential property business of Equity Residential.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Essex Property Trust Inc	USA	Essex Property Trust, Inc. is a self-administered and self-managed real estate investment trust. The Company is engaged primarily in the ownership, operation, management, acquisition, development and redevelopment of predominantly apartment communities, located along the West Coast. Its segments include Southern California, Northern California, Seattle Metro and Other real estate assets. The Company owns all of its interest in its real estate and other investments directly or indirectly through Essex Portfolio, L.P. (the Operating Partnership). Its properties include Mio, Form 15, Emerson Valley Village and Ashton Sherman Village. As of December 31, 2016, it owned or held an interest in 245 communities, aggregating 59,645 apartment homes, excluding its ownership in preferred equity investments, as well as two operating commercial buildings (totaling approximately 140,564 square feet), and six active development projects with 2,223 apartment homes in various stages of development.
Front Yard Residential Corp	USA	Front Yard Residential Corp, formerly Altisource Residential Corporation, is a real estate investment trust (REIT). The Company focuses on acquiring, owning and managing single-family rental (SFR) properties throughout the United States. The Company conducts its activities through its subsidiary, Altisource Residential, L.P., and its subsidiaries. The Company also converts a portion of the real estate owned (REO) properties that it acquires through resolution of its mortgage loans into SFR properties. The Company has also entered into property management service agreements with two third-party property managers: Altisource Portfolio Solutions, SA (ASPS) and Main Street Renewal, LLC (MSR), to provide, among other things, leasing and lease management, operations, maintenance, repair and property management services in respect of its SFR portfolios. As of August 9, 2018, the Company had approximately 15,000 homes.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Independence Realty Trust Inc	USA	Independence Realty Trust, Inc. is an internally-managed real estate investment trust (REIT). The Company is engaged in the business of owning, managing, operating, leasing, acquiring, developing, investing in, and disposing of real estate assets. The Company owns apartment properties in geographic non-gateway markets. As of September 26, 2017, the Company owns and operates 55 multifamily apartment properties, totaling 15,165 units. Its properties include Copper Mill, Crestmont, Heritage Trace, Runaway Bay, Berkshire Square, The Crossings, Reserve at Eagle Ridge, Windrush, Heritage Park, Raindance, Augusta, Invitational, Carrington Park, Walnut Hill, Lenoxplace, Bennington Pond, Jamestown, Meadows, Oxmoor, Bayview Club, Arbors River Oaks, Fox Trails, Bridge Pointe, The Aventine Greenville and Westmont Commons.
Investors Real Estate Trust	USA	Investors Real Estate Trust is a real estate investment trust, which is focused on ownership, management, acquisition, redevelopment and development of apartment communities. The Company conducts its business operations through its operating partnership, IRET Properties, which is principally engaged in acquiring, owning, operating and leasing real estate. As of April 30, 2018, the Company owned interests in 90 multifamily communities, containing 14,176 apartment homes. The Company's multifamily properties include 71 France-Edina, Minnesota; 11th Street 3 Plex-Minot, North Dakota; Ashland-Grand Forks, North Dakota and Avalon Cove-Rochester. The Company's healthcare properties include 2800 Medical Building-Minneapolis, Minnesota; 2828 Chicago Avenue-Minneapolis, Minnesota; Billings 2300 Grant Road-Billings, Montana and Edina 6517 Drew Avenue-Edina, Minnesota.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Invitation Homes Inc	USA	Invitation Homes Inc. is a real estate investment trust. The Company owns and operates single-family homes for lease in the United States. The Company's segment relates to acquiring, renovating, leasing and operating single-family homes as rental properties, including single-family homes in planned unit developments. As of September 30, 2016, the Company's averaged approximately 1,850 square feet with three bedrooms and two bathrooms. As of September 30, 2016, the Company's portfolio included 48,431 homes. As of September 30, 2016, the Company's homes were located in Southern California, Northern California, Seattle, Phoenix and Las Vegas in Western United States; South Florida, Tampa, Orlando and Jacksonville in Florida; Atlanta and Charlotte in Southeast United States; and Chicago and Minneapolis in Midwest United States. As of September 30, 2016, the Company had 73 homes in escrow that we expected to acquire, subject to customary closing conditions.
Mid-America Apartment Community	USA	Mid-America Apartment Communities, Inc. is a multifamily focused, self-administered and self-managed real estate investment trust (REIT). The Company owns, operates, acquires and develops apartment communities primarily located in the Southeast and Southwest regions of the United States. It operates through three segments: Large market same store, Secondary market same store and Non-Same Store and Other. Its Large market same store communities are communities in markets with a population of at least one million and at least 1% of the total public multifamily REIT units that it has owned. Its Secondary market same store communities are communities in markets with populations of more than one million but less than 1% of the total public multifamily REIT units or markets with populations of less than one million that it has owned. Its Non-same store communities and other includes recent acquisitions and communities in development or lease-up communities.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
New Senior Investment Group Inc	USA	New Senior Investment Group Inc. is a real estate investment trust with a diversified portfolio of primarily private pay senior housing properties located across the United States. The Company operates through two segments: Managed Properties and Triple Net Lease Properties. As of December 31, 2016, the Company owned a diversified portfolio of 152 primarily private pay senior housing properties located across 37 states. Under its Managed Properties segment, the Company invests in senior housing properties throughout the United States and engages property managers to manage those senior housing properties. As of December 31, 2016, the Company owned 94 properties under property management agreements with the property managers. Under its Triple Net Lease Properties segment, the Company invests in senior housing and healthcare properties throughout the United States, and leases those properties to healthcare operating companies under triple net leases.
NexPoint Residential Trust Inc	USA	NexPoint Residential Trust, Inc. is an externally managed real estate investment trust (REIT). The Company's investment objectives are to maximize the cash flow and value of properties owned, acquire properties with cash flow growth potential, provide quarterly cash distributions and achieve long-term capital appreciation for its stockholders through targeted management and a value-add program. The Company is focused on multifamily investments primarily located in the Southeastern and Southwestern United States. All of the Company's business operations are conducted through NexPoint Residential Trust Operating Partnership, L.P. (OP). The sole limited partner of the OP is the Company. Its subsidiary, NexPoint Residential Trust Operating Partnership GP, LLC, is the sole general partner of the OP. As of December 31, 2016, the Company owned 39 properties representing 12,965 units in eight states, including two Parked Assets. The Company's advisor is NexPoint Real Estate Advisors, L.P.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
Sun Communities Inc	USA	Sun Communities, Inc. is a self-administered and self-managed real estate investment trust (REIT). The Company is a fully integrated real estate company, which, together with its affiliates and predecessors, has been in the business of acquiring, operating, developing, and expanding manufactured housing (MH) and recreational vehicle (RV). It owns and operates or has an interest in a portfolio of properties located throughout the United States and Ontario, Canada, including 226 MH communities, 87 RV communities, and 28 properties containing both MH and RV sites. The Company operates through two segments: Real Property Operations and Home Sales and Rentals. The Real Property Operations segment owns, operates, or has an interest in a portfolio, and develops MH communities and RV communities throughout the United States and is in the business of acquiring, operating, and expanding MH and RV communities.
UDR Inc	USA	UDR, Inc. is a self-administered real estate investment trust. The Company owns, operates, acquires, renovates, develops, redevelops, disposes of and manages multifamily apartment communities generally located in various markets across the United States. The Company's segments are Same-Store Communities and Non-Mature Communities/Other. As of December 31, 2016, the Company's consolidated real estate portfolio included 127 communities located in 18 markets, with a total of 39,454 completed apartment homes. As of December 31, 2016, the Company also had an ownership interest in 27 communities containing 6,849 apartment homes through unconsolidated joint ventures or partnerships. As of December 31, 2016, the Company's properties were in various locations, such as Orange County, San Francisco and Los Angeles in California; Seattle, Washington; Richmond, Virginia; Baltimore, Maryland; Orlando and Tampa in Florida; Nashville, Tennessee, and Dallas and Austin in Texas.

COMPARATOR	COUNTRY	COMPANY DESCRIPTION
UMH Properties Inc	USA	UMH Properties, Inc. (UMH) is a real estate investment trust (REIT). The Company's primary business is the ownership and operation of manufactured home communities, including leasing manufactured home sites to private manufactured home owners. The Company also leases homes to residents, and through its taxable REIT subsidiary, UMH Sales and Finance, Inc. (S&F), conducts manufactured home sales in its communities. The Company owns approximately 122 manufactured home communities consisting of approximately 23,000 developed homesites. The communities are located in New Jersey, New York, Ohio, Pennsylvania, Tennessee, Indiana, Maryland and Michigan. In connection with the operation of its communities, UMH also leases homes to prospective tenants. These rental homes are owned by the Company and rented to residents.

Source: Thomson-Reuters.