Shared Housing Ownership for Moderate-Income Households in Auckland: a Path to Affordability

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Executive summary

Ensuring the availability of affordable housing is a long-term challenge in New Zealand. In the last decade, policy debate has focused on supply-side interventions, relying almost solely on increasing land supply as the mechanism to improve affordability. In recent years, policy has (slightly) shifted toward interventions where improving the access to homeownership occur through some form of policy intervention in tandem with the operation of market mechanisms (Emsley et al., 2008).

Finding a way to ensure the delivery of affordable housing remains a central long-term challenge. The role of local councils then becomes critical by considering affordability within the local planning framework, and its effects on the competitiveness of land and housing market. Councils have a natural role liaising with community housing providers, serving target population groups and building bridges with initiatives of the central government. Thus, affordability touches on the strategic commitment of councils. Furthermore, research and advice derived from local experiences can inform investment initiatives and policies that are flexible and evidence-based (Johnson et al., 2015).

Shared ownership (SO) is a policy alternative that may widen access to affordable housing to low and moderate-income households in Auckland. SO allows the potential owner to purchase a share in a property (between 20 and 80 per cent), while a third party (e.g. a housing association, HA) owns the remaining share, on which the shared owner pays rent. Over time, the shared owner can staircase up to full ownership (Cowan et al., 2018; Mitchel, 2018; Nanda & Parker, 2015a; Temkin et al., 2013). A few organisations provide SO products in Auckland, however, the scale of SO required to have a meaningful impact on affordability is not widely investigated or understood.

This technical report estimates the costs of SO and its potential effectiveness to improve access to homeownership for moderate-income households, using Auckland as a case study. We explore SO with a matching model similar to Auckland Council (2017), Fernandez (2019b) and Fernandez & Martin (2020). The model simulates the interaction between the potential buyers of housing (current renters) and new dwellings entering the market. It measures the extent to which potential buyers can purchase a dwelling, conditional on the distribution of prices and the availability of SO. We restrict the analysis to moderate-income households (those earning the Auckland median income of $96,000 a year or less). The SO scheme entails a third party, for example, a housing association (HA), absorbing a share of the housing price, while the rest must be paid by the buyer.

Results reveal that expanding SO could be effective in Auckland, given the right policy settings. A SO programme with retained dwellings below a target price of $750,000 and a price share of 40 per cent being absorbed by a HA, could result in about 535 households becoming homeowners, 108 are additional, i.e., they could not have bought a dwelling

without the SO. This report contributes to the debate about the mix of policy options intended to mitigate the housing crisis while relying on private development and private owner-occupation (Meen & Andrew, 2008; Nanda & Parker, 2015b; Tunstall, 2003).

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1.0 Introduction

Auckland's housing market is one of the most unaffordable in the world (Cox & Pavletich, 2018). After a decade of supply-side policies intending to boost housing supply (e.g. the Special Housing Areas, the National Policy Statement on Urban Development Capacity, KiwiBuild), the impact has been negligible or small relative to the size of the housing crisis (Fernandez, 2019a; Fernandez, Sanchez, & Bucaram, 2019; Murphy, 2016). An additional layer of complexity in the affordability problem is the uncertainty and disruptions on supply chain, labour costs and shortage, and potential construction delays produced by the Covid-19 pandemic.

Therefore, finding a way to ensure the delivery of affordable housing remains a central long-term challenge. The role of local councils becomes critical by considering affordability within the local planning framework, and its effects on the competitiveness of the land and housing markets. Councils have a natural role liaising with community housing providers, serving target population groups, and building bridges with initiatives of the central government. Thus, affordability touches on the strategic commitment of councils to research and advice derived from local experiences, can inform investment initiatives and policies that are flexible and evidence-based (Johnson et al., 2015).

In the last decade, policy has focused on supply-side interventions relying almost solely on increasing land supply as the mechanism to improve affordability, which has had limited success. In recent years, policy has (slightly) shifted toward interventions where affordable housing is made available through some form of policy intervention, rather than prices being set strictly by the market (e.g. the KiwiBuild or SO initiatives available in New Zealand). That is, supply-side measures operating jointly with demand-side factors in order to close the incompatibility between the prices of new dwellings and the purchasing power of potential first-home buyers (current renters) (Fernandez, 2020).

Shared ownership (SO) is one of the policy alternatives that may widen access to affordable housing to low and moderate-income households. SO allows the potential owner to purchase a share in a property (between 20 and 80 per cent of the property price), while a third party, e.g. a housing association (HA), owns the remaining share, on which the shared owner pays rent. In the United Kingdom, for example, this rent is set at three per cent or below of the unpurchased price of the dwelling. Over time, the shared owner can staircase up to full ownership (Cowan et al., 2018; Mitchel, 2018; Nanda & Parker, 2015a; Temkin et al., 2013). SO then assists the buyer to access a mortgage and becomes a means of reducing the financial barriers to owner-occupation. SO can also produce psycho-social benefits between having a financial

stake in a property, regardless of how small, relative to living in social or private rental tenure (Wallace, 2012a).

Nonetheless, the design and implementation of SO may be costly as extensive funding is needed for HAs to absorb a share of the housing price. Though that share is repaid in the long-term through a financial arrangement different to a mortgage, and public funds may be channelled through HAs, it is a fiscal commitment dependent on the scale of the SO scheme. SO also requires greater institutional coordination as affordable housing is not delivered by public entities, but by private developers. As affordable housing policy has gained traction in recent years in the New Zealand planning system, and SO is one of the policy alternatives currently discussed in local and central governments, there is the need for robust evidence to inform policy formulation and implementation (Johnson et al., 2015; Nanda & Parker, 2015b; Parsell & Moutou, 2014).

This report estimates the costs of a publicly funded SO scheme and its potential effectiveness in improving access to homeownership for moderate-income households by using Auckland as a case study. We measure the effectiveness of the scheme as the number of households that manage to purchase a property (because of the SO scheme) relative to a baseline scenario where the SO is not available. Therefore, this report links costing measures of the scheme to effectiveness measures. Considering a context of high housing prices, coupled with economic disruptions of Covid-19 and recovery measures announced, the arising policy question is whether there exists a role for SO to improve overall affordability conditions. Hence, this report explores the optimal allocation of a scarce social benefit (affordable housing) linked with budget requirements, and the feasibility of SO in Auckland.

We explore SO with a matching model similar to Fernandez (2019), Fernandez & Martin (2020) and Auckland Council (2017). The model simulates the interaction between the potential demand for housing (current renters) and new dwellings entering the market. It measures the extent to which potential buyers can purchase a dwelling, conditional to the distribution of prices and the availability of SO. A baseline is defined with respect to an affordable market scenario that includes retention of affordable dwellings to moderate-income households, mimicking a retention-and-targeting programme, but without any SO available.

The affordable market scenario consists of a spatial distribution of dwellings with a median price equal to $940,000. The affordable dwellings are defined as those with prices below a target, either $650,000 (as defined in the KiwiBuild programme) or $750,000 for simulation purposes. The SO scheme takes the form of a price discount, from the perspective of the buyer, and may be 20, 40, 60 or 80 per cent of the housing

price, which is absorbed by the HA. The cost of SO is interpreted as the share absorbed by the HA in order to improve access to homeownership. The cost figures do not include implementation or administrative costs for the HA or any other valuation or marketing fees.

We restrict the analysis to moderate-income households (those earning the Auckland median income of $96,000 a year or less[1]) for two reasons. First, as Auckland's housing market is highly heterogeneous, focus on households earning the median income or less may be used as reference or benchmark for housing and urban policies. Second, to simplify the units of analysis and keep the model tractable. In addition, we do not model specifics of the SO as an intermediate tenure model, i.e., we do not model how rights and responsibilities are shared between buyers and housing associations, repairs and maintenance costs, source of funding, resales potential, sharing or risk and capital gains, or mechanisms for retained affordability (Mitchel, 2018). These are all policy relevant issues for decision-makers, particularly for SO adoption and implementation, and are left for future research.

This report explores the multiple goals usually ascribed to a SO scheme. First, as an instrument to increase homeownership where cost-effectiveness measures should be considered to identify the features that simulate the uptake of affordable housing. Second, SO may be used to mitigate housing stress on first-home buyers as well as to increase the number of "additional" buyers that would not have bought a dwelling without the assistance of the SO scheme. Results reveal that SO could be an effective component of housing policy in Auckland. A SO programme with retained dwellings below a target price of $750,000 and a discount of 40 per cent, results in about 535 households becoming homeowners. Relative to a baseline when SO is not available, 108 of those households are additional, i.e., they could not have bought a dwelling without the SO scheme.

This technical report contributes to the debate about the mix of policy options intended to mitigate the housing crisis while relying on private development and owner-occupation (Meen & Andrew, 2008; Nanda & Parker, 2015b; Tunstall, 2003). It is structured as follows: Section 2 describes some background of SO as an affordable housing policy. Section 3 briefly describes the model and simulation. Section 4 presents and discusses the results. Section 5 concludes. The appendix provides details on the modelling approach.

[1] Calculated from 2017 Household Economic Survey

2.0 Background: Shared Ownership

Homeownership has positive effects on every facet of communities and individuals. It is considered a means of accumulating wealth, as an asset that can be used as collateral to secure borrowings, as an inheritance to be passed on or a fund to draw against in old age, as an insurance against the risks and uncertainties in life, and as a financially sound means of paying for a roof over the head (Bright & Hopkins, 2011). Homeownership improves neighbourhood health and stability, increases subjective well-being, and brings higher levels of investments and levels of civic engagement by owners (Dipasquale & Glaeser, 1999; Manturuk et al., 2012; Temkin et al., 2013; Wainer & Zabel, 2020; Zheng et al., 2020). Furthermore, affordable housing is an essential ingredient of liveable communities (Porter, 2004) and is a critical component mediating the locational and intergenerational distribution of opportunities in any society (Emsley et al., 2008).

Private and social housing tenants in New Zealand are subject to limited protection from insecure tenure, which may lead to involuntary evictions and limited opportunity to generate social cohesion and sense of place (Chisholm et al., 2016; Joynt, 2019; Witten et al., 2017). The logic underlying the development of different intermediate tenures (such as SO) is to improve access to sustainable and affordable housing with benefits for both the individual households and the wider community (Provan et al., 2017). Thus, SO may serve multiple purposes such as providing funding for first-home buyers; greater diversification of real estate investments for equity partners and mortgage providers; channels for local and central governments to leverage private finance (Mitchel, 2018); and, better value for money, at least in certain areas, compared with social rented accommodation (Cowan et al., 2018).

Though the design and implementation of SO programmes is nuanced, their basic operation entails households purchasing a share in a property (between 20 and 80 per cent of the property price), while a third party (e.g. a housing association or community housing provider) absorbing the remaining share, on which the shared owner pays a rent (Guest, 2005). Over time, the household (shared owner) can staircase up to full ownership (Cowan et al., 2018; Mitchel, 2018; Nanda & Parker, 2015a; Temkin et al., 2013).

SO was introduced in England in the late 1970s to help people unable to afford a home on the open market to become homeowners. Provided by HAs, SO allows the purchase of a share in a property (typically between 25 and 75 per cent), accounts for about one per cent of households in England (about 115,000 dwellings), and around 0.7 per cent of the total value of mortgages held (Williams & Whitehead, 2015). There is then some potential for it to play a much larger role in the housing market (Bright & Hopkins, 2011).

However, demand for SO dwellings is high: HAs in England approve around 85,000 applications a year, against government funding for the development of 11,000 SO dwellings (Sinn & Davis, 2014). Nonetheless, SO has enabled more mixed development by avoiding segregation particularly in areas of most severe unaffordability (Wallace, 2012b; Whitehead, 2010).

Experience in England reveals that demand for SO dwellings has been less buoyant and financially riskier because of the restricted range of units available and in the form of small units on large new sites (Wallace, 2012b; Whitehead, 2010). However, compared to other policies, SO appears to be relatively effective in delivering affordable housing. SO uses up less than a half of government grants required for social rented accommodation and every £1 of public grant enabled HAs to invest in £4 of SO properties. The government SO loan is repaid at a faster rate compared to social rental property development, and since private finance is a major actor in the sector, it can be reduced as SO developments may even occur without government grant at all (Cowan et al., 2018; National Audit Office, 2006).

Similarly, in Scotland, between 2005/06 and 2009/10 about 730 dwellings were allocated through SO schemes. In 2010/11, the Government allocated £20 million to help households to buy a property (Scott et al., 2011). Nonetheless, because of the targeted nature of the products and the scarcity of funds available to scale them up, the growth of the SO schemes has been limited.

In Australia, through a $50 million grant from the Queensland State Government, Victoria's Social Housing Innovations Project stimulated the provision of over 800 units. This was accomplished through the funding of innovative housing models encouraging the participation of equity joint venture partners such as local government, charitable organisations and not for profit organisations (Emsley et al., 2008). Still, the scope and scale of local government's capacity to intervene in the supply of affordable housing is dependent on the level of commitment given to the provision of housing by central government (Emsley et al., 2008).

In New Zealand, there are Community Housing Providers (CHP) offering SO products. In particular, the Auckland CHP Network (ACHPN) is a source of about 5625 affordable dwellings, where the majority (4666) are leased and the rest are owned. The ACHPN consists of 21 community housing organisations run by not for profit organisations (ACHP, 2019). CHPs buy, manage and develop housing using a range of procurement models, as well as using a range of financial investment sources. CHPs adopt a range of housing access strategies, including affordable rental, rent to buy, shared equity,

Papakāinga[2], as well as private market rate sales used to fund ongoing investment. Hence, community housing targeted to the intermediate housing market has been acknowledged as a solution for households unable to purchase a dwelling at the lower quartile price at standard bank lending conditions (Joynt, 2019). Funding for these initiatives comes from a range of places: capital grants, philanthropy, bank loans, leveraging existing assets, and more recently through central government sponsored KiwiBuild. However, limited access to low cost patient capital (i.e. investors willing to wait for profits in the long-run rather than immediate) including government grants and changing government policy have all limited their ability to grow and operate at a larger scale (Joynt, 2019; Milligan & Gilmour, 2012; Mitchel, 2018).

The common thread of SO implementation across countries is that the SO markets have not fully developed. People's attitudes may be against having their dwelling partially owned by a third party, and difficulties around management, maintenance, and valuation of the property. Therefore, scaling up the SO market segment is complex. Local and central governments could have a role in providing an appropriate regulatory framework to encourage its uptake (Whitehead & Yates, 2010). Hence, this report employs a modelling approach to estimate the likely scale of funding necessary for SO to widen the access to homeownership to moderate-income households. The matching model presented, based on mathematical programming, develops a deeper understanding regarding trade-offs of housing policies, and identifies alternative policies configurations and courses of action (Johnson, 2011).

[2] Group of houses, of three or more, on Māori land referred to as a 'community' which may include broader support and occupant involvement (Te Puni Kokiri, 2017)

3.0 Research Methods

This section relies on a previous model developed and expanded in Auckland Council (2017) Fernandez (2019a, 2019b) and Fernandez & Martin (2020).

The model takes the perspective of a policymaker on planning the costs of SO linked to the dwellings that could be targeted to moderate-income households. The model resembles a housing allocation problem where a set of households (current renters), $A = \{1, \dots, n\}$, search and bid for a new dwelling from, $H = \{1, \dots ., m\}$.

The model first orders households starting with the one with the largest willingness to pay (WTP) who searches for a dwelling across the housing markets of their preference, bids for a dwelling and buys it if the WTP is greater or equal to the dwelling price (or mortgage payments if in annualised terms). Once the purchase is complete, both the household and the dwelling leave the market. This process is then repeated for the remaining households and dwellings.

A simple example of the model is in Table 1. There are three households (J1, J2 and J3) and two new dwellings entering the market (H1 and H2). Case 1 implies that household J1 outbids the others and buys dwelling H2. Dwelling H1 remains unsold because J2 and J3 cannot afford it and decide to remain as renters. Case 2 shows that household J1 buys H2 and J2 buys H1, and J3 is outbid and remains as a renter. Case 3 shows that all WTPs are lower than prices so that no household will buy a dwelling. The outcome of the model is a matching: a competitive equilibrium where each dwelling has a price and each household buys the best dwelling (i.e. highest priced) that they can afford (Sönmez & Ünver, 2011). Holding other things constant, the model assumes that a higher dwelling price is associated with a better-quality and well-located dwelling that renders higher utility to the household (Alonso, 1960).

Table 1: Basic Representation of the Matching Model

	Demand		Supply		Matching
	Households	WTP	New Dwellings	Prices	Who Buys What?
Case 1					
	J1	100	H1	120	J1:H2
	J2	90	H2	99	
	J3	80			
Case 2					
	J1	100	H1	89	J1:H2
	J2	90	H2	99	J2:H1
	J3	80			
Case 3					
	J1	100	H1	120	
	J2	90	H2	110	
	J3	80			

The model is implemented through a mathematical programme detailed in the appendix. The setup entails the interaction of a sample of synthetic households mimicking potential first-home buyers (current renters), and a sample of dwellings entering Auckland's market. A sample of 9017 synthetic households is constructed based on 2013 Census data by Area Unit (AU), downscaled to the spatial intersections between meshblocks and housing submarkets, identified through hedonic modelling (Auckland Council 2017)[3]. These intersections mimic the relocation alternatives of households across Auckland. For tractability and to prevent extreme reallocations (e.g. a household relocating from a wealthy area to a poor one), submarkets are aggregated into 13 sections, that is, submarkets 1, 2 and 3 (wealthy areas) are aggregated into Section 1, submarkets 4, 5 and 6 are aggregated into Section 2, and so on. Any household may relocate only within one section. Figure A1 in the appendix shows the submarkets identified through the hedonic models in Auckland Council (2017). Figure A2 shows the aggregation of the submarkets into the 13 Sections.

The supply scenario is extracted from simulation runs of the Auckland Council Development Capacity (ACDC) model (IHP, 2015). The model simulates profit-maximising developers buying land and selecting development alternatives at parcel-level (standalone dwellings, terraces, apartments), where those alternatives are conditional on the zoning provisions. The model calculates the development costs for that parcel and built form typology and dwelling size (e.g. how many dwellings are possible on the parcel). Supply mimics the behaviour of community housing providers but preserving the competitive nature of the market so that developers are willing to deliver the affordable dwellings. That is, the supply scenario resembles market-actors seeking profit maximisation and who could deliver below-market affordable housing, if compensated for the lower return on investment. This compensation is not explicitly modelled but can take several forms, such as financial grants, lower land prices or loan guarantees (Czischke & van Bortel, 2018). The supply scenario delivers 6000 new dwellings, 1200 of them are priced below $650,000, and 1790 below $750,000. Figure A3 displays the prices distribution of the (affordable) supply scenario.

The analysis in this report is an ex-ante approach to assess the compatibility between housing prices distribution and the capability of households to absorb affordable housing, conditional on the availability of SO. Thus, we explore the role that SO may have on improving access to homeownership to moderate-income households considering the interaction between demand and (affordable) supply. The SO takes

[3] At the time of writing, 2018 Census data on income and rent data were not available at the fine spatial scale required for the model. Any updates on the model are left for future research.

the form of a price discount, from the perspective of the buyer, ranging from 20 per cent to 80 per cent, which is absorbed by a third party (an HA, e.g.).

The SO cannot operate in an environment where affordable dwellings are not delivered or retained for target population groups. The simulations then start with a retention-and-targeting programme operating Auckland-wide where dwellings below a target price ($650,000 or $750,000) can be bought by moderate-income households only[4]. Though the income threshold for households to affordably buy a dwelling should also increase, the focus of this report is on moderate-income households (Mitchel, 2018). Fernandez & Martin (2020) prove the relevance of the simultaneous operation of price targets and income thresholds, along with cascading, in this report we focus on the SO.

[4] The San Francisco Citywide Inclusionary Affordable Housing Program (SFIZ) requires developers to sell or rent 20 per cent of units in new residential developments at a price that is affordable to low- or middle-income households (Temkin et al., 2013)

4.0 Results

Baseline results show that when no SO scheme is available, and the target price is set at $650,000, 425 affordable houses are sold to moderate-income households. For a target price of $750,000, sales amount to 427.

Table 2 shows the cost of SO and the rate of take-up of affordable dwellings. The cost should be interpreted as the amount of money that the third party (e.g. an HA) must absorb to enable moderate-income households to buy a dwelling. The cost figure does not include any implementation and management costs of the SO programme. Also, as the model is reflective of the potential number of dwellings entering the Auckland market on an annual basis, the cost is on a yearly basis.

The SO cost can be separated into its two components: as an instrument to mitigate housing stress (for households that would have purchased a dwelling even without the SO), and the additionality effect (for households that could have not purchased a dwelling without the SO). Mitigation occurs when there are households who may use the SO and do not necessarily face a binding financial constraint but may perceive other risk factors (e.g. unemployment or risk of indebtedness). In these cases, some relief from mortgage repayments may contribute to reducing housing stress and increasing the household's well-being. Additionality, in turn, is about extending the choices available for both moderate-income households and developers who may have limited capacity to expand given the constrained demand of affordable dwellings (Finlay et al., 2016). That is, the SO provides these households the only opportunity they have of becoming owner occupiers (Mitchel, 2018).

The annual cost of SO to the third party starts at $752,000 (for a price target of $650,000) or $8,800,577 (for a price target of $750,000). The large cost difference occurs because as a larger number of affordable dwellings become available (though at a higher price), moderate-income households have more buying opportunities when searching and bidding for a dwelling. This is observed as the number of additional buyers increase from 7 to 67.

As the SO discount (i.e. price share absorbed by the HA) increases, the SO cost does too, and every cost component is higher under a price target of $750,000. However, the number of additional households remains fairly constant for a discount larger than 60 per cent. That is, higher price discounts may not necessarily induce further purchases on moderate-income households.

Given the setup of the model, it is likely there is no compatibility between household location preferences and the location of affordable dwellings, or there does not exist a large enough pool of moderate-income households capable to absorb the number of

affordable dwellings. This latter point is confirmed as the rate of SO take-up remains about a third of the number of affordable dwellings entering the market. However, conditional to the availability of cascading into the broader market, the rest of affordable dwellings would be purchased by households earning more than the median income in Auckland (Fernandez & Martin, 2020).

Similar reasoning applies if we introduced even higher target prices (e.g. $850,000). Prices are too high for the additionality effect to kick in for moderate-income households. Arguably, increasing the income threshold would increase the rate of take-up, jointly with a SO programme targeted for higher-income households (Fernandez, 2020). This is left for future research.

If the goal of SO is to move as many moderate-income households into homeownership, policy makers or stakeholders can use the results in Table 2 to guide the design of a SO scheme. Furthermore, results in Figure 1 also indicate that, for moderate-income households, the price target of a retention-and-targeting programme should be set at $750,000 (or at least higher than the current KiwiBuild price target of $650,000) and the SO discount should be set between 40 per cent and 60 per cent in order to maximise the number of additional buyers. A discount greater than 60 per cent may not be efficient as it only takes the form of a stress mitigation instrument at an increasing cost, and based on these simulations, the optimal discount is likely to be close to 40 per cent.

A SO scheme set at 40 per cent and a target price of $750,000 requires funds amounting at least $104 million for 535 households in Auckland to become homeowners, 108 of them as additional – an increase of 61 per cent relative to a SO discount at 20 per cent. The worsening housing crisis and highly inflated house prices forcing more would-be-homeowners into the rental market which further stresses out households on accommodation supplement. As a benchmark for our results, the accommodation supplement that was paid by June 2018 reached $1.2 billion (Ministry of Social Development, 2019), which has been argued as becoming less effective at making housing affordable in the private rental sector (Joynt, 2019; Kemp, 2015). The interaction of the SO with the target price is not trivial, setting a higher target price implies that a larger pool of affordable dwellings becomes available to the target population group (Fernandez & Martin, 2020).

It should also be noted that in all cases the biggest impact of SO is to reduce housing stress for households that are already able to, with significant difficulty, buy a dwelling at these price points. While reducing housing stress is not an undesirable outcome of SO, it does illustrate that policies designed to increase the absolute levels of

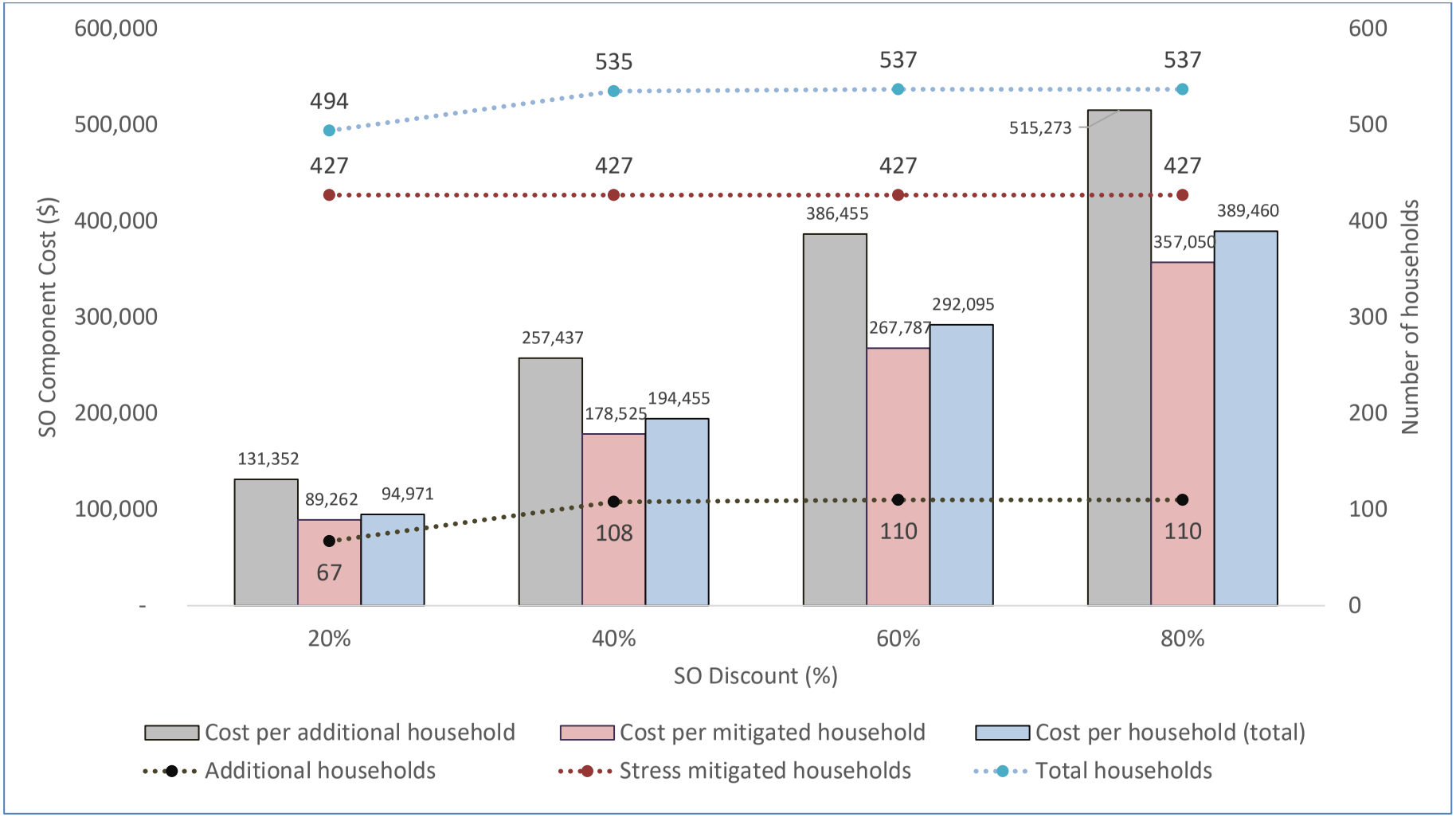
homeownership can and do have other impacts on the market – often larger in scale than the primary intention of the policy.

Table 2: Cost of SO and rate of take-up of affordable dwellings

		SO Cost		Take-up	
		Price Target		Price Target	
SO discount	Cost Component	650,000	750,000	650,000	750,000
20%	Additionality	752,001	8,800,577	7	67
	Mitigation	37,846,652	38,115,052	425	427
	Total	38,598,653	46,915,629	432	494
40%	Additionality	2,582,405	27,803,230	14	108
	Mitigation	75,693,304	76,230,104	425	427
	Total	78,275,709	104,033,334	439	535
60%	Additionality	3,873,607	42,510,045	14	110
	Mitigation	113,539,956	114,345,156	425	427
	Total	117,413,563	156,855,201	439	537
80%	Additionality	5,164,809	56,680,060	14	110
	Mitigation	151,386,608	152,460,208	425	427
	Total	156,551,417	209,140,268	439	537

Note: Under a price target of $650,000, 1200 affordable dwellings are potentially delivered; while under a price target of $750,000, it delivers 1790.

Figure 1: SO Cost per household (Price Target: $750,000)



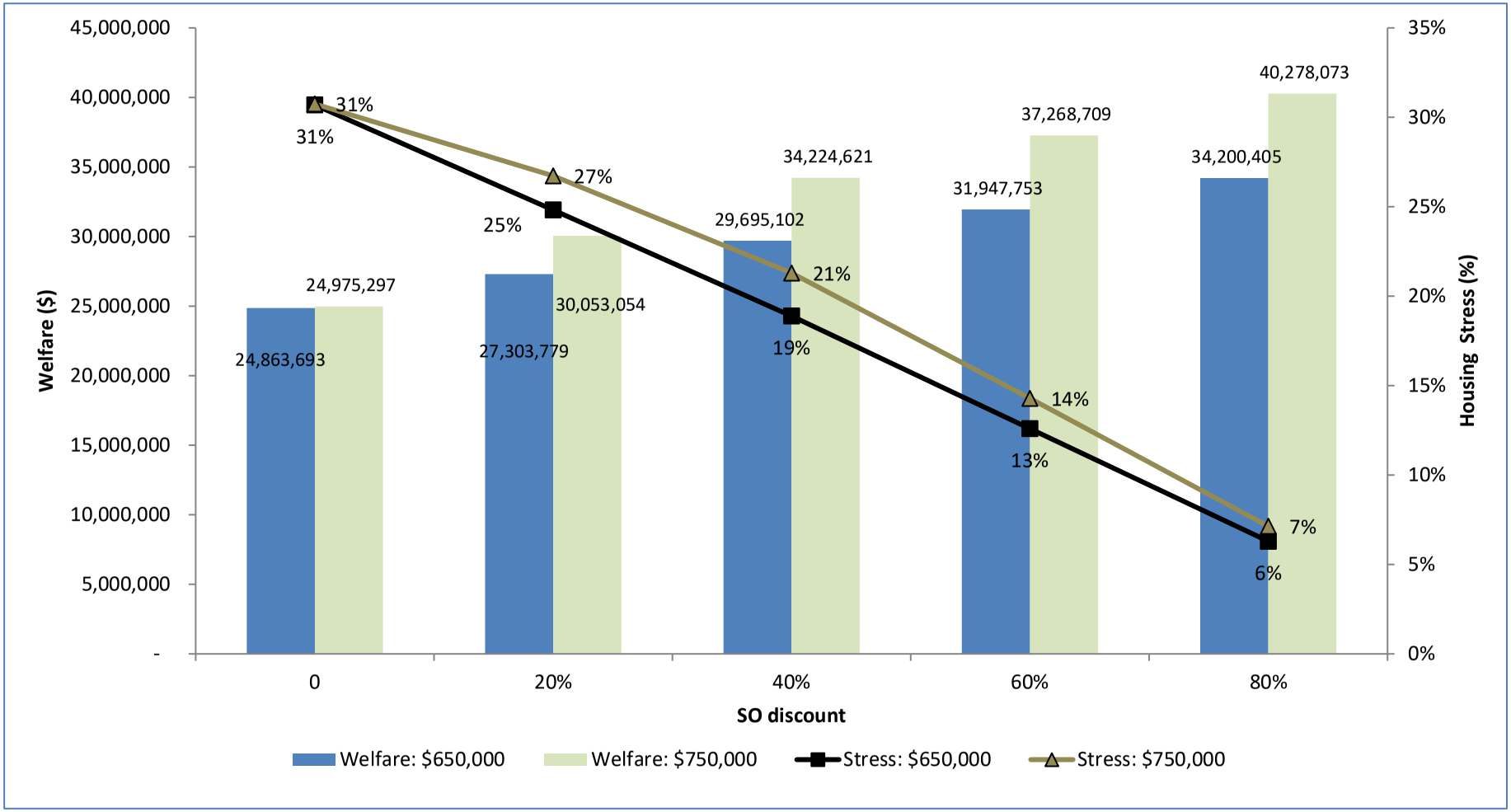
In the context of the model, welfare is calculated as the difference between WTP and mortgage repayments, in annual terms. Welfare may be interpreted as the share of the household's income that could have been allocated to mortgage repayments but is in turn kept and directed to other consumption given the availability of SO or other affordable housing policies.

Figure 2 shows that welfare (willingness to pay minus mortgage repayments in the context of the model) is about $25 million when SO is not available, it is increasing with respect to the SO discount but there is also an increasing gap for a price target of $750,000. This reveals two effects of the higher target price: (i) moderate-income households gaining access to relatively more expensive dwellings and still being able to accommodate mortgage payments; and, (ii) the additionality effect of other moderate-income households gaining access to homeownership.

Furthermore, even though a SO discount of 80 per cent does not necessarily increase the number of additional buyers, its mitigation effect on welfare is noticeable.

Housing stress is measured as the ratio between mortgage payments and household income. Figure 2 also shows that the average housing stress across households who become homeowners; all differences between price targets are statistically significant at a 95 per cent level. Without any SO discount, housing stress is about 31 per cent but decreases relative to higher discounts. Consistent with results above, higher discounts may be redundant (for moderate-income households) as the same households would outbid lower-income households when searching and bidding for a dwelling. That is, the additionality effect ceases to occur as purchase possibilities ran out.

Figure 2: Welfare and Housing Stress by SO discount



5.0 Discussion

The ability of a household to live in a safe, secure, affordable dwelling has implications for health costs, and employability. A household that is not able to secure housing may enter existing assistance programmes resulting at a significant public cost. (Bratt, 2019). In the long-run, those programmes are increasingly costly and their impact on improving access to homeownership are uncertain (Murphy, 2016). A careful examination of affordability policies should consider the input of local governments as it enhances their sustainability by considering them within a local government planning framework (e.g. targeting housing for particular social groups); contextualising projects within local programmes; contributing staff to research (Emsley et al., 2008); and, exploring mechanisms to improve better supply of development opportunities (Bratt, 2019) through optimised regulations and planning provisions (Emsley et al., 2008). Local governments are naturally positioned to design effective affordable housing policies (Emsley et al., 2008); and on identifying the optimum settings while allowing private actors to operate within a competitive market setting, that is, remaining profitable (Fernandez & Martin, 2020; Hawtrey, 2009).

The purpose of this report is to provide guidance to stakeholders on the costs of SO initiatives and how to optimise their social impact. The feature of SO is their reliance on market mechanisms but the sale of dwellings also reflecting a social focus, in addition to profit maximisation. Thus, SO lies somewhere on the continuum between conventional renting and home ownership (Whitehead & Yates, 2010). From a policy perspective, SO may widen the range of tenure options for moderate-income households. However, results in this report show that the operation of SO is not cost-free. SO requires significant quantities of low cost patient capital for it to operate at a significant scale and make a dent on the housing crisis (Mitchel, 2018; Murphy, 2019). Such scale requires a multidisciplinary and comprehensive interaction of policies targeting both demand and supply factors, all within an environment where institutional arrangements should ensure that developers are willing to deliver affordable housing (Fernandez, 2020).

In particular, regarding policy design, this report suggests that for moderate-income households to have a meaningful improvement on their chances to access to homeownership, the price target of a retention-and-targeting programme should be set at $750,000 (or at least higher than the current KiwiBuild price target of $650,000), and the SO discount should be set between 40 per cent and 60 per cent. This report then links the costing of SO with their relative effectiveness under different configurations of the modelling approach. Therefore, SO could become an important feature of the New

Zealand housing market. This claim becomes more relevant as affordability problems may be exacerbated by the economic downturn because of the Covid-19 pandemic.

Likewise, SO schemes in England and Scotland have succeeded in helping households into home ownership, particularly at a time when affordability pressures have contributed to decreases in the level of national homeownership (Fernandez, 2019b; Heywood, 2016). Nonetheless, any SO scheme in New Zealand should consider that a discount greater than 60 per cent may not be efficient as it only takes the form of a stress mitigation instrument at an increasing cost, and based on our simulations, the optimal discount is likely to be close to 40 per cent.

Most importantly, even in the best of economic times, policy priorities compete for public funding. Public money allocated to SO is tied up for a significant period and could crowd out other investment (Cheung & Wong, 2019). But SO could be funded by private investors, which raises the issue of how to develop a secondary market for SO to work into the longer term and allow greater mobility of households either to full ownership or toward a different dwelling (Scott et al., 2011; Wallace, 2008). An alternative to this approach could be the issuing of government housing bonds. In Australia this approach has been implemented with some success and offers a more manageable approach to securing private patient capital, whilst controlling the secondary market in SO [NHFIC,2020. https://www.nhfic.gov.au/] .

The operation of SO in interaction with other policies overlaps with the roles of local councils on promoting affordable housing. SO has even been argued as a complementary policy to enhance the momentum of the KiwiBuild (Johnson, 2018). The modelling approach in this report mimics such complementarity in the form of a retention-and-targeting programme operating region wide with the retention of affordable dwellings for target population groups. In the context of the model, retention is understood as holding some affordable dwelling back from the open market for the purposes of SO. The core modelling assumption is that a (sufficiently large) incentives package is available so that some developers would switch to supplying affordable dwellings. The features of such a package may consist of land contributions, planning provisions reducing transaction costs for resource consenting processes, or other cost-offsetting mechanisms that fill the gap on developers' profitability for delivering affordable housing compared to market-rate units (e.g. density bonuses, zoning standards, tax exemptions, impact fee waivers or deferrals, and alternatives to developing affordable units onsite) (Calavita & Grimes, 1998; Fernandez, 2019b; Mallach & Calavita, 2010; Mukhija, Regus, Slovin, & Das, 2010). All those features could be championed by local councils.

Some caveats and limitations are worth mentioning. First, retention-and-targeting programmes with SO schemes usually require that dwellings remain affordable for a specific length of time, rather than allowing them to be resold to anyone and then lost from the inventory of affordable housing (Elsinga et al., 2015; Porter, 2004). This issue should be accommodated in a more dynamic modelling approach while considering policy design and implementation (Calavita et al., 1997). Second, simulations show that SO does not help households at the lower end of the income distribution where deeper assistance programmes should be explored. Third, as reducing the purchase price often involves some reductions in property rights, the interaction between the HA and the buyer involves contracting arrangements out of the scope of this report (Hoekstra & Marais, 2016). This can have mobility implications for those wanting to exit the market either to trade-up or to cash-up their equity gains, particularly where the housing market has contracted. Or to leverage equity from their house, which is a benefit afforded to more traditional models of homeownership (Wallace, 2012b).

A future research agenda is briefly described. First, financial modelling about the rate of return of SO schemes relative to other affordability programmes or investment alternatives (Collins, 2014) would need to occur. Second, as a SO scheme may generate neighbourhood-level externalities, a targeted area might receive further private investment attention. Or, it could relegate low-income homebuyers to areas with little investment that offer fewer amenities or access to opportunities, so that the benefits of owning a home maybe undermined (Collins, 2014). Striking a balance on creating mixed communities falls within the design and implementation of the scheme. Third, this report demonstrates that a SO scheme could be effective in Auckland. Much more effort could be invested in exploring the specific design features that would make a SO scheme practical. In particular, the ability for SO users to access the equity in their homes would be limited and subject to the terms of the agreement. The model assumes that the SO recipient does not fall into mortgage or rental arrears, which could actually result in their losing money they have invested and ending up worse off as the HA could recapture their losses if the property is on-sold. Finally, we assume that the market continues to grow. What happens if the property falls in to negative equity, how do we protect the part owner from losing out to the other share owner? We need to make sure that those offering SO are bound by agreements to protect the purchaser.

6.0 Concluding Remarks

Increasing homeownership creates positive externalities for communities. As externalities may not necessarily be reflected in competitive market outcomes, too few renters would become homeowners than would be optimal for society (Collins, 2014). To account for secondary benefits of homeownership, public sector intervention is then justified through programmes like SO and the associated retention-and-targeting scheme simulated in this report. Interventions in the form of affordability policies investigate how to achieve the higher marginal social benefits of higher ownership (relative to marginal private benefits of an individual buying a home) and to incorporate traits of fairness to the outcomes of private markets (Collins, 2014; Fernandez, 2019a). Thus, results in this report may be interpreted as the potential of scalability for SO schemes: how large they need to be so the chances of moderate-income households to become homeowners improve (Collins, 2014).

Most importantly, this research feeds into the capabilities of local councils to advise and contribute on the design of SO schemes, as well as their incorporation on planning rules.

7.0 References

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8.0 Appendix

This section relies on Fernandez (2019a, 2019b) and Fernandez & Martin (2020).

The matching model

The model takes the perspective of a policymaker on planning the costs of SO linked to the dwellings that could be targeted to moderate-income households. The model resembles a housing allocation problem where a set of households (current renters), $A = \{1, \ldots, n\}$, search and bid for a new dwelling from, $H = \{1, \ldots., m\}$. A purchase is viable if the willingness to pay (WTP) is greater or equal to the dwelling price (or mortgage payments if in annualised terms). The model first orders households starting with the one with the largest WTP who buys the dwelling of their preference within a budget constraint. Once the purchase is complete, both the household and the dwelling leave the market. This process is repeated for the remaining households and dwellings.

A simple example of a model is in Table 1. There are three households (J1, J2 and J3) and two new dwellings entering the market (H1 and H2). Case 1 implies that household J1 outbids the others and buys dwelling H2. Dwelling H1 remains unsold because J2 and J3 cannot afford it and decide to remain as renters. Case 2 shows that household J1 buys H2 and J2 buys H1, and J3 is outbid and remains as a renter. Case 3 shows that all WTPs are lower than prices so that no household will buy a dwelling. The outcome of the model is a matching: a competitive equilibrium where each dwelling has a price and each household buys the best dwelling (i.e. highest priced) that they can afford (Sönmez & Ünver, 2011). Holding other things constant, a higher dwelling price is associated with a better-quality and well-located dwelling that renders higher utility to the household (Alonso, 1960).

Table A3: Basic Representation of the Matching Model

	Demand		Supply		Matching
	Households	WTP	New Dwellings	Prices	Who Buys What?
Case 1					
	J1	100	H1	120	J1:H2
	J2	90	H2	99	
	J3	80			
Case 2					
	J1	100	H1	89	J1:H2
	J2	90	H2	99	J2:H1
	J3	80			
Case 3					
	J1	100	H1	120	
	J2	90	H2	110	
	J3	80			

The model is implemented through a mathematical programme as follows.

Indices and sets:

$i = 1,2, \dots, n$ number of households in the sample

$hb = 1, \dots, m$ number of new dwellings entering the market

$z = 1, \dots, 13$ number of sections in Auckland created from the aggregation of 40 housing submarkets

Data

$Cost_{hb,z}$ Annualised cost to buy and relocate into the new dwelling

$Bid_{i,z}$ Bid (willingness to pay) of household i that buys a dwelling at section z

$MortgagePayment_{hb,z}$ Mortgage payments

$Income_{i,z}$ household income

$StressFactorBuyer$ maximum share of income to be allocated on mortgage payments

$Deposit_{i,hb}$ housing deposit

$Minimum$ share of housing price to be paid upfront as deposit

Decision Variables

$BUYHOUSE_{i,hb,z}$ dichotomic variable that in the optimal solution takes the value of 1 if a dwelling is bought, and 0 otherwise

Model

maximize $Welfare = \sum_{i,z,hb}(Bid_{i,z} - Cost_{hb,z}) * BUYHOUSE_{i,z,hb}$ (1)

subject to

$MortgagePayment_{hb,z} * BUYHOUSE_{i,hb,z} \leq Income_{i,z} * StressFactorBuyer,$ (2)
$\forall$ i, hb, z

$Deposit_{i,hb} \geq Minimum * Price_{hb,z} * BUYHOUSE_{i,hb,z},$ $\forall$z (3)

$\sum_{hb} BUYHOUSE_{i,hb,z} \leq 1,$ $\forall$i, z (4)

$\sum_{i} BUYHOUSE_{i,hb,z} \leq 1,$ $\forall hb, z$ (5)

$BUYHOUSE_{i,hb,z} = \{0,1\},$ $\forall i, \forall hb, \forall z$ (6)

The objective function (Equation 1) maximises the difference between WTP and price. Constraint (2) limits mortgage payments to 50% of the household income; this limit is set by a stress factor, which is simply the share of income that can be spent on mortgage. Mortgage payments embed the development costs and profit margin for the developer, estimated at a time-horizon of 25 years and 5% discount rate. Constraint (3) indicates that the deposit should be at least 20% of the price. Constraints (4) and (5) ensure that a household will purchase one dwelling only and that a dwelling is purchased only by one household. Every dwelling is occupied by the highest bidder, but the model does not require that the market clears. That is, that every household need not buy a dwelling and every additional dwelling need not be sold in the market (Miron, 2017).

Model setup

This section is a brief description of modelling implementation. More details are found in Fernandez (2019a) and Fernandez & Martin (2020).

Demand

Synthetic households are created based on 2013 Census data by Area Unit (AU) where imputation of income and rent figures is based on a regression of rent in terms of income, household type (single person, couple without children, couple with children, and single-parent households) and AU fixed effects. AU figures are assumed to apply to meshblocks inside each AU. A total of 100 synthetic households are created per AU.

Housing submarkets, identified through hedonic modelling (Auckland Council 2017), are intersected with meshblocks to mimic relocation alternatives of households across Auckland. From each intersection those households with the 10 highest incomes are selected and are assumed as those with the greatest likelihood to buy a dwelling, resulting in 9017 households. For tractability and to prevent extreme reallocations (e.g. a household relocating from a wealthy area to a poor one), submarkets are aggregated into 13 sections, that is, submarkets 1, 2 and 3 (wealthy areas) are aggregated into Section 1, submarkets 4, 5 and 6 are aggregated into Section 2, and so on. Any household may relocate only within one section.

Figure A1 in the appendix shows the submarkets identified through the hedonic models in Auckland Council (2017). Figure A2 shows the aggregation of the submarkets into the 13 Sections.

Supply

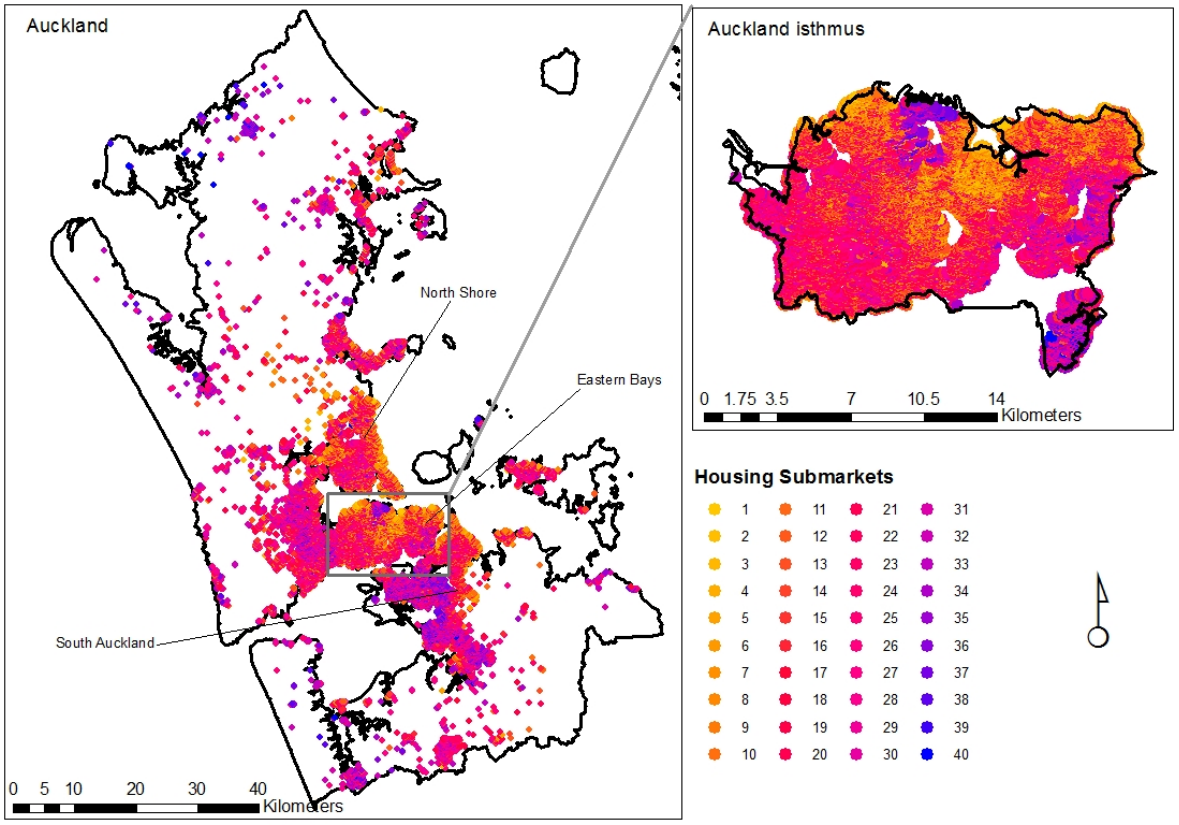
Supply of new affordable dwellings is extracted from simulation runs of the Auckland Council Development Capacity (ACDC) model (IHP, 2015). The model simulates profit-maximising developers buying land and selecting development alternatives at parcel-level (standalone dwellings, terraces, apartments), where those alternatives are conditional on the zoning constraints. The model calculates the development costs for that parcel and built form typology and dwelling size (e.g. how many dwellings are possible on the parcel).

Supply is extracted from an affordable market scenario where developers select the option whose price per dwelling is the lowest. For example, if two development options are available where dwelling prices are $800,000 and $900,000, the developer will choose the lowest price. This scenario (with a median price of $940,000) entails the

shift toward a price distribution with a more affordable nature because of the participation of community housing providers, but preserving the competitive nature of the market so that the developer is willing to deliver the affordable dwellings.

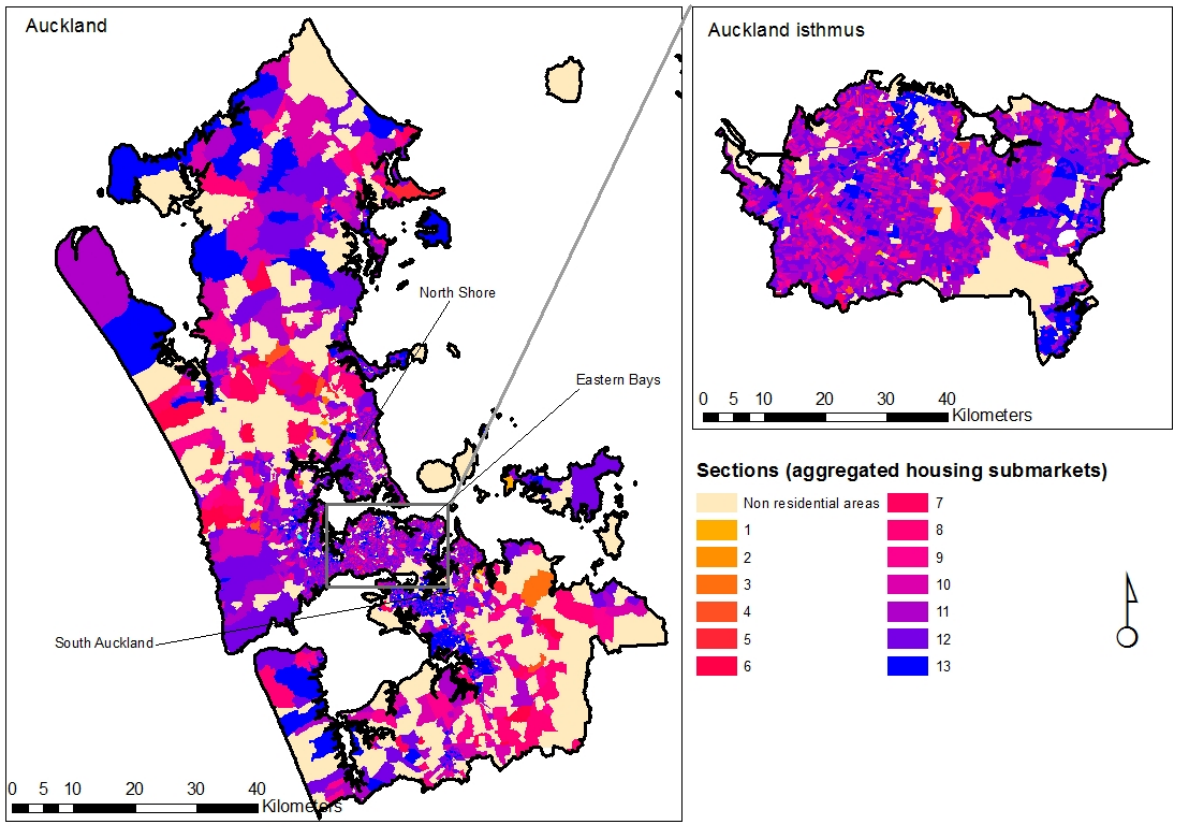
The supply scenario resembles market-actors seeking at profit maximisation and who could deliver below-market affordable housing, if compensated for the lower return on investment. This compensation is not explicitly modelled but can take several forms, such as financial grants, lower land prices or loan guarantees (Czischke & van Bortel, 2018). The supply scenario delivers 6000 new dwellings, 1200 of them are priced below $650,000, and 1790 below $750,000. The model assumes that the additional housing capacity does not alter overall market prices. All households are fully informed about the prices and spatial distributions of dwellings entering the market, and both developers and households may anticipate the future (forward looking behaviour). Therefore, the analysis in this report is an ex-ante approach to assess the compatibility between housing prices distribution and the capability of households to absorb affordable housing, conditional on the availability of SO.

Figure A1: Housing submarkets – Auckland and Auckland Isthmus



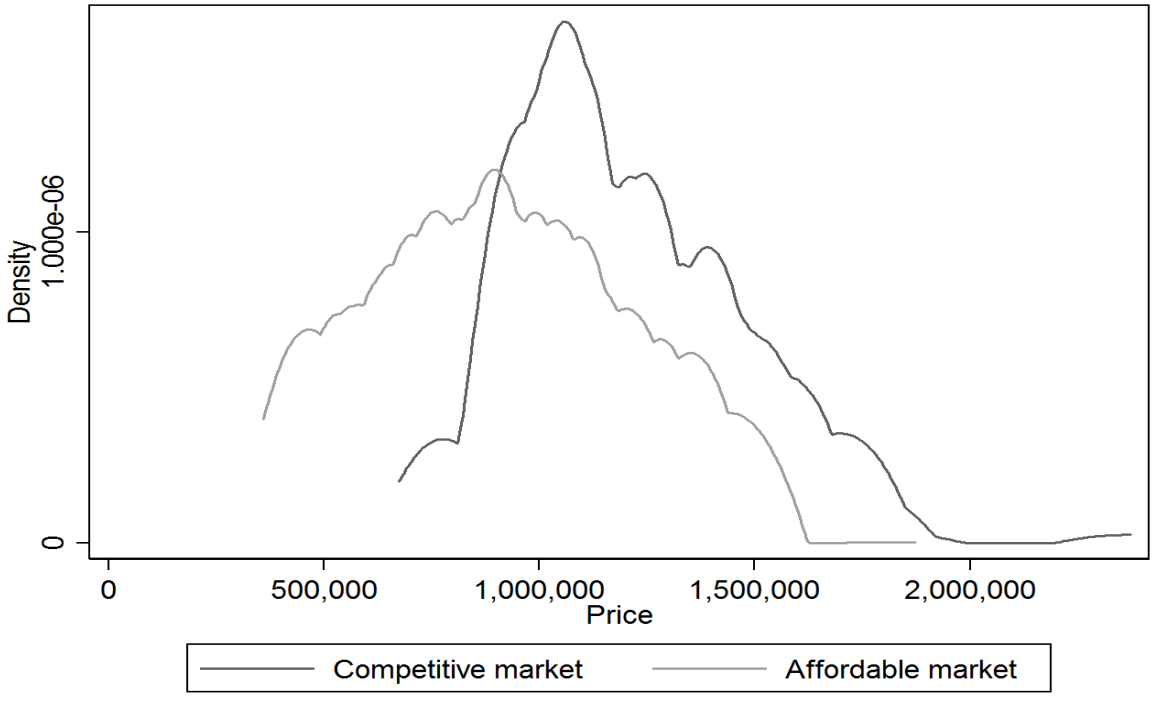
Note: adapted from Auckland Council (2017) and Fernandez (2019)

Figure A2: Housing submarkets and sections – Auckland and Auckland Isthmus



Note: adapted from Auckland Council (2017) and Fernandez (2019)

Figure A3: Prices distributions of supply scenarios



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