Can Build-to-Rent Generate Affordable Housing Outcomes? A Whole-Life Costing Approach to Investment Analysis

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Abstract

Doubts remain among stakeholders in academia and the housing industry about the potential success of build-to-rent to generate positive outcomes for institutional investors and affordable dwellings for low- and moderate-income households. However, a systematic study on the viability of build-to-rent to deliver affordable housing in Australia is largely rare and non-existent in the literature. We fill this gap in the literature by investigating the financial viability of build-to-rent and its potential to generate affordable rental housing outcomes in Brisbane, Australia. Using rental prices from CoreLogic (Formerly RP data) and construction-related costing data from WT Partners Australia for 2019, we apply the whole-life costing approach to investment analysis and confirm that build-to-rent can be feasible in Australia under equity financing. Also, we find that under the current regulatory regimes and market structure, build-to-rent will fail to deliver affordable housing outcomes. Moreover, providing free land alone cannot help to make build-to-rent affordable. Thus, significant public subsidy and tax concessions, particularly on Goods and Services Tax (GST) on construction-related costs, may be required if build-to-rent developments are to generate affordable housing outcomes in Australia.

Keywords: build-to-rent, affordable housing, whole-life costing, public subsidy and investment analysis

1. Introduction

Financing affordable rental housing in urban centres continues to be a challenge across the world. Part of the problem is the fact that land costs in urban centres are very high, thanks to the increased number of people moving to urban centres in search of jobs, etc. (Bryant, 2016; Debrezion et al., 2007; Immergluck, 2007; etc.). Bryant (2016), in particular, observed that increased land cost due to its high demand makes it difficult to acquire appropriate locations for affordable housing and thus puts the development of new affordable rental housing at risk. In recognition of the need for affordable rental housing, governments across the globe have, over time, instituted various affordable housing financing systems. The aim of such financing systems as noted by King (2009) is to provide funds through public and private institutions to customers who want to buy or rent a house and cannot afford to do so on their income. These financing systems take different forms (Warnock & Warnock, 2008) and include the Central Provident Fund (CPF) in Singapore, Housing Provident Fund (HPF) in China, Homes and Communities Programme (HCP) in the United Kingdom (UK), and the Low-Income Housing Tax Credit (LIHTC) in the United States (U.S) (Todd & Burnett, 2015).

In Australia, the Commonwealth Rent Assistance (CRA) scheme, National Rental Affordability Scheme (NRAS), and the Managed Investment Trust (MIT) have been the mechanisms through which the government has financially supported renters. However, the housing sector in Australia continues to be ranked among the most unaffordable countries of the developed world, third only to Hong Kong and New Zealand in 2018 (Cox & Pavletich, 2019). This means that the government-led initiatives alone cannot address the affordability challenges experienced in Australia and around the globe. Also, the National Rental Affordability Scheme (NRAS) was discontinued in 2019 and the existing private rental housing stock is inadequate and unaffordable to most low- and moderate-income households. Therefore, alternative investment vehicles in the affordable rental housing sector are required.

Both the government and industry have been suggesting the introduction of build-to-rent (BtR) housing to boost the supply of rental housing at affordable rental prices in Australia (Cranston, 2017; Russo, 2017; etc.). A build-to-rent (BtR), as opposed to a Build-to-Sell, involves the development and professional management of large-scale residential property specifically for the "renter market", and it is controlled by institutional investors and developers. Build-to-rent has helped to deliver affordable rental housing alternatives in countries such as Switzerland, the Netherlands, USA, Japan, and the UK. Moss (2018) notes that the "build-to-rent" market in the UK is growing strongly and nearly 20,000 BtR units have been constructed with over 80,000 more under planning or construction. However, except for private developers such as Grocon and Mirvac, who are developing unaffordable build-to-rent properties across some states, there is no established market in Australia for build-to-rent. The commonwealth government's budget for 2017 discussed policy initiatives on affordable housing that sought to boost affordable housing provision and "encourage Social Impact Investment". The aim was to reduce youth homelessness in Australia through investment tax incentives such as the additional 10 per cent Capital Gains Tax (CGT) discount to resident individuals who invest in qualifying affordable housing.

Nonetheless, there is seemingly a lack of interest on the part of institutional investors to channel their investable funds into the affordable rental housing sector. The finance literature teaches that investors, whether individual or institutional, are rational and therefore will put their funds into investments where they can generate maximum returns at minimal risk. Institutional investors and their agents are very keen on the risk-return nexus of their investment portfolios and will therefore not risk their capital into investments for which the prospects are not clear.

Two questions are asked whenever build-to-rent is discussed in Australia. First, will build-to-rent be financially viable in Australia? Second, can build-to-rent generate affordable housing outcomes without public subsidy? Answers to these questions, although critical, are currently rare in the literature—at least in the context of Australia, to the best of our knowledge. The only analysis of this subject matter identified in the literature is that of Pawson et al. in 2019. In the mentioned study, the authors modelled the potential feasibility of BtR in Australia, based on data and assumptions on five different BtR archetypes in the inner-city of Sydney, New South Wales. The general conclusion from their analysis suggests that build-to-rent could be feasible in Australia but will not result in the provision of affordable dwellings without some form of public subsidy. We extend the analysis on this subject by providing some new evidence in the context of Brisbane. We seek to answer two questions: (1) Can commercial build-to-rent investment be financially viable to attract institutional investors? (2) Can build-to-rent generate affordable housing outcomes in Brisbane, Australia? The paper also focusses on a typical residential build-to-rent over a longer time horizon as opposed to the 10-year investment period assumed by Pawson et al. (2019).

Our paper further contributes to the investment appraisal literature by applying the whole-life cost approach to analyse build-to-rent affordable housing. This approach analyses commercial and residential investments from the pre-development phase through to the management of the property over the life cycle of the project. The use of WLC, as noted by the Royal Institute of Chartered Surveyors (RICS, 1986), allows investment alternatives to be more effectively evaluated and choices made between options. Again, the WLC helps to effectively manage completed projects as it considers not only the initial cash outlay but also the impact of all other costs associated with the development. Clift (2003) notes that using WCL helps to determine whether a higher initial cash outlay is justified by reductions in future costs of alternative investments. The use of WLC approach further helps to optimise the total cost of ownership/occupation by striking a balance between the initial cash outlay and running costs (construction Client's Forum, 2000). The WLC approach ensures realistic budgeting for operation, maintenance, and repair, as well as ensuring that risk and cost analysis of loss of functional performance resulting from failure or inadequate maintenance is performed (construction Client's Forum, 2000). Notwithstanding the potential benefits associated with the WLC approach, its application has been limited to commercial real property developments. No systematic study on the application of the WLC approach to build-to-rent affordable housing has been cited in the literature, at least in the context of Australia. This paper is, therefore, the first empirical attempt to apply the WLC approach to analyse build-to-rent affordable housing in Australia.

Construction, development, and management-related expenditure data from WT Partnership Australia and National Affordable Housing Consortium (NAHC) on a proposed 100 units build-to-rent project in the inner city of Brisbane, Australia is used. We apply the whole-life cost approach to investment appraisal to analyse the financial feasibility of this project. As a preview of our results, we confirm that yes, a build-to-rent investment can be feasible in Australia, but it is not affordable without significant public subsidy. We note the Net Present Value (NPV) of the market rate build-to-rent is positive ($7,878,881) and the Internal Rate of Return (6.02 per cent) is a little above the investors' required IRR of 6 per cent. This means that over a 30-year investment horizon, a build-to-rent investment that employs 100 per cent equity capital and is at a discount rate of 4.5 per cent to 6 per cent is financially viable. Also, the

investment yields a positive NPV of $2,143,555 over a 25-year horizon, but the IRR is 5 per cent, which is below the investors' required IRR of 6 per cent. Over a 20-year horizon, however, the investment fails to generate a positive NPV. A negative NPV of $-4,266,844 and the IRR is 3.22 per cent, which is significantly below the investors' required IRR of 6 per cent. In addition, we find that the investment yields a positive NPV of $ 4,106,635 over a 30-year horizon when 10 per cent of debt capital is incorporated into the capital structure at an amortised cost of 4.5 per cent. However, such a financing arrangement fails to yield the investors' required IRR of 6 per cent. The IRR resulting from the incorporation of 10 per cent debt capital is 5.3 per cent, which is below the required 6 per cent. The required IRR is only obtainable when the debt proportion is 1 per cent or lower.

The findings also show that under the current regulatory regimes and market structure, build-to-rent will fail to deliver affordable housing over a thirty-year (30) investment horizon. Again, we observe that providing free land and absorbing land-related costs, such as that of legal transfer and stamp duty, does not help to make build-to-rent affordable. Thus, significant public subsidy; some form of rezoning; and tax concessions, particularly, Goods and Services Tax on construction-related costs, might be required if build-to-rent developments are to generate affordable housing outcomes in Australia.

The remainder of the paper is organised as follows: the theoretical framework of build-to-rent as an investment vehicle, a review of how the build-to-rent has been applied in the United States of America (USA) and the United Kingdom (UK), and the Australian precursor developments. This is followed by the methodology of the paper. The discussion of the empirical results is presented next, and we conclude the paper with some policy recommendations.

2. Conceptual Framework of Build-to-Rent Housing

Build-to-rent (BtR), as opposed to a build-to-sell investment, encompasses the development, professional management, and control of large-scale residential property by institutional investors and developers specifically for the "renter market". Traditionally, developers build houses to sell to either owner–occupiers or investors. For instance, a developer like Mirvac builds apartments to sell them but not to hold them back and rent them out. Build-to-rent, on the other hand, is a long-term investment channel where developers are required to hold on to the constructed dwellings and collect the rental proceeds over a longer period. The developers can also sell shares in the project to investors (both institutional and private) who then share in the profits coming out of the investment.

As observed by Cranston (2017), if one can identify a developer and the necessary support given, then the developer will be able to construct dwellings on a large scale for long-term rental occupancy. Thus, BtR targets the growing "renter market" seeking secure long-term rentals with increased amenity. Superannuation funds in particular, whether small or large, are thought to be particularly suited for the BtR model due to its potential for constant cash flows (rent income) and less riskiness. According to Moss (2018), a build-to-rent development is different from the traditional private rental apartments, which are typically composed of individual flats and dwellings designed with the ultimate focus on owner–occupiers. The author also notes that the traditional private rental apartments are inundated with poor management and ill-suited tenancy arrangements. Following from the discussions above, we conceptualise the BtR model as in Figure 1.

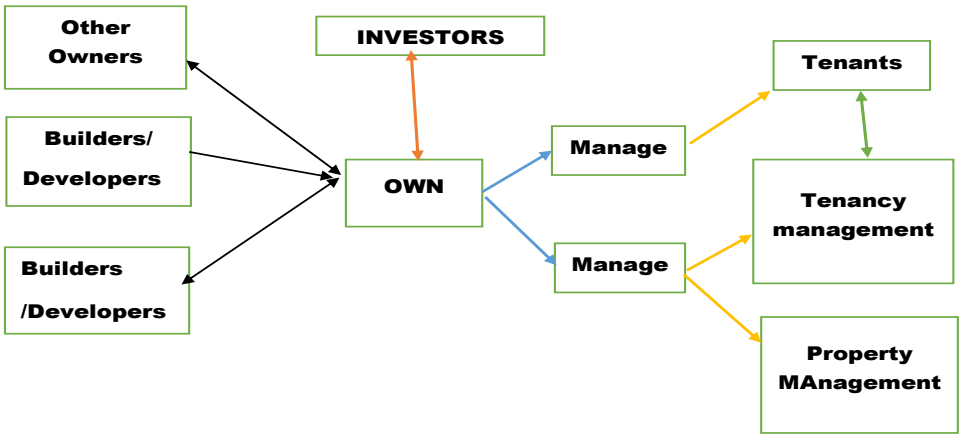

Figure 1. Conceptualisation of build-to-rent model
Source: Authors construct, 2020

Moss (2018) notes that BtR developments present several benefits to market participants, among which are:

- Build-to-rent dwellings are completed faster than dwellings for sale. This is because BTR does not suffer the same issue of the oversaturated market and its associated risks. For instance, a developer or builder is highly unlikely to construct a 2,000-unit scheme in the market in one go because of concerns over the impact on sales value. On the contrary, a rental property owner will often be confident they can succeed with such a scheme rapidly.
- Build-to-rent investors are more likely to build larger schemes than housebuilders do. Judging from the definition of a BtR investment by the BPF, dwellings of 50 units are considered the minimum size to qualify as a BtR. Developers most often than not also look for bigger schemes to benefit from economies of scale; a case can be made for Quintain, which is delivering 5,000 units at Wembley Park.
- Build-to-rent presents an attractive option for households and individuals who cannot or are unwilling to buy their own homes, allowing people to live near the jobs and services they need.
- Build-to-rent represents an avenue for attracting alternative sources of capital into the housing property market. This is because traditional housing developments, which are usually associated with high-risk and short investment cycles, do not appeal to pension funds looking for long-term cash inflows.
- Since BtR investors seek returns over decades, it is believed that BtR investment will be less sensitive to economic cycles than traditional buildings for sale. Unavoidably, private homebuyers are very sensitive to immediate economic fluctuation; on the contrary, long-term investors who can forecast a long-term demand for the property may be keen to capitalise on bargains in a recession (Moss, 2018).

Although the BtR model can be harnessed to supply affordable dwellings, it is not automatic that all BtR projects will result in the provision of affordable housing. By build-to-rent affordable housing, we mean the provision of rental housing at rental prices that can meet the demand of low- and moderate-income households who cannot afford to rent at market prices. Mia (2018) believes that affordable BtR can only happen if there are favourable regulatory and tax regimes. Globally, countries such as Switzerland, the Netherlands, the United States of America (USA), Japan, and the United Kingdom (UK) have all advanced in developing BtR markets in their respective economies. We present a review of how the BtR models have been implemented in the UK and the USA.

2.1 Build-to-Rent Housing Systems: the UK Experience

According to Stephens et al. (2018), the private rental housing sector houses about 19 per cent (i.e. a 100% increase over the last 20 years' figure) of all households in the UK. Before 2015, the buy-to-let private rental housing concept dominated the rental sector in the UK; Ronald and Kadi (2016) note that owners of these private rental housing units are mostly individuals controlling one or two 'buy-to-let' (BtL) rental properties. Wilcox and Williams (2018) observe that from 2015, however, BtL acquisitions have declined; the authors attribute this decline to the advent of the prudential lending restrictions and winding back of tax concessions. Again, government policy initiatives after 2012 spurred growth in the UK housing and finance market. The result is the reintroduction of the "purpose-built-for-market" rental development last seen in the 1930s.

Authorities in the UK actively support the build-to-rent scheme. The BtR programme involved an initial £1billion off-balance-sheet funding from the government to support the development of market rental units (by institutional investors, private developers, and social proprietors) and other initiatives to reduce constraints on investment (Homes and Communities Agency, 2012b). Government funding for private initiatives was the mainstream and focussed on integrating the rental sector where assistance was provided based on who was to be housed, rather than who owned the property (Webb, 2012). Framer and Donnel (2013) observed that in England alone, more than half of the local authorities stand willing to support viable BtR developments. In further affirming its support for the BtR scheme, the UK government also provides bridge financing to the developers as a means of bearing part of the risk associated with the development until all developed properties are fully let out (O'Donovan, 2014; cited in Earl et al. 2017).

In November 2016, the London council published a draft Supplementary Planning Guidance (SPG), which provides that a project must go through a viability process if the affordable houses consist of less than thirty-five (35) per cent of the developments. The SPG also gives authorities the opportunity to offer general assistance, including institutional investment on public land. The London council defines the general scope of developments qualifying as build-to-rent housing. By the council's definition, any development that satisfies the following nine conditions is deemed as build-to-rent housing. These conditions are that they:

i. are a development, or block/phase within a development, of at least 50 homes—but boroughs can choose to set their threshold to reflect their housing market,

ii. are the homes to be held as build-to-rent under a covenant for at least 15 years,

iii. are self-contained homes that are let separately,

iv. operate under unified ownership and management,

v. offer longer tenancies (three years or more), with break clauses that allow the tenant to end the tenancy with one month's notice after six months,

vi. provide certainty about the rent for the length of the tenancy, including the basis of any increase, which should be linked to a formula,

vii. provide on-site management, although it does not have to be on-site full time,

viii. operated by a provider with a complaints procedure in place and are members of a recognised ombudsman scheme, and

ix. do not charge up-front fees of any kind to tenants or prospective tenants, other than deposits and rent in advance (London council, 2017).

The UK government currently focusses on incentivising institutional investors to participate fully to assure sufficient market size, depth, and liquidity in the sector. The call for private sector participation appears to have yielded some dividend in the UK, as various developers and institutional investors both in the UK and outside are actively providing BtR apartments in the UK. As reiterated earlier, the build-to-rent market in the UK is growing strongly to such an extent that over 20,000 BtR units have been completed and over 80,000 more are either in planning or under construction. UK investors such as Legal & General and M & G, together with investors from North America, the Middle East, and Australia, and builders and developers including Telford Homes, Balfour Beatty, and Willmott Dixon have been actively promoting BtR schemes (Moss, 2018). Furthermore, Canadian investor Ivanhoé Cambridge has also made some investments, as have Greystar and Atlas. Most recently, Courtland Partners, which is one of the biggest players in the US market, has also made some strategic acquisitions in the UK's BtR sector (Yates, 2018).

The initial reaction towards the BtR scheme at the local government level was a mixed one. While some planning departments were supportive of the BtR scheme, others were in complete disagreement with it. A report by Nexus planning cited in Moss (2018) indicates that in London, out of the 33 local authorities, only 30 per cent of them were in support of the BtR scheme and hence have planning policies towards its promotion. A majority of 46 per cent of these authorities disagreed with the BtR scheme, while the remaining 24 per cent appeared to be indifferent towards it. However, as more BtR participants complete their dwellings and enter the operation stage, some authorities have become aware of the fact that the BtR could help build their communities due to its professional management. This notwithstanding, some authorities remain unconvinced about the BtR model.

2.2 Build-to-Rent Housing Systems: the USA Experience

Multifamily housing, the US version of the build-to-rent concept, represents residential buildings consisting of five or more rental apartments. The multifamily housing system has a long history and is a well-established and increasingly growing module of the overall American housing system (Pawson et al., 2019). Real estate companies, financial institutions, and individuals developed or acquired residential blocks as income-producing assets and held the properties in single ownership for the long term. Similar to owner–occupier mortgages, banks and thrift entities were the historical financing agents, and they raised and lent funds from the local market for the developments. However, Bradley et al. (1998) observed a swing in the financing sources to the effect that in the 1990s, most developments were funded directly from global capital markets using Real Estate Investment Trust vehicles. The result is that by the end of the 1990s, multifamily rental housing was seen to be more like a financial asset (Fields & Uffer, 2016). Yates (2018) also notes that the multifamily system has been maturing over the past two decades and, over time, BtR has been perceived by the citizenry as a viable lifestyle choice.

The Joint Center for Housing Studies at the Harvard University (JCHS, 2018) notes that 43 per cent, translating to 20 million of the total 47 million rental housing units in 2017, were in multifamily buildings. The JCHS (2018) further notes that in the recent past, a considerable proportion of the new multifamily developments have been located in high-rise buildings in downtown neighbourhoods and targeted at rich households. While events of the Global Financial Crisis (GFC) might have interrupted the growth of the multifamily housing sector, about 300,000 units

have been added to the national stock of multifamily housing units every year for the past forty years (ibid; Bradley et al., 1998).

Data from the National Multifamily Housing Council (NMHC, 2019) website shows that several large industry players are involved in the growth of the multifamily housing industry in the USA. Chief among them is MAA, a Tennessee-based Real Estate Investment Trust with a current interest in about 101,954 homes as of 2018. On property management, however, Greystar Company from South Carolina has the largest dwelling stock. It had 418,000 units under its control in 2018. With about 5,600 new completed homes, Greystar also ranked as the largest multifamily developer in 2017 in the USA. Concerning the structure of the multifamily housing industry, 3.3 million units out of the estimated 20 million were under the management of the largest 50 management companies in 2018, whereas 2.1 million of the units were for the 50 largest ownership entities. Additionally, the actual development of the units appears to be more the reserve of the largest companies and in 2017, for instance, the largest 25 companies constructed 76,000 out of the total national output of 347,000 units.

2.3 Build-to-Rent Housing Systems: the Australian Precursor Experiences

In Australia, certain developments in the private rental housing sector precede discussions on the modern build-to-rent housing. We review the Purpose Built Student Accommodation (PBSA), which is a significant development in Australia as a case in point.

The PBSA began in the 1990s, with other important developments in the housing sector helping its industry to rapidly expand. For example, government support through NRAS incentives and guaranteed income agreement were critical to the success of the PBSA sector. Fell (2015) notes that the PBSA operates under four private provider models. The author outlines the models as follows.

- Management-only providers – this is where there is a collaboration between private developers and universities to operate completed blocks under PBSA contract.
- Build, own, operate and transfer (BOOT) – this refers to a PBSA modelled in the form of a Public-Private-Partnership (PPP), such that a PBSA provider collaborates with a university on a long-term lease basis to build and operate the facility constructed on university-owned land. At the expiration of the lease term (e.g. after 30 or 40 years), the facility becomes the property of the university. According to Fell (2015), the BOOT model is attractive to investors due to the security of the income stream supported by the university covenant.
- Develop, strata, and manage (DSM) – the DSM model is where PBSA blocks are developed on a strata subdivision basis and sold to private investors. The completed blocks are leased to the operating entity and the use of the building is somewhat restricted for this purpose.
- Wholly integrated providers – this is the situation whereby providers develop and manage the PBSA assets in-house. The assets are held for use over the long term. According to Savills (2017b), Campus Living Villages, HRL Morrison Urbanest, and Unilodge were the leading private providers under this model in Australia for 2017.
- Most PBSA developments were based mostly on the DSM model at the nascent stages in the 1990s. According to Pawson et al. (2019), because investors were guaranteed a 6 per cent gross yield on their investment under this model, the resulting product was seen as a high demand stock (with overseas student families among the high demanders).

Subsequent events in the industry have meant that the standard arrangement shifts to the unified ownership model, which closely mimics the mainstream market BtR approach that was emergent in 2018. One key characteristic common to all the PBSA models described above is that they all focus exclusively on small units due to the potential for high returns that can result from operating self-contained studios relative to large apartment blocks. Also, contributing to yield advantages of the PBSA model has been the absence of land use planning obligations on, for instance, car parking provision and GST reliefs. The GST provision, in particular, allows providers in the PBSA schemes to be classified as commercial residential premises and thus benefitted from a concessional 5.5 per cent GST rate on development expenditure (Cridland, 2017). Moreover, the provision of add-on services increasing the rent is seen as a sweetener by customers, which has helped to supplement the yields from such developments. Knight (2018a) observes that PBSA bedspaces exceeded 75,000 by 2014 and the number was again expected to exceed 90,000 by 2018. Beginning in 2017, a further estimate of about 40,000 extra bedspaces was envisaged across the country for five years (Knight, 2017).

The advent of globalisation in the higher education sector, particularly the growth in the number of overseas students in Australia and across the world over the past 20 years, spurred the development of the PBSA (Savills, 2017a). Australia's population of overseas students is said to have risen sharply in the 2000s and peaked in 2010 at about 472,000 students. From the year 2013, the overseas student population upsurged once again, such that the 2018 overseas student population was about 70 per cent higher than the 2013 numbers at 645,000 (Australian Government, 2018a, cited in: Pawson et al., 2019). Supporting the growth in the PBSA in Australia is the increasing demand by global investors for income-producing assets as well as the heightened interest from PBSA companies outside Australia who aim to expand their operation to the Australian market. For instance, pension funds and sovereign wealth companies across the globe have underwritten the PBSA business in Australia. In 2017, two large off-campus PBSA schemes were initiated and funds for the development were mobilised from Singapore, with one coming from the national sovereign wealth fund, and the other a private entity (Knight, 2018a). Also, the Canadian Pension Plan Investment Board plays a significant role in the PBSA industry in Australia and insurance companies, including L&G from the UK, who are very important in the industry.

In addition to the PBSA, other Australian property forms and/or property market phenomena that follow tenets of the 'mainstream market BtR' have been identified in the literature in Australia. Some examples are the New Generation Boarding House model, Defence Housing Australia's housing, the Meriton 'diversification' into rental housing provision, and the development of purpose-built social and affordable rental housing by not-for-profit Community Housing Providers (CHPs).

Developers are one of the main groups of players who can promote the growth of the build-to-rent industry in Australia. For developers, the BtR is expected to be an additional line of business to their build-to-sell (BtS) assets. To most developers, BtR will require new models of financial arrangement with investors, such that the post-development interest of these investors can be sustained while at the same time acquiring the needed capacity in property and tenancy management under the BtR. It is the expectation that already existing developers cum operators in the PBSA may consider expanding into the BtR industry. This is because most of the large developers already have existing relationships with institutional investors and have the capacity in property and tenancy management that is required for BtR to succeed. Indeed, some of these developers have already started some BtR or are in the process of doing so. Table 1 provides a summary of the BtR activities in Australia as of December 2018.

Table 1. Australian mainstream BtR projects: underway or publicly announced, December 2018

Developer	Project name and location	Size and form	Status
Grocon	'Parklands' Gold Coast, Qld	1,252 units and townhouses (Commonwealth Games Athletes Village)	Development complete, BtR operations from 2019
Grocon	Southbank (Melbourne), Vic	410 units	Approved, yet to commence development
Grocon	St Leonards (Sydney) NSW	Unknown	Approved, yet to commence development
Sentinel	'Element 27', Subiaco (Perth), WA	360 units	Under construction 2018
Mirvac	'Indigo', Sydney Olympic Park, NSW	257 units	Under construction 2018
Salta	Docklands (Melbourne), Vic	260 units (in tower with 150 hotel rooms)	proposed project
Salta	'Victoria Gardens', Richmond (Melbourne), Vic	42 units	Approved, yet to commence, proposed BtR on hold.
Gurner	South Melbourne, Vic	128 units	Proposed, yet to be approved
Meriton	Various Sydney sites, including 'Signia', Mascot	Total approx. 6,000 units, including 237 units in Signia	In operation

Source: Authors construct, 2020.

Expectedly, the large residential build-to-sell operators are also the developers pioneering the BtR model in Australia. The list of possible BtR developments is not exclusive to those in Table 5.1, as small projects, which are

mostly less than 20 units, have been reported in the media as BtR developments. Indeed, the Property Council of Australia estimates that as of March 2018, twenty-three (23) announced and unannounced developments were under consideration (Pawson et al., 2019).

3. Methods

3.1 Empirical Framework: Whole-life Costing (WLC) Approach

The paper follows the whole life costing methodology by the British Standards Institution, (BSI, 2008) and Konstantinos et al. (2014). Whole-life costing (WLC), according to BSI (2008), is the methodology for the systematic economic consideration of all whole life costs and benefits for analysis, as defined in the agreed scope. The WLC approach has a broader scope because it considers all costs and benefits associated with the entire lifespan of real property development, including non-construction related costs (finance costs, business costs, incomes from sales/disposals, etc.). The WLC approach also incorporates, where applicable, the external social/environmental costs and benefits associated with the development. The life cycle costing (LCC), on the other hand, is defined as "methodology for the systematic economic evaluation of life cycle costs throughout the analysis, as defined in the agreed scope" (BSI, 2008). The life cycle costs (LCC) incorporate "the costs of an asset or its parts throughout its life cycle while fulfilling the performance requirements" (BSI, 2008). The LCC, thus, considers costs associated with the development over the economic lifespan of real property. Figure 2 depicts the conceptual relationship between the WLC and the LCC as used in the paper.

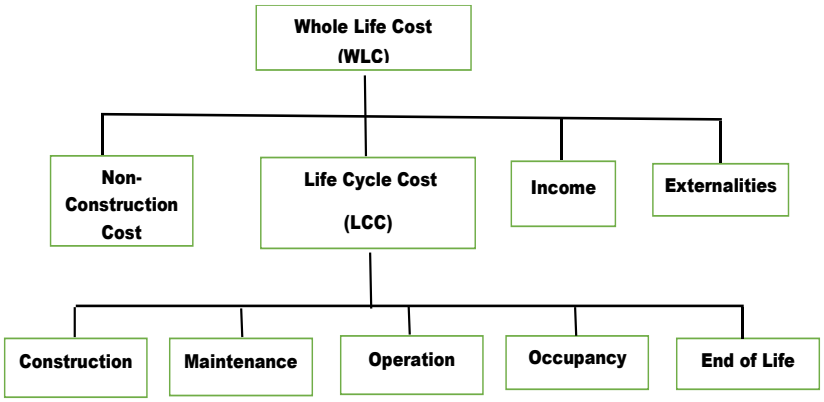

Figure 2. Relationship between WLC and LCC

Source: Authors construct based on (BS ISO 15686-5:2008)

The WLC is a more comprehensive approach relative to the LCC, yet most literature on this investment appraisal technique used these terms interchangeably. Nonetheless, we use the term WLC in the paper because the build-to-rent concept is more consistent with the WLC approach. The financial viability of build-to-rent residential property is analysed by incorporating all non-construction costs, life cycle costs, and rental incomes expected from a property over the investment horizon. The WLC methodology has received wide application in the real estate literature.

Kishk et al. (2003) note that the traditional approach to analysing building developments emphasises on initial capital costs and because the capital costs of construction are mostly distinguished from the operating costs, it has become a norm in the real industry to take the lowest initial cost and then hand over the maintenance of the building to others. Tietz (1987), however, thinks that the initial building costs might be completely misleading since additional maintenance activities or earlier obsolescence can lead to capital savings due to major life expenses. Flanagan & Norman (1987) further note that occupancy costs represent about 70 per cent of the total cost of a building over its life cycle. The authors, therefore, note there is an over-reliance on the initial capital expenditure to result in designs, which do not satisfy clients' budget desires of reducing their life cycle costs.

Again, research by Evans et al. (1998) on behalf of the Royal Academy of Engineering in the UK finds that the operational expenditure for a typical commercial development (office building) is five times the capital costs, and the operating cost of businesses in the building is 200 times the initial costs over a 30-year horizon. In a more recent study, Olubodun et al. (2010) opine that the motivation for applying the WLC is to minimise the costs associated with operating and maintaining, since these costs constitute the bulk of the whole of life costing of the property. Subsequently, the WLC methodology has assumed more relevance to both private and public sector real property

owners. BRE (2004) notes that prospective property owners with interest over the long term are now concerned and demand to know how much it will cost them to own.

Similarly, groups seeking Private Finance Initiatives (PFI), Public-Private Partnerships (PPP), and Build-Operate-Transfer (BOT) initiatives are interested in the financial risks associated with the long-term responsibility of operating and maintaining such properties and thus rely on the WLC approach when evaluating such investments (BRE, 2004). Moreover, financial institutions who provide the needed capital and insurance for such developments are also interested in the WLC during their diligence investigations about the robustness of the cost estimates prepared by the developers, in addition to how the risks of design and delivery of projects have been captured in the estimates (Constructing Excellence, 2003).

The build-to-rent investment vehicle does not only concern the development of the residential properties for renting but also involves professional management and operation of the developed properties to deliver superior benefits to all the stakeholders. Thus, build-to-rent analysis begins from the pre-construction phase where financing and business models are arranged, and their associated cost captured. The costs incurred during the life cycle phase of the project and the rental incomes generated from the completed residential properties are incorporated to assess the financial viability of a build-to-rent development. Accordingly, this paper applies the WLC approach as a more robust methodology for evaluating the financial viability of a build-to-rent investment over the long-term horizon.

3.2 Data and Empirical Procedure

To implement the WLC approach, the paper follows the works of Flanagan et al. (1983), Ferry & Flanagan (1991), Kishk et al. (2003), Konstantinos et al. (2014), and Woodward (1997). We obtained data on construction costs, operating costs, repairs and maintenance costs, and other costs associated with operating the project as estimated by WT Partnership Australia. Data used in the analysis on the expected inflation and discount rates are from the Australian Bureau of Statistics (ABS, 2019). Moreover, the rental prices, which form the revenues from the completed units, are gleaned from CoreLogic (Note1) for 2019. The analysis in this chapter is for one development located in Brisbane city with 100 units. The study assumes 100 units consisting of 1-bedroom, 1-bedroom with 1 study room, 2-bedroom, 2-bedroom with 1 study room, and 3-bedroom apartments.

The paper followed the steps proposed by Constructing Excellence (2003) to conduct the WLC analysis. These steps require that first, I identify and estimate all costs and incomes associated with the development of the apartment units over the entire horizon of the project. Then a decision is made on when these costs and incomes are expected to be incurred/generated based on the assumed stages of the development. The discounted cash-flow technique is employed to discount all future costs and incomes over the whole life of the project to their present value. The NPV and IRR of the projects and sensitivity analysis in respect of the capital structure, the investment period, etc. are performed to ascertain the potential viability of the build-to-rent investment. The equation for the NPV analysis under the whole-life cost (WLC) approach is stated as:

$$NPV = -NCC - \left(\sum_{t=i}^{T} \frac{CO_t}{(1+r)^n} + \sum_{t=i}^{T} \frac{O_t}{(1+r)^n}\right) + \sum_{t=i}^{T} \frac{NRCF_t}{(1+r)^n} \quad \ldots\ldots\ldots (1)$$

where, NPV is the net present value, NCC is the total of non-construction costs, CO_t (Note 2) is the total of construction-related costs at time t, O_t is the total operating costs, at time t, $NRCF_t$ (Note 3) is the net rental cash flow at time t, r is the discount rate, n is the number of years and i = 0,1,2……..T. The equation above captures not only the life cycle cost associated with the development but also all non-construction costs and incomes expected from the project. The modelling in this study, however, does not explicitly capture the costs and benefits from externalities associated with the development.

3.3 Key Assumptions and Modelling Limitations

The modelling and analysis performed in this paper assume that the investment will occur over the long term (i.e. 30 years investment horizon) and that no recapitalisation is envisaged over the investment period. Accordingly, the study assumed a resale value of zero (0) at the terminal period in the base models. As a sensitivity analysis, however, we relaxed this assumption and made provision for a 20 per cent recapitalisation at the end of the investment period. For the market rent build-to-rent model, we assume an investor required IRR of 6 per cent, which is largely consistent with what the industry expects from comparable investments (NAHC, 2020). In the case of the affordable build-to-rent, the study assumes a 5 per cent required IRR. While this assumption might deter growth-seeking investors from such investment, it is argued that investing in affordable build-to-rent is a potential contribution to easing affordability stress among the vulnerable in the society and therefore might be considered in part as a social

impact investment. As such, 5 per cent required IRR, which is highly comparable to similar asset classes, might be enough to compensate prospective investors over the long term.

Furthermore, the analysis is limited to the financial viability of a build-to-rent development composed of only residential units as the income-generating activity. While a build-to-rent development may encompass other commercial units, such as retail outlets and other commercial recreational components, the analysis in this paper does not consider any of these auxiliary components of a build-to-rent development. It is, therefore, possible to achieve outcomes different from those reported in this paper when the analysis incorporates some of these auxiliary components.

Again, Table 2 presents a summary of the total units of each bedroom type completed under the project.

Table 2. Assumptions on the units completed in each stage of development

Type	Number of units Stage 1 (60%)	Number of units Stage 2 (40%)	Total (100%)
1 Bedroom	12	8	20
1 Bedroom + Study	12	8	20
2 Bedrooms	12	8	20
2 Bedrooms + Study	12	8	20
3 Bedrooms	12	8	20
Total	60	40	100

Moreover, the appraisals performed in this paper used median prices of standard market rented units and apartments as reported by CoreLogic, in the last quarter of December 2019. We further limit the expectations of rental income growth as well as the escalation of operation and management-related costs to the expected growth in the inflation rate. Also, issues of corporate taxation are not incorporated in the analysis of this paper on the assumption that all excess cash flows resulting from the investment are immediately distributed among investors who are taxed at different marginal tax rates on their incomes.

Again, we assume the development to be completed in two phases, such that 60 per cent of the development is completed in the year of commencement (i.e. phase 1) and the remaining 40 per cent a year after commencement (i.e. phase 2). Accordingly, 60 per cent of the total development cost is assumed to have been incurred in Stage 1 of the development and the remaining 40 per cent of the development cost incurred in Stage 2 of the project. Figure 3 depicts the timelines for the completion of the entire development.

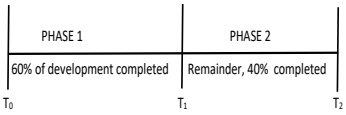

Figure 3. Development phases of the build-to-rent project

Another assumption is that all completed dwelling units within a period are available for rent in the subsequent period. Thus, since 60 per cent of the development is completed at the end of phase 1, rental income generation will begin at the commencement of phase 2.

As noted earlier, the only cited study that also conducts investment analysis of build-to-rent in Australia, to the best of my knowledge, is that of Pawson et al. in 2019. We, therefore, provide a summary of the key components of their study relative to my paper to underscore the key differences between their study and our paper. We present the details in Table 3.

Table 3. Summary comparison of Pawson et al. (2019) vs our paper

Indicator	Pawson et al. (2019)	Our paper	Remarks
Context and location	Sydney, inner-city	Brisbane, inner-city	The capital 2 cities represent different socio-economic settings
Types of units analysed	Five archetypes made up of both standard and premium components	Only standard bedrooms (1 bedroom, 1 bedroom + study, 2 bedrooms, 2 bedrooms + study, and 3 bedrooms	A major difference in the units analysed
Number of units/ apartments		100 units	
Investment horizon	10 years	30 years, 25 years, and 20 years	A significant difference in the investment horizon
Recapitalisation of (resale) after the investment period	Allowed for recapitalisation at the terminal year of the project in the base model	Project is assumed to have zero (0) recapitalisation value to the investor in the base model (recapitalisation is only used in the sensitivity analysis.	A significant difference in the base models which could affect the outcomes
Sensitivity analysis	Performed	Performed	
Capital structure	Equity	Equity, (with 10%–20% debt in the sensitivity analysis)	Similar capital structure
Impact of COVID-19	Could not have analysed due to the period of the study	Potential impact of COVID-19 is analysed as a separate line item in the models	A significant difference in the two studies
General conclusion	Build-to-rent can be feasible but will not generate affordable housing without substantial public subsidies	Build-to-rent can be feasible under equity financing but will fail to produce affordable housing outcomes without significant public subsidy	Both studies arrive at similar conclusions

4. Financial Viability of Build-to-Rent: Presentation of Results and Analysis

The paper seeks to find out whether build-to-rent housing will be viable as an alternative investment capable of generating positive NPV and required IRR for investors. The paper also explores the possibility of build-to-rent generating affordable housing outcomes, while providing investors with the required IRR. In the subsequent sections, we discuss the results of the various estimations under commercial build-to-rent (i.e. rents are charged at the market prices) and affordable build-to-rent (i.e. where the market rents are discounted to incorporate the affordability element).

4.1 Financial Viability of Commercial (Market Rent) Build-to-Rent Housing

The summarised key assumptions underlying the NPV and IRR estimations based on the WLC approach for commercial (market rate) build-to-rent development are in Table 4.

Table 4. Key assumptions for market rent build-to-rent modelling.

Item	Description
Operating cash inflows assumptions (Rental income)	'000AUD
Gross rental income (A)	'000AUD
Escalation of revenue & costs	2.20% p.a., begins in the year entire development is complete
Allowance for vacancy (B)	2.0% p.a. of gross rent
Allowance for uncollected rent (C)	0.2% p.a. of gross rent
Allowance for COVID 19 impact (D)	5% (for the first 5 years after the development is complete)
Net rental income (Cash inflows) (A-B-C-D)	
Operating cash outflow assumptions (OCF)	
Property management fees	7% p.a. of gross rent
General site maintenance & gardening	1% p.a. of gross rental income
Repairs & maintenance of property	2% p.a. of net rental income
Marketing costs	1% p.a. of net rental income
Water & other utilities	1 % p.a. of net rental income
DEBT/EQUITY	0%
Debt repayment	Amortisation method (sensitivity analysis)
Construction period	2 years
Total investment amount required	AUD, 37,722,423
Discount rate	4.5-6%
Investors required IRR	6%
Investment time horizon	30yrs, 25yrs, 20yrs.
Residual value after 30yrs	0

In addition, the estimates of the expected gross rental revenue for the market rent (base model) build-to-rent analysis in the first 2 years of operations are present in Table 5.

Table 5. Assumptions on gross rental income analysis (Model 1: base model)

Year 1 (60%)	**Units/Type (A)**	**Rent/Unit/W (B)**	**Weeks/Year (C)**	**Gross rent (A*B*C)**
1 BEDROOM	12	390	52	243,360
1 BEDROOM + STUDY	12	420	52	262,080
2 BEDROOMS	12	500	52	312,000
2 BEDROOMS + STUDY	12	530	52	330,720
3 BEDROOMS	12	660	52	411,840
Total (Yr1) D	60			**1,560,000**
YEAR 2 (40%)				
1 BEDROOM	8	390	52	162240
1 BEDROOM + STUDY	8	420	52	174720
2 BEDROOMS	8	500	52	208000
2 BEDROOMS + STUDY	8	530	52	220480
3 BEDROOMS	8	660	52	274560
Total (Yr2) E	**40**			**1040000**
Gross Revenue (Yr2) (D+E)				**2,600,000**

Similarly, the detailed development costing analysis and an extract of the resulting NPV and IRR estimations are provided in Tables 6 (a & b) and 7, respectively.

Table 6a. Total development costs analysis

Total value of land analysis						Total
Cost per Sqm method						
Land cost ($ per Sqm) (1)		2350				
Building plate		926				
Site cover		70%				
Land area (Sqm) (2)		1,323				
Land value (1*2) (a)					**$3,108,714**	
Stamp duty analysis (Qld)						
Land value (AUD)		**3,108,714**				
Bracket		**Excess**	Dutiable amount	Duty rate	Duty	
5,000		**3,103,714**	5,000	0.015	75	
75,000		**3,028,714**	75,000	0.035	2625	
540,000		**2,488,714**	540,000	0.045	24300	
1,000,000		**1,488,714**	1,000,000	0.0575	57500	
			1,488,714	0.0575	85,601	
Stamp duty (b)					**$170,101**	
Legal costs - land transfer (c)					**20,890**	
Total cost of land (a+b+c)	**A**					**$3,299,705**
Construction cost analysis						
Number of units and construction cost <10 floors						
Residential floors		10				
Number of units		Each floor	Total in building	Gross floor space/Unit	Construction cost (per Sqm)	Construction cost
1 Bedroom		2	20	70	2,820	3,948,150
1 Bedroom + study		2	20	79	2,768	4,373,255
2 Bedrooms		2	20	90	2,611	4,700,178
2 Bedrooms + study		2	20	100	2,559	5,117,972
3 Bedrooms		2	20	116	2,486	5,767,223
Residential units	**B**	**10**	**100**			**23,906,776**
Construction of car basement analysis	**C**					
Car basement floor		Total in building (1)	Gross floor space/Unit (2)	Construction cost (per Sqm) (3)		Construction cost (AUD) (1*2*3)
Residential units		100	37	1,253		**4,637,509**
Professional fees and costs analysis						
Construction		Total units	Cost per unit	Total		
Professional service cost		100	22,039	2,203,900		

Compliance & legal cost		100	6,267	626,670	
Project manager		100	4,700	470,000	
Contingency allowances		100	15,772	1,577,172	
Council infrastructure and approval costs		100	9,400	940,000	
Total professional fees and costs (AUD)	**(D)**	100	58,178		**5,817,742**

Table 6b. Total development costs analysis (cont.)

Land rate and analysis (1)	Rate (%) (a)	Land value (AUD) (b)		**Rate payable (AUD) (a*b)**	
	0.476	3,108,714		**14,797**	
Land tax analysis					
Total land value	3,108,714				
Tax schedule (Bracket)	Excess	Duty amount	Duty rate	Duty	
349,000	2,759,714	349,000	0.00%	0	
2,249,000	510,714	2,249,000	1.70%	38,233	
4,999,999	-4,489,285	510,714	1.50%	7,661	
1,000,000	-5,489,285	0	2.00%		
		0	2.00%		
Tax payable (2)				**45,894**	
Land rate and taxes (1+2)	**E**				**$60,691**
Total development costs (AUD) (A+B+C+D+E)					**37,722,423**

Table 7. An extract market rent build-to-rent residential housing

ITEM/YEAR		Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 30
Gross rental income	A	0	1,560,000	2,600,000	2,657,200	2,715,658	2,775,403	2,836,462	4,781,877
Allowance for vacancy	B	0	31,200	52,000	53,144	54,313	55,508	56,729	95,638
Allowance for uncollected rent	C	0	3,120	5,200	5,314	5,431	5,551	5,673	9,564
COVID-19 impact	D	0	78,000	130,000	132,860	135,783	138,770	0	0
Net rental income (A-B-C-D)	E	0	1,447,680	2,412,800	2,465,882	2,520,131	2,575,574	2,774,060	4,676,676
Other income	F	0	0	0	0	0	0	0	0
Total income (E+F)	G	0	1,447,680	2,412,800	2,465,882	2,520,131	2,575,574	2,774,060	4,676,676
Operating expenses									
Property management fees (7%) Gross rent	(a)	0	109,200	182,000	186,004	190,096	194,278	198,552	334,731
Repairs & maintenance (2%) Net rent	(b)	0	28,954	48,256	49,318	50,403	51,511	55,481	93,534
Marketing costs (1%)		0	14,477	24,128	24,659	25,201	25,756	27,741	46,767
Net rental	(c)								
Water & other Utilities (1%) Net rentals	(d)	0	7,238	12,064	12,329	12,601	12,878	13,870	23,383
General site maintenance &		0	15,600	26,000	26,572	27,157	27,754	28,365	47,819

gardening									
Gross rent (1%)	(e)								
Operating cash outflow		0	175,469	292,448	298,882	305,457	312,177	324,009	546,234
(a+b+c+d+e)	H								
Net operating cashflow (G-H)	**I**	0	1,272,211	2,120,352	2,167,000	2,214,674	2,263,397	2,450,051	4,130,442
Project cash outlay	**(J)**	22,633,475	15,088,983	0	0	0	0	0	0
Net cash flow	(I-J)	-22,633,475	-13,824,010	2,108,288	2,154,670	2,202,073	2,250,519	2,436,180	4,107,059

The Net Present Value (NPV) of the commercial build-to-rent within the assumptions specified above is positive (i.e. $ 7,878,881) and the Internal Rate of Return is 6.02 per cent, which is a little above the investor required IRR of 6 per cent. This means that over a 30-year investment horizon, a build-to-rent investment that employs 100 per cent equity capital at a discount rate of 4.5 per cent to 6 per cent under the assumptions stated in Table 4 is financially viable. Also, the investment yields a positive NPV of $2,143,555 over a 25-year horizon, but the IRR is 5 per cent, which is below the investors' required IRR of 6 per cent. Over a 20-year horizon, however, the investment fails to generate a positive NPV. A negative NPV of -$4,266,844 and the IRR is 3.22 per cent, which is significantly below the investors' required IRR of 6 per cent; this is obtained over a 20-year investment horizon. The implication is that build-to-rent investment favours a longer investment period of 30 years and more.

4.1.1 Sensitivity Analysis: Capital Structure, Resale Value, and COVID-19 Impact

Next, the study investigates the sensitivity of the IRR to changes in the capital structure to include debt capital, the possibility to recapitalise part of the investment after the investment period, and the possibility of the negative impact of COVID-19 to persist longer than 5 years. To proceed, the assumptions in Table 4 are restated with some modifications in Table 8.

Table 8. The key assumptions for sensitivity analysis: Market rent build-to-rent

Item	Description
Operating cash inflows assumptions (Rental income)	'000AUD
Gross rental income (A)	'000AUD
Escalation of revenue & costs	2.20% p.a., begins in the year entire development is complete
Allowance for vacancy (B)	2% p.a. of gross rent
Allowance for uncollected rent (C)	0.2% p.a. of gross rent
Allowance for COVID-19 impact (D)	5% (for the first 10 years after the development is complete)
Net rental income (Cash inflows) (A-B-C-D)	
Operating cash outflow assumptions (OCF)	
Property management fees	7% p.a. of gross rent
General site maintenance & gardening	1% p.a. of gross rental income
Repairs & maintenance of property	2% p.a. of net rental income
Marketing costs	1% p.a. of net rental income
Water & other utilities	1 % p.a. of net rental income
DEBT/EQUITY	10–30%
Cost of debt capital	4.5%

Debt repayment	Amortisation method (sensitivity analysis)
Construction period	2 years
Total investment amount required	AUD, 37,722,458
Discount rate	4.5 - 6%
Investors required IRR	6%
Investment time horizon	30yrs, 25yrs, 20yrs.
Residual value after 30 years	$7,544,485 (20% of the total cash outlay)

In the sensitivity analysis, we assumed that the negative impact of the COVID-19 on the private rental sector would persist for about 10 years into the future. We also alter the capital structure of the development to incorporate a maximum of 30 per cent debt capital at a cost of debt of 4.5 per cent. Moreover, we provide for 20 per cent of the total cash outlay on the development to be recouped at the terminal year of the investment horizon.

4.1.1a. Sensitivity to Capital Structure

The capital structure of a firm refers to the proportion of debt to equity that the firm uses to finance its development. The paper finds that the investment yields a positive NPV of $ 4,106,635 over a 30-year horizon when 10 per cent of debt capital is incorporated into the capital structure at an amortised cost of 4.5 per cent. However, such a financing arrangement fails to yield the investors' required IRR of 6 per cent. The IRR resulting from the incorporation of 10 per cent debt capital is 5.3 per cent, which is below the required 6 per cent. The required IRR is only obtainable when the debt proportion is 1 per cent or lower.

Over 25- and 20-year investment horizons, the investment produces negative NPVs of -$1,290,421 and -$7,279,274, respectively. Accordingly, the IRRs are 4.2 per cent and 2.3 for the 25- and 20-year horizons, respectively. These findings suggest that build-to-rent investment is very sensitive to the capital structure of the development. The above analysis implies that a successful build-to-rent investment will require a large pool of equity capital as opposed to debt capital.

4.1.1b. Sensitivity to Net Resale/Net Residual Value (Recapitalisation)

In the base model, the assumption was that the investment would have a resale value of zero (0) after the 30-year investment period. To find out the impact of a possible resale/residual value on such an investment decision, we relaxed this assumption and allowed for 20 per cent net resale value from the initial cash outlay at the terminal year of the project. Keeping all other assumptions as in Table 4, the paper finds that the investment produces a positive NPV of $9,890,019 and an IRR of 6.3 per cent, which is above the investors' required IRR of 6 per cent. However, over a 25- or 20-year investment horizon, the investment does not yield the 6 per cent required IRR (i.e. 5.5 per cent and 4.2 per cent for 25- and 20-year horizons, respectively). The results imply that the opportunity to recoup part of the initial investment at the end of the investment period can greatly influence investors' decisions to invest in build-to-rent residential housing.

4.1.1c. Sensitivity to COVID-19's Impact on Commercial Build-to-Rent

Under the base model, the paper also assumed that the novel coronavirus would hurt the demand for private rental housing over the short term. To capture this, we provide for a 5 per cent reduction in the gross rental income over five years. After five years, we expect that the demand for private rental housing will upsurge to return to the pre-COVID-19 levels. In the sensitivity analysis, we assume that the negative impact of COVID-19 will persist for 10 years. That is an additional five years from the base model, while keeping all other assumptions as in Table 4.

The results from the analysis show that if the negative impact of the COVID-19 pandemic persists for 10 years, the investment yields a positive NPV of $7,378,645 and IRR of approximately 6 per cent (5.92 to be precise) over a 30-year investment period. This finding holds even if there is no opportunity to recoup part of the investment after the end of the investment horizon. Over the 25- and 20-year investment periods, however, the investment yields IRR well below the 6 per cent required IRR (i.e. 4.9 per cent and 3.1 per cent over the 25- and 20-year periods, respectively). The results imply that the COVID-19 pandemic should not scare potential investors away from long-term investment in build-to-rent residential housing.

4.1.1d. Sensitivity to Capital Structure, Resale Value, and COVID -19 Impact

Finally, we examine the sensitivity of the build-to-rent residential development to the combined effect of debt capital, resale value, and the COVID-19 impact. The detailed assumptions are described in Table 7. The NPV resulting from the estimates is $5,620,779 and the IRR is 5.5 per cent over 30 years. Thus, the IRR is slightly below the investors' required IRR. This means that if an investor employs 10 per cent debt capital at an amortised cost of 4.5 per cent with a potential to recoup 20 per cent of the investment and the COVID-19 negative impact persists for 10 years, the investor will obtain an IRR of approximately 5.5 per cent. The investment under such arrangement will fail to produce positive NPVs over 25- and 20-year investment horizons. The IRR is also well below the required IRR of 6 per cent (i.e. 4.7 per cent and 3.2 per cent over 25 and 20 years, respectively). The analysis, in general, indicates that build-to-rent residential housing will be attractive over a long-term horizon of 30 years and over.

A summary of the findings from the commercial build-to-rent analysis is provided in Table 9.

Table 9. Summary of findings: Commercial build-to-rent housing

	Base model		**Sensitivity analysis**							
			Capital structure (10%)		Resale value (20%)		COVID 19-impact (10 years)		All 3 factors	
Investment period	NPV (AUD)	IRR (%)	NPV (AUD)	IRR (%)	NPV (AUD)	IRR (%)	NPV (AUD)	IRR (%)	NPV (AUD)	IRR (%)
30 years	7,878,881	6.02	4,106,635	5.3	9,890,019	6.3	7,378,645	5.9	5,620,779	5.5
25 years	2,143,555	5.0	-1,290,421	4.2	$4,649,799	5.5	1,643,319	4.9	719,627	4.7
20 years	-4,266,844	3.22	-7,279,274	2.3	-1,143,608	4.2	-4,767,080	3.1	-4,651,2409	3.2

4.2 Affordable Build-to-rent Residential Housing Analysis

It is interesting to note at this point that the analysis done so far does not suggest affordability of build-to-rent since market rental prices at no discount have been used in the analysis. We, therefore, extend the analysis to incorporate the affordability element by discounting the market rental prices by 25 per cent, consistent with the National Affordable Housing Consortium (NAHC) (Note 4) charges for NRAS properties. Details of the estimated affordable rental prices and the gross rental revenues are provided in Table 10.

Table 10. Estimates of affordable rental prices and gross rental revenues

Phase 1 (60%)		Units	Rent/Week	Affordable rent/week	Gross rent/annum
		(A)		(B)	(A*B*52)
1 Bedroom		12	390	293	182,520
1 Bedroom + Study		12	420	315	196,560
2 Bedrooms		12	500	375	234,000
2 Bedrooms + Study		12	530	398	248,040
3 Bedrooms		12	660	495	308,880
Total (Yr1)	C	60			**1,170,000**
Phase 2 (40%)					
1 Bedroom		8	390	293	121680
1 Bedroom + Study		8	420	315	131040
2 Bedrooms		8	500	375	156000
2 Bedrooms + Study		8	530	398	165360
3 Bedroom		8	660	495	205920
Total (Yr2)	D	40			**780000**
Gross revenue (Yr2)		C+D			**1,950,000**

Furthermore, certain key assumptions are necessary for the analysis under affordable build-to-rent housing. First, since the housing affordability problem is high in Australia, we expect the vacancy rate in affordable build-to-rent residential dwellings to be relatively lower than in the commercial (market rent) build-to-rent housing. Also, the allowance for uncollected rents is expected to be low among occupants of affordable build-to-rent housing due to the relative affordability of the dwelling units. Other assumptions are summarised in Table 11.

Table 11. The key assumptions for affordable build-to-rent modelling

Item	Description
Operating cash inflows assumptions (Rental income)	'000AUD
Gross rental income (A)	'000AUD
Escalation of revenue & costs	2.20% p.a., begins in the year after entire development is complete
Allowance for vacancy (B)	1% p.a. of gross rent
Allowance for uncollected rent (C)	0.1% p.a. of gross rent
Allowance for COVID 19 impact (D)	50% decrease in the vacancy rate
Net rental income (Cash inflows) (A-B-C+D)	
Operating cash outflow assumptions (OCF)	
Property management Fees	7% p.a. of gross rent
General site maintenance & gardening	1% p.a. of gross rental income
Repairs & maintenance of property	2% p.a. of net rental income
Marketing costs	1% p.a. of net rental income
Water & other utilities	1 % p.a. of net rental income
DEBT/EQUITY	0%
Construction period	2 years
Total investment amount required	AUD, 37,722,423
Discount rate	4.5 - 6%
Investors required IRR	5%
Investment time horizon	30yrs, 25yrs, 20yrs.
Residual value after 30 yrs	$7,544,485 (20% of the total cash outlay)

In the case of affordable build-to-rent, the impact of the COVID-19 pandemic is expected to reduce the vacancy rate even further. Under normal economic conditions, the vacancy rate in affordable housing is expected to be lower than in private rental housing at market rentals. However, we are not in normal times and the COVID-19 pandemic is expected to bring some economic hardships to various households, particularly among those on low and moderate household incomes. Thus, more households will move into the affordable housing sector, further lowering the vacancy rate. Homelessness will also increase if the government cannot provide a safety net for households identified as not being able to pay the more affordable rate of rent. To capture the impact of COVID-19 in the affordable build-to-rent modelling, therefore, we assume that the vacancy rate will further reduce by 50 per cent due to COVID-19. We estimate this will be 50 per cent out of the vacancy allowance and add back to the total expected income from the affordable housing project. An extract of the resulting computations for the NPV and IRR analysis is in Table 12.

Table 12. An extract of NPV and IRR estimation: Affordable build-to-rent

Item/Year		Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 30
Gross rental income	A	0	**1,170,000**	**1,950,000**	**1,992,900**	**2,036,744**	**2,081,552**	**2,127,346**	**3,586,408**
Allowance for vacancy	B	0	11,700	19,500	19,929	20,367	20,816	21,273	35,864
Allowance for uncollected rent	C	0	1,170	1,950	1,993	2,037	2,082	2,127	3,586
COVID-19 impact	D	0	5,850	9,750	9,965	10,184	10,408	10,637	14,977
Net rental income (A-B-C+D)	E	0	1,162,980	1,938,300	1,980,943	2,024,523	2,069,063	2,114,582	3,546,958
Other income	F	0	0	0	0	0	0	0	7,544,492
Total revenue (E+F)	G	0	**1,162,980**	**1,938,300**	**1,980,943**	**2,024,523**	**2,069,063**	**2,114,582**	**11,079,311**
OPERATING EXPENSES									
Property management fees (7%) Gross rent	(a)	0	81,900	136,500	139,503	142,572	145,709	148,914	251,049
Repairs & maintenance (2%) Net rent	(b)	0	23,260	38,766	39,619	40,490	41,381	42,292	70,939
Marketing costs (1%) Net rental	(c)	0	11,630	19,383	19,809	20,245	20,691	21,146	35,470
Water & other utilities (1%) Net rentals	(d)	0	11,630	19,383	19,809	20,245	20,691	21,146	35,470
General site maintenance & gardening Gross rent (1%)	(e)	0	11,700	19,500	19,929	20,367	20,816	21,273	35,864
Operating cash outflow (a+b+c+d +e)	H	0	140,119	233,532	238,670	243,920	249,287	254,771	428,791
Net operating cashflow (G -H)	I	0	1,022,861	1,704,768	1,742,273	1,780,603	1,819,776	1,859,811	10,650,520
Cash outlay	J	**22,633,475**	15,088,983	0	0	0	0	0	0
Net cash flow	(I – J)	**-22,633,475**	**-14,066,122**	**1,704,768**	**1,742,273**	**1,780,603**	**1,819,776**	**1,859,811**	**10,650,520**

The results from the NPV and IRR analysis under the assumptions in Table 10 show that build-to-rent affordable housing might not be feasible and financially viable without significant government support. For instance, the NPV resulting from the model is -$467,124 and the

IRR is 4.41 per cent over a 30-year horizon. Similar, negative NPVs (-$4,326,400 and -$8,576,319) and IRR of 3.50 per cent and 2.06 per cent are reported for the 25- and 20-year investment horizons, respectively.

4.2.1 Sensitivity to Resale Value, Costs of Land, and Land-related Taxes

To proceed with the sensitivity analysis under affordable build-to-rent housing, we make two (2) significant assumptions. First, the paper assumes that the state government will offer, for free, land for affordable build-to-rent and therefore all related land rates and taxes are exempted. Second, we assume that investors will be able to recoup up to 40 per cent of (rather than 20 per cent in the base model) their initial cash outlay on the development. The other assumptions remain unchanged and are summarised in Table 13.

Table 13. The key assumptions for sensitivity analysis—affordable build-to-rent modelling

Item	Description
Operating cash inflows assumptions (Rental income)	‘000AUD
Gross rental income (A)	‘000AUD
Escalation of revenue & costs	2.20% p.a., begins in the year after entire development is complete
Allowance for vacancy (B)	1% p.a. of gross rent
Allowance for uncollected rent (C)	0.1% p.a. of gross rent
Allowance for COVID 19 impact (D)	50% decrease in the vacancy rate
Net rental income (Cash inflows) (A-B-C+D)	
Operating cash outflow assumptions (OCF)	
Property management fees	7% p.a. of gross rent
General site maintenance & gardening	1% p.a. of gross rental income
Repairs & maintenance of property	2% p.a. of net rental income
Marketing costs	1% p.a. of net rental income
Water & other utilities	1% p.a. of net rental income
DEBT/EQUITY	0%
Construction period	2 years
Total investment amount required	AUD, 34,362,062
Discount rate	4.5 – 6%
Investors required IRR	5%
Investment time horizon	30 yrs
Residual value after 30 yrs	$13,744,824 (40% of the total cash outlay)

The NPV resulting from the sensitivity analysis is $4,494,119 and the resulting IRR is 5.38 per cent. The project IRR is, therefore, above the required IRR of 5 per cent. This means that offering free land and exemptions on land rates and taxes in addition to allowing for high net resale value (40 per cent) at the terminal period for build-to-rent housing will make build-to-rent affordable over the 30-year horizon. Again, the investment produces a positive NPV of $1,043,193 over the 25-year investment period, but the IRR is 4.74 per cent, which is below the 5 per cent required IRR. Over the 20-year investment horizon, however, the project fails to produce a positive NPV (-$2,697,849) and the associated IRR is 3.75 per cent. The economic implication is that build-to-rent affordable housing will yield higher returns over a very long-term investment horizon of 30 years or more.

5. Discussion of the Results

The analysis results in this paper have shown that build-to-rent housing can be viable in Australia, but it might not lead to affordable housing outcomes without substantial state and federal government support. Under the commercial (market rent) model, the investment produces an IRR of 6.02 per cent, which is a little above the required IRR by investors (i.e. 6 per cent) when 100 per cent equity is used to fund the investment over 30 years. Where there is an opportunity to recapitalise at least 20 per cent of the initial outlay on the investment after 30 years, the IRR of the development is better at 6.3 per cent. This finding appears to support an earlier observation by Pawson et al. (2019). The authors note that build-to-rent might be feasible in Australia, but without some form of public subsidy, it will not produce affordable housing.

Also, when at least 10 per cent debt capital at an amortised cost of debt of 4.5 per cent is incorporated in the capital structure of the development, the investment produced a positive NPV but failed to generate the investors' required IRR of 6 per cent. This again suggests that developing a build-to-rent market in Australia might be feasible if developers can assess a large pool of equity capital, since the investment appears not to favour the use of debt capital. Also, the future outlook for private rental housing demand and, hence, build-to-rent following the COVID-19 pandemic is positive as previously noted in chapter 4 of this paper. It means that when the sources of funding for a build-to-rent is structured to consist of more equity, the build-to-rent investment might be feasible and financially viable over the long term in Australia.

Furthermore, the analysis done under the affordable build-to-rent suggests that build-to-rent housing will not generate affordable housing outcomes without support from state and federal governments. In the sensitivity analysis, we assumed that a developer is offered free land, and all land rate and related taxes are exempted. What this means is that the developer's total cost of development is reduced. Again, making allowance for up to 40 per cent of the development cost to be recouped through a resale at the terminal year improves the overall revenue streams from the project over the 30 years. With these favourable assumptions, the resulting NPV is $4,494,119 and the IRR is 5.38, which is above the investors' required IRR of 5 per cent under affordable build-to-rent. Thus, build-to-rent might generate an affordable rental outcome with significant state and federal government support.

The findings corroborate early observations by industry players like Cranston (2017) and Mia (2018). Cranston (2017) opines that the current tax regime, whereby developers are not entitled to receive credits on GST resulting from participating in a build-to-rent scheme, is a disincentive for developers and investors. Similar, Pawson et al. (2019) note that build-to-rent without some form of public subsidy will not produce affordable housing.

6. Conclusion

Both government and industry players alike know about the absence of a structured build-to-rent market in Australia. Also, the recent heightened interest among developers and investors on one side, and states and federal government on the other side, have been well reported in the media. Nonetheless, there remain critical issues to be addressed if build-to-rent is to take off at a rate that can result in the supply of affordable housing to meet the growing rental housing demand. Critical among the issues is whether build-to-rent can be feasible under the current regulatory regimes and market structure. Also interesting to stakeholders is the question as to whether build-to-rent can help increase the supply of affordable housing in the private rental sector.

We developed this paper to offer some empirical evidence on the potential financial viability of build-to-rent as an innovation to address the housing affordability challenges in Australia. The paper uses development and management related costing data by WT Partnership Australia and market rental prices from CoreLogic (Formerly RP data) on a proposed 100 residential build-to-rent units and apartments with a car parking basement in the inner city of Brisbane in 2019 for the analysis.

Applying the whole-life costing (WLC) investment analysis methodology, this paper provides some empirical evidence that build-to-rent might be feasible in Australia if the financing arrangement for the development is well structured to incorporate a significantly high proportion of equity financing. Again, the analysis shows that the development might be more viable if investors can recoup part of the initial investment over the investment period. Moreover, it is evident from this paper that under the current regulatory regimes and market structure, build-to-rent will fail to deliver affordable housing. It is, however, observed that providing free land and land-related costs such as stamp duty and other land-related costs in addition to the opportunity to recoup part of the initial cash outlay might help to make build-to-rent affordable. Thus, significant public subsidy, some form of rezoning, and tax concessions costs might be required if build-to-rent developments are to generate affordable housing outcomes in Austral.

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Notes

Note 1. CoreLogic, Formerly RP data is one of the most credible sources of rental prices in Australia. National Affordable Housing Consortium (NAHC) granted access to CoreLogic's database for this paper.

Note 2. Since the construction occurs in stages, the CO_t at time t represents the total construction cost incurred at each stage of the development. The appendix to the paper presents details of the components of CO_t

Note 3. The net rental cash flow is the gross rental cashflow net of allowances for vacancy and uncollected rents.

Note 4. The National Affordable Housing Consortium (NAHC) is the leader and the most successful not-for-profit organisation to have delivered the highest number of NRAS properties under the NRAS scheme.