Revisiting the Housing Allowance Algorithm and its Theoretical Implications on Rental Housing Demand and Rents. Evidence from New Zealand.

Wasay Majid

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Abstract

The Accommodation Supplement (AS) is a means-tested direct cash allowance to assist low- and middle-income households in the private residential market in New Zealand. Generally, housing allowances are argued to be inflationary due to the programmes reliance on the market to satisfy the ‘subsidized’ demand. This argument makes it market distortionary a priori. I deconstruct the modern housing allowance algorithm (for rent) and challenge its commonly held notions in literature. My theoretical contribution posits that housing allowances are not a price variable, and neither are they a permanent income add-on to a household’s intertemporal budget constraint. I show that the AS functions similar to a negative income (and wealth) tax (NIT) where the subsidy, in general, is generated inversely to income and wealth and diminishes over time with higher savings and incomes. Theory eludes us under the housing allowance context. My academic contribution provides an augmented demand framework for rental housing at the household level. To this end, I analyse the full Household Economic Survey (HES) data for 2008, 2011, 2014, 2017 to understand housing consumption behaviour by income quintiles. Housing demand, it seems, follows the Schwabe’s law. For a microeconometric empirical analysis, I employ a ‘fixed-effects’ model. Using New Zealand Census panel data (2006 and 2013) and aggregating nearly 1,500 census Area Units (AU), my study manages to cover over 90% of households. My housing allowance data is the complete universe of subsidy recipients at the Area Unit level providing data for both, demand for or participation in the scheme and cost of or redistribution of incomes under the subsidy scheme. In a natural experiment setting I exploit these ‘plausibly exogenous’ variations in demand and expenditure on the subsidy alongside variations in rents experienced post Global Financial Crisis with additional controls for drivers of rent. I extend the empirical model to control, as well, for spatial interactions between Area Units that are not time invariant via a Geographically Weighted Regression (GWR) to complement the analysis. Contrary to what is argued in the literature, I find statistically significant results for the increase in the subsidy’s demand and cost at the submarket level to affect market rents negatively across the New Zealand rental housing markets over the study period (2006-2013). For low-income renters the subsidy, over time, did not have a statistically significant impact on their rents. As per my thesis, the presence of such monies signals more pronounced poverty or ‘systemic poverty’ of a cohort at the housing submarket level. Poor renters rent low, can have tenure discounts, and are susceptible to be part of the filtering
stock. The cross-section results reinforce this. For policy, I construct an index to identify and manage the scheme’s objectives. I uncover evidence of the subsidy’s distribution across households to influence aggregate consumption demand for food. This effectively captures the incidence of the housing cash transfer suggesting welfare gains.
To my parents

whom I lost during this journey

and

to my son

whom I saw grow into a beautiful soul during this journey
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THEORETICAL FRAMEWORK FOR DEMAND FOR RENTAL HOUSING  

OVERVIEW ........................................................................................................................................................................ 135
BACKGROUND .......................................................................................................................................................................... 137
HOUSEHOLD BEHAVIOUR FOR RENTAL DEMAND .................................................................................................................. 138
HOUSING PREFERENCE AND INCOMES – AN EMPIRICAL INVESTIGATION ........................................................................... 148

REVISITING THE HOUSING ALLOWANCE ALGORITHM  

HOUSING ALLOWANCE SCHEME REVISITED ............................................................................................................................ 156
HOUSING ALLOWANCE MISCONCEPTIONS .................................................................................................................................. 156
KEY DIMENSIONS OF THE ACCOMMODATION SUPPLEMENT ..................................................................................................... 158
DESIGN FEATURES ..................................................................................................................................................................... 160
HETEROGENEITY UNDER A HOUSING ALLOWANCE .................................................................................................................. 165
ACCOMMODATION SUPPLEMENT AND THE NEGATIVE INCOME TAX FORMULA ................................................................. 170
HOUSING ALLOWANCES VS PRICE SUBSIDIES ........................................................................................................................ 173
HOUSING CONSUMPTION UNDER A HOUSING ALLOWANCE: OPTIMIZE OR NOT? ............................................................... 174
‘POVERTY’ AS DRIVER FOR HOUSING DEMAND ......................................................................................................................... 177
HOUSING ALLOWANCE VIEWPOINTS ..................................................................................................................................... 179
OBJECTIVE OF AN ALLOWANCE AND LOW-INCOME RENTAL BEHAVIOUR ............................................................................. 182
GENEROSITY ISSUES ................................................................................................................................................................. 183

MODELLING THE ACCOMMODATION SUPPLEMENT ON RENTS  

MOTIVATION AND THEORY ....................................................................................................................................................... 189
MODELLING CASH TRANSFERS .................................................................................................................................................. 191
RESEARCH QUESTION .................................................................................................................................................................. 194
METHODOLOGY ......................................................................................................................................................................... 196
MODELLING .................................................................................................................................................................................. 197
RENT FORMATION MODEL .......................................................................................................................................................... 200
DATA ..................................................................................................................................................................................................... 208
TEST FOR PLAUSIBLE EXOGENEITY OF INCREASE IN AS DEMAND .............................................................................................

A MICRO-ECONOMETRIC ANALYSIS  

FIXED EFFECTS MODEL .................................................................................................................................................................. 221
EMPIRICAL STRATEGY ................................................................................................................................................................... 222
REVIEW OF RESULTS .................................................................................................................................................................... 226
FALSIFICATION TEST FOR CHECKS ON PRE-EXISTING TRENDS ..............................................................................................

iv
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.5</td>
<td>ACCOMMODATION SUPPLEMENT AND FOOD EXPENDITURE</td>
<td>234</td>
</tr>
<tr>
<td>10.6</td>
<td>DISCUSSION</td>
<td>236</td>
</tr>
<tr>
<td>11</td>
<td>CONCLUSION</td>
<td>241</td>
</tr>
<tr>
<td>11.1</td>
<td>OVERVIEW OF THE STUDY</td>
<td>241</td>
</tr>
<tr>
<td>11.2</td>
<td>ACADEMIC CONTRIBUTION</td>
<td>242</td>
</tr>
<tr>
<td>11.3</td>
<td>STUDY LIMITATIONS</td>
<td>246</td>
</tr>
<tr>
<td>11.4</td>
<td>POLICY RECOMMENDATIONS AND IMPLICATIONS</td>
<td>248</td>
</tr>
<tr>
<td>APPENDIX 1</td>
<td>DI-PASQUALE-WHEATON (D-W) FRAMEWORK – A PEDAGOGICAL EXERCISE</td>
<td>250</td>
</tr>
<tr>
<td>APPENDIX 2</td>
<td>SUMMARY STATISTICS</td>
<td>256</td>
</tr>
<tr>
<td>APPENDIX 3</td>
<td>ECONOMETRIC OUTPUTS</td>
<td>260</td>
</tr>
<tr>
<td>REFERENCES</td>
<td></td>
<td>291</td>
</tr>
</tbody>
</table>
1 Introduction

“Make for thyself a definition or description of the thing which is presented to thee, so as to see distinctly what kind of a thing it is in its substance, in its nudity, in its complete entirety, and tell thyself its proper name, and the names of the things of which it has been compounded, and into which it will be resolved. For nothing is so productive of elevation of mind as to be able to examine methodically and truly every object which is presented to thee in life, and always to look at things so as to see at the same time what kind of universe this is, and what kind of use everything performs in it, and what value everything has with reference to the whole…."

The Meditations, by Marcus Aurelius

1.1 Thesis background

It is argued that the housing allowance programme for renters in New Zealand leads to upward pressure on market price for rental accommodation for participants and other renting households in the market (Hyslop & Rea, 2019). And recent empirical literature on housing allowances, in general, posits that rent inflation would result from the programmes reliance on the market to satisfy the ‘subsidized’ demand, given the short-run inelasticity of housing supply (Fack, 2006; Gibbons & Manning, 2006; Grislain-Letrémy & Trevien, 2016; Kangasharju, 2010; Laferrière & Le Blanc, 2004; Susin, 2002; Viren, 2013).

Advanced capitalist societies aim to de-commodify housing in various forms, including housing allowances. The modern housing allowance is a cash transfer that is an entitlement where the entire housed population of the country is eligible for an unlimited period if poor enough (Nordvik & Sørvoll, 2014). As in most advanced countries, this is available to the poor that rent, board, or have a mortgage. The overarching criticism against the housing allowance is its negative incidence on price for housing. Most empirical studies use the standard textbook demand theory where the incidence of the subsidy will depend on the elasticity of the demand and supply curves for housing in the usual way and presume housing is a normal-good for most households thus the design of
the housing program should eventually increase housing consumption (Fack, 2006; LaFerrère and Blanc, 2004; Gibbon and Manning, 2006; Collinson et al, 2015; Viren, 2013).

Most of these studies find housing allowances to have impacted rents upwards. For instance, in the UK when looking at a decrease in the rent subsidy that is the Housing Benefit (HB), the incidence on landlords reached to 66% of the subsidy reduction (Gibbons & Manning, 2006). In France, exploiting the policy reforms of the early 1990’s which extended the benefit to all low-income households, Fack (2006) finds around 78% is landlord capture when looking at new benefit claimants. Susin (2002) finds that housing vouchers in the US raised market rents substantially by 16%, on average, in the 90 biggest metropolitan areas. A reform in Finland in 2002 that increased rent ceilings for the existing subsidy cohort finds one additional euro of allowance increases the rent of claimants by 60-70 cents (Kangasharju, 2010). LaFerrère & Blanc (2004) use aggregate data and find a short term impact of a rise in rents for dwellings occupied by subsidised renters following reforms in France between 1992 and 1994. Viren (2013) analyses the 2002 and 2005 housing allowance reforms in Finland and finds a conservative estimate of around one-third of the allowance shifting to rents. Interestingly, in almost all these studies, such findings are significant in the absence of any demand shifts for housing within the subsidy recipient cohort.

Initial works that included the Experimental Housing Allowance Program (EHAP) and the Housing Assistance Supply Experiment (HASE) which began in the early 1970’s and culminated in 1982 in the US under the RAND Corporation concluded, in general, with a consensus that the housing allowance did not have any significant impact on increases in demand for rental housing (Frieden, 1980; Lowry, 1982; Rydell, Neels, & Barnett, 1982). Similarly, other studies found that most recipients simply remained in place and allowances did little to effect demand (Loikkanen, 1988; Steele, 1979). The weak response was probably because the scheme had minimal habitability standards and was very close to a lump-sum transfer (Susin, 2002). The income elasticity of demand for housing derived from allowance data in the EHAP surprised many policy makers and academics alike. These were as low as 0.2 in many cases. Whereas, recent studies find similar results, that is, no housing demand shifts occur under the housing allowance. The problem is, such findings are inconsistent with the theory applied in such works. That is, subsidy being a price drop increases demand that does not show up in the data as supply is fixed in the short-run creating demand-push inflation reflected as increased rents. The rationale to counter this unexplained
behaviour has, in most studies, been the inelastic supply of rental housing (Brackertz, de Silva, & Fotheringham, 2015).

The core assumption thus far is mostly that the subsidy shifts the price for housing, that is, perceived rent changes altering relative prices and therefore demand. Brackertz et al. (2015) find that one common assumption, that is elasticity of housing supply is the key factor that impacts on the degree of landlord capture prevails in most studies. However, no study tested for supply elasticity, rather they treated housing supply elasticity as an explanatory factor for their results. Even if “landlord capture” is a risk, rent subsidies are not unique in this respect; landlord capture is a possibility under any targeted transfer.

In essence, these studies look at the housing subsidy as a price variable. Loikkanen (1988), who developed the “Search Theory” model for housing in an earlier work, points out that assuming the housing allowance only changes the price of housing, one could simply use existing evidence on price elasticities of housing demand to estimate induced changes in housing consumption. This argument assumes, a priori, that all such households move. He, nonetheless, develops a model to reveal that the actual demand effects of the allowance (rent) seem to be small relative to their impact on desired demand, which also are rather small. Housing consumption may shift via a move however, predominantly based on whether if the present level of consumption is too little or to large. Housing allowances have also been argued to be income transfers, albeit sometimes paid in the form of rent rebates or vouchers (Griggs & Kemp, 2012; Susin, 2002; Viren, 2013). Most researchers have predominantly considered their core property as affecting relative price of housing. Such a disposition is increasingly probable as the literature on housing allowances has largely focused on its housing policy objective (Haffner & Boelhouwer, 2006; Oxley, 1987; Turner & Elsinga, 2005).

A logical evaluation, in my view, would be to assess if the subsidy is designed to increase housing demand. Such a viewpoint becomes important as the effect of housing allowances on affecting market equilibrium limits the redistributive objective of this social policy (Bozio, Guillot, Monnet

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This has consequences for application of theory as well. The validation for the subsidy being inflationary comes from the theoretical argument that subsidy shifts demand a priori and the extent of inflation depends on the elasticity of demand and supply of rental housing in the market. Whereas, if the housing allowance does not manage to alter housing demand for recipient households then the supply elasticity within the rental markets is inconsequential surely. Note, inflation can be a result of aspects other than demand where negotiation and bargaining for rents over time can influence prices as well.

1.1.1 Proposed Theory

It is important to recognise that economists in the past have pointed to the literature on to the efficiency of cash, compared to in-kind, assistance as a redistribution measure (Apgar Jr, 1990) as it increases welfare by choice. Furthermore, when first developed in the US under a pioneering experiment in the 1970’s, the most common form of housing allowance considered was a negative income tax subsidy formula (Hanushek, 1986). Morrison (1995) notes that the Accommodation Supplement (AS) formula was based on suggestions from American consultants, that being

\[ AS = p(FMR - (r.I)) \]  (1.1)

where FMR is the fair market rent of the dwelling occupied by the eligible tenant, I is their net benefit income (plus first child family support, usually), r is the percentage of the household's income (I), and p is the proportion of the difference paid as the supplement. It seems the formula suggested was very similar to the benefit formula proposed by Milton Friedman for the negative income tax in the 1960’s. The general formula for the benefit is

\[ B = G - tY \]  (1.2)

where G is the guarantee, t is the tax rate, and Y is recipient non-transfer income (Moffitt, 2003). “And since the effect of a tax-rate change is theoretically ambiguous, it becomes extremely

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3 Exceptions to this general rule are when individual choice leads to the underconsumption of a good that society values or the consumption of a good that imposes costs on others, in-kind provision of assistance may be judged superior for efficiency. For general review see Sa-Aadu, Alternative Estimates of Direct Tenant Benefits, 1984; id., Another Look at the Economics, 1984.
important to ascertain the effect empirically” (Moffitt, 1985, p.1). Moreover, Moffitt (2003) reminds us that Milton Friedman, who proposed the negative income tax (NIT) scheme, saw as an additional advantage that the negative income tax does not distort market prices like minimum wages, tariffs and farm subsidies do.

As an empirical social scientist, I endeavour to investigate data to form theory rather than the other way around as theory eludes us in this case. I deconstruct the housing allowance algorithm to uncover that neither price nor incomes, in theory, can be considered as a housing allowance proxy. Essentially, for the eligible cohort, the allowance does not alter market rents nor does it form part of their permanent incomes, in most cases. Also, the allowance does not place the cohort higher up along the income distribution anywhere close or beyond median incomes and neither does it place recipients in a position of housing affordability. Whereas, the allowance does aim to maintain or stabilize the recipients intertemporal income levels to a degree in the face of any shocks. Therefore, the theory of demand (price and income) and, specifically revealed preference theory (price) appears to be inconsistent with a housing allowance scheme.

I test the theory presented by me in this thesis. In short, housing allowances such as the Accommodation Supplement cash transfers to low income poor renters i.e. the systemic poor, do not, as an objective, motivate in anyway a move to another dwelling. That is, housing allowances do not influence housing demand directly. Cash transfers are a consumption variable and can impact effective demand for all consumption including housing. As these transfers are only targeted to the very poor households it seems unlikely households with higher subsidies are predisposed to a higher willingness to pay more rent. In other words, it seems unlikely that landlords can easily extract economic rents from their tenants that are on housing allowances. The poor tenants can surely use these monies towards other consumption leaving housing rental market equilibrium unaffected. Moreover, at the housing sub-market level, I argued that a greater number of subsidy households in a neighbourhood will signal a relative poorer housing rental sub-market resulting in a relative lower rent growth rate.

Hanushek (1986) noted that whereas social experiments are limited by obvious drawbacks, a longer-run effect which may be observed in a steady state under a permanent and fully operational
housing allowance scheme might provide more robust estimates. My thesis presents such an exercise.

1.1.2 Gaps in literature

Not surprisingly, U.S. policymakers in the 90s did an about turn on their understanding of implicit assumptions about welfare policies having zero behavioural elasticities to designing policies on the explicit assumption that their design did have large, nonzero elasticities on topics such as labour supply, marriage, education, childbearing etc. (Moffit, 2003). Such realisations do advocate that issues may exist when comprehending any effects of welfare instruments, such as the housing allowance. I believe, narratives need to be formed subject to careful perspectives based on rigorous investigations of mechanisms than simply a choice of existing theory. This can certainly explain the viewpoint formed in the early 2000’s regarding housing allowances which considers the allowance inherently market distortionary by choosing to operationalise the lump-sum income transfer as a price differential.

Looking at the direction of past research, majority of the literature on housing allowances has relied on the relative price fall for housing as the key dimension for application of a theoretical model when analysing rental subsidies inflating rents. Some have argued that the allowance is a non-negligible part of household disposable incomes especially for families in the first quartile and this affects demand for housing (Koning & Ridder, 1997). Others consider arguments which portray it as a tool that manages to raise household residual incomes for non-housing budget items (Griggs & Kemp, 2012). Earlier research also looked at utility functions in order to observe household maximization problems under a subsidy scheme although mostly based on assumptions that may be inconsistent with the various dimensions of the present-day housing allowance instrument (Koning & Ridder, 1997; Loikkanen, 1988). For instance, under Search theory, utilising its equilibrium and acceptance sets, Loikkanen (1988) posits that changes in income and price of housing via allowances can be used to consider effects on housing demand as well as mobility using utility functions. Moreover, when viewed as a pure income transfer where the housing consumer, in theory, can pick the exact level of desired consumption in housing and in other goods, it is also argued that housing subsidies work to influence rents through changes in ‘effective demand’ for accommodation (Haffner & Boelhouwer, 2006; Hulse & Kemp, 2007; Kemp, 2007;
Viren, 2013). I argue that housing allowances may not be mimicking price or incomes in the traditional sense.

Interestingly, the more recent studies (approximately 2015 onwards) mirror, in their results, the initial experiments in the US which found no rent inflation; where specifically the Housing Assistance Supply Experiment (HASE) conducted from 1975 to 1980 reported no rent inflation i.e. rents in the two experimental sites increased by about the same amount as rents nationwide with shifts in rents as landlord’s costs (Lowry, 1983; Rydell et al., 1982). Among others, Eriksen and Ross (2015) exploit an increase in supply of housing vouchers using a panel setting between 2000 and 2002 to find that in the US the voucher does not raise overall market rents. Similarly, a recent UK study by Brewer, Browne, Emmerson, Hood, and Joyce (2019) using administrative data sets concluded that, on average, the incidence of the Housing Benefit (HB) subsidy cuts analysed fell mostly on tenants i.e., rents did not reflect the shortfall in subsidy. Interestingly, another UK study found tenants absorbing the higher housing stress coming from a subsidy cut signifying that income was not the overriding determinant of housing demand (Sanderson & Wilson, 2017). In Finland, Eerola & Lyytikäinen (2019) use a regression discontinuity design as the HA in Finland depends stepwise on the floor area and construction year in addition to the household income and size. They finds that HA has no influence on HA rents and HA (KELA) rate discontinuities were stronger than HA discontinuities. Moreover, it has been pointed out that in the case of the US, past studies that find housing allowances as significantly affecting market rents may have been biased due to unobserved determinants of rent (Eriksen & Ross, 2015; Khadduri & Wilkins, 2008; Olsen, 2003). It seems availability of better and big data in the shape of administrative data sets coupled with panel settings is helping to provide clearer results in favour of housing allowance schemes as not inherently inflationary at least empirically.

It almost seems that a sort of ‘positioning ’ bias entered the academic realm at some point in time near the beginning of the 21st century. Most studies were inclined towards consistently using the same economic reasoning when analysing demand-side housing allowances (i.e., subsidy decreasing price, housing a ‘normal’ good for the recipient, demand increases as a given and thus supply elasticity dictating housing allowance impacts). That is, the housing allowance was being considered as market distortionary a priori, in theory and practice (via inelastic supply). It would suggest the literature fell victim to path dependency even though this choice of modelling
assumption was not providing a robust answer, and neither was it building a single uniform consensus amongst academics concerned with the impacts of housing allowances on rents. Interestingly, in the case of New Zealand, Hyslop and Rea (2019 p.1) consider the Accommodation Supplement to be a “cash payment” whereas they consider price theory for the analysis of any predicted impacts of a housing allowance on rents. This, I feel, seems inconsistent, in the least.

In my view, the literature presents a critical gap when dealing with; (a) the effective role of the housing allowance algorithm and its intertemporal behaviour in the household budget constraint of the target population, and moreover, (b) how the subsidy seemingly may impact behaviour of the targeted households in order to influence effective demand in the economy via a redistribution in incomes. This, I believe, has invariably led to inappropriate theoretical models, misspecification, and identification problems.

Although, over the years a number of changes have taken place to reshape this policy instrument in many countries which creates a danger of producing an opaque system, nonetheless potential problems including policy interventions for efficient incentives can arise if the system is not well understood (Nordvik & Sørvell, 2014; Lindbom, 2010).

1.1.3 Contribution to literature

My contribution therefore is threefold. First, and most important, is to reveal the design and mechanism of a modern housing allowance to be inconsistent, in theory, to an extent with price and incomes. Second, to develop an intuitive theoretical framework for housing demand for low-income poor households. I argue that as the subsidy is not designed to shift households up the income distribution to a higher residual income cohort over time and space, it may not carry attributes that suggest a demand increase in housing is warranted under the subsidy. This is because the subsidy only goes to households with housing stress levels of 25% and above where their incomes are below median as well. Third, to undertake a microeconometric empirical exercise to support my theory that the subsidy, in general, does not increase demand for housing. I investigate whether the cash transfer, now part of household consumption budgets, contributes in any way towards rent trends. If significant, this can suggest that the allowance impacts market equilibrium.
In the case of New Zealand, it was only recently pointed out that housing supply elasticity, low-income household preferences, and type and size of housing allowance scheme are crucial to the understanding of any impacts of these subsidies on market rents (Treasury, 2017). Housing supply elasticity for the low-income housing stock, nonetheless, is an important variable as it certainly can play a role under policy measures that may curtail the housing allowance (decrease subsidy) which can lead to downsizing or socio-economic and demographic conditions that elevate poverty putting obvious pressure on the limited stock of low-income rentals. Whereas supply elasticity might be less critical in cases where allowances are stable or even generous (increase subsidy) within their broader confines.

1.1.4 Direction of my proposed theory

My research posits that the modern housing allowance is not a price subsidy for housing. The allowance cannot be considered as a price variable and does not alter the (perceived) price of housing as presented in the literature. The relative price of housing cannot simply be considered as independent as well; it is dependent on the cash transfers and the tax system (Trannoy & Wasmer; 2013). The design of the allowance scheme ensures market rents are unaltered when choosing a rental dwelling. This makes the subsidy non-reflective on price of housing when making a decision to rent. Therefore, revealed preference theory is inconsistent here and demand for housing, in theory, cannot shift a priori nor be optimised under such a scheme. And as the expected subsidy value at the household level is dependent on incomes, taxes, tax credits, wealth, and level of housing in addition to various exogenous housing allowance parameters, it is virtually an unknown parameter to the rational consumer. Thus, forming an effective household utility maximizing function is improbable. In addition, I show that the allowance is not characteristically income and therefore may not be perceived as permanent income within the household budget constraint. It therefore is not a determinant of demand for housing mimicking incomes. It is, in effect, generated inversely to incomes.

I believe research in this vein has pointed to problems with the manner in which theory is applied. These problems have resulted in fragmented and incoherent research findings, ultimately leading to a stagnation of new knowledge. The focus of this thesis is on the narrative, structure, and incidence on rental markets of the rental housing allowance policy instrument.
The modern housing allowance in New Zealand is not a price drop in rents and neither is it an income increase for recipient households. It is an income maintenance scheme where households that face high housing stress, as per policy, will, in general, receive cash in proportion to their relative positions in the labour market. The eligible cohort is targeted using a predefined policy threshold using labour markets and not housing markets which is some proportion of the median earner. And, in general, eligible households that are relative income poor will receive a higher allowance compared to higher income earning eligible households. Moreover, this (relative) amount of the allowance, over time, is subject to the households own intertemporal earning capacity as well. Therefore, as the same household over time is made better-off by earning or saving more their allowance decreases. The housing allowance scheme thus aims to maintain some level of equality in disposable residual incomes for the same household over time and seemingly aims, as well, to lower income inequality amongst the pool of households that are in the lowest income quartiles that suffer from cash asset poverty in an economy at any given time. In short, the housing allowance scheme is equalising residual incomes of the renting poor found at the bottom of the income distribution within the economy over time and space.

A demand-side cash subsidy influences consumption decisions of households, in general, and therefore housing consumption is not affected a priori. Few early studies formed utility functions and conducted empirical works using sample data to inform their theoretical arguments for the effects of the subsidy on housing demand. Revealed preference and formation of utility functions, both suffer from limitations, especially when assuming aggregation of utility functions to form aggregate demand conclusions. The theory of demand is formed using conventional price and income changes. The modern housing allowance is neither a conventional price variable nor is it generated in the labour or capital markets and therefore is not a conventional income variable. I argue that theory is absent when one is required to estimate the effects of a housing allowance on the preference set of an individual or household.

Specifically, as the modern housing allowance recipient is a clearly defined cohort with respect to income and wealth, one can form an augmented theoretical framework to better conceptualise such a cohorts behaviour towards housing consumption demand under the subsidy scheme’s design and parameter limitations. To that effect, there is ample empirical evidence in the literature informing us of the absence of demand shifts under housing allowance programmes. In the empirical
literature this behaviour is witnessed, both, at inception of a housing allowance programme and when changing subsidy parameters to either increase or decrease generosity. This behaviour, in my opinion, is due to the fact that the allowance is neither fundamentally a price drop nor an income increase for the subsidy cohort. It is an intertemporal grant that diminishes as the recipient, over time, is made better off in the labour and financial markets. On the other hand, rising housing and rental markets can actually result in a negative externality for the recipient (for rents above ceiling). Moreover, on the intertemporal household budget, limitations whether the recipient may not know how much their subsidy will diminish over time as incomes rise are of concern, along with expectations that are not uncommon where rent revisions upwards (a negative) seemingly tend to be more frequent and disproportionate to any minimum wage revisions upwards (a positive) thus eroding future expected income gains, whereas both these expectations (negative and positive) essentially shrink any future allowance.

In addition, relying only on revealed preference theory, where analysis is limited by price relativity or change, any wealth differentials are essentially ignored and tend to remain outside the model especially when studying consumption demand behaviour of the poor at the household level. Under a modern housing allowance policy two identical renting households having similar low-incomes are distinctively different with respect to their level of wealth i.e. under the cash asset means test for eligibility for a subsidy. Whereas they are assumed identical under revealed preference for setting price and demand. Wealth levels can be a significant decision-making tool with regards to consumption behaviour of the very poor, especially when faced with either planning or requiring a house move including rent increases as well as deciding between two competing rent contracts as all such situations incur either a short term or a longer term fixed or recurring cost that is substantial for such a target population. Thus, it can be argued that with respect to demand behaviour the two populations - subsidy and non-subsidy renting populations with low incomes - are differentiated by wealth as it is a critical defining parameter of the scheme. Search theory model for rent demand ignores the wealth levels of the renting cohort as well. It is highly likely that a renting cohort with no wealth, for example, is less likely to exhibit behaviour towards a house move or an increase in their housing consumption once housed. This is because their capacity to absorb any present cost (fixed costs under a move) is minimal. Another realisation comes in the form of rent inflation (rent increases for the same dwelling). Lack of wealth can lead
to rent inflation in a similar way as argued under the ‘Search’ theory where poor renting households may not be in a position to move when landlords increase their rents whereas better-off renters can move more freely (Muthoo, 2000). Such issues further inform us that the effects on the demand and price for rental housing for such a cohort when compared to a cohort with similar incomes but higher wealth levels can be different. Interestingly, this suggests if non-recipients are expected to change their housing demand, in theory, with changes in price, it is somewhat likely that the recipient cohort may remain ‘in place’ and thus seem unaffected by price shifts to some degree as well. An attribute not associated with the subsidy but the target population’s socio-economic conditions. Here the coefficient on the subsidy would show up as inflationary whereas the inability to move house in the face of rising rents is due to the lack of wealth (and not due to the extra funds available from the subsidy). Moreover, the detrimental effects (i.e., the resulting rent inflation) from their behaviour not to move house mainly because of high moving costs in the face of price shifts (hikes) can, in turn, be absorbed in part by the availability of the subsidy making them incrementally slightly more resilient than otherwise, in instances, where price increases but demand does not shift.

Prior to the housing allowance experiments in the US a separate set of four parallel experiments beginning in the 1960’s on a negative income tax (NIT) scheme were also conducted (Munnell, 1986). The formula for the housing allowance evolved from these experiments (Hanushek, 1986). Interestingly, past studies did not essentially grasp the fundamental characteristic of the housing allowance algorithm that makes it a pure un-tied cash transfer mimicking more so a negative income tax (NIT) scheme.

Again, to date, most studies have found no evidence of any ‘demand shifts’ for rental housing under the housing allowance (Brackertz et al., 2015; Fack, 2006; Frieden, 1980; Kangasharju, 2010; P. Kemp, 2007; La Ferrère & Le Blanc, 2004b; Lowry, 1982; Rydell, Neels, & Barnett, 1982; Steele, 1979; Viren, 2013). Whereas some studies have nonetheless found it as inflationary i.e., increasing rents. As I point out, inappropriate modelling assumptions, identification issues such as incorrect instruments and omitted variable bias can lead to conclusions inconsistent with the subsidy as the cohort essentially can suffer rent inflation regardless of subsidy. And elasticity of supply is not the only explanation for inflation as behaviour with respect to wealth, intertemporal budget constraints, including necessity are seemingly as important in explaining rent inflation.
faced by a cohort that tends not to ‘move’ or alter housing demand under a price shift. Also, most empirical studies, in general, have not found any direct evidence of price shifts that may not be due to changes in dwelling size and quality in the case of housing allowances for rental housing ruling out inflationary impacts to an extent. (Fack, 2006; Frieden, 1980; Kangasharju, 2010; P. Kemp, 2007; Laferrère & Le Blanc, 2004; Lowry, 1982; Rydell, Neels, & Barnett, 1982; Steele, 1979; Viren, 2013; Hyslop & Rea, 2019).

1.1.5 Objective of the modern housing allowance

Housing allowances can be viewed essentially as having an income support role instead of a housing policy role (Bradshaw & Finch, 2003; Griggs & Kemp, 2012; Kemp, 1997; P. Kemp, 2007; Stephens, 2005; Stephens & van Steen, 2011). Whereas it seems empirical researchers approaching the incidence issue of housing allowances are still ambiguous as to the exact objective of a housing allowance. Depending on the researcher or policy advisor, their views oscillate or more likely tend to be a mix of the two, that is, from its role of either being one that ensures social security or one that assists towards housing affordability. These are, in their view, provided via quality housing, increases in permanent incomes (mostly up to poverty lines), help with costs for non-housing consumption, or deal with issues such as overcrowding, among others. Interestingly, Kemp (2000) when questioning whether housing allowances are mainly seen by government officials as an instrument of housing policy or of social security found that in New Zealand, they consider it as a housing policy whereas housing, under the Accommodation Supplement, is not required to meet any minimum standards in terms of condition or size relative to household needs. In cases where it enables recipients to reduce their rent burden the housing allowance is to be considered as a social security and not a housing policy instrument (Kemp 2000).

As pointed out in a recent report, it is unclear exactly what the AS objective is. Work and Income department of the Ministry of Social Development in New Zealand describes it as “a weekly payment which helps people with their rent, board or the cost of owning a home” – but “helping” with accommodation costs is not a measurable goal as the authors of the report argue (McAllister. J, St. John. S, and Johnson, A., 2019 p. 43). A Ministry of Social Development (MSD) report on the AS describes it as “a payment to low-income individuals and families who have high housing
costs” and says it and other such payments “play an important role in protecting the living standards of a significant fraction of low-income families” (Rea & Thompson, 2017 p. 27).

Once the algorithm is understood, I believe, it becomes clear that the modern housing allowance’s objective seemingly is to provide cash to increase residual incomes in line with maintaining relative residual income equality of the very poor that are housed. It is, in effect, an income maintenance scheme. The allowance, due to certain design features, may seemingly be neutral to the labelling effect; the most apparent being where agents have no information of the distribution of subsidised rents under the scheme i.e. the range of rent prices subsidised and the corresponding subsidy values for each rent level of each client. This is especially true in the case of the Accommodation Supplement. The labelling effect can be thought of as a corollary to the Hawthorne effect in experimentation literature. Studies on the labelling effect of social benefits suggest that naming a cash transfer with a direct reference to the subsidised good, such as housing benefits, encourages households to consume more of the targeted good, while they could have spent the money differently, given that housing benefits are a cash transfer (Abeler & Marklein, 2008; Beatty et al, 2014). To sum up, as Mills and Sullivan observed:

Coercing the poor to spend transfer incomes on housing when they view their most urgent needs elsewhere is hardly the way to improve conditions for the poor. (p. 260)\textsuperscript{4}

\subsection*{1.1.6 New Zealand experience}

Demand-side housing allowances in New Zealand are, in general, quite similar to Australia and Canada and are typical of schemes in European countries including France, Finland, and Norway\textsuperscript{5} in principle (Kangasharju, 2010; Nordvik & Sørvell, 2014). Therefore, an evaluation of the New Zealand housing allowance programme can be informative to an international audience. To date, three major studies in New Zealand have looked at the effects of the housing allowance on rents (Grimes, Hyland, Coleman, Kerr, & Collier, 2013; Hyslop & Rea, 2019; Stroombergen, 2003).


\textsuperscript{5} Although, in Finland, according to the Social Insurance Institution in November 2006, the programme paid the monthly allowance of 53\% of assisted households directly to the private or public landlord (Kangasharju, 2010).
These studies, in general, considered subsidy monies fundamentally as either price shifts or specifically as injections to housing markets.

As no single study in New Zealand to date, in my knowledge, has managed to fully address the core characteristic and underlying objective of the Accommodation Supplement, my work will aim to contribute towards forming an understanding of the role of the Accommodation Supplement instrument. It is the first ever attempt at trying to fully decipher and detail the workings of this transfer in NZ.

1.2 Thesis structure

In part 1 of this introduction, I discussed my thesis proposal presenting my core direction of research and investigations on the literature, narrative, and incidence of a modern housing allowance on rents. Part 2 of the introduction will present the structure of my thesis and its specific contents chapter-wise.

Chapter 2 provides an overview of the evolution and debate on housing welfare policies in the advanced nations. I present a general background of the various demand and supply side housing welfare policies of advanced nations. The emphasis leans more towards the architecture and international perspective of demand-side housing allowances.

Chapter 3 provides a macroeconomic overview of the housing and welfare burden on the State over time for New Zealand. A comprehensive overview of the Accommodation Supplement policy within the Social Security Act of New Zealand 1964 and how it stands today is presented. In addition, State housing sector is introduced with a comparative analysis outlining a few peculiarities between the two housing welfare provisions in New Zealand.

Chapter 4 highlights the evolving institutional tide of residential financial capitalism in New Zealand which is presented to reiterate the crucial importance of AS in a growing disenfranchised housing and property market for humans as shelter. Increasing financialisation of advanced economies ensured that demand for credit increased and assured incomes no longer were sufficient for consumption purposes across large swathes of society. Such an economic system creates
demand for greater business for creditors which, in turn, simply distorts the money supply in an economy that has multiple repercussions for the real value of money amongst other distortions. I show how this economic paradigm translates into residential financial capitalism in New Zealand. This analysis, I believe, compliments my thesis to provide a parallel perspective of contemporaneous macro variables critical in shaping rent inflation. Concerns of any public policy scheme such as the AS that essentially redistributes incomes and is designed not to distort markets in the process, in comparison, can seemingly appear less critical so to speak.

A detailed literature review is presented in chapter 5. This primarily looks at empirical studies that engage in the analysis of the impacts of the modern housing allowance on rents and rental demand. The review also presents a critique on the theory perpetuated in the literature. In addition, a critical review has been carried out on each New Zealand research study on the topic.

A detailed overview of the mechanics of the housing allowance are presented in chapter 6. A comprehensive schematic showing the consumption behaviour towards housing at the household level within an economy with a housing allowance scheme is introduced. Detailed discussions on how housing allowances impact rents and markets conclude this chapter. My thesis introduces the reader to the recent admission of central banks on how money supply is created and its impact on asset prices. This too is introduced in chapter five in the schematic. I believe comprehensive understanding of the issue of rent inflation and how macro variables help to explain this phenomenon should not be ignored.

In chapter 7, I introduce an augmented theoretical framework for demand for rental housing. The chapter also utilises the Household Economic Survey (HES) data to compare and analyse in detail the relationship between housing consumption and incomes across income quintiles for four separate years.

In chapter 8, which is a critical part of my thesis, I unravel the AS algorithm to ascertain its objectives and behavioural limits and their consequent impact on rational consumer behaviour. I show that the modern housing allowance algorithm in NZ is essentially an income maintenance scheme and similar to the negative income tax proposed by Friedman (1962). The arguments in empirical literature are revisited to uncover, that (i) the subsidy is heterogeneous and cannot be
perceived as a price drop, (ii) higher subsidies do not suggest higher willingness to pay for housing by the recipient cohort, (iii) housing allowances are not designed to be optimized by recipients, and (iv) such allowances may not be considered as a (permanent) income add-on for the recipient. I also reveal the instrument is designed to be sensitive to labour markets and not housing markets. It is a consumption variable. I attempt to construct an ordinal index to measure the Gap in the Accommodation Supplement Promise (GASP) for use as a policy instrument for the government in future. The premise being the crucial importance of efficiently structured housing policy tools that are critical in an environment witnessing rapid residential capitalism.

Chapter 9 deals with the methodology adopted for the panel data setting for my study and the various limitations and drawbacks are addressed with respect to the available choices for modelling. Details on the data set and their various limitations and advantages are presented. A rent model is developed with the help of theoretical arguments and empirical evidence for the purpose of my analysis. The panel fixed effects empirical estimation is also extended to include spatial interactions using Geographically Weighted Regression (GWR).

In Chapter 10, using a unique administrative dataset for the Accommodation Supplement provided by the Ministry of Social Development (MSD), New Zealand along with census and other datasets from government departments I provide evidence on the impact of the Accommodation Supplement cash transfer on rent inflation as being statistically significant and deflationary, on all three rent measures, that is median market rents, actual rents, and lower quartile rents over time. Using panel data (2006 and 2013), I exploit variations in (i) participation rates (or demand and supply) of subsidy and (ii) cost of subsidy due to a natural experiment that was the Global Financial Crisis (GFC) which provides us with disruptions in an otherwise stable universal scheme. Whereas at the macro level, there seems no evidence of the rental subsidy contributing to rental revenues as the mechanism is simply absent, I ask whether at the micro-level (neighbourhoods) any exposure to the supply of these income transfers in relation to participating households manages to contribute to rent growth over time and space. The experiment exploits the increased variation in, both, the expenditure and participation rate of the subsidy. As per my argument, the subsidy monies are not a price variable and do not impact demand a priori. Also, it seems they do not get used for increased housing consumption by the cohort. The presence of such monies although signals poverty levels and relative high values of the subsidy reflect relative high poverty. AS reflects the
financial position of households in income and wealth terms and therefore higher subsides reflect lower rents. A discussion follows to revisit past empirical literature to conclude my research efforts. Analysis of selected studies is undertaken in this regard. Chapter 11 concludes my thesis with a summary of the study, its academic contributions, study limitations, and future policy recommendations.
2 Housing assistance and welfare policy

2.1 Shelter, welfare, markets nexus

The term ‘liberal welfare regime’ has emanated from the seminal work of Esping-Andersen (1990) in which he identifies post-world war welfare systems to be emerging in three distinct clusters, namely conservative, liberal and social democratic. Esping-Andersen explains that the underlying aspects for the evolution of different types of state welfare regimes is broadly based on the historical background of the political activities. Esping-Andersen groups the United States, Australia, Canada, and New Zealand as core examples of a distinct liberal welfare regime, whilst Ireland and the United Kingdom too are moving in a similar direction (Esping-Andersen, 1999). Esping-Andersen’s original typology was structured specifically on unemployment insurance, sickness benefits, and pensions, supporting his index of de-commodification.

Keeping in view the ‘three worlds of welfare capitalism’ typologies (‘liberal’, ‘social democrat’, ‘corporatist’) of Esping-Andersen (1990) as the base, Schwartz and Seabrooke (2009) in their pioneering work, insert housing as an institution into the ‘varieties of capitalism’ debate to form a set of typologies labelled ‘varieties of residential capitalism’ (VORC). This exercise provides a perspective to move away from the classic debate between Kemeny (1980) and Castles (1998, 2002) over the salience of owner-occupied housing for the development of the welfare state. The traditional argument by Kemeny (1980) where there is a trade-off that exists between the level of homeownership and the quality and quantity of welfare benefits posits that the level of home ownership was not a natural outcome of rising per capita income levels. They were also equally based on what policies and politics had to say about social spending (Kemeny, Kersloot, & Thalmann, 2005). As higher taxes crowd out cash income for home purchase especially for young lower income households, they essentially became a natural constituent not favouring a large welfare state. Castles (1998) tested a more precise causal micro-foundation for home-owners’ hostility towards welfare states by concluding that countries with low levels of old-age pension provision also typically had high rates of homeownership. Thus, imputed income from home ownership substituted for public pension income. Countries or people could trade-off
homeownership against robust public pensions. Therefore, for Kemeny housing affected general welfare spending, whereas for Castles housing affected pensions essentially.

Before capitalism, few workers were considered commodities, that is, their survival was dependent upon their labour price. When markets become universal is when welfare of individuals became entirely dependent on the cash nexus. De-commodification occurs when any service is rendered as a matter of right, and when a person can sustain a livelihood without any reliance on the market. De-commodified rights are evolved therefore differentially in modern societies with welfare system. In states with large welfare systems, rights are not so much attached to work performance as to demonstrable need. In such states, tools such as ‘means-tests’ confirm to supply meagre benefits to curtail the de-commodifying effect. The Anglo-Saxon countries remain predominant in enforcing such systems and, effectively, these are designed to actually strengthen the market since all but those who fail in the market will be encouraged towards insurance and asset-based welfare within the private-sector (Esping-Andersen, 1990).

2.2 Housing welfare policy

Traditionally, governments were mostly providing housing assistance on the supply-side. This practice was as much as building houses itself as much as it was to assist the market towards building a growing housing stock in the country. Typically, supply-side assistance was geared towards builders, landlords, and financing capital investments into the residential construction sector. This would be possible via direct subsidies to builders or landlords, such as low interest rate loans or capital grants and the like. These supply-side policies famously came to be known as ‘bricks-and-mortar’ subsidies (Oxley, 1987). Indirect means such as incentives of tax relief to landlords for the provision of housing, especially for low-income households is another aspect of supply-side interventions. The aim of such measures, direct and indirect, is to make it possible for the landlords to charge at the economic cost or below market rents for the dwelling, effectively subsidising the end user in this way.

Governments have the option of providing demand-side subsidies as well. These come in the form of direct cash payment to the consumer, which may be a renter or a home buyer. These cash subsidies assist households in affording to pay towards their dwelling rent or mortgage payments.
The main form of such demand-side subsidies is perhaps, generally known as housing allowances. These are income-related subsidies that are a function of housing costs. Housing allowances provide cash assistance to mainly lower income households to help pay their rent for what should be a minimum-standard dwelling they cannot, otherwise, afford. It is also the case, in some countries, where the subsidy is paid instead directly to the landlord. The basic principle behind housing allowances is to ensure that housing is made affordable to ordinary citizens.

Housing no longer is simply a matter of shelter but, in recent times, most households have come to realise that it is also the largest single item in their budget. In addition, we have seen that real wages have either remained unchanged and, in some cases, even stagnated effectively leaving poorer and marginalised households with higher housing costs to income ratios. A new McKinsey Global Institute (MGI) report (2016)\(^6\) finds that between 2005 and 2014, real market incomes in 25 advanced economies were flat or fell for 65 to 70 percent of households - more than 540 million people- and similarly for after taxes and transfers (disposable incomes) this figure is still 25 % of households. Interestingly, in recent years, housing allowances have become a major political tool as well, making headlines near election times and then taking a back seat during other periods.

2.2.1 Demand-side cash subsidy

The first step in assessing housing allowances is to examine their impact in terms of realising their original objectives and those of the housing subsidy policies in general. In this light, the work of Esping-Andersen (1990) on the three worlds of welfare capitalism immensely helps in understanding how various nations approach such a policy instrument (Hulse, 2003). Housing allowance schemes that are based on income seem disassociated with their welfare regime types. They may more so differ on the grounds of generosity and their scope with respect to housing choice than being a substitute for supply of social housing and rent controls in the private housing market (Kemp, 2007).

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The two main objectives of any demand-side housing subsidy are: (i) the degree to which they impact the physical living conditions: I call this the supply-side; and, (ii) the degree to which they impact excessive rent burdens for households: I call this the demand-side.

On the supply-side, the long-term impact of housing allowance on the supply of housing is dependent on many variable such as degree of initiative and flexibility in the construction industry, the types of housing finance systems, the direction of private capital, execution of planned urban growth, the availability of developed land, and legislation for private rental markets (Howenstine, 1985).

On the demand-side, an attempt to reduce or eliminate the excessive rent burden of poor households depends on various factors that relate to the housing allowance instrument for its success. These may be outlined as: the level of individual subsidies; the comprehensiveness of coverage; the participation rate, any offsetting rent increases; and the degree of flexibility in eligible income ceilings which may affect the scope of such instruments (Howenstine, 1985). Although the extent of population coverage by the instrument is of concern with regards to reduction in rent burdens at the aggregate level, such concerns have been adequately addressed by modern day housing policy objectives by being much less restrictive to include all cohorts.

Modern day housing allowances have, to some extent, tried to manage this issue by structuring schemes to include policy that relates to administrative rules and controls that vary by area. For example, the Accommodation Supplement (AS) scheme in New Zealand incorporates caps of this sort which vary between different parts of the country. Whereas the British Housing Benefit (HB) scheme manages to employ a plethora of design parameters that aim to dampen any possible over-consumption of housing (Kemp, 2000). Although, in cases where a housing policy affects both supply and demand for housing, this makes identification a steep challenge.

Nonetheless, all schemes use a universal metric or idea that is ‘Housing Affordability’. The arbitrariness of the choice of measure used, I believe, is of concern. The creation of such a measure is arguable. It first cropped up around the turn of the previous century. It initially argued that one week’s pay should equal one month’s rents. This led to the arbitrary number of 25 percent of income going to rent as a benchmark for affordable housing (Hulchanski, 1995). Although it is
now being used widely for various policy formulations and social measurements, perhaps its most accepted form is for comparing rents as being affordable.

### 2.2.2 Supply-side housing assistance

Social housing in ‘liberal’ welfare regimes (Australia, UK, Canada, Ireland, New Zealand and the USA) is targeted on the poor and needy. Meanwhile, in Denmark, Sweden, France and the Netherlands, social housing encompasses a much broader social spectrum and is not confined to the needy (Stephens, Burns, & MacKay, 2003; Stephens, Fitzpatrick, Elsinga, Van Steen, & Chzhen, 2010).

The earliest moves towards the provision of public housing in modern day history have their beginnings in late nineteenth century Britain where slum clearance and squalor resulting in conditions leading to high infant mortality together led to local government gaining powers concerned with housing conditions on account of health issues. Wilding (1972) and Orbach (1977) note that public involvement of a more direct nature was initiated once private investment in housing provision started declining even before the introduction of rent control in 1915, leading to proposals for an Exchequer subsidy for housing as early as 1909 (Forrest & Murie, 2014). It may be said that slum clearance and “homes fit for heroes” a legacy of the Addison Act 1919 of the British Parliament allowing the building of new houses following the First World War may have steered the direction towards a more inclusive public housing policy beginning in early twentieth century.

In the case of New Zealand, it is not only a question of policy, but it is also a question of tradition and culture. The fact that every New Zealander should have a home to live in has been reflected in state policy as a priority since as early as the 1900’s (Schrader, 2005). It would be difficult to ignore previous state policy and a long tradition of the state’s level of intervention in the New Zealand housing market geared towards elements of home ownership and a residual state-housing sector for provision of tenure security for the poor in society.
2.3 Architecture of housing allowances

2.3.1 Background

The trend towards Demand side subsidies like Income-related housing allowances has increased as a policy instrument replacing the more traditional bricks and mortar subsidies in many advanced welfare states after the 1970’s (Kemp, 2007). This increasing reliance on cash subsidies for low income families facing high housing costs mirrors a view that the problem at hand is one of income rather than of housing (Kemp, 1990).

Welfare programmes that deal with housing subsidies on the demand-side may consist of in-kind benefits, and cash benefits. The classic justification in favor of in-kind transfers instead of cash transfers is that housing needs to be a merit good as the poor would not themselves increase consumption (Fack, 2006). When assessing the effects of housing programmes on low-income households it may be that one of the main goals of these programmes is “to induce the worst housed families at each level to occupy better housing than they would choose if they were given equally costly cash grants with no strings attached” (Olsen, 2003 pp.369-370). While cash transfers may tempt everybody to access the subsidy, in-kind transfers may very well only entice the needy to claim them.

Housing allowances can have housing policy or income support objectives. In practice, however, schemes can mix and match design levers and other parameters like thresholds, payment formulas, etc. to form their own versions of this allowance, whereas it seems, in most cases, though one or the other is usually dominant. Under a housing policy perspective, this would ensure to provide proper standard of housing and which that corrects any housing market failures (Kemp, 2007). Under a social support perspective, this should enable households to spend more on non-housing consumption by increasing their residual incomes.

Moreover, most housing allowance schemes across the board are combined into a formula and differences in the way their three core variables (rent ceilings, income thresholds, co-payments) shape the subsidy impacts the level of assistance that can be targeted at various recipients. Hence, unique distributional implications arise under individual schemes.
Housing allowance schemes did suffer problems too at the behest of their inherent structural aspects, such as ‘means tests’. Means testing did result in a disinterest and an unwillingness on the part of many low-income families towards participation in the system. Many families found these tests demeaning and preferred to forego their rights towards assistance than submitting private information regarding financial affairs to public scrutiny. Other hurdles included lack of awareness of families, especially the elderly, on eligibility and options. Also, amounts of benefits being so meagre that families did not bother to consider them was of concern. Yet in other cases, shifting house was not preferred by families as per requirements under the subsidy for it to be a minimum standard dwelling, due to inconvenience (Steele, 1979).

2.4 Housing allowances in international perspective

In the early days following the introduction of housing allowances, their impact on reducing rental burdens faced by low-income households and moderate income families was significant. For example, in Finland, in 1982, housing allowances reduced the cost of shelter for renters from 27.8 percent of disposable income to 14.3 percent. Germany saw a similar reduction in recipients total rent payments that reduced the ratio of housing cost to gross income by 6 to 9 percent, depending on the household income. The Dutch experience saw a 5 percent decrease in shelter to income ratios due to the subsidy. In Australia, under the South Australian Mortgage and Rent Relief Plan, 72 percent of recipients that were facing in excess of 40 percent of their incomes in rent fell to only 8 percent in total after receiving assistance (Howenstine, 1985).

And with regards to the coverage of the population, these housing allowance schemes showed a growing trend towards opening up to all low-income households by the end of the first decade, in addition to their core target market which was the elderly and large family units to begin with, as these were considered to be the ‘neediest’. Sweden had the most coverage, with roughly 39 percent of all households receiving some form of housing allowance. Finland, France, and the UK saw one-fifth coverage, and in Australia, Denmark, and the Netherlands it was around one-tenth and above (Howenstine, 1985).
2.4.1 International housing allowance schemes

The French housing allowance subsidy which is provided to tenants comprises of a personal housing subsidy \((aide\ personnalisée\ au\ logement,\ APL)\), a family housing allowance \((allocation\ de\ logement\ familiale,\ ALF)\), and a social housing allowance \((allocation\ de\ logement\ sociale,\ ALS)\) that benefit homeowners and tenants of social and private dwellings and is a subsidy that can be paid to the tenant or directly to the homeowner (Létrémý, Trevien, 2014). Also, there are almost no restrictions imposed by the subsidy on the housing unit, it is simple to claim, and there is no stigma attached to the benefit (Fack, 2006).

The French housing allowance scheme is very similar in its design to the one in New Zealand, although the private rental sector is vastly different when it comes to rents. In the French housing market, rents are only freely set once the tenancy changes. During the life a tenant, the annual rent changes are bound not to exceed a reference index that is the construction cost index of the Ministry of Housing. And the legal duration of the leases is 3, 6, or 9 years and in addition a tenant cannot be expelled, in general (Fack, 2006).

In Canada, among at least four types of housing subsidy, the Housing Allowance also known as the Canadian Allowance is the nearest to the New Zealand housing allowance design. That is, it depends both on incomes and rents, intends to reduce affordability issues for private renters, is available to beneficiaries and non-beneficiaries, and is paid to tenants and not the landlords (Steele, 2007).

In contrast the other main housing allowance of Canada is the Rent Supplement. The recipients that benefit from the rent supplement programme do not freely choose their units and almost always must move in order to receive the subsidy. Similar to the US Housing Choice Voucher, not all of the Canadian households who are eligible and apply receive the subsidy. This is in stark contrast to housing allowances. Moreover, it is possible to pay the assistance directly to landlords. For this reason, rents and cost per recipient tend to be high (Steele, 2007).

The Australian Rent Assistance (RA) is different in particular ways to the Accommodation Supplement. Eligibility is an entitlement subject to means testing for primary source of income support payments or defined family payments and there is no separate test of income or assets. It
is tenure-specific and is for private renters only. Maximum rates of RA and rent thresholds are indexed twice yearly in association with indexing of primary payments, whereas in New Zealand only the main benefit in the formula is indexed once annually, and this can actually work to reduce the housing allowance payment under certain conditions (explained later). RA abates as income is earned as per applicable rates. RA is a cash transfer paid to the recipient and not the landlord. The RA recipient is free to choose their dwelling type and location regardless of rents, within the scheme’s income and supply constraints. In addition, the extent to which they allocate RA to housing costs or other expenditures is a matter of choice (Hulse, 2007). The RA is uniform across Australia, and the design does not cover regional variations in rents, unlike the Accommodation Supplement which categorizes housing cost variations by four specific national divisions.

Housing allowance in New Zealand is very similar to those in Australia and Canada and is highly typical of schemes in European countries including France, Finland, and Norway⁷ (Kangasharju, 2010; Nordvik & Sørvell, 2014). Therefore, an evaluation of the New Zealand housing allowance programme can surely be informative to an international audience and therefore is used as an illustration in my thesis.

2.4.2 Adequacy of the housing allowance scheme – international comparison

The lack of ‘de-commodification’ across the OECD nations towards basic income and housing in particular can been seen in figure 2.1. New Zealand does not fare well in comparison to other OECD nations with respect to the level of minimum cash incomes for beneficiaries after housing allowance provisions. Standing at 40 percent of median income welfare provisions including housing subsidies in New Zealand fail to provide assistance that places a typical married family with two children above the poverty threshold. Although in terms of the minimum cash income benefit level itself, New Zealand seems to provide a fairly balanced amount within the OECD.

⁷ Although, in Finland, according to the Social Insurance Institution in November 2006, for example, the programme operator paid the monthly allowance of 53% of assisted households directly to the private or public landlord (Kangasharju, 2010), whereas typically in New Zealand it is exclusively paid to the recipient.
Figure 2.1
Income levels provided by cash minimum-income benefits
Net income value in % of median household incomes, 2015
(Married couple, two children)

Source: OECD, Income distribution database www.oecd.org/els/social/inequality
Beneficiaries in New Zealand tend to be the very poor and seem to be placed well below the median earner in the country, enabling stratification instead. Such a condition seems to be accelerating over the past decade, where, for New Zealand the minimum cash income benefits equalled 44 percent of median income in 2005 (bottom graph in figure 2.1) in comparison to a value of 35 percent of median income in 2015 for a married family with two children.

### 2.5 Housing allowance and market demand shifts

In theory, the effective demand shift in the market caused by a housing allowance possibly equals the product of three factors:

(i) Eligibility rate  
(ii) Participation rate  
(iii) Demand shift per recipient: (% increase in housing consumption after housing allowance)

Under a demand-side housing allowance scheme participation rates may fluctuate over time due to changes in eligible households in addition to ease of access, generosity levels, and stigma related issues, especially in the ‘liberal’ welfare states that follow a residual welfare approach. Eligible households do not, on the average, remain eligible and tend to fall out of the pool containing recipients of housing allowance. Newly eligible households replace those that leave the eligibility pool assuming poverty remains stable. However, usually the newly eligible households may not immediately join the allowance scheme. Hence, at any given time, some households still remain out of the pool and therefore tend to dampen the demand that would otherwise be induced by a fully efficient participation rate. Furthermore, any demand shift under a stable cohort would be from one dwelling within the low-income housing stock to another within the same lot, having a net effect that is zero with regards to total housing units demanded in the market. Any housing allowance policy changes that affect the eligibility criterion are assumed to disrupt the aggregate demand for low-income rental housing instead via a larger population influencing effective demand (Brackertz et al., 2015).

If the subsidy is to increase the effective supply of housing, and if there is a need for such housing and where this gap is expected to be provided by the market, then surely it is to be understood as
a payment for the service of the provision of new housing rather than a transfer payment. Another favorable character of a housing allowance is that it introduces a stabilizing flow of income in the face of fluctuating incomes, non-payment of rents, high rates of turnover, and similar aspects that may plague low-income housing markets (Howenstine, 1986).

In our case, any shortfalls in the labour markets may lead to a shift in effective demand levels for rental housing. Similarly, any injections in the shape of housing allowances also affect income levels from outside the labour markets. Furthermore, ‘effective demand failures’ instead impair the economy's ability to restore itself to a state in which economic activities are reasonably well coordinated. Arguments for both, shifts in effective demand and resulting effective demand failures form the basis of such an argument. To be fair, the significance of effective demand should not be affected by the fact that the probability of actually ever observing an economy in a perfectly coordinated state might be zero (Leijonhufvud, 1973). Housing allowances primarily may ‘affect’ the labour and goods markets by design via changes in ‘effective’ demand in each market (Kemp, 2007). Moreover, as Hills (1991) argued that housing allowances can surely increase the demand for all other goods apart from rental accommodation for low-income households facing severe housing stress.
3 Housing welfare policy in New Zealand

3.1 Overview of political economy

In the early 1990s, major moves to dismantle the traditional New Zealand welfare system, with all the individualistic rhetoric of, but a great deal more policy substance than, the earlier Thatcher reforms in the United Kingdom took place (Kelsey, 1995). And alongside this a simultaneous decline in the rates of homeownership was also clearly witnessed near the end of the 1980’s (see figure 3.1). In figure 3.2 I provide an overview of the country’s housing policy, showing the housing welfare aggregate expenditure time series for New Zealand. This includes the demand-side and supply-side housing welfare instruments, where the demand-side subsidy is known as the Accommodation Supplement (AS). The number of Accommodation Supplement recipients has been integrated into the graph whereas the number of State houses (supply-side), that receive the Income related rent subsidy (IRRS), has usually fluctuated between 60,000 and 70,000 for the period in question (not included here).

Figure 3.1: Home ownership over the century - New Zealand

Source: Stats NZ
This shift in trend in homeownership rates is aligned with New Zealand’s experiment of implementing atypical IMF structural adjustment programmes that were inflicted upon third world countries as stabilizing macroeconomic policy prescriptions in the post-World War 2 era, much to their detriment (Kelsey, 1995a). These policies included but were not limited to the financialisation of the real estate sector. Key aspects of the neo-liberal shift were to decrease the role of the state in its provision of social safety nets and instead opened them to market forces via privatizations (see figures 3.3, 3.4, 3.5). A key underlying purpose was to undermine and eradicate trade union powers and break free from constant threats and wage bargaining. Popularly known as the ‘Washington Consensus’, these policies introduced user charges in order to balance the budget of the government, access to health benefits for the population were restructured, tuition fees were introduced, and a burgeoning insurance sector was unleashed onto the people (Kelsey, 1995a).
**Figure 3.3:** Social welfare structure of the New Zealand government spanning over half a century

**Figure 3.4:** Government as provider of Social Security - 1965-1990

**Figure 3.5:** Government shifting responsibility to the market

*Source: Stats NZ*
These “new” liberal policies resulted in a decrease in the spending on services by the government and efforts towards maintaining a budget surplus a priority. This was reflected in higher taxes, additional costs towards living relating to user fees on health and education amongst others which effectively reduced residual incomes of people. Furthermore, access to increasingly more money as a result of financial deregulation led to inflationary pressures that further reduced the purchasing power of shrinking incomes (Kelsey, 1995b).

In figure 3.5 we can see that the government has been reducing its share of activity in relation to rising GDP. Interesting to note is that in an overall shrinking government sector as a proportion of GDP, funds devoted to the welfare sector are themselves on the decrease, reinforcing the distancing of the government from its traditional role and an important purpose, in general.

In the case of housing welfare, the case for ‘landlord capture’ and ‘fiscal blowout’ are also clarified. Looking at figures 3.5 and 3.8, a simple comparative analysis of the dual housing regime can be deconstructed to reveal interesting aspects of the housing polices of New Zealand. In the case of AS (fig. 3.5), the picture almost suggests a ceiling mechanism at work within the complex layers of the subsidy, in effect, comfortably managing any risk of a ‘fiscal blowout’ under the subsidy’s parameters at present. Alternatively, social housing results in ‘perfect landlord capture’ – when market rents increase, change in subsidy goes to the landlord (i.e. Crown) as IRRS as can be seen in figure 3.8. Interestingly, the AS has never overshot its budgeted projections in any year as well (see figure 3.6).

Therefore, the introduction of the neo-liberal model impacted the political economy of New Zealand in terms of government, welfare and housing. Terms like “the New Zealand Disease” were coined by the likes of Australia on having reservations on implementing the same neo-liberal policies that had led to the deterioration of the New Zealand social fabric (Kelsey, 1995).
3.2 Accommodation Supplement policy

In New Zealand the demand-side housing subsidy is known as the Accommodation Supplement (AS). The AS is a direct cash subsidy that assists in reducing the high housing costs faced by low to middle income poor households in the private residential market in New Zealand. In addition to this, there is a stock of social housing that citizens can access (for details see section 3.4). The support goes mainly to households living in rental housing, although a small fraction of the AS goes to the households that live in their own homes. Table 3.1 provides information on the typical client profile across New Zealand as at 30 September 2018 based on tenure, incomes, and demographics. Access to the Accommodation Supplement depends on how much rent, board, or mortgage is due, recipient’s personal circumstances such as income and cash assets, where they live, and the number of people in the household. Apart from State housing tenants, it is not easy to identify if a potential tenant is a beneficiary and/or recipient of the Accommodation Supplement. The AS for renters is targeted at the recipient without any prejudicial information that may be made available to the landlord. The housing allowance is asymmetric in nature with regards to information on access to the subsidy in favour of the tenant.
Table 3.1: Characteristics of Accommodation Supplement primary recipients as at 30 September 2018.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodation type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renting</td>
<td>194,890</td>
<td>67%</td>
</tr>
<tr>
<td>Boarding</td>
<td>65,112</td>
<td>22%</td>
</tr>
<tr>
<td>Own home</td>
<td>32,004</td>
<td>11%</td>
</tr>
<tr>
<td>Total</td>
<td>292,006</td>
<td>100%</td>
</tr>
<tr>
<td>Benefit status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving an income tested main benefit</td>
<td>193,396</td>
<td>66%</td>
</tr>
<tr>
<td>New Zealand Superannuation or Veterans Pension</td>
<td>40,753</td>
<td>14%</td>
</tr>
<tr>
<td>Not on main benefit</td>
<td>57,857</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>292,006</td>
<td>100%</td>
</tr>
<tr>
<td>Family type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Couple with no children</td>
<td>22,443</td>
<td>8%</td>
</tr>
<tr>
<td>Couple with one child</td>
<td>9,107</td>
<td>3%</td>
</tr>
<tr>
<td>Single person with no children</td>
<td>167,874</td>
<td>57%</td>
</tr>
<tr>
<td>Sole parent with one child</td>
<td>38,095</td>
<td>13%</td>
</tr>
<tr>
<td>Couple with two or more children</td>
<td>15,906</td>
<td>5%</td>
</tr>
<tr>
<td>Sole parent with two or more children</td>
<td>38,581</td>
<td>13%</td>
</tr>
<tr>
<td>Total</td>
<td>292,006</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note:

As the A.S. is an injection into the economy, in the shape of government spending, I argue that it is surely a good thing and any government expenditure successfully targeting populations for welfare gains, in this specific case resulting in increased disposable incomes, tends to support positive economic growth through sustained consumer spending in the economy. Although this argument lends support to the tool but says nothing about its efficiency, which lies solely in its structural formation.

A central notion to the benefit system is the principle that assistance is provided based on need. When people receive income from sources other than social benefits, the principle then is that this should lead to a reduction in financial assistance they receive. Assistance is means-tested using income and cash assets tests.
The structural approach of the benefit system in New Zealand has been neatly summarized in a Treasury document as having three tiers of assistance. The document neatly presents these as follows:

i. the first tier is the main benefits, providing a basic income for people who are not able to support themselves through paid work, which are only income tested,

ii. the second tier is additional assistance paid to people in particular situations or with specific on-going costs. For example, low-income people may be eligible for this assistance whether or not they receive a main benefit. This tier of assistance is mostly subject to income testing and may be subject to cash asset testing, such as the Accommodation Supplement, and

iii. the third tier is tightly income and cash asset tested and provided generally to people in hardship (whether on benefit or not) as one-off grants such as Special Needs Grants or may continue over a relatively short period. Such assistance includes the Temporary Additional Support.

### 3.2.1 Historical background

Prior to 1st July 1993, the Accommodation Benefit existed. I begin with presenting a historical investigation into the path that led to the present-day subsidy and how it was shaped. The literature is almost silent on the housing allowance policy within New Zealand prior to the inception of the Accommodation Supplement. A few papers carry a cursory mention of the Accommodation Benefit mainly to reinforce that the Accommodation Supplement evolved from the Accommodation Benefit and that the formula for both is, in effect, similar (Morrison, 1995; Murphy, 1997).

In the original Social Security Act (SSA) 1964, section 61 titled ‘Emergency Benefits’ provided the necessary space within the legal framework for any future additions within its guidelines. An emergency benefit was to be provided only to non-beneficiaries suffering from hardship and

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having insufficient livelihood for self and any dependents. Within four years the provision was utilized for the creation of a new benefit namely the ‘Family Maintenance Allowances’ via the Social Security Amendment Act (SSAA) 1968 (1968 No 44). This essentially went against the initial purpose of assisting non-beneficiaries in emergency and was, in fact, now being used to provide extra benefit to a beneficiary. This, in essence, laid the foundations for additional and supplementary support provisions within the larger document. The space occupied by the housing allowance as a supplement in today’s Social Security Act 1964 (SSA) has its roots as far back as 1975. Following the very first amendment in 1968 to the principal act, there were three others before a well-defined housing allowance policy as a demand-side subsidy was first introduced in New Zealand. The three in quick succession were, first, the ‘Additional Benefit for Dependent Children’ that repealed and substituted the ‘Family Maintenance Allowances’ in 1972. Second, the ‘Benefit for Inadequate Maintenance’ added via the Social Security Amendment Act (SSAA) 1973 (1973 No 34); and the third, which introduced ‘Benefits on Death’ for widows, and widowers, and children as a supplementary benefit through the Social Security Amendment Act 1974 (1974 No 46). The chronological summary of the amendments in the law are shown in figure 3.7.

**Figure 3.7**: Evolution of housing policy within the Social Security Act, 1964 (NZ)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Benefits on Death’ for widows, and widowers, and children</td>
<td>‘Benefits on Death’</td>
<td>‘Accommodation Benefit (beneficiary)’</td>
<td>‘Accommodation Supplement (AS)’</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Social Security Act of New Zealand; various versions.*

### 3.2.1.1 ‘Additional Benefit’: SSAA 1975

In 1975, New Zealand saw its first housing allowance subsidy to be available for beneficiary recipients that may be utilized for both, private rental accommodation and state houses. This was mainly to provide extra assistance for people on benefit facing difficulties in paying their housing
costs, for whichever property they were consuming as a home. This was evidenced by the mention of ‘…weekly rent, or weekly outgoings on any property occupied by him as a home’ in the wording of the policy, essentially being the first structured housing allowance for the housing market of New Zealand.

It was, in comparison to today’s complex formula, a simple but comprehensive formula in its scope and guidelines. It carried the obvious income and cash limit tests from the outset. The maximum limit of the additional benefit paid to a beneficiary in 1975 was NZ$10 for couples and NZ$6 for unmarried people without children towards accommodation costs. The amount of the benefit though would reduce by 50 cents on every $1 of income above a weekly income of $1 for single (twice this for couples). The abatement in the quantity of benefit under cash assets test started at over $100 for single and $200 for couples, where each increment of $100 for singles and $200 dollars for couples reduced the benefit by 50 cents and a $1 respectively, with no upper limits. In addition, for both single and married, a further maximum of $6 was available on top, if rents were beyond certain limits.

3.2.1.2 ‘Accommodation Benefit’: SSAA 1981

In 1981 through another amendment the introduction of the word “accommodation” in place of “additional” replaced the heading to ‘Accommodation Benefit’ marking another milestone towards a formalization of the housing allowance policy within the welfare structure of New Zealand.

The supplementary benefit was essentially for beneficiaries. It was towards rents or weekly outgoings on any property. It was means tested for income and cash asset tests. The benefit payments were two thirds of the amount of weekly rent exceeding $18 with a maximum limit of an accommodation benefit payment of $18, for both; single and couple with or without children. This was across-the-board, for single and 2+ people families. Every $100 of cash assets, in total, lead to a $1 reduction in the accommodation benefit amount received. Abatement from income was applicable over a weekly income of $5 for single and $8 dollars for couples, where each dollar of income above these limits would reduce the benefit by a similar amount of $1.
3.2.1.3 ‘Accommodation Benefit’: SSAA 1987

In 1987 the accommodation benefit was now available for beneficiaries and non-beneficiaries alike and for people renting privately or paying a mortgage for their own home. The accommodation benefit is not payable to anyone occupying Housing New Zealand Corporation (HNZC) property i.e. State housing.

The formula is complex in its details but, in general, in the case of a couple, it pays 65% of the accommodation cost that exceed 20% of income with the limit for the benefit amount not exceeding 25% of income. This is for a couple having accommodation costs either as rent, board, or lodging payments.

For a single person, the limit for the accommodation benefit payment is reduced to 15% of income, where the accommodation benefit amount is 65% of the accommodation costs exceeding 12% of income. Note that the benefit limits increase with incomes (not rents) as per formula.

Income here is the maximum amount of main benefit in case of beneficiaries. In addition, if any beneficiary has some source of extra income, the benefit is reduced by 25% for an income up to $80 a week.

3.2.1.4 ‘Accommodation Supplement’: SSAA 1993

In June 1993, through a vesting order under the Housing Restructuring and Tenancy Matters Act 1992, all state housing assets and liabilities and the corporation assets and liabilities were vested into a newly formed Crown entity that was ‘Housing New Zealand Limited (HNZ)’. State housing assets here date back to the first Housing Act of 1919 and the Corporation refers to the Housing New Zealand Corporation established under the Housing Corporation Act 1974. The very first state housing initiatives that were taken by the New Zealand government at the time and were also one of the first such endeavours towards the evolution of a state housing policy of sorts within the developed world were under the Housing Act 1919. The very beginning of the Housing Act 1919 stated:

Housing Act 1919, No. 32.
AN ACT to consolidate and amend the Law relating to the Title, Erection and Disposal of Workers' Dwellings, and to make Further Provision for the Housing of the People. [5th November, 1919] 9

Almost 75 years later, the newly formed HNZ Company would have its principal objective read as:

Principal objective of company

“(1) The company's principal objective is to help meet the Crown's social objectives by providing housing and related services in a business-like manner, whether in accordance with its statement of corporate intent or pursuant to any agreement made under section 7, and to that end to be an organisation that—…

“(c) operates with good financial oversight and stewardship, and efficiently manages its assets and liabilities and the Crown's investment;……10

Following the vesting order of 1993, the Housing Corporation of New Zealand, now an asset management company, had evolved into a Crown owned commercial enterprise. Housing New Zealand Limited Company, as it was to be called, would manage the state housing stock in a more commercial manner and would compete in the private sector for tenants.

The Accommodation Supplement form of housing assistance (for renters and mortgagors) although was first introduced (in the parliament) in the 1991 budget but was not implemented until July 1993 (McTaggart, 2005). This was to replace the previous combination of help in the form of income support and/or subsidised state housing via income related rents (IRR), and these older forms of assistance were to be phased out in the next three years. The reasons for these changes were:

• inequity between people/families in similar circumstances on how much assistance they received
• an income-related formula that did not take into account the changes in circumstance for tenants
• long waiting lists for state houses of people/families more in need than some of the existing tenants
• the proposal that an across-the-board accommodation supplement would allow people to use private/non-state accommodation, not possible under the Housing Corporation

The Accommodation Supplement introduced in 1993 was seen as advantageous with respect to the prevailing state housing policy at the time because: (a) it would offer housing assistance to a wider range of people; and (b) it would allow tenants to seek assisted accommodation not just within the state housing sector but also in the private rental market. These initiatives were aimed at countering the problems of large waiting lists for state homes, which resulted in substantial numbers not receiving assistance whilst being eligible for it.

In 1993, New Zealand shifted from having a ‘dualist’ policy towards housing assistance and instead decided to implement a ‘universalist’ demand side housing assistance regime. From August 1993 onwards, a uniform demand-side housing allowance known as the ‘Accommodation Supplement’ would be available for all residents for all types of property, whether in the private housing market or the social housing sector. This excluded full time students (they can get an accommodation benefit with their student allowance), homeowners without mortgage, and the homeless.

The Accommodation Supplement in 1993 was structured such that in case of a couple with children whose accommodation costs are rent or payments for board and lodgings, their rate of Accommodation Supplement would be 65 percent of the amount by which an applicant's weekly accommodation costs exceed 25 percent of the ‘base rate’, but not more than;

a) $100 a week, if the applicant resides in Auckland:
b) $65 a week, if the applicant resides in Wellington:
c) $55 a week, if the applicant resides elsewhere in New Zealand.
The maxima for a single person under the policy were reduced proportionately to reflect payments not exceeding,

a) $60 a week, if the applicant resides in Auckland:

b) $50 a week, if the applicant resides in Wellington:

c) $42 a week, if the applicant resides elsewhere in New Zealand.

The ‘Base rate’ here refers to the maximum weekly rate of benefit a recipient was entitled to receive. The housing allowance had divided the entire country into three regions, in total, to reflect the regional differences in rental and property values. The other category that defined the housing allowance amounts was the household type, which, in addition, can loosely be understood as a proxy for dwelling size relative to household type.

The abatement rules for subsidy rates payable and overall ineligibility for a housing assistance using cash asset tests were carried forward from the previous policy whereby an Accommodation Supplement shall not be paid to any person who has cash assets exceeding:

(a) $16,200 in the case of

i. A married person; or

ii. A single person with a dependent child or children:

(b) $8,100 in any other case.

Prior to this point, the New Zealand housing sector was divided into two distinct markets, namely the private sector and the public housing sector. New Zealand had kept a tradition towards supply side housing assistance up until this point and, under its state housing policy, provided state homes for eligible low-income households at subsidized rents that were linked to their incomes and not the market rental rates. In 1993, the state housing sector stood at 21.5 % of the total rental sector of New Zealand, which included private rental accommodation, boarding houses, and state homes11.

11 Author’s own calculations using Census data for rental dwellings and Housing New Zealand data for state houses.
In August 2000, this move was reversed and the introduction of Income related rent subsidy (IRRS) was reintroduced with the introduction of a new Housing Restructuring (Income-Related Rents) Amendment Act 2000. From now on, Housing New Zealand Limited was to charge income related rents from its tenants in place of the market rent rate. After much suffering and increasing hardships for access to affordable housing as a result of the policy regime introduced in 1993, now with the arrival of a new labour government the re-introduction of income related rents was to be implemented. Although, the rent burden for the tenant had shifted in their favour, under the commercialization banner the HNZ Company covered the difference in the rent received and market rents from the government for the Crown.

3.3 Algorithm

As the tool and the present housing policy stands, I have presented this in a generalized formula that helps to better understand and explain the many underlying structural attributes within this housing policy tool with respect to its principles and the target population.

At present, the Accommodation Supplement policy tool’s core principle is to “…provide(s) targeted financial assistance to help certain people with high accommodation costs to meet those costs.”\(^\text{12}\) The formula remains identical in its structure since 1993 with a slight change where a more generous payment in proportion to housing costs that exceed 25% of income was introduced in 1997. The amount effectively was increased to 70% from 65% in 1997 under the Social Security Amendment Act 1997, No. 21. Subject to means testing, the Accommodation Supplement (AS) is an entitlement and is available to all eligible in the private housing markets excluding state and emergency housing tenants, full time students (they can get an accommodation benefit with their student allowance) and the homeless.

Formula:

\[ A.S_{h,i,x} = \min \left[ 0.7 \left( R_h - \frac{B(n)_i}{4} \right) ; S_{c,i,x} \right] - \left[ 0.25 \left( Y_{g,h} - Y_{t,i,x} + Y_{CA,h,i} \right) \right] \]

where:

\[ A.S_{h,i,x} = \text{accommodation supplement amount for household 'h' of type 'i', in area 'x'} \]

where:

\[ h (\text{households}) = \{1 \ldots n\} \]

\[ i (\text{type of household}) = \text{Single 25+, Couple w/o children, Couple with children 1+, sole parent 1 Child, sole parent 2+ children} \]

\[ x (\text{geographical area}) = \text{Area 1, Area 2, Area 3, Area 4} \]

\[ R_n = \text{weekly rent for household} \]

\[ B(n)_i = \text{weekly benefit amount net of tax at rate 'M' for beneficiary type 'i'} \]

\[ S_{c,i,x} = \text{subsidy ceiling for household type ‘i’ in area ‘x’} \]

\[ Y_{g,h} = \text{gross income of eligible household} \]

\[ Y_{t,i,x} = \text{‘entry threshold’: income classified as the income cut-out point for benefit (job seeker support) as per household type ‘i’ in area ‘x’} \]

\[ Y_{CA,h_i} = \text{an income equivalent for the level of cash assets calculated using specified formula for household type ‘i’} \]

I have divided equation (3.1) in two sections. This is to differentiate between the ‘allowance’ part of the formula and the ‘abatement’ part. There are conditions relating to both these aspects of the housing allowance equation. Let us start by identifying them individually.

The first set of brackets represented as "\( A_{x,i} \)" provides the amount of housing allowance that may be payable to household type ‘i’ in area ‘x’. This amount can go up to the allowable subsidy ceiling limit for that area and household type. In this part of the equation, the minimum rental liability is expressed as \( \left( \frac{B(n)_i}{4} \right) \) i.e. 25% of ‘jobseeker support’ (unemployment benefit) net weekly payment after tax; conceptually the rent ‘entry threshold’\(^{13}\). This amount is deducted from the actual rent,
of the recipient of which 70% is to be the subsidy. Here $S_{c,i,x}$ is the subsidy ceiling for household type ‘i’ in area ‘x’. For all rent levels $R_{h_i}$ that result in a subsidy value above the ceiling amount, $S_{c,i,x}$ is applied instead. In order to fully utilize the above equation, an accompanying table is supplanted in order for it to disseminate the housing allowance. Table 3.2 sets the limits for each area according to household type.

The second set of brackets represented by "$a_i$" is the abatement. The cash transfer is reduced relative to the amount of gross income $Y_{g,h_i}$ earned by household ‘i’ over and above the entry threshold income $Y_{t,i}$ for household ‘i’. The income entry threshold and income cut-out points define the ineligibility for allowance. The income entry thresholds are based on the relevant income cut-out point for an unemployment benefit determined exogenously under the labour policy. The income cut-out point for the Accommodation Supplement is some proportion of median incomes (approx. 80% of median incomes; see section 5.4).

There is further abatement via cash assets where $Y_{C,A,h_i}$ is an income equivalent calculated using the following argument. That is, in 2017 across all areas, a single person household (16+) receiving the subsidy starts to witness an abatement via an addition of $1 onto their weekly income for every $100 they have in cash savings over $2700 up until $8100, where they are now ineligible. For a 2 person or more household, the same rule applies whereas the range considered for abatement of subsidy from cash asset limits is from $5400 up until $16,200 where this, being the asset cut-out point, strips the household of the subsidy. As the ‘jobseeker support’ is updated in line with the CPI on 1st April annually, the rent ‘entry thresholds’ and income ‘entry thresholds’ automatically

<table>
<thead>
<tr>
<th>Household type = ‘i’</th>
<th>Geographical Area = ‘x’</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area 1</td>
</tr>
<tr>
<td>Single, 16 +</td>
<td>145</td>
</tr>
<tr>
<td>Couple w/o children</td>
<td>160</td>
</tr>
<tr>
<td>Couple with Children 1+</td>
<td>225</td>
</tr>
<tr>
<td>Sole Parent, 1 child</td>
<td>160</td>
</tr>
<tr>
<td>Sole Parent, 2+ children</td>
<td>225</td>
</tr>
</tbody>
</table>

Source: Social Security Act 1964.
get adjusted. Note, revision of income cut-out points for the Accommodation Supplement which are adjusted in line with median incomes can affect eligibility at the margin in some cases. This is not a policy shift but rather entrenched.

Note that for beneficiaries the income threshold of 25% towards rent payment is from disposable income, which is gross benefit in net benefit terms after tax ‘M. Whereas, for non-beneficiaries the proportion of income that is equal to the main benefit (jobseekers support) is considered in gross income terms and any income earned above the predetermined amounts that lead to ineligibility for the main benefit (also termed as entry threshold) is taken at gross value for abatement purposes. As a 25% share of this extra income will be effectively required to pay the share of rent, therefore recipients that are in employment end up paying a slightly higher proportion towards rent as their 25% income share is calculated from gross income rather than net. Also, the second part of the equation will always be positive for non-beneficiaries, therefore they will always endure abatement in their housing allowance amount. The subsidy design, therefore, is more accommodating for beneficiaries than the employed, as they may incur higher effective tax rates. This design feature displays vertical inefficiency between earners and the unemployed, although it is uniform for all earners.

Eligible households for the Accommodation Supplement are based essentially on three criterions that are based on the recipient’s income level, the amount of cash assets, and housing costs over a minimum amount. An illustration of these limits according to household types are presented in table 3.3.

It is interesting to note that the income cut-out points for a couple without children and a sole parent with one child are quite similar. And a sole parent with 1 child can have a much lower income, on average, than a couple household. The income cut-out level for a sole parent is very high which would decrease their chances of ineligibility. The problem lies in the fact that the limit for a couple may render them ineligible most of the time even if both members (each) are earning below median wages.
Note that under the Accommodation Supplement policy the dwelling size relating to the number of bedrooms is not taken into account but instead the household type/size is considered to reflect such information about the dwelling. In general, a household comprising of a couple with one child is expected to rent a two-bedroom dwelling.

Beyond the household size of three, the housing policy has no implicit compensation relative to the respective dwelling size per household as the compensation is uniform. This can lead to externalities such as ‘overcrowding’ that are ignored within such a policy design. The reader can refer to the guidelines for “overcrowding” as per the standards used by the government. On measures for ‘overcrowding’ the government of New Zealand uses the Canadian Standards for a typical dwelling that is required in accordance with different family size and dwelling requirements.

Under the legislation, an annual CPI adjustment of rates of certain benefits is undertaken (see Social Security Act 1964, section 61HA). The main benefits are indexed to the Consumer Price
Index and adjusted annually on the 1st of April. The AS policy allows for adjustments relating to an increase of the CPI. The adjustment for indexation of benefits under the policy is one directional. Any adjustment to the main benefit that may lead to the reduction of the weekly amounts of the Accommodation Supplement are not entertained. This helps to assist than desist income add-ons to households via transfers.

Under the scheme’s policy, the Accommodation Supplement is counted as income for a Special Benefit under the ‘means test’ criterion. Also, the Accommodation Supplement formula takes into account the Family Support Payment for the first child as income which impacts the entry threshold and not just the income abatement where both these work to decrease the subsidy.

Although such a policy is consistent with price adjustments, it is peculiar to note that only labour markets are indexed. Interestingly, if income and rents remain unchanged, the indexation of the main benefit (labour market indexation) should result in a higher Accommodation Supplement payment for all rents above ceiling in case of non-beneficiaries. Therefore, helping to maintain incomes, at least in proportion to inflation subject to formula, if the labour market is not.

Another important concept when looking at such subsidies is the 'effective marginal tax rate' (EMTR). Whereas high EMTRs may result in 'employment traps', they are also necessary to confine such problems to as few people as possible. Although, high EMTRs have distortions and disincentives, on the other hand, lower rates of abatement are expensive.

Income and cash assets

For the purposes of income, it is gross earnings plus any business income. According to the Social Security Act (1964), cash assets include cash in hand, bank and savings accounts, shares, debentures, bonds, loans made by beneficiary, mortgages owed to beneficiary or partner, land and buildings owned but not lived in by beneficiary (net equity in holiday homes).

One car per adult per household is not considered as an asset for the purpose of eligibility under the cash asset test as it is said to be providing a necessary service. Any other vehicle/s that may be
used as recreation or as a collector’s item is/are to be considered as an asset and used towards consideration for eligibility under the cash asset test for the Accommodation Supplement\textsuperscript{14}.

### 3.4 Implied rent ceiling in the Accommodation Supplement

At the outset, the Accommodation Supplement policy does not identify any rent limits relating to the housing assistance to be received. Essentially it provides for an open limit in order to shop around for the most appropriate accommodation of choice. This is not to say that the housing policy would provide an opportunity to be compensated across all size and quality of accommodations. The formula can be manipulated for discovery of the rent ceiling.

In order to identify the rent ceiling levels for each geographical area and household type under the Accommodation Supplement policy, we need to utilize the ‘$A_{x,i}$’ section, also labelled as the ‘allowance’ part of equation (3.1). We know that the maximum rates under the subsidy are limited by the area limits for each geographical area defined by the policy (see table 3.2). Therefore, we get:

$$
\begin{align*}
\text{Maximum allowance} & = \text{Area limit} \\
0.7 \left( R_{\text{max.}} - \frac{B(n)_i}{4} \right) & = \text{Area limit}_x \\
\text{where:} \\
R_{\text{max.}} & = \text{Maximum rent} \\
\frac{B(n)_i}{4} & = \text{Rent entry threshold for household type ‘i’, } E_{T_i} \\
\end{align*}
$$

(3.2)

Rearranging to get:

$$
\begin{align*}
\left( R_{\text{max.}} - E_{T_i} \right) & = \frac{\text{Area limit}_x}{0.7} \\
R_{\text{max.}} & = \frac{\text{Area limit}_x}{0.7} + E_{T_i} \\
\end{align*}
$$

(3.3)

(3.4)

Looking at this equation, we see that area limits conversely suggest a maximum allowable rent over which essentially the client is *perceived* to be in a situation where they are either experiencing ‘over consumption’ or are indulging in ‘up marketing’ their accommodation choices. Table 3.4 provides us the rent ceiling levels for each geographical area for all household types within the AS policy.

<table>
<thead>
<tr>
<th>Category of household</th>
<th>Rents (maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area 1</td>
</tr>
<tr>
<td>Single, 18+</td>
<td>260</td>
</tr>
<tr>
<td>Couple</td>
<td>318</td>
</tr>
<tr>
<td>Couple with Child, 1+</td>
<td>439</td>
</tr>
<tr>
<td>Sole parent, 1 child</td>
<td>334</td>
</tr>
<tr>
<td>Sole parent, 2+ children</td>
<td>427</td>
</tr>
</tbody>
</table>

*Source: Author’s own calculations.*

Any rent over these specific amounts will be borne by the client at the rate of hundred percent. It is argued that once quantified, these rents limits may *push* clients to remain near these limits when making decisions for rental accommodation. Such limits simultaneously may act as buffers with respect to landlords *seeking* to capitalize on the ‘capture’ of the demand driven housing subsidy. Although, keep in mind that these figures are not available to the tenant or the landlord under the AS scheme and, as explained in section 5.8, can be considered as irrational moves by the subsidy recipient cohort.

### 3.5 State housing in New Zealand

The earliest state houses that were built in New Zealand are a legacy of the Worker’s Dwellings Act under Prime Minister Richard Seddon initiated in 1905. The motivation was to provide a higher standard of living for urban workers with low-cost suburban housing and essentially shift the market from ‘greedy’ city landlords. Coupled with the issue of high costs due to city landlords, slum like conditions also existed within inner city areas. This prompted a policy that directed its focus towards building state houses in the suburbs.
The next phase was led by the Railways department, where whole suburbs were built consisting of pre-cut houses from local timber, initially at Frankton and at Moera, Lower Hutt. Up until the first Labour government in 1935, under Michael J. Savage, real momentum towards state housing was lacking. Within a few years, Labour, led by Savage managed to complete the 5000th state house by 1939 (Schrader, 2005).

Since the 1950’s though the construction and sale of state houses has fluctuated dependent of the political party in power. In general, Labour has promoted state housing stocks while National governments have tried to encourage tenants to purchase state homes until 1999 when a new Labour-led government placed a moratorium on further sales of state houses.

Interestingly, the design of state houses has stirred much debate since the first workers dwellings were built. Cynics were critical of the first workers' dwellings for being 'too swell' and called for simpler shelters. The total opposite was the sentiment nearly half a century later as the issue now was that state houses were stingy, shoddy and slum-like (Schrader, 2005). There seems to be little debate as to the quality of the state houses of the 1930s and '40s which raised the standard of housing in New Zealand. Fast forward to the present day and interestingly, the recent 'leaky building crisis' that was experienced by the housing market in New Zealand experienced some homebuyers to reject modern homes in favour of these ex-state houses, being fully aware of their built standard and quality (Schrader, 2005).

3.5.1 Structure of Public housing

Housing New Zealand Corporation (HNZC) is a Statutory Corporation (Crown entity as defined by the Crown Entities Act 2004) and is domiciled and operates in New Zealand. The relevant legislation governing the operations of HNZC and its subsidiaries (the HNZC Group) is the Crown Entities Act 2004 and the Housing Corporation Act 1974 (as amended). HNZC’s ultimate parent is the New Zealand Crown. The Housing Corporation Act 1974 sets out the Corporation’s functions to provide housing and housing-related services to support the Crown’s social objectives. The Corporation is a Crown entity.
3.5.1.1 Housing New Zealand

Housing New Zealand (HNZ) is mainly a group consisting of Housing New Zealand Corporation (HNZC) that is responsible for legacy lending products and provides management services to Housing New Zealand Limited (HNZL) (i.e. operational support) at an agreed fee. Whereas, Housing New Zealand Limited, owns almost all State house properties and leases, receives income from the Income-Related Rent Subsidy (IRRS) and tenant rents, and pays direct costs and management fee to Housing New Zealand Corporation. Income-related rental revenue is received from State house tenants, and Income-Related Rent Subsidies are received from the Crown.

3.5.1.2 State house rents

HNZ under its rent management strategy for state houses requires, as an indicator, a series of benchmark rents that are consistent with market rents; and in line with the Corporations performance standards these rents are required to be updated quarterly. Income Related Rent Subsidy (IRRS) is part of the Government's financial support for social housing. When a client is assessed as needing social housing assistance they are referred to a social housing provider. There is mainly only one social housing provider in New Zealand, which is Housing New Zealand Limited (HNZ) and to a very small scale some Community Housing Providers (CHP) also exist in the market. Social housing providers are paid for the difference between the value of the Income Related Rent and the market rent rate or agreed rent rate for their social housing properties. This payment is called the Income Related Rent Subsidy. Such subsidies have usually been the most generous and reliable support for low-income households and have been labelled as deep, ‘gap-filling’ rent subsidies (Turner & Kingsley, 2008). Families receive this kind of “gap-filling” subsidy only if they live in State housing.

The rent charged by the social housing provider is a market rent that is set by the housing provider using an agreed process with the government. When setting their rents to reflect market rents and remain within the agreed process, a housing provider needs to consider the benchmark property rate, the condition of the property and level of amenities, and if the property possesses any special features that may add to its rental value. Under the agreed rules the properties will generally reflect
lower quartile of rents for properties of a similar type, size and location. The housing provider needs to look at similar properties in the area and what other landlords are charging in rents for them. They specifically need to consider the advertised private rents using real estate agents and private rental companies, ‘Trademe’ data using their website and tenancy bond data which reflects actual bonds lodged by private landlords.\(^{15}\)

### 3.6 Housing policy peculiarities

#### 3.6.1 State housing vs housing allowance

First, state housing is inefficient in comparison to housing allowances by structure. It simply costs more to house/assist a similar family between the two policy instruments (see fig. 3.9). State housing also suffers from horizontal inequity with limited access. From the perspective of the Crown, state housing is very lucrative and deeply secured; both in terms of income stream and capital gains. This is, in part, due to the Crown being a private landlord and receiving market rents for state housing units.

From the perspective of the taxpayer, any new state house built is Crown property that is paid by the taxpayer to build in one generation and paid for to occupy at market rents by all generations to come. Moreover, in the process depleting the share of available real estate for housing for citizens. It captures for itself the intertemporal transfers, both social and financial, that were secured for future citizens.

\(^{15}\) https://www.workandincome.govt.nz/map/social-housing/income-related-rent-subsidy/agreed-process-for-setting-the-market-rent-rate-01.html
Under the current structure, any new state house built would be a heavy burden on the taxpayer of today and tomorrow. Constructing a state house would incur a tax today, have higher running expenses via the IRRS, and would be a private landlord’s asset and not a public good that may be appreciating as well.

A Salvation Army report (Boyce, 2011) regarding New Zealand’s housing allowances notes that from 2002-2012 the average value of a Housing New Zealand tenants’ rent had risen 35% in nominal terms from $4230 per year to $5730. Over the same period the average per tenancy subsidy paid to Housing New Zealand by the Crown rose 93% from $4450 to nearly $8900. The authors point out that this larger increase cannot be explained by rapidly increasing rents in the private sector which should be the basis for setting income-related rent subsidies. What the report missed here is that any income earned above the job seeker amount by a state housing tenant is charged at 50% towards their rent until this amount reaches the market rent level. Thus, if a large number of state house tenants were made unemployed or chose to work less during this period, the burden of IRRS would increase phenomenally. This is what seems to explain the difference mentioned above.

Second, by structure at birth, the Accommodation Supplement is most likely a shift from one social expenditure to another with an additional capacity for a larger eligible cohort as per the definition at law. In the case of New Zealand, the birth of the Accommodation Supplement (AS) in 1993 may...
not have witnessed an additional cost to the exchequer of the amount of the expenditure on the housing allowance (AS) as it was merely a shift from a previous social expenditure known as the ‘Accommodation Benefit’. This type of shift within government budgetary and ministerial shuffling with regards to the present instrument dates back to the birth of the New Zealand Social Security Act of 1964 (as discussed earlier). This was an income transfer to poor households in need of financial support for living expenses. As they were poor, they most probably could be in rental housing. Most probably, the same pool of households was assisted across time. On the other hand, state housing was simultaneously privatized at the birth of the Accommodation Supplement through a vesting order that transferred all public (peoples) assets to the Crown whilst simultaneously introducing a much higher user cost for each house which now was the ‘market rent’ of the neighbourhood as opposed to a function of the respective income of the tenant (i.e. the income related rent).

Herein lies the true cost of the birth of the demand-side housing allowance that is hidden away from plain site. One presumes that the new demand-side instrument would introduce new costs. In fact, the existing stock of state housing now received the AS as they needed to pay market rents overnight instead of an income related rent. Whereas most probably the Accommodation Benefit and Accommodation Supplement households would have remained the same from 1992 to 1993 or from one quarter to the next that witnessed the changeover. These extra additional costs that required market rents with a much smaller cash transfer subsidy, i.e. the Accommodation Supplement, thrust upon state house tenants were shared by the taxpayer and the tenant to basically house the same population living in the same house but at a much higher market rent instead of an income related rent. And with the re-introduction of the Income Related Rent Subsidy (IRRS) in 2000 again, this burden of market rents for state houses then simply transferred these costs onto the taxpayer.
3.7 Structural issues in housing welfare policies

3.7.1 Cash asset as imputed incomes

Within a dualist housing policy environment for the low-income sector, one of the most inconsistent policies in particular is the cash asset limit for abatement purposes. The AS policy, in the case of a couple for example, says that each $100 increment over $5400 until the cut-out limit of $16200 will be accounted for as equalling $1/week of income. This will then be added to a client’s weekly income for the purpose of income abatement and ineligibility.

Two very damaging consequences may arise from such a policy. Before one identifies these, it is helpful to point out the bias inherent in this policy. In effect, this policy suggests that clients’ cash assets generate an imputed income. This imputed income is presumed to be at a rate of 52% per annum (each $100 earns $1 weekly which gives $52 per annum). First, to see this we may take, for example, a couple that has cash assets of $12,000. This amounts to ($12000 - $5400=$6600; and as each $100 = $1 above $5400, we get $66) an imputed income of $66 per week from the client’s cash assets. This equals an annual (imputed) income totalling $3,432 from $12,000. This gives the ‘effective rate of return’ on their cash assets of just under 30% per annum (effectively this is still 52% per annum as annual imputed income of $3,432 is from $6600). Such an unfavourable and unrealistic rate of return leads to a very high imputed income being used for abatement. And the higher the savings the incrementally higher the imputed ‘effective rate of return’ for abatement. Such unfavourable policy mechanisms that lead to a lower rate of Accommodation Supplement incentivize low cash and wealth holdings, in order for them not to be detrimental. Furthermore, this perpetuates a persistent poverty mechanism within the AS branch of the housing assistance policy framework.

In the case of state housing policy, where the landlord is the Housing New Zealand Company on behalf of the Crown, a similar amount of cash asset holdings by a couple, when considered to be ‘assessable income’ will use the actual income earned by that cash adjusted for NZ$2700 threshold for a single person. This gives a much lower effective rate of return as imputed income from cash assets in the case of state housing tenants and therefore higher IRRS payments as well.
3.7.2 Cash asset limit test bias

The story is bleaker once we turn our attention to the same policy in relation to the state housing sectors cash asset limit for eligibility. In 2020, the State housing cash asset limit for eligibility is $42,700, whereas a couple that has cash assets of $16,200 is not eligible for the private market subsidy. In effect, State housing tenants that have a higher wealth level than their counterparts in the private rental sector get to enjoy tenure security of the State. Moreover, another fallacy that State house tenants are generally poorer than their counterparts in the private rental market (housing allowance eligible cohort) is thus clarified.

Also, the eligibility for a state house requires a cash asset limit of NZ$42,700 at the time of application. On the other hand, there seems to be no clear cut statute in the Social Security Act anywhere that suggests that once housed in a state house, there is a cut-out limit for cash assets (and therefore continued eligibility for tenancy) as ‘assessable income’ for calculating income related rent for sitting tenants that occupy a state house. Moreover, on their website, in their example, they use a single person having a qualified ‘cash asset’ financial instrument, i.e., mortgage investments, worth NZ$80,000 which is being used as ‘assessable income’ for the calculation of the IRR for that tenant16.

If, for example, the government equates this cash asset limit under the dualist housing policy - equal to the Accommodation Supplement cash asset limit i.e. $16,200 - then Housing New Zealand is expected to lose its share of wealthier low-income households. Higher wealth levels also suggest less risky clients and thus a more efficient allocation of assets by HNZ, in line with its core policy and principal of managing the housing stock in a “business-like manner”. This puts a disproportionate share of risk on the private sector landlord, who has to sell his product to the residual low-income household population. To reiterate, Public housing (private) landlord (i.e. Crown) has its pick from the pool of poor tenants, albeit as an embedded policy. Furthermore, the state provides below market rates for mortgages towards the purchase of a state house, if the tenant decided to opt for home ownership.

3.7.3 ‘Housing poverty’ trap and the Accommodation Supplement

Cash endowments of prospective housing allowance clients are a direct reflection of their ability to save towards any sort of deposit required towards a prospective property for use as own home. A housing allowance regime that renders recipients ineligible due to their respective wealth levels has far reaching consequences, especially in the long run. In order to understand how cash asset limits may affect a citizen’s situation within such a regime of housing assistance, I will provide a comparison between these cash limits as they evolved with the prevailing average house price at the national level during that time. I believe that as the ‘cash asset’ element represents a means test for quantifying the wealth of a client /recipient for the housing allowance, and that such a ‘means test’ has been a requirement under the policy since its inception in 1975, it carries an implicit ‘policy initiative’ relating to the wealth level of the target population at the outset for a housing assistance instrument within New Zealand.

In table 3.5, I include the information relating to the median price of a house sold in the respective year. This provides us with a clear picture as to the implicit attitude of the housing policy towards its client and their ability to actually afford a house. To begin with, the policy was generous enough towards people having an initial endowment for a minimum deposit towards purchase of an average house. With a median house price around $23,000 in 1975, a couple with savings exceeding $6600 would not be helped towards high housing costs. If such a couple, in fact, were in a situation where they had high housing costs, this would have to be fully absorbed by their incomes and savings. Although, they could easily afford to enter the housing market based on their wealth solely on cash availability. Even for prolonged periods, a couple having over $6600 could sustain their high costs by utilizing their cash assets and still not jeopardizing their chances or choice for entering the housing market at some later date. Alternatively, in January 2021, the cash limit under the policy amounts to only 2.0% of the median house price. This suggests that a family is ineligible for the present Accommodation Supplement if their savings equal 2.0% of the median priced house. As this would lead to zero housing assistance, this situation leads to the family using their meagre savings towards high weekly housing costs, effectively running down their total savings where their savings are kept perpetually below 2% of the price of a median house. This is the poverty trap implicitly laid out within the demand side housing policy regime in New Zealand.
3.7.4 Tenure bias within the Accommodation Supplement

In order to get an AS payment a household, whether a renter or homeowner, is required to have positive accommodation costs above the entry threshold level. In the case of private renters, the landlord is in no way privy to information on their tenants’ access to any AS payment (and amounts). The tenant could be a new subsidy recipient in an on-going tenancy, a new tenant negotiating for a new place either due to moving either within the rental market or from outside, that is, from a family home to rental. In each case, they could be having prior access to the AS or be eligible for the AS due to the move. Information regarding the bargaining position of the tenant is asymmetric.

In the case of a bank, a client approaching a bank for a mortgage loan for home ownership exposes their post-purchase financial position to the bank. As the AS eligibility with respect to the ‘income’ and ‘asset’ test is public knowledge, the bank is armed with complete information about the borrower with respect to subsidy eligibility and amount of subsidy that will be provided by the State once the bank allows the house to be purchased. In this way, the AS transfer secures (a proportion of) the income stream of the bank for the entire period of the loan contract, in the case the loan is extended by the bank. Once the client becomes a debtor (to the bank), they are eligible to apply and receive an AS payment for homeowners. The clients’ payments (interest + principal)
which essentially are income (interest) for the bank are categorized as ‘accommodation costs’ under the law within the housing allowance scheme.

The Accommodation Supplement policy, therefore, promotes a fair market practice for private landlords by keeping information on eligibility of their clients asymmetric thus keeping the rental markets competitive. On the other hand, the same housing policy provides an unfair advantage to banks by making information on eligibility of their clients symmetric thus making credit markets less risky.

3.7.5 ‘Landlord capture’ under state house rents

State housing rents are quarterly revised in line with market rents at the neighbourhood level using actual rent contract data from the Ministry of Business, Innovation, and Employment (MBIE) tenancy bond database. This effectively favours the revenue stream for the state housing landlords. Therefore, state housing provides ‘perfect landlord capture’ because when market rents increase, this increase is fully captured by the IRRS and goes to the landlord (i.e. Crown) as per agreed process for setting of state house rents. This price taking behaviour has a potential to distort market rents as the landlord here is a passive agent for accepting market rents effectively bypassing bargaining and owns over 20% of the entire rental housing stock in New Zealand.

In the case of the A.S. rents are typically delinked from the subsidy payments, that is, as rents increase the subsidy does not increase in most cases and certainly not dollar for dollar, ever, in favour of the private housing landlord. Thus, in New Zealand, each additional state house costs, on average, over three times more to the taxpayer than the Accommodation Supplement in order to house recipients. Then the question of efficiency becomes more of inter-policy rather than the policy objective (having vertical or horizontal equity/efficiency).
4 Residential financial capitalism in New Zealand

4.1 Overview

Understanding elasticity of supply, which is price elasticity of supply, means that one will need to look at how prices of houses have affected the housing stock. In economics, markets are cleared at equilibrium prices, which is to say prices are the outcome of fundamental market determinants. Under this system general price levels are controlled by monetary policy which essentially is money supply management. This makes money supply and money creation endogenous and markets that engage in money, credit, borrowing, debt, and collateral-based money core determinants in particular. Markets that require monies apart from incomes for market clearance inherently suggest some element of disruption present. In such a setup it would seem consumer preferences driven by income (labour markets) are not sufficient for market clearing rather money from credit (financial markets) is a necessary requirement. Financialization therefore essentially is a part of and a key structural transformation channel within advanced capitalist economies (Fernandez, & Aalbers, 2016). Therefore, housing markets may vary in their elasticities (price) without shifts in fundamentals for housing demand and supply from within, suggesting different approaches and structural issues that could underpin rent inflation and consequently the effectiveness and ability of housing allowances towards their objectives.

As commercial banks have a sizable monopoly over providing the citizens in an economy with money, it is crucial to understand that prices of commodities will fluctuate with the lending policy and general business atmosphere of the banking industry in an economy. To the degree that the housing markets are financialised and commodified in an economy is the extent, in a sense, to which the housing markets may be susceptible to be influenced by the size of the financial sector in addition to the behaviour towards lending by the banking industry (ECB, 2011). The coupling of induced demand via credit and artificially constrained supply together as an institutional structural force is fundamental to understanding the housing and tenure crises. An institutional
perspective is paramount then to look beyond the dissection of the interaction of the market only and explore the wider context within which those forces operate (Burke & Hulse, 2010).

In a planned economy, under stable conditions, the demand and supply needs to be exposed to shocks in order for markets to generate economic rent. Institutional demand and supply shocks are formed to provide markets with inertia. Two fundamental institutional shocks to residential housing are real estate financialisation and supply side constraints such as construction by-laws, tenancy systems, geographical zoning laws etc.

4.2 Institutional shocks on real estate

The construction industry, like other sectors, is cyclical, similar in its behaviour of adjustments during business-cycle downturns. As one would expect, like others, it cannot eject itself from the economic landscape in times of uncertainty. Since the financialisation of residential capital, we see that real estate has seemingly become more accessible via financial instruments. Supply restrictions for the built environment seemingly exist due to limitations that are artificially put in place by policy. For example, urban limits for the individual cities and towns, development restrictions for aesthetic purposes and environmental preservation concerns, to name a few. In theory, these constraints can impact prices as these policies create shortages in the availability for residential space leading to scarcity of land. These artificial limitations, it seems, are the primary cause of the symptom of short run (and long-run) inelastic supply of housing and a function of its existing uses.

Interestingly, a recent report from New Zealand (Fernandez, 2016 p. 2) discusses the housing crisis as follows:

In almost all policy discussions (see Krupp, 2016), it is hypothesised that the solution (or at least the alleviation) of what is being coined as a ‘housing crisis’ should rely on increasing the supply of residential land. That is, the policy focus should be on removing regulations or constraints that limit the supply of land (Aura & Davidoff, 2008) in order to incentivise the growth and densification of cities (Glaeser and Gyourko 2003; Glaeser, Gyourko, and Saiz 2008; Gyourko 2009; Nieuwerburgh and Weill 2010) and,
consequently, the development of new and affordable dwellings (see Krupp and Voutratzis 2016; Grimes, Liang, and Liang 2008). While it is acknowledged that land supply constraints affect housing prices (Grimes, Liang, and Liang, 2008; NZIER, 2015), it is difficult to assess the role of those constraints econometrically because it is not possible to observe the same city at the same time with different regulations (Aura and Davidoff, 2008; Glaeser, Gyourko, and Saiz, 2008).\(^\text{17}\)

Under these artificial conditions, price adjusts towards a clearing price in the housing residential markets during stable times. Forces such as labour mobility, higher wages, and excess capital seeking ‘capital gains’ within real estate investment now achieve industry equilibrium in the short run.

The industry is provided with incentives, both on the supply and the demand side. For the supply side, the industry is provided tax and other developer incentives, increased bank lending at very low interest rates leading to a revival of the (construction) industry resulting in competitive construction cost projections that, combined together, help increase supply. On the demand side, the financialisation of the industry pegged it to other idle, non-productive financial investments that increasingly are a playground for speculators of recent. Such investments are typically disconnected with any aspect of the dwelling and its characteristics, further complicating price modelling issues. The availability of space, I believe, is not of concern but rather the accessibility to space. In order to access the available space, the required premiums (now) are far exceeding the available means, in general. Put simply, it is increasingly difficult to afford space, whereas space may be easily available in the market.

Financialisation, it seems, may help to create ‘new’ distortions not present in the construction and real estate industry. As financial innovations and integration creeps into the property markets, money flows that were present in the construction market including new money flows from other sources due to financial deregulation now instead seek higher yields. This effectively ‘crowds out’ investment in ‘real’ construction and instead finds its way into available financial instruments which are mostly derivatives of this same very market leveraged on existing construction (Achour-

Fischer, D., 1999). This crowding out results in a lower than ‘otherwise’ investment in new development in the ‘real’ real estate sector. This can have long term effects by removing a proportion of ‘real’ tangible risk-takers that help with coping with the demand of the construction sector and shift them to the financial sector making them ‘digital’ risk-takers instead. In addition to the ‘crowding out’ of investment in new construction, it helps to drive up prices artificially, creating further inefficiencies for the supply-side (which reflect on the demand side) and have very negative outcomes for the general well-being of an economy and its people.

In Appendix 1, I present the dynamic process of how financialisation impacts and disrupts the competitive equilibrium of real estate markets resulting in higher equilibrium prices. I illustrate my point with the help of a much-celebrated model within the real estate literature, namely the DiPasquale and Wheaton (D-W) model for real estate markets (1992). The model is elegant and simple because it manages to introduce two basic markets for real estate property, which are the markets for real estate assets and space. The model has the power to describe the dynamics and has a pedagogical significance of its own. The use of this model is primarily for its explanatory potential for basic mechanisms within the real estate and construction markets.

DiPasquale & Wheaton (1992, p. 197) noted that “developing an intuitive framework similar to the one in (their) paper that traces the intermediate term dynamic path to a new equilibrium remains a formidable challenge”. I attempt to furnish the intermediate processes to a new equilibrium of a shock of greater financialisation of the real estate sector and how this translates into higher rents.

### 4.3 Rental markets

Housing is a multi-layered good and can be defined as, at least, being all of the following:

i) Heterogeneous good (for employed vs unemployed)
ii) Spatially fixed good (resulting in labour mobility)
iii) Consumption good (durable and short-lived i.e. renting)
iv) Investment good (long term and speculative)
v) Social public good (via subsidies and tax incentives)

Housing tenures, such as private renting, are a form of institution which may be looked upon as socially constructed configurations of property rights and obligations that vary in their specifics
between different societies (Kemp, 2015). Recent history shows that rental markets in most advanced countries are now increasingly dominating activity within the housing market spectrum (see figure 4.1). This suggests that housing markets or broadly speaking real estate transactions in the housing markets are essentially rental housing transactions and thus housing markets are rental markets in character now. This also suggests that major institutional shifts are in play that are moving the market in the direction of greater tenure insecurity for the citizen.

Source: OECD housing database

Within an environment that reflects rising prices and supply restrictions, what is not obvious is housing sector growth with respect to tenure of households. Even though home ownership was on the rise in New Zealand for most part of the century, an interesting shift occurs during the exact period when New Zealand experimented with the shift towards a more liberal political economy. Adopting the Washington Consensus it seems had very dynamic and broad ranging effects that may have well been hidden beneath the economic fundamentals. It seems that a tenure shift from home owning to home renting was put in place by these structural shifts in policy that were not visible at first.

I devise a ratio reflecting the total renting households in relation to the total households that own their own homes to reflect the ‘velocity of tenure shift’ (see figure 4.2). The values are from the census data and therefore reflect the actual numbers in the whole country at the night of each individual census. The data for our analysis covers the past century. Although data for 1916–1926 is available for rental housing, it is not very clear as to the various tenure types missing/included
in the total count for the period which is reflected as a flat line. Over the longer run the trend is markedly downwards suggesting a proportionately increasing take up by owner occupiers of the available dwelling stock in the country. This trend is reflective of the already discussed New Zealand culture of a ‘home owning democracy’.

**Figure 4.2:** Shifting tides in housing tenure over the past century – Velocity of tenure shifts using renting households to owner-occupied household ratio

**Figure 4.3:** Long-run relationship between housing demand and supply over the past century for New Zealand

*Source:* Author’s calculations and Stats NZ.

1. Data for 1931 and 1941 are imputed values as there was no census held in these years due to the depression and the war.
2. Renting households exclude state houses.

New Zealand’s housing stock growth rates have, on average, outpaced the growth rates for its population. Looking at figure 4.3, the data for the previous century tells a story of consistent positive growth in the residential housing sector. This suggests that the number of private dwellings have always been on the rise in New Zealand during the entire last century, on average. A similar pattern emerges in the rates for population growth for New Zealand. If we take a closer
look at the period for World War 2, New Zealand still showed positive growth for its housing stock and population growth, suggesting that there was no loss of constructed dwellings, neither was there any substantial loss to life as a result of the war. This is true as the war was far away from its turf keeping the infrastructure intact. Whereas, estimates go as far as two million houses that may have been destroyed during the same war in Britain.

Looking at figure 4.3, I see that there also are no significant structural breaks as such for the entire history of the New Zealand housing market in spite of two world wars, the great depression, the oil shock of the 70’s, up until the mid-1980’s. Such a relationship suggests a stable equilibrium within the housing market, especially in the long-run in the case of New Zealand until that period. Although, one can see that between the period of the First World War and the great depression in 1934, the housing growth rates initially decrease during war time and then suddenly pick up after the war as soldiers return and construction starts once again after the war to its previous pre-war level.

With the advent of the 80’s we see that population growth tends to start shifting upwards with a corresponding slowdown in the rate of housing stock growth. This may be caused by any number of endogenous and/or exogenous factors within the economy. This is the first indication of a structural shift that may affect long-run equilibrium in the housing market of New Zealand which prior to this was stable. And shifts in market conditions are argued to lead to prolonged disequilibrium in the owner-occupied housing markets (Case and Schiller, 1989; Riddel, 2004).

On the other hand, an increasing trend in the velocity of tenure shift can be summed up as evidence that an increasing share of dwellings ends up in the rental sector with each passing census as a proportion of additional (new) dwellings. First, it is interesting to note that, looking at figure 4.2, the long run trend in tenure shift evidenced by data covering the entire population clearly shows the shift in trend or the reversing of the tide beginning around the 1990’s.

Second, it is also peculiar to find that the structural shift that I discussed earlier in the long run relationship between housing supply and demand tends to show its signs around this very period. And third, this is the precise moment when successive New Zealand Governments were embarking on an experiment towards shifting their role to a market-based governmental structure. This
included the opening up of the country’s residential sector to the newly liberalised financial system. This brought about changes that resulted in the evolution of residential capitalism in New Zealand. These changes had a significant impact on the country’s traditional ways of providing state support for expanding home ownership among the population as a social right including restructuring state housing ownership, transfer of its mortgages, introduction of market rents for public housing etc.

4.4 Financialisation and citizenry

Simultaneously, on the supply side of this spectrum that is the market, we observe a transformation towards financialisation. An increasingly larger share of productivity is being absorbed by financial innovation and finance and related industries is what seems to be providing economic growth in recent times in the advanced nations (Kelsey, 2015). In the US, the finance and insurance sectors grew, on average, at double the speed of the entire economy during the decade preceding the GFC. In the US during the 1970’s and 1980’s corporate profits from financial institutions were below 20 percent of the total contribution towards revenue, by 2004, finance accounted for a massive 40 percent of the total revenue. And all this progress came at a cost, where the rationale for higher efficiency in financial innovation to secure more profits was achieved by acquiring unstable credit and a depleting pool of quality workers in the productive economy, with flow-on effects to the workforce (Kelsey, 2015).

All this innovation relating to the functional form of societies, especially the Anglo-phone countries, lead to essential human capital innovation requirements such as, for example, the concept of ‘financial literacy’ (for a detailed discussion on the definition, see Remund, (2010)). As the financial industry, increasingly, is no longer regulated on the basis of merit, and instead oversight relies on disclosure by those who are being regulated in the first place, citizens are implicitly being made responsible for their own choices and the resulting consequences. Financial literacy is now a mandatory adjunct in parallel with the deregulated and light-touch system of disclosure regime, whose motive is to arm agents with information and understanding they need in order to make decisions (Kelsey, 2015). Broome (2009) notes that a successful financial policy must instil a shift in norms that guide financial behaviour, which can very well bring about
unintended outcomes. Toni Williams (2007 p.34) coined the term, “responsibilisation” explaining the phenomenon as “a form of regulation by which the state holds individuals accountable for aspects of market governance and social security that it used to provide”.

4.5 Commodification of housing in New Zealand

Following globalisation, specifically after the late 1970’s and the subsequent implementation of the Washington Consensus embodying the neo-liberal spirit, much of the advanced world entered economic fundamentalism. New Zealand joined the club early on in the late 1980’s and was very much in the lead in the 1990’s at adopting the strictest version of the model. The coming of deregulation of the domestic financial markets effectively restructuring the national housing finance system and putting it in the hands of private enterprise, selling off of state mortgages to commercial banks, conversion of the social housing sector to be shaped into a commercial Crown entity, amongst others, are considered the main drivers towards commodification of housing in New Zealand (Broome, 2008). As a result, the evolution of residential capitalism in New Zealand may be characterised by an unequal access to finance for housing, higher risk and volatility towards borrowing costs, asset price inflation, and an increasing constraint on the supply, especially for residential space (Kelsey, 1995a; Broome, 2009; Murphy, 2004).

Table 4.1
Additions to the New Zealand housing market for the period 1991-2013 - Census Data

<table>
<thead>
<tr>
<th>Type of Tenure (category-wise)</th>
<th>Housing stock - #’s 1991</th>
<th>Housing stock - #’s 2013</th>
<th>Addition to stock, #’s (1991-2013)</th>
<th>% increase tenure size (1991-2013)</th>
<th>% share in additional stock</th>
<th>Average annual supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owned (active mortgage)</td>
<td>456,447</td>
<td>490,812</td>
<td>34,365</td>
<td>7.5</td>
<td>9</td>
<td>1,562</td>
</tr>
<tr>
<td>Owned (freehold unencumbered)</td>
<td>396,042</td>
<td>416,769</td>
<td>20,727</td>
<td>5</td>
<td>6</td>
<td>942</td>
</tr>
<tr>
<td>Owned (mortgage not specified)</td>
<td>..</td>
<td>33,144</td>
<td>33,144</td>
<td>-</td>
<td>9</td>
<td>1,506</td>
</tr>
<tr>
<td>Rental</td>
<td>267,345</td>
<td>453,135</td>
<td>185,790</td>
<td>70</td>
<td>50</td>
<td>8,445</td>
</tr>
<tr>
<td>Rent free</td>
<td>39,804</td>
<td>58,977</td>
<td>19,173</td>
<td>48</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,177,665</td>
<td>1,549,890</td>
<td>372,225</td>
<td>31.6</td>
<td>100</td>
<td>16,919</td>
</tr>
</tbody>
</table>

Source: Stats NZ
### Table 4.2
Additions to the New Zealand housing market for the period 1971-1991 - Census Data

<table>
<thead>
<tr>
<th>Type of Tenure (category-wise)</th>
<th>Housing stock - #'s 1971</th>
<th>Housing stock - #'s 1991</th>
<th>Addition to stock, #'s (1971-91)</th>
<th>% increase tenure size (1971-91)</th>
<th>% share in additional stock</th>
<th>Average annual supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owned (active mortgage)</td>
<td>329,730</td>
<td>456,447</td>
<td>126,717</td>
<td>38</td>
<td>34</td>
<td>6,336</td>
</tr>
<tr>
<td>Owned (freehold unencumbered)</td>
<td>212,376</td>
<td>396,042</td>
<td>183,666</td>
<td>86</td>
<td>49</td>
<td>9,183</td>
</tr>
<tr>
<td>Rental</td>
<td>206,466</td>
<td>267,345</td>
<td>60,879</td>
<td>29</td>
<td>16</td>
<td>3,044</td>
</tr>
<tr>
<td>Rent free</td>
<td>47,853</td>
<td>39,804</td>
<td>-8,049</td>
<td>-17</td>
<td>-2</td>
<td>-402</td>
</tr>
<tr>
<td>Total</td>
<td>801,684</td>
<td>1,177,665</td>
<td>375,981</td>
<td>47</td>
<td>100</td>
<td>18,799</td>
</tr>
</tbody>
</table>

*Source: Stats NZ*

Looking at table 4.1, which uses the census data for housing in New Zealand for the period 1991 – 2013, one can see the proportion of rental dwellings that have been added to the total housing stock of New Zealand is a staggering 50% of additional dwellings. The increase in total dwellings in this period was 372,335 dwellings in total, although the number of dwellings that stated a tenure in the census survey fell shy by 98,308 dwellings. In addition, the homeownership sector with an active mortgage grew a measly 7.5% in over two decades in comparison to the concentration in growth experienced by the rental sector that averaged at around 70%. Table 4.2 highlights the data for the two decades preceding the reforms of the 1990’s (1971-1991), where the average annual supply of total homes (owned and rented) was higher than the average for the next two decades i.e., 1991-2013 in absolute numbers. This reflects the declining trends towards construction that may be a legacy of financialisation. Whereas one can see the rental housing stock for the period 1991-2013, on average, increased approximately three-fold from its previous level (1971-1991). Such a massive shift in tenure compositions for housing witnessed in the decades post reform confirms shifting trends in demand towards investment properties. Although the data details the increase in dwellings by tenure proportion, this does not suggest that the changes in tenure reflect new dwellings. It may very well be the case that the entire new stock is now inhabited by home
owners and the 68 percent increase in the additional stock for rental accommodation is constituted of older dwellings, a phenomenon explained by the ‘filtering’ model and highly probable in the case of New Zealand housing stock.

The phenomenon of ‘asset-based welfare’ was developed following such transitions in economies which essentially promotes individuals in place of the state to invest in financial assets to counter the risks of poverty. And as Doling and Ford (2007) note, housing as an asset has, in effect, replaced the state as asset of insurance. In New Zealand, asset-based welfare seems to be firmly anchored on the credit markets. Figure 4.4 shows the increasing interest by banks towards lending for housing and real estate with an increasing neglect for business and agriculture lending which interestingly is backed by residential housing.

Between 1991 and 2016, bank lending to housing increased approximately tenfold (over 900%). Simultaneously, the total housing stock value in New Zealand experienced an increase by roughly the same magnitude, whereas the physical housing stock increased less than 40% reflecting the real demand and supply in the aggregate (see figure 4.5). And in 1991, the nominal GDP was NZD 75.98 billion which reached to NZD 251.76 billion in 2016, approximately a 230% increase in incomes only. This is surely indicative of asset (house) price inflation driven by the credit

![Figure 4.4: Credit lending (sector-wise) - New Zealand banking industry](image-url)

*Source: RBNZ*
expansion by banks towards housing markets not for construction but trading and as a result of capitalizing low interest rates (in many countries falling since the 1990s).

Behaviour towards housing markets has shifted primarily from consumption demand to the practice of trading. In New Zealand, trading in houses is on average five times higher than the provision for housing, suggesting that perceptions towards housing are increasingly in support of commodification of the home. This is evidenced in the quarterly figures for houses built in New Zealand, that reflect real demand, which tend to average 5000 homes whereas, on average, homes traded every quarter are around five times this amount in some periods (see figure 4.6). The solid line represents the actual quarterly increase in the housing stock within New Zealand (proxied using approx. 95% of the building consent data lagged two quarters for completion) which is compared to the number of transactions for the same quarter in the housing real estate markets (aggregate) shown as the dashed line. This indicates that homes have acquired the residual value of a commodity that is traded for reasons other than consumption.

Interestingly, the value of housing (dotted line), represented here in nominal NZ dollars, increased at a high pace whilst real estate activity and real housing construction, both, declined with respect

![Figure 4.5: Asset price inflation – a disparity explained by bank lending](chart)

*Source: RBNZ and Stat. NZ*
to previous quarterly levels. This can suggest supply constraints that result in lower trading, keeping the trading ratio constant, with a higher access to credit pushing house prices up.

**Figure 4.6:** Commodification of housing.
Trading in homes versus building homes - Quarterly levels

Activity in housing markets has witnessed a transformation from being one that dealt in home ownership to increasingly one that is dominated by rental property activity. Using census data for the past century I have shown that the trend towards owner-occupied dwellings is on the decline. The pace at which this shift is unraveling the ‘historical institutional foundation’ of home ownership is gaining momentum (see figure 4.7 below that covers the period after the reforms). This shift has not reversed since the economic reforms that were delivered to New Zealand in the late 1980’ and early 1990’s.

In simple terms, what this means is that a greater proportion from the entire housing stock (of the country) is in the hands of a smaller proportion of people (with respect to the measurement period). In other words, I try to think of this as an increase in ‘tenure insecurity per capita’.
To conclude my discussion on how residential capitalism in New Zealand affects the housing market I argue that bank behavior towards credit lending for housing appears to be a fundamental determinant for modelling in studies on house prices (in order to avoid omitted variable bias). This helps to better understand asset price (house) inflation which I call “affordability inflation”. And, interestingly, a strong correlation is witnessed directly between bank lending for housing sector and rents (see figure 4.8). The data covers the entire period since the financial reforms of the 1990’s, spanning nearly a quarter of a century. And housing markets transactions are now essentially rental housing transactions. My analysis here leans towards an idea of (a sort of) ‘institutional transformation’ being set in place leading to a growing private rental sector, and NZ losing its traditional role of a home owning democracy. I find that ‘velocity of tenure shift’ is on the rise in NZ, with rapid mortgage-debt led accumulation of residential property tipping in favor of investment property instead of homeownership.

Under a stable fundamental demand framework, that is stable populations and income levels, house prices are extremely likely to move with the supply of housing finance (Aalbers & Haila, 2018).

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18 This is a simple correlation. More formal tests like Granger causality can surely be performed This is beyond the scope of this chapter.
Schwartz and Seabrooke (2009) in their thesis, ‘Varieties of residential capitalism’ present how residential housing and housing finance systems have important causal consequences for social stability, the structure of welfare states, macroeconomic outcomes and political behavior. Incomes no longer determine demand for housing, it is the supply of and demand for credit which underpins this behavior (Albers, 2018).

In highly financialised economies, it seems fundamentals such as population levels as well as incomes levels tend to play an increasingly diminished role and demand is induced in place by credit availability. And at many instances, researchers have argued that there are empirical questions about housing supply elasticity conditions that need to be answered in order to estimate the inflationary impacts of housing allowances (Brackertz et.al, 2015). Although, not a direct consequence, whereas if the allowance manages to induce demand for rental housing, under some systems, then supply elasticity becomes important. This, I believe, is increasingly more a macroeconomic and institutional issue than simply a microeconomic or even a construction industry issue. Schwartz and Seabrooke (2009) in their thesis, ‘Varieties of residential capitalism’ present how residential housing and housing finance systems have important causal consequences for social stability, the structure of welfare states, macroeconomic outcomes and political behavior.
Ball (1986) identifies housing tenures as part of wider institutional arrangements labelled “structures of housing provision (SHPs)” encompassing processes of production, finance, exchange, and consumption of housing. It is increasingly understood that type of housing finance system and the extent of financialisation within an economy will dictate the price elasticity of supply of housing, as well as demand.
5 Literature review and theoretical issues

5.1 Empirical history on housing allowance and rents

I begin with the review of the theoretical framework applied in the well-established empirical works on the subject. Economic theory, as argued in the literature, suggests that the balance of the incidence of a housing allowance between tenants and landlords depends on the details of the rental market. For example, under a neo-classical model this will depend on the relative elasticity of supply and demand for rental housing. These demand elasticities depend mainly on price and income elasticities. Then, if the allowance is considered as a price shift (perceived) it may follow that an analysis of the respective price elasticities would provide an answer. Whereas, if the allowance is an income shift, in that case, similarly one may argue to study the income elasticities of demand for rental housing.

Most empirical studies on housing allowance use the standard textbook demand theory where price elasticity tells us the extent of demand shifts for rental housing with respect to housing allowances altering the relative price of renting. For example, Fack (2006, p. 754) states that “housing can be considered a normal good, so as the housing allowance reduces the price of housing services compared to other goods, there is an increase in the demand for housing by the new recipients.” Similarly, Laferrère and Blanc (2004, p. 40) argue that “an increase in the subsidy (up to the ceiling rent) lowers the relative price of housing.” When discussing the impact of a reform in the UK housing benefit, Gibbon and Manning (2006, p. 805) seem to move in the same direction stating that “the incidence of the subsidy will depend on the elasticity of the demand and supply curves for housing in the usual way - …” Collinson et al. (2015) presume housing is a normal-good for most households thus the design of the housing program should eventually increase housing consumption. Viren (2013, p. 1502) explains this as “if supply side functions well, in the sense of being highly price elastic (and competitive) the housing allowance simply increases tenants’ income and shows up as increased demand for housing.” In essence, these studies look at the housing subsidy primarily as a price variable.
As mentioned in the introduction, initial works such as the EHAP reported no rent inflation with shifts in rents as landlord’s costs instead. It also found that most recipients remained in the same dwelling and there was no demand shift as well (Lowry, 1982; Rydell, Neels, & Barnett, 1982). It was found that money was used by recipients not for housing but for other consumption (Bradbury & Downs, 1981). This provides evidence of the effects of a subsidy at birth, in a sense. Moreover, recent studies that argue demand shifts a priori via a price shift find similar results, that is, no demand shifts occur under the housing allowance (Brackertz et al., 2015; Fack, 2006; Frieden, 1980; Gibbons & Manning, 2006; Grislain-Letrémy & Trevien, 2016; Hyslop & Rea, 2019; Loikkanen, 1988; Lowry, 1982; Rydell, Neels, & Barnett, 1982a; Sanderson & Wilson, 2017; Steele, 1979). Such findings are certainly possible as price and income elasticity for housing are on average quite low (Flambard, 2013). There are, in addition, other reasons as well which I explain later. Recall my argument in the introduction, that, the problems with such findings are that they are inconsistent with demand theory presented in these studies. The rationale to counter this unexplained behaviour has, in most studies, been the inelastic supply of rental housing. That is, demand increases but does not show up in the data as supply is fixed in the short-run which then creates demand-push inflation and is reflected as increased rents. Brackertz et al. (2015) point out that most studies in their literature review on housing allowances noted that elasticity of housing supply is the key factor that impacts on the degree of landlord capture, however this was not tested for in any of the studies, rather housing supply elasticity is treated as an explanatory factor to present their findings. A recent French study does however incorporate supply elasticity using the rental housing stock to reach a conclusion that housing subsidies do impact rents in tighter markets (Grislain-Letrémy & Trevien, 2016).

As noted earlier, an important evaluation, it seems, would be to assess if the subsidy is designed to increase housing demand. Such a viewpoint becomes important as the effect of housing allowances on affecting market equilibrium limits the redistributive objective of this social policy (Bozio et al., 2017). This has consequences for application of theory too.

Loikkanen (1988), who developed the “Search Theory” model for housing in an earlier work19 notes that when using standard demand theory the optimal housing consumptions are derived by

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19 See Loikkanen’s (1982) paper titled, “Housing demand and intra-urban mobility decisions: a search approach”.

79
economists’ as if moves took place “overnight” as responses to changed initial conditions. This helps to ignore mobility issues implicitly. Moreover, if allowances changed prices, then the present elasticities of demand for renting would simply reveal the estimated effects of the allowance on consumption. This also presumes all recipients move house.

Under the search model, Loikkanen (1988) found very small effects on actual demand of an introduction of an allowance relative to their desired demand impacts, which too were small. Households only tend to move and change demand under extreme conditions of either over or under-consumption of housing (Loikkanen, 1988).

Again, the subsidy does not seem to increase demand for rental housing as evidenced in most studies. And this is counter to price theory for a normal good considering the subsidy is a price fall. Brackertz et.al (2015) point out that studies which used stronger or more appropriate methodologies tended to have lower estimates of landlord capture. In addition, they conclude their literature review noting that amongst the studies reviewed the question of whether demand-side housing subsidies contribute to an increase in the consumption and quality of housing remained inconclusive. This is because, as argued by me, the design of the housing allowance is such that it impacts residual incomes of the systemic poor only and as housing is a necessity good, and already in consumption and, most probably, in equilibrium there is no need for moving house. That is, recipients of the subsidy characteristically seem to exhibit a zero subsidy elasticity of demand for rental housing as evidenced empirically in past studies.

5.2 Review of empirical methodologies and design of allowances

As presented in the introduction chapter, the empirical studies have, in most cases, found allowances to be inflationary. French country studies consistently seem to find rent inflation a consequence of their housing subsidy which can, amongst others, suggest that the French housing allowance design may be to blame. In the French context, below a certain ceiling, the owner can increase the rent without extra cost to his tenants: a one euro increase in the rent entails an extra one euro in subsidies. As a result, tenants have no incentive to choose housing with rent below the rental ceiling: they can have better housing without spending more. The owners have no incentive to offer rents below the ceiling: they can increase the rent without losing potential tenants
or without reducing their solvency. Such a design causes rental inflation (Bozio et al., 2017). As Flambard (2013) points out that in the case of a previous history of non-payment of rent by tenants, landlords in France can request the government to pay them directly as well. This third-party payment system too can distort rents and make the housing subsidy inflationary by making it visible to landlords which of the tenants receive an allowance. Also changes in benefits can make the owners respond in a similar way as economic agents are more responsive to an increase in benefits when this change is visible to them (Finkelstein, 2009). Cases where landlords advertise rent net of subsidy and increase the gross rent payable as the subsidy increases have been documented as well, in particular in the rent of rooms to students (Trannoy & Wasmer, 2013).

The experience in the UK is mixed. Studies for the UK used a policy shift that reduced the subsidy. One such study found tenants absorbing the higher housing stress coming from a subsidy cut, signifying that income was not the overriding determinant of demand for housing for the subsidy recipients (Sanderson & Wilson, 2017). Whereas an earlier study provides empirical evidence claiming that landlords took the hit of between 60% to 66% of the incidence of the subsidy reduction, again with no fall in demand for housing (Gibbons and Manning, 2006). Although, Gibbons and Manning (2006) themselves point out concerns about their identification strategy which is based solely on rent and Housing Benefit gaps between tenants with short and long tenures. Whereas, a recent study using administrative data sets concluded that, on average, the incidence of the cuts analysed does fall mostly on tenants they uncover heterogeneity in this incidence (Brewer et al., 2019). Certain groups that most likely have differing elasticity of demand for rented housing are to explain such heterogeneity. Groups that had a high subsidy relative to needs before reforms show a significant fall in their quality-adjusted rents in the short-run. In the earlier two cases, even though the subsidy fell, that is to say relative price of housing increased, there was no shift in housing consumption of recipients, whereas in the most recent study high subsidy recipients (meaning the poorest households) do show a fall in housing demand with a lower income add-on. In case of a loss of subsidy, it seems highly likely that, the poorest households may ‘under-consume’ housing in order to feed themselves.

In my view, it is quite likely that not only a price change but also the direction of the price change can influence matters for low-income households that contribute a large portion of their incomes towards rent. For such households, a price increase (in the long-run) may push their housing
consumption downwards from a ‘sufficient housing’ level to one which seems akin to overcrowding suggesting that housing is price elastic (Sanderson & Wilson, 2017); whereas if rents fall it is highly probable that the same households would keep housing consumption constant and remain at ‘sufficient housing’ level than opt for over-consumption (in line with HASE findings) which, in this case, would suggest that housing is now perfectly price inelastic for the same household.

In the US, the voucher system is very different to the demand-side housing allowance schemes in other countries as its supply is limited by a quota system. The scheme carries conditions for dwelling quality and Housing Choice Voucher term expiration, which pertains to the deadline for submission of a request for tenancy approval within at least 60 calendar days\(^{20}\). The voucher scheme also carries symmetric information on the subsidy between tenant and landlord. Eriksen and Ross (2015) exploit an increase in supply of vouchers between 2000 and 2002 using a panel setting to find that in the US the voucher does not raise overall market rents. Although compared to rents prior to the expansion the voucher scheme tends to increase rents for the same unit for units that rent within 20 percent of the local Fair Market Rent in 1997 in the short-run. This is consistent with the fact that to increase housing quality tenants would need to relocate and incur costs. Landlords near the FMR increase their rents without increasing quality knowing that the tenant, now having the voucher, can and will pay the new rent without incurring any extra rental burden.

The Eriksen and Ross (2015) study has findings at the aggregated MSA level and uses the AHS dataset which is intended to be a national representative of all housing units in the US. Each housing unit in the AHS national sample is weighted and represents between 450 and 4000 other housing units in the United States. They use rents for 1997 and at least one other year between 1999-2003; therefore, not strictly a uniform time period for rent trend variation at the MSA level. Their (rental) unit level covariates in each MSA are the evidence of rodents, sewerage problems

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\(^{20}\) The expiration date does not refer to the date the unit must be available for occupancy. For example, if a housing choice voucher term expiration date is June 15, the request for tenancy approval could be dated June 15 for an occupancy date of August 1. Also, the Public Housing Agency (PHA) has the authority to grant extensions of search time and to determine the length of an extension and the circumstances under which extensions will be granted. See Housing Choice Voucher Guidebook.


82
repaired in the last two years, number of cracks in walls and presence of washer/dryer. Usually during search for rentals, it is highly unlikely tenants may come across such information and in addition, these seem like weak determinants for rent for the analysis of the large distribution of rental properties across 134 MSA rental markets. In addition, the variation at the rental unit level for rodents, cracks and sewerage is low as well (see summary stats), which contributes credibly less to a fixed effects methodology. For their study, Eriksen and Ross (2015) actually estimated the number of vouchers made available in each MSA via a lengthy process, therefore, do not use the precise vouchers actually in circulation in each MSA. More importantly, the rental units in the AHS survey are weighted at the sample level as well as at the unit level. And if the representative sample has within changes over time (i.e., vacant homes, demolished homes, etc.) this alters the weights for each unit in the sample. A time series study then requires the researcher to adjust his sample for all the units included with the new weights for the new time period used by the AHS.

Susin (2002), in an observational study, found the voucher system to increase overall market rents by 16% in the US. Although his results are more externally valid, concerns of omitted determinants of rent which may be correlated to the supply of vouchers in the past can bias his estimate (Khadduri & Wilkins, 2008; Olsen, 2003). On the other hand, Eriksen & Ross (2015) point out that in the case of the US, past studies that find housing allowances as significantly affecting market rents may have suffered from bias due to unobserved determinants of rent.

Grislain-Letrémy & Trevien (2016) follow the spatial discontinuity design and analyse the variation in subsidy for Zone II and Zone III in France. They argue that there are very comparable agglomerations in zones two and three that mainly differ by the amount of received subsidies due to zoning specifics. These comparable agglomerations are the ones in which population is just below or just above the population limit between these two zones i.e. 100,000 inhabitants. Their main findings were that housing subsidies had an upward impact on rents in the 1990’s and the 2000’s with no effect on housing quality and the size of the rental housing stock.

In Finland, a recent study by Eerola and Lyytikäinen (2019) adopts an empirical strategy of a regression discontinuity design similar to Hyslop and Rea (2019). The HA in Finland depends step-wise on the floor area and construction year in addition to the household income and size. This makes the design of the HA tied to dwelling characteristics which provides a pool of ineligible
rentals as well in the market; very different to the AS in New Zealand. When looking at the entire population of HA recipients, their IV estimates of the effect of HA on HA recipients rents are insignificant having a narrow confidence interval\textsuperscript{21}.

In the UK in 2010, the newly elected Coalition Government announced reforms to the benefit system that, amongst others, included the direct payment of the Housing Benefit (HB) reserved for the social housing tenants to the respective household and not their social housing landlords as was the norm for the past three decades (Hickman, Kemp, Reeve & Wilson, 2017). This is interesting because, say for example, I present this policy shift in the UK to reflect an increase in incomes for tenant households in social housing whilst increasing their housing costs by the same amount. This results in keeping residual incomes constant for such households with respect to the policy change before and after the implementation. As incomes increase, households do not opt to demand ‘more’ housing, as they do not perceive their residual incomes to be higher, which is consistent with their budget constraints. Although, the study found that in the aggregate, (some) households tend not to fulfil their rental obligations (Hickman et al., 2017). It seems that the extra disposable income now shifts to other consumption, in the face of extra rental obligations (which equal the income increase). This would suggest that monies confined to accommodation costs, once freely available as cash, do not tend to satisfy their designated purpose and instead may be diverted to other use as evidence from the above study reveals. That is, the social housing tenants not fully paying their rents. This can either suggest financial mismanagement or conversely that housing stress is so high that any money in hand would be better off spent on food than even tenure security. Note, housing allowances are not confined to accommodation costs; they are simply labelled as such.

It seems better and big data coupled with panel settings is helping to provide clearer insights that such income maintenance schemes, if designed well, may inherently be non-inflationary. Again, if no actual demand shifts seem to occur under a housing allowance scheme then elasticity of housing supply is simply irrelevant. And if it is argued that any increased demand could not be satisfied with increased supply (in the short run) which then results in higher rents, then evidence

\textsuperscript{21} Note, as discussed in detail in later sections, the stepwise nature of the instrument or the discontinuity design does not ensure correlation between rents and HA as many households could be getting a higher HA in a lower step region in comparison to a higher HA step region (e.g. floor-wise, construction year-wise, geography-wise).
of increased demand affecting rents can possibly be captured via rent contract renewals. This reflects either rent inflation for the same household without a move and having the subsidy or households priced out of the market by more affluent ones carrying the subsidy. Without a contract revision for the subsidised cohort, the unsatisfied demand or excess demand cannot translate into higher rents, which usually requires some moving and searching assuming not all contract renewals were for existing tenants.

5.3 Debunking theory and methodology in empirical research

Many researchers have relied on the relative price fall for studying rental subsidies; yet, I believe research in this vein has pointed to problems with the manner in which scholars have applied the theory. In order to see this, let’s start from how economics looks at the demand curve; the demand curve reflects the exogenous price and quantity relationship based on the endogenous determinants of demand of which income is a fundamental one. Hagenaars (1986) informs of the determinants of income as the five following categories: (1) individual choice, (2) inheritance, (3) chance, (4) market imperfections, and (5) public income redistribution. The last of the determinants of income constitutes the housing allowance. This suggests that the underlying demand function for the household itself is affected under a housing allowance transfer scheme, keeping prices constant. It is not merely a move along the demand curve reflected by a relative price change. And this unearned income is generated via taxes and distributed as transfers, and the direct effects, especially of transfers, are of crucial importance in reducing poverty. A second, indirect effect of taxes and transfers is that they may affect the choices that people make with respect to labour supply, savings, and possibly marital status and living arrangements (Hagenaars, 1986). And any shortfalls in the labour markets, whether demand-side that relate to wage levels, and /or supply-side which reflect unemployment levels may lead to a shift in effective demand levels for rental housing as well. Therefore, any injections in the shape of housing allowance also affect income levels from outside the labour markets. It should be noted that beneficiary income too leads to shifts in effective demand for consumption goods which may lead to effective demand shifts in all other markets, including housing, in the aggregate (Leijonhufvud, 1973).
Although the un-tied housing allowance is argued to create a relative price difference for *additional* housing among recipients and non-recipients up until the maximum (rent or subsidy) value (Laferrère & Blanc, 2004; Hyslop & Rea, 2016), it certainly does not affect market prices for rental accommodation which remain unchanged. Again, this price relativity alteration only exists in argument (discussed below). In order to understand the subsidy’s economic character specifically, it does not follow the logic that ‘due to the subsidy which now makes housing cheaper, a demand shift is imminent’ but rather the argument for the housing allowance mechanism follows that ‘due to the subsidy eligible renters see a residual income increase and effective demand for relative cheaper *additional* housing for a certain range of rents is absent and beyond that rent as well, where additional housing is not relatively cheaper’. Under such conditions, supply elasticity of rental housing may seem insignificant to some extent. Although, we see that housing allowances have also been argued to be income transfers, albeit sometimes paid in the form of rent rebates or vouchers (Griggs & Kemp, 2012; Susin, 2002; Viren, 2013), researchers have predominantly considered their core property as affecting the relative price (and therefore demand) for housing. Such a position is increasingly probable as various authors including Haffner & Boelhouwer (2006), Oxley (1987) and Turner & Elsinga (2005) have argued that the literature on housing allowances has largely focused on its housing policy objective and this, I believe, can certainly blur perspectives. Note, as per design, demand cannot be impacted (directly) via price but (in a sense indirectly) via effective demand under a housing allowance.

Economists, we know, have long suggested that housing is a normal good, albeit identifying it as a necessity correctly (income elasticity of demand (1<Ye<0). Thus, most researchers on housing benefits anchor their work on the usual economic theory of supply and demand elasticity of price. In addition, their works presume housing for the subsidy cohort to be a normal good (Viren, 2013; Fack 2006; Laferrère and Blanc 2004; Kangasharju 2010; Gibbon and Manning 2006; Collinson et al 2015).
Diagram 5.1: How past researchers theorized cash transfers

a. Subsidy changes relative price (rent), X  b. Housing market equilibrium

Looking at diagram 5.1, I show graphically the argument of how, in the past, the narrative has been shaped under the price theory to conclude housing allowances as market distortionary by design. Subsidy was modelled as a *price* variable; specifically rents. The argument was that the subsidy introduces a (perceived) price decrease (see pivot of budget line in ‘a’ from *L*₁ to *L*₂) leading to an increase in demand for housing as a given from *X*₁ to *X*₂ in ‘a’ and *D*ₑ to *D*₁ in ‘b’ which is not satisfied by the market as supply is fixed / inelastic (see *S*ᵣ in ‘b’) and so rents rise (from *P*ₑ to *P*_₁ in ‘b’). This is rent inflation due to the subsidy on the argument that supply is inelastic at least in the short run. Interestingly, this was never tested in the relevant literature if whether the price increase was, in fact, due to (in)elasticity of supply (Brackertz et al, 2015). Rent inflation under these assumptions can also suggest people being priced out of the market, supposedly by the very poor.

The above theoretical approach implies that the housing allowance is market distortionary to begin with. This is not the case as housing allowances are income supplements and do not change the
price or perceived price of rental housing for renters. Importantly, all eligible households, whether a recipient or not, face the same prices for all goods, housing and non-housing, and the subsidy which is ‘uneared’ income increases disposable residual incomes. Recipient households simply face a new higher after-housing-costs (AHC) budget constraint reflecting the amount of their respective subsidy. Recipient households at each market rent will have a new and different budget constraint under a housing allowance scheme with respect to the algorithm. Thus, they can now buy more of both, housing and non-housing goods. This leads to a hypothesized price line for housing under a housing allowance scheme in the literature which is assumed to represent the budget constraint as seen in figure 5.2 (in next section). That is, the BC now reflects the new price for housing, and this is assumed to exist for each household across the distribution of market rents.

Whereas, in order to see what actually happens, take rent to be R1 in diagram 5.3 for a dwelling in the rental market. Now, assuming there is a housing allowance scheme such as the Accommodation Supplement present, I will show how this affects the budget constraint of an income earning household receiving a subsidy. The diagram includes a budget line for a non-recipient household as well for all market rents. Now a household that is assessed as eligible, call this AS hh, will be given a subsidy amount that is generated in line with the particular characteristics of this household which equals ‘S’. This amount is arrived at by using the algorithm which can, in theory, be hypothesized for all available rent levels as shown by the dotted price line in diagram 5.3. The crucial difference being that this is not a known line or metric at each point under the scheme. This amount is deposited into the bank account of the household every week. And now this is the amount by which this household’s budget constraint shifts out in comparison to if they did not receive this cash transfer. Note the hypothesized price line is unknown to the recipient under the design of the Accommodation Supplement.

As only the (present) amount of the subsidy is readily known to the recipient at their present rent R1, as shown in figure 5.3, the budget constraint thus alters (shifts out) and is fixed in line with this subsidy value, S. And as no prices are altered, under the theory of demand the marginal rate of substitution (MRS) remains constant and so does demand. Whereas a pivot assumes price of one good has changed.
In short, diagram 5.2, which is based on the argument in diagram 5.1(a), argues that rent falls under an allowance scheme whereas diagram 5.3 shows a residual income increase is affected, which is based on the actual algorithm and design of the housing allowance being a cash transfer. Amongst others, Hyslop and Rea (2019) in their study on the Accommodation Supplement accept it as an cash transfer.

Second, modelling them in a capacity that argues relative price change altering demand behaviour also assumes the optimization problem that naturally follows in the case of a rational economic agent faced with price changes proposed under the allowance. That is, the relative price change increases rental demand which, by design, can then increase the subsidy (again) which should then increase demand once again providing yet another higher subsidy (possibly) and this should continue until an optimization point is reached with respect to increasing the demand for rental
housing under the subsidy policy parameters. This dynamic optimization problem has neither been explicitly argued nor incorporated into models in the literature. Revealed preference theory nonetheless deals with this issue neatly as optimization will occur as a result of all available options of discounted rents under the subsidy. In reality, the distribution of discounted market rents is unknown to the recipient thus negating revealed preference. Therefore, modelling the subsidy as price is critically flawed.

In economics, under consumer choice theory demand is assumed to shift when the market price of a particular good changes (i.e. rents change) while keeping prices for all other goods constant thus creating relative price differences with respect to a fixed budget constraint. Researchers depict the housing allowance to shape the budget constraint of a recipient household as shown in figure 5.2. They inherently construct the post-allowance budget constraint of the household at all rent levels. The kink points are the rent levels where the subsidy starts (at entry threshold) and then increases with housing and reaches its limit (at maxima). Although, one can argue that the housing allowance may work to form the hypothesized budget constraint similar to a price subsidy for the recipient household, the fact is that market prices - i.e. rents and rent contracts - under the housing allowance do not ever change as per policy design. Consequently, the decision-making process with respect to demand for housing, in theory, remains intact i.e. marginal rate of substitution (MRS) remains constant. That is, preferences cannot be affected in theory. As the hypothesized budget constraint which is the price line for housing under a housing allowance is unknown to the recipient, revealed preference is not applicable and optimization on the price line is also impossible. Price theory breaks down under the housing allowance design. As Kemp and McLaverty (1998) reveal, HB recipients that plan to move will not know how much money they will receive or how their purchasing power is impacted under the new tenancy until they move and apply for the HB. This is the characteristic of an ex-post subsidy. Now as residual incomes, on the other hand, are altered under all situations within such a scheme, the demand for rental housing is expected to be greater. As no theory is present on the consumption behaviour of the very poor towards rental housing with respect to income add-ons that diminish with income increases, theory was borrowed from economics to argue a ‘demand increase via an income increase’ as housing is a normal good (in studies that may be using the income argument).
To sum up, although under a housing allowance scheme, in theory, a hypothesized price line for housing can be formed at the household level for each household, nonetheless in practice, the ‘actual’ and unique budget constraint corresponding to the present level of rental housing consumption and the corresponding cash subsidy is the true available measure to each household under the scheme when forming decisions and influencing preferences. Note the two distinct populations, recipient and non-recipient, characteristically hold different budget constraints. For the subsidy recipient there exists a boost in disposable residual income; which is the allowance. This primarily can now alter their preferences for work-leisure trade-offs in the labour markets. Collinson et al., (2015) in their attempt to model budget constraints for low-income housing allowance recipients ignore the distortions of the subsidy on labour supply. Whereas, I believe, an income transfer has a higher chance of impacting number of hours worked per week than compel the recipient to move to a different rental accommodation.

The assumption that a housing allowance lowers the perceived price of housing is simply a fallacy in my view. As discussed, other things being equal, any move to upmarket, from levels below ceiling rents, will mitigate the reduction in the share of income spent on housing due to the subsidy (Kemp, 2012 See endnote 11). In New Zealand, under the AS, such a move would decrease residual incomes in all cases (due to co-payment rule). For this reason, when La Ferrère and Blanc (2004) assert that the housing allowance provides a ‘….strong incentive to consume more housing…’, I believe, this assertion is pertinent to the design of the particular scheme and not the instrument of housing allowance itself. However, a particular allowance scheme design that matches the subsidy to rents can surely do exactly that. Furthermore, under the revealed preference doctrine there would be no such issue of moving up in stages, as decision making would be under perfect information (a known price line) and the only move would be to a point on the price line that is optimal.

Recall, similar to most studies the earlier two French studies (Fack, 2006; La Ferrère & Blanc, 2004) assume that the housing allowance scheme incentivizes ‘upmarketing’ where Fack (2006) argues that people will find units at the reference rent and La Ferrère & Blanc (2004) argue that for the large distribution of rents below ceiling rents, there is a possibility of collusion between landlord and tenant on sharing part of the allowance as it burdens neither. Kangasharju (2010) argues that housing is such a basic good that increased resources definitely raise the consumption of housing services, particularly among the poorest households. This is counter to empirical evidence in the
literature on housing allowances not affecting demand. Also, indulging in more housing than already being consumed by the very poor and the poor would seem to be irrational behaviour (as discussed). And as mentioned earlier, any upmarketing reduces the meagre residual incomes of recipients for food and other goods. Most of the studies have a similar view that extra resources would incentivize the recipient to increase housing. This is simply not the case as per the design, structure, and especially the target population of the allowance and, to an extent, in theory as well. Moreover, transfers are typically distributed only to a subset of people or households, not to mention being means-tested systems where rules cannot be clearly specified. Such realisations beg the question whether if it is even reasonable or plausible to apply the general rules of demand theory, let alone presume a uniform behaviour between the two cohorts; the eligible and the general population.

5.3.1 Spatial discontinuity and the housing allowance scheme

Many housing allowance schemes vary in their subsidy limits based on a boundary defining the different monetization levels of the subsidy within and outside of its limits. Therefore one can say that landlords may or may not successfully practice price (rent) discrimination under a housing policy that imposes an arbitrary (presumably) spatial discontinuity for the dissemination of differing levels of the subsidy. As argued by Hyslop & Rea (2016) this could very well be a line going through a neighbourhood within a city, as is the case for Auckland between Area 1 and Area 2 post 2005 policy shift where their study restricts attention to this geographical discontinuity to ensure that the same local housing market factors were influencing both demand and rents. Under spatial discontinuity, the policy parameters provide an asymmetric information set between tenants and landlords as to the access of the subsidy as only tenants have this information, while it provides a symmetric information set for landlords and tenants with respect to the geographical area or the discontinuity as identification of a higher (possible) subsidy. In other words, in the eyes of the landlord a tenant may or may not be eligible (poor enough) for a subsidy but if so, all such tenants in the higher subsidy area would (presumably) receive a higher subsidy than all such tenants in the other area, as a matter of fact. And this monetary difference, it is argued, may create price discrimination with respect to the policy’s spatial discontinuity attribute.
Although such a difference cannot be expected to last over the medium to long run as rents would revert back to their mean. Neither is it true that the higher subsidy area will induce a higher subsidy at the household level in comparison to a household in the lower subsidy area. In other words, housing allowance maximum levels under the policy are based on rents by policy makers whereas the household level of allowance is based mainly on income and asset levels. And this is what makes the area maximum subsidy levels an unsuitable proxy for household subsidy levels. And sample data sets can be more susceptible to the spurious relationship between higher rents and higher subsidy limits than if one was to analyse the population data.

Moreover, I feel that such an approach may be oversimplifying one critical aspect within the argument. It can be understood that, in general, the housing policy does not randomly dissect the two areas as different under the policy parameters, but the fact that the policy advisors identify the two areas as being different in the first place (via some identification process before implementing a change in policy or at inception to form such a policy). The spatial discontinuity defined by the policy presumably manifests in the rents and the price difference is there not because of the policy but rather the policy has been shaped and put in place, as such, due to the price differentiation for rents present in the first place (which is then represented by the housing policy as spatial discontinuity).

Another practical issues arises as it is potentially too simplistic to assume to extrapolate the heterogeneity in subsidy from rent trends where the two different housing sub-markets on each side of the boundary / discontinuity are heterogenous with respect to other variables. Surely, the policy makers identify the inherent difference between two policy zones and maybe within the sub-markets itself before and after the change in subsidy. It may not be simple to extrapolate the two arguments once the subsidy exists.

Therefore, modelling for rent trend differentials (assuming a discontinuing regression line for the two sub-markets) for these neighbourhoods may not be simple, that is, the underlying price variability may not be easily identifiable in the rent equation. These may include various reasons that are neighbourhood specific, to say the least. If not explicitly identified, the policy discontinuity cannot be argued to be extrapolated as the omitted variable bias remains. Hypothetically, assuming no subsidy existed, one could certainly test the two neighbourhoods for rent differentials with
respect to control variables. If insignificant, then the policy of spatial discontinuity would seem impractical in the first place and a policy parameter certainly will not exist or be formed. And in case if the policy exists or is so formed to reflect a subsidy discrimination between these two neighbouring areas having a similar housing market then the policy is clearly set to identify them as different and cannot be attributed to landlord behaviour or any other ‘a priori’ conditions i.e. it may be considered random. And if the two neighbourhoods are significantly different in rents, any difference in subsidy levels in the two areas (spatial discontinuity in policy) is (already) present in rents; possible either due to existing fixed effects, or any other historic, present or future factor or a combination of all of them including the housing policy itself. And this is operationalised by the subsidy formula via simultaneous determination. Simply put, one cannot extrapolate the subsidy effect, if any, within the different rent levels that (may implicitly) exist for the two areas. The subsidy discontinuity follows rents; specifically, some known identifiable (by the policy maker) parameter correlated to rent. Attempting such an approach requires very robust homogeneity assumptions by the researcher for the two specific areas that may be categorically divided within a country’s rental housing market and this assumption would further require that there are no unobservable components that affect the rents and that the fixed time effects are the same for the two areas. Moreover, a clearer understanding of the subsidy, that is, it is a consumption variable at the household level and not a housing market determinant, can help towards comprehending that the regression discontinuity is less probable to be a result of the availability of the subsidy.

Furthermore, formation of rental housing models, it seems, is more a discretion issue with respect to the researcher than a theoretical one. For example, debates on whether user cost of housing capital, property values, or some other concept define rental pricing still remain. Regardless, such experiments are limited and biased in their scope to begin with as they try to study the issues at the boundary, which lacks external validity and falls short of any systemic approach towards questions on policy at the market level. As housing allowance payments have been present in the markets (housing and labour) for over fifty years, and are universal and an entitlement, issues relating to household mobility at inception of policy are most likely to be viewed as redundant now. And housing allowances, just like many neo-liberal policies are part of the data generating process and now inherently are part of the representative markets. An alternative viewpoint may be presented where housing allowances, now an intrinsic part of public policy, impact areas
differentiated via different subsidy levels to reflect rent setting as this is seen as an investment in the local area or as a positive investment for low-income landlords in housing sub-market by the government. Housing allowances may be argued as similar to other government investments that impact land values and reflect in the pricing process creating an inflationary effect in general price levels for housing. Whereas, in this case the housing allowance is a positive externality for the renter and landlord. On the other hand, certain public sector investments can be a negative externality for renting households in the shape of rent inflation, if these households do not reap any benefits from such public sector investments in their areas i.e. new infrastructure, railroad access, parks, new schools, etc.

### 5.4 Critical review of the New Zealand experience

My intention is not to undermine the previous works on the topic and confess that it took considerable examination to decipher the mechanism of the AS policy instrument. The Accommodation Supplement was developed in the early 1990’s with the assistance of American consultants (Morrison, 1995). And recall, welfare programs in the US are fundamentally based on the negative income tax formula proposed in the 1960’s (Moffit, 2003). It seems almost prejudicial to not inform the public of the intricate design and objective of the AS developed by the government. I believe this leads to inefficiencies in the service industry that has been attempting various studies to date on the AS. In addition, it hinders in resolving the unsettled national debates of importance such as the AS being a payment to landlords.

I deal with arguments from previous studies on the Accommodation Supplement. Not fully comprehending that the AS is not purely a housing subsidy and thus not an economic tool for the housing markets is seemingly the main concern. As mentioned in the introduction, New Zealand has, to date, produced three such studies mainly.

I feel past studies may have suffered from conceptual issues relating to the Accommodation Supplement. Before embarking on an exercise of whether the AS influences market rents, one must
attempt to fully grasp the mechanism of the AS instrument within the economy. As the Treasury New Zealand points out:\footnote{Treasury Report T2017/261: Impact of Accommodation Supplement Increases on the Housing Market Released 28 July 2017}

“Estimates from (previous) empirical studies should be treated with caution for a number of reasons…

- separating out the influence of subsidies and other factors with confidence is challenging, generally resulting in significant assumptions, and
- in many cases the method and modelling used are able to explain only a small part of the overall variation in rents.”

(Treasury, 2017, p. 6)

A detailed literature review study (Brackertz et al., 2015) on the impacts of demand-side housing allowances was recently completed which was commissioned by the Ministry of Social Development (MSD), New Zealand. The study attributes explicitly were concerned with research design, appropriate methodology, data, robustness checks and the explanatory power of models. The study, too, arrived at the conclusion that to date, research for New Zealand is not reliable stating:

“However, as the detailed review of these studies (New Zealand) highlights, both need to be treated with caution due to the nature of the data and modelling used…. This type of data and modelling is not well suited to picking up changes in rents…” (p.19).

On Grimes et.al (2013) they concluded:

“There are, however, a number of limitations on the study that draw into question the utility of its findings about the impact of the AS on rents” (p.21).

On Stroombergen (2004) the study mentions:
“… the data and method used are not suited to addressing the research question and there is doubt about the reliability of the findings” (p.22).

Although, on New Zealand, Brackertz et.al (2015) discuss limitations and other related modelling problems exist similar to other studies under the same lens; their review is not an exercise in developing arguments and inference on the specific mechanisms that underpin the housing allowance policy instrument.

I will provide excerpts from previous studies that attempt to tackle the issue of the Accommodation Supplement and rent inflation in New Zealand. The intention here is to find out how each study approached the AS instrument, their understanding of the AS instruments’ mechanism in the marketplace in general, and any modelling issues specifically. It is hoped that this exercise will benefit public and private sectors, and academia equally.

### 5.4.1 Identification of approaches towards the Accommodation Supplement in previous studies

An initial study which was commissioned to Infometrics in 1999 by Housing New Zealand Corporation (HNZC) produced an econometric model for market rents. In 2004, the Ministry of Social Development, New Zealand requested Infometrics to update their work in order to study provider capture of the Accommodation Supplement (AS) i.e. is the AS raising market rents? As per study;

“… (the total value of the Accommodation Supplement benefits paid) …captures the overall weight or prevalence of the AS in the (rental) market.”

(Stroombergen, 2004, p. 5)

“Figures 1 and 2 do not show much of a relationship between the value of the Accommodation Supplement and weekly market rents. Of course, this does not mean that there is no relationship but if one does exist it is camouflaged by other factors.”

(Stroombergen, 2004, p. 5)
“…The weekly value of the Accommodation Supplement in March 2003 was $12.7 m, of which about 17% is paid to mortgagors. The total rental market is about $84m, so the share of the rental market 'affected' by the Accommodation Supplement is about 13%, which would lead one to expect a larger effect than that identified above.”

(Stroombergen, 2004, p. 6)

I believe, Stroombergen (2004) suffered in managing to decipher the mechanisms that underpin the AS instrument on various levels. It is crucial to understand that changes in rent data can change the AS payments data mechanically by design, although this does not suggest that the AS money captures the overall weight of the tool in the rental markets; it can go to purchasing non-housing goods.

“Econometrics tells us little about causation. It can tell us if series are correlated but we must rely on economic theory to provide guidance on causation… we test for (granger causality) and find: …neither the lags of the rate of the Accommodation Supplement nor the lags of market rents are found to be statistically significant in explaining the rate of the Accommodation Supplement.”

(Stroombergen, 2004, p. 7)

“… The Accommodation Supplement by itself is an inadequate measure of the effect of government policies on market rents. A series that combined the Accommodation Supplement, income related rents and the provision of state housing might show a stronger effect.”

(Stroombergen, 2004, p. 6)

A core oversight by this study was that it assumed the AS outlay to be part of the housing market. I would like to point out that the AS would essentially track income and housing poverty and not higher rents (as discussed in chapter 5) whereas income related rent and state housing, both are directly concerned with housing consumption. Nonetheless, granger causation shows us some proof of a non-existent relationship between the two.
The researcher went on to conclude that the AS variable was insignificant and that even if significant, the impulse effect was a rise in rents of $0.05 cents per recipient of an increase of $7 AS weekly payment after a five-month lag. This is so because the AS is in principle an income supplement and does not enter the housing market unless recipients alter their housing demands. The AS may be considered as entering the housing markets, although, if rents increase. This amount will be the change in the AS payment and not the AS amount itself (Laferrière and Blanc 2004).

I believe, the researcher needed to engage further in the definition and construct of housing allowances in general, and towards the peculiar setting of the Accommodation Supplement in particular. Furthermore, the Income related rent subsidy (IRRS) is paid directly to the landlord (Crown) by the government, whereas the AS is paid to a tenant by the government. This raises numerous other issues as discussed with respect to market rents. Brackertz et.al (2015) categorize this study as “flawed”. I would say the study does provide us with some evidence of how the two series are related, that is they lack a relationship.

The other study is where Grimes et al (2013) construct a long-run system of housing equations that constitutes an equation where house price is a function of housing stock, consumption and the opportunity cost of investment, credit restrictions ‘CR’ which capture bank lending behaviour and the Accommodation Supplement. They introduce the AS in their model as:

“Long run rents are positively determined by house prices and interest rates (the one-year mortgage rate). Rents are influenced negatively by expectations of future house price inflation… An additional (positive) short term influence is the change in the average rate of Accommodation Supplement payable to renters.”

(Grimes et al., 2013, p. 8)

Their rationale to use this AS measure in the housing equation may be similar to the reason for inclusion of per capita consumption (Cons), which they do not define fully as being total consumption or housing consumption. At one point in the paper when searching for a proxy for per capita consumption at the TLA level they mention that ‘…coefficient on the proxy variable can be expected to differ from that on the per capita dwelling variable’ before going on to test three
proxies for per capita consumption. Although their choice for proxy selection does suggest ‘total consumption per capita’ is the variable of interest and not housing consumption, what is meant by ‘per capita dwelling’ is confusing (Grimes, et al., 2013, p.19). Either case, it is important to note that any AS payment is reflected in total consumption (and not rents).

“…For instance, the model can simulate the impact of a rise in developer contributions on residential lot prices, thence to new housing supply, house prices and rents. In doing so, population and incomes of an area are assumed to remain unaffected…”

(Grimes et al., 2013, p. 12)

Grimes et al (2013) model assumes that ‘population and incomes of an area are assumed to remain unaffected…’ which presents a view that the study approach adopted suggests that although labour mobility (population variations within and across areas) is assumed constant (at this stage), it nonetheless also suggests that incomes (i.e. benefits, tax credits, transfers, and accommodation supplement which reflect present incomes) are also assumed as constant (or taken as fixed effects via trend terms). This means that their simulation models can study only AS shocks and not AS trends.

“… Rents (relative to house prices) may also rise as government rental assistance (accommodation supplement) rises. The effect of this policy instrument will depend on the elasticity of supply of new landlords…”

(Grimes et al., 2013, p. 14)

“In practice, the AS scheme is sizeable; the average proportion of rents paid (over 1996-2012) for those in receipt of AS was over 35%.”

(Grimes et al., 2013, p. 35)

This suggests that the researchers presume that the Accommodation Supplement is used to strictly pay rents, whereas it can be used to consume any type of good and service, housing or otherwise. Theoretically, AS payments can be argued to be covering accommodation costs but, in practice and essentially for modelling purposes the aggregate accommodation costs in a steady state remain
constant before and after an AS transfer or whether a housing policy scheme exists or not in an economy. Thus, the policy’s effects are not strictly dependent on the elasticity of supply of new landlords. It is true only if the AS shock induces a housing demand shock as well.

“… The higher (AS) homeowner transfer level is realised as a higher level of income that can only be spent on housing. This results in a higher long run house price, which begins to increase in the second period after the shock. The higher rate of assistance to renters puts short run pressure on rents…”

(Grimes et al., 2013, p. 48)

Again, the AS is not a tied housing transfer payment and may be spent in anyway the recipient prefers and it is incorrect to argue that it will only be spent on housing. Although, they point to the fact that AS owner-occupied low-income households as having an increased ability to pay their mortgage via the AS, this has no direct bearing on the housing markets and instead affects the banks income and hence capital position (this mechanism was discussed in detail in chapter 4). In a steady state, the shock provides more consumption income for the mortgagee household with the same mortgage.

Mortgage payments are payments to banks in connection to money borrowed from banks. The house price may be rising as banks are privy to information on clients receiving the transfer and thus may be providing loans to clients as their (Banks) incomes are more secured with such clients, where after a shock each new mortgagee can now pay slightly higher, keeping all else constant which can allow the bank to increase their interest rate for that client in line with the AS policy shock. This bias creates (policy structured) induced demand raising prices presumably. As Kemp (2000) points out that ‘For this reason, landlords, and the banks that lend mortgages to them, have tended to be wary or critical of proposals to cut or reform Housing Benefit (in the UK).’

These payments however can work to influence the level of the bank’s capital position by increasing loan repayment security levels, which under the authors’ assumptions are a proxy for credit restrictions (CR). Therefore, they can decrease ‘CR’ and increase loans which tend to push house prices up. Then again, as for the subsidy, AS homeowner payments can be used for any consumption purposes and therefore can suggest only to assist in insuring towards better
compliance with mortgage payments by these recipients. There is no direct channel from the recipient of the subsidy into the housing market in this case as argued by the authors. Moreover, new knowledge in the literature (Werner, 2014) and from within the financial industry (ECB, 2014) now suggests that a bank’s ability to lend is not constraint by the banks reduction in capital due to non-performing loans as was assumed by Grimes et al. (2013). Banks instead extend loans at will, without having money to lend. Therefore, the Credit Restriction assumption in their model is no longer valid.

The more interesting conclusion is captured in the following paragraph;

“Higher rates of accommodation supplement for homeowners place upward pressure on house prices. We find no evidence that rates of rental assistance have any direct impact on house prices. However, as noted above, the rental and ownhome assistance rates are highly correlated. Accordingly, our ownhome assistance variable may be proxying for the influence of the accommodation supplement scheme as a whole. We therefore caution that the AS estimate should be considered as a broad AS scheme influence and not treated solely as an ownhome assistance estimate.”

(Grimes et al., 2013, p. 24)

The AS scheme to renters is around 90% with only a meagre 10% that goes to own home recipients. Still, the authors argue that the rental assistance (variable) which represents pretty much the entire scheme and has no impact on house prices needs to be lumped with the ownhome estimate in order to perceive the AS scheme as a whole. Interestingly, camouflaging the true results that inform us that the small ownhome part of the AS scheme is market distortionary. Nonetheless, the overarching limitation of this study is that the data for the AS is only available at the national level i.e., one aggregate value for each year, whereas the study is at the territorial level.

The two recent studies on the Accommodation Supplement in New Zealand, which have been initiated, in parallel, by the Ministry of Social Development include another government transfer payment as an add-on to the Accommodation Supplement called the Temporary Additional Support (TAS). I would like to explain that, firstly, the TAS is only a 13-week emergency payment and therefore does not essentially play a substantial role towards consistent support all throughout
a tenant’s tenure. Secondly, it is a “temporary financial assistance within the prescribed limits as a last resort to alleviate the financial hardship of people whose essential costs\(^{23}\) cannot be met from their chargeable income and other resources…”\(^{24}\). This suggests that, this too, is not a payment exclusive to rent. Thirdly, the TAS is a “financial assistance” and therefore is classified as an income supplement.

“There are a variety of other payments (including Temporary Additional Support) which act as add-ons to the Accommodation Supplement…”

(Rea & Thompson, 2017, p. 7)

“Temporary Additional Support functions as an add-on to the Accommodation Supplement when a person has high housing costs relative to their income and other outgoings. In virtually all cases individuals receiving Temporary Additional Support also receive the Accommodation Supplement.”

(Rea & Thompson, 2017, p. 10)

In contrast, a very high proportion of AS recipients also receive the main benefit (which equals, as mentioned in their own study, 67% as at September 2016, of all AS recipients). As the study does not consider the main benefit as a determinant or an add-on to the AS, therefore this is inconsistent where only TAS is used as an add-on to the AS. Furthermore, to a question as to “How much is paid in Temporary Additional Support for accommodation each year?” in a Government Treasury document the responses included\(^{25}\):

“We cannot identify the proportion of TAS that is solely for accommodation costs.”

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\(^{23}\) See Social Security Act, New Zealand, 1964. Section 61G (7) where: ‘essential costs’ means the sum of a person’s allowable costs and standard costs. And, ‘allowable costs’ has the meaning prescribed in regulations made under section 132AB; but does not include standard costs; and ‘standard costs’ has the same meaning as in section 132AB(1)(b)

\(^{24}\) See Social Security Act, New Zealand, 1964. Section 61G (1)

“As above (these amounts are not just for accommodation costs). As at 28 April 2017, 62,000 people receive TAS and they receive an average of $63 a week.”

(Treasury, 2017, p. 15)

And lastly, even if TAS is to be considered as an income increase (as explained earlier) and therefore may affect outcomes in studies approaching this issue in terms of bargaining and negotiations as the fundamental channels into rent, principally the TAS is independent of the Accommodation Supplement. Combining the two will necessarily neither provide clarity on either in terms of their influence on rents individually as a policy metric, and more importantly on the question of the housing policy imperative under scrutiny.

Rea and Thompson (2017) define the Accommodation Supplement as:

“Non-taxable second tier benefit that provides assistance towards a person’s accommodation costs. Approximately 290,000 recipients and a fiscal cost of $1.1 billion in 2014/15”

(Rea & Thompson, 2017, p. 7)

Note that the Accommodation Supplement is not an “assistance towards a person’s accommodation costs” but rather is an assistance ‘to a person having high accommodation costs (relative to income)’.

“The Accommodation Supplement is currently the government’s largest direct investment in housing…”

(Hyslop & Rea, 2016, p. 5)

Conceptually, this is an incorrect statement, as it is not a “direct investment in housing”, but rather is an injection to incomes, measured by using housing costs relative to incomes, and therefore is an investment which may lead to an overall increased consumption demand of the affected cohort (albeit with an income redistributive effect).
Hyslop & Rea (2016, p.9) mention that in the case for New Zealand, where:

“…the subsidy is tied to some percentage of the actual rents paid by the recipients, up to some maximum. For recipients with rents not constrained by the maximum payment, a high rental subsidy rate is likely to induce more housing demand as it reduces the relative price of housing, as well as increasing incomes.”

If one looks at the proposed changes that are being discussed by the government for the AS effective from 1st April 2018, we see two measures, namely the generosity of the subsidy (maxima) and the shared assistance towards accommodation costs (co-payment) are being considered for revision. The first policy change will affect all households that are renting above the ceiling at present, whereas the second policy tweak affects all clients via a 5% increase in the subsidy’s marginal rate towards rents in excess of 25% of beneficiary gross income for that household type. Hyslop and Rea (2016) argue that a ‘high rental subsidy rate’ will induce more housing demand. As for recipients with rents not constrained, a change in the ‘maxima’ rate does not change their subsidy whereas a higher co-payment or subsidy rate usually translates into a few dollars depending on incomes and rents where it is relatively greater at higher housing stress levels. It is an empirical question as to whether these two policy changes amount to substantial residual income shifts that induce renters to, in fact, move and for higher priced housing. Although, for any subsidy rate below 100% a higher housing demand would always lead to lower residual incomes. Note that the maxima change only affects households that already face the highest levels of housing stress i.e. at and above constrained rents. In the end, the policy change that actually came into effect from 1st April 2018 was only regarding the subsidy maxima levels changes.

All these studies, I feel, fall short in addressing the channel by which a housing subsidy such as the AS could, and if so would, increase demand. They each individually mention that the subsidy may increase housing demand, never fully charting the (correct) mechanism of how it actually translates into the economic system of households and who really are these households. They

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26 The (proposed) 2018 Accommodation Supplement changes improve residual incomes for around 136,000 families, who on average gain $35 per week. This lifts around 14,000 families out of what the Ministry of Social Development considers is severe housing stress (i.e. defined as having equivalized residual income less than $180 per week). Source: Regulatory Impact Statement, NZ Budget 2017 Family Incomes Package, The Treasury.

collectively tend to incorrectly think of it as a monetary injection in the housing markets, especially maintaining that the allowance drops rents which induces more housing mimicking this theoretical model across mostly all recent studies on impact of housing allowances on rents.

### 5.4.2 A critical commentary on the approach (not methodology) of the most recent NZ study

The most recent study for New Zealand (Hyslop & Rea, 2019) uses administrative data specific to subsidy recipients to provide new insights into the instrument although the study is thus confined to recipient segment of the rental market only. This limits an opportunity for a systemic analysis of the rental markets with respect to the effects of a housing subsidy in terms of public policy analysis at the market level.

Hyslop and Rea (2019) study price discrimination with respect to A.S recipient households using spatial discontinuity as a quasi-experiment. Their study is based on the subsidy differences at the border between two geographical areas that carry different levels of the subsidy. Note that this limits the analysis at the border, specifically a 1 km wide ribbon only on both sides, which can be considered as being somewhat insufficient representation of the general subsidy cover. Rather, any inference on the three borders that define the four distinct divisions for subsidy payment variations across the entire country may not be sufficient to draw conclusions for effects of housing subsidies on overall rental markets. In short, the external validity (beyond the 1km ribbon on borders to simply compare the two areas) of such an experiment is at best questionable.

Most surprisingly, I noticed that Hyslop and Rea (2019) consider the Accommodation Supplement to be a cash income payment whereas they argue the use of price elasticities for the analysis of any predicted impacts of a housing allowance on rents. Also, they use price theory for their study. This, I feel, seems inconsistent, in the least.

“The AS provides cash payments to low income individuals and families…”

(Hyslop & Rea, 2019, p. 1)
Nonetheless, the conclusion of this study which is restricted to renters receiving the AS in narrow ribbons either side of the boundary is that the discrete policy change in 2005 which increased the subsidy maxima levels also increased rents. Their concluding discussion is as follows:

“In the second year following the policy change (thus allowing for time lags for tenancy rents to adjust) total accommodation support was $6.81 per week higher inside the boundary for the new zone. The full sample estimates show that rental payments increased by $2.44 per week more as a result. Larger rent increases were also observed among those who received larger increases in accommodation payments…..Panel data analysis shows that much of the measured rent increase occurred with the formation of new tenancies.”

(Hyslop & Rea, 2019, p. 15)

In the case of Hyslop and Rea (2019), the AS will, by design, increase as there is no constraint on the formula for most of the households due to the recent maxima policy shift upwards. Whereas prior to the policy shift, the maxima was unchanged since inception in 1993 which led to mechanically delinking rents and subsidy in the following years which consequently would show no trend in rents and AS for data approaching 2005. As the new maxima in 2005 are chosen by using 2003 lower quartile rents, in a few years beyond 2006 no rent renewal at the household level will, again, mechanically reflect a higher subsidy. Here, the $2.44 increase in rents would also mechanically generate (2.44 x 0.7) $1.7 in additional subsidy to assist all (average) eligible unemployed households towards rents. Also, as expected, given the policy change increased the maximum amount of AS payable on the inside, they find larger increases in both subsidies and rents for recipients at the higher end of the rent distribution. This is in line with the structure of the AS algorithm (see figure 5.2, as rents rise so does the gap in the hypothesized price line and the non-AS households budget constraint rise giving more subsidy).

Note, any study or analysis at the household level which looks at the data at or near the maxima policy shift (increase) will be susceptible to the reverse causality issue. Reverse causality or simultaneous determination is certain at the household level at this point in time (new policy) as the AS is mechanically linked to the rent distribution albeit for a limited number of households that now fall below the (new) rent ceiling which prior to the policy shift were above the old rent
ceiling. At their present rents under this discrete policy change, all households that were above the (old) maxima and now fall below the (new) rent ceiling will get an increase in AS, impacting the average AS rate, which will be dependent on their level of income and cash asset wealth. The increase in AS amounts following the policy shift will equal the increase in household residual incomes (all else constant). And all households which experience a rent renewal/tenancy change in the very near future will experience a further increase in AS in proportion to their rent increase using the marginal rate of subsidy although adjusted/abated using each households unique income and cash levels. All rent increases, whether the existing annual trend rent growth or rent inflation over and above the trend, will generate a greater subsidy mechanically. Recall, Hyslop and Rea (2019) conclude that most of the impact on rent was associated with tenancy changes.

If the economics and mechanism of the AS is to be understood, the discrete policy change in 2005 impacts the residual incomes of the cohort that was renting above the old rent ceilings. And if argued that this increase in AS impacts rents once the tenancy lags are accounted for, all such households will also experience a new level of AS above the post-policy level dependent on the new rent. This cohort is entirely mechanically linked to have their AS payments increase with rents. And their new tenancy is based on their previous residual income levels and only once this tenancy is secured will they receive the new higher AS payment based mechanically on the new rent constraint by the new maxima. Therefore, a new tenancy (rent increase) for this cohort will increase their AS over and above the (initial) increase of the AS from the policy shift. For some period at and post policy change in ceilings the ‘allowance part’ of the algorithm will not simply be a benchmark, it will work as a variable.
6 Housing allowance mechanism and impact on markets

6.1 Housing allowance scheme

At law, the Accommodation Supplement for rental households (aims to) extrapolate those households from within the housing markets that, in particular, are part of the rental market segment, and fall within the policy’s implicit economic parameters (i.e. rent thresholds, income cut-out, and asset limits). The recipient population is to be renting a priori. Under the policy the target population will receive direct cash into their bank as per formula. This is an income injection to after-housing cost incomes based on identification of renting households defined broadly on the household’s family size, wages, wealth, and location. This raises residual incomes. In pure economic terms, existing renting households that are eligible under the policy have higher disposable residual incomes than before. Technically this transfer payment lowers the housing cost burden statistic (keeping rent constant). In general, the residual income rise alters the purchasing power of the household while keeping all prices constant.

In the case if households desire to move dwellings, they do not know how much money will be transferred to their accounts under the new rental contract which they have to sign before they get the final subsidy. Tenants do not know at what rent level does the subsidy cease to provide partial cover of additional rents as well. Nothing related to the subsidy is obvious in relation to rent pricing at the outset for the recipient. With respect to income and savings, this too is ambiguous for a tenant to figure out. There is a website that gives a general idea of how much one could possibly get but this in no way is a public guarantee. The actual payment amount is only confirmed once the new contract is signed, rent bonds deposited (usually four weeks rent) and realters commission incurred and the rent deed provided to the Ministry in charge of the subsidy.
6.2 Characteristics of the Accommodation Supplement

Re-distribution of income

The Accommodation Supplement being a transfer payment by the government from the taxpayer to the targeted population (low-income poor with high housing stress), would, in theory, suggest that there would be no increase in aggregate consumption, assuming a constant propensity to consume across all cohorts in the economy. This is what defines it as having a redistributive property. This is unlike when the government may borrow to spend on the economy similar to the ‘New Deal’ in the US under President Franklin D. Roosevelt between 1933 and 1939, in which case one can argue the merits of such a scheme to reap increased consumption spending, in the aggregate. This distinction is mentioned as inflation is a monetary concept and while AS monies are not borrowed or created monies (via seigniorage) rent inflation is nonetheless still a concern under the scheme in the literature.

Un-tied transfer income

The un-tied cash transfers are additions to income with no ties or obligations in relation to their consumption by the recipient. The recipient may spend this increase in income however and in any way, they deem desirable. In theory, the un-tied assistance will offer the recipient the maximum choice in relation to any consumption shifts that may follow such a cash transfer. Such instruments, in general, do not impede market forces therefore comply with principles of welfare economics (Haffner & Boelhouwer, 2006). Market failures can be prevented in rental markets when an income transfer is not tied to a certain dwelling (Barr, 1998). Thus, in the case of a pure ‘un-tied’ transfer such as the Accommodation Supplement for housing in New Zealand, the housing consumer, in theory, can pick the exact level of ‘desired’ housing consumption and consumption of all other goods and services. It is, therefore, crucial to understand that the cash subsidy in New Zealand, by design, has no underlying condition which suggests that it is tied to paying rents. This may present a conceptual problem for the researcher when deciding on how to incorporate such an instrument into a theoretical model for the purpose of empirical testing as has been the case in previous studies (Brackertz et.al, 2015).
**How to measure generosity of income**

Fundamentally such a subsidy alters residual income levels (for the recipient) and not disposable income levels as it is only available to people who have (incurred) positive housing costs. Also, it is argued in the literature that as the subsidy is conceptually perceived to reduce the rent burden (rent/income) one should alter the rental value in the equation by the amount of the subsidy to reflect such a reduction (Kemp, 2012: see endnote 10). I believe, a more plausible measure and arguably more appropriate in dimension would be to increase the income and not reduce the rent when using the ‘rent burden measure’ tool, as rental obligations remain unchanged for the recipient.\(^{28}\)

A housing allowance fundamentally shifts the residual income levels although *conceptually* it reduces the rent burden. For instance, a housing allowance subsidy reduces a households housing stress level (rent/income), in principal, by *suggesting* that their rents have decreased relative to income. This is to say market rents have decreased by the amount of the subsidy. In practice, the landlord still receives the (higher) market rent as opposed to the rent amount suggested to calculate the housing stress levels post subsidy in the literature. Rental receipts for the private rental housing markets remain the same in the aggregate, with or without such a housing allowance scheme present.

A reduction in rent burdens typically suggests that rents now are a smaller proportion of income in comparison to when no housing allowance cash injection was available to the household. Notice that essentially a housing allowance does not augment rent levels nor does it, in any way, alter rent receipts of the landlord, but instead increases the after-housing-cost (AHC) disposable income for the household. An important spill over is a possible increase in demand for all goods including housing.

*Housing consumption levels*

The AS scheme has a mix of rules that prevent ‘over-consumption’ as well as promote an incentive to shop towards finding a better deal. As full rent increases are not subsidized by the AS and the

\(^{28}\) This distinction will be revealed more clearly in the following chapter/s where I show how the allowance is, in general, relative to incomes.
tenant only receives 70% of any increase in rents (only if under-consuming) and in addition also has to pay 25% of any gross income increases over time towards rent (reflected as a reduction in AS payment), such a design, is argued in the literature, can incentivize behavior when searching for a dwelling that best fits ones’ housing needs. And, in principle, as the AS scheme carries a subsidy maximum payment, it is also argued that this sends a price signal to the consumer to search for the ‘best deal’ or conversely to optimize on housing costs relative to the maxima, if moving to a new house. Although, the 1991 reforms specifically target to encourage families “to find only as much accommodation as they need” (Luxton, 1991). Also, recall that in practice, the AS policy is not explicit with respect to rent ceilings that could arguably influence behaviour.

In the case for housing, the AS being an income supplement, does not enter the housing market unless recipients alter their housing choice due to the subsidy in which case the amount that can be perceived to enter the housing market would depend whether renting below or above ceiling. If below, this would mimic the co-payment value of the subsidy covering the additional housing demand within the formula; whereas if above, it would be nil. Alternatively, the AS may conceivably enter the housing markets when rents increase (no move). This amount will be the change in the AS payment due to the change in rents (based on AS formula) and not the aggregate AS payment itself. Note that only AS households renting below ceiling rent will receive an increase in their AS payment in case of a rent rise. Nonetheless, in both cases, the amount will be simultaneously determined mechanically at the household level.

**Endogeneity of the Accommodation Supplement**

The variable of housing allowance is very peculiar in its structure indeed. It can be seen as exogenous and endogenous at the same time with respect to housing markets. It can be viewed as having attributes that arguably can show up as a capitalisation on rents and/or house prices or both.

The *endogenous* rent element present in the housing allowance variable is fundamentally part of its structure. The AS variable is a partial function of rent for a range of market rents (between entry threshold and rent ceiling) for each household type and geographical location. In addition, the housing subsidy variable is *correlated* with the independent variable of household income, that is,
‘income’ is a core part of the equation for a housing allowance. This would also suggest some multi-collinearity although, in economics, much of the analyses suffer this fate.

AS generation has partial endogeneity (simultaneous determination) with rents constrained by the allowance algorithm as the two are mechanically linked to a degree. This, in no way suggests endogeneity between rent revenues and the AS, based on changes in demand. AS is a consumption variable and not a housing price variable and is constraint to a target population which is why the endogeneity of rent demand and the subsidy is, at best, absent. The algorithm churns out the subsidy amount (mechanically impacted by rents in some cases) which is then simply allocated towards consumption expenditure. Issues of simultaneity (price) can be an issue where the subsidy specifically increases rental demand in an economy.

The maximum amount of housing allowance for each category of household is determined by the government and neither the tenant nor the landlord can affect it. Regardless of markets, prices, and or disequilibria, the maximum amount that each category of renting household (as per rules) receives does not shift or change. The shift in this parameter is controlled exogenously by the government. Therefore, in this respect, I consider the housing allowance, in part, as exogenous.

Furthermore, there are other exogenous elements present within the housing allowance as well; such as the choice of entry threshold, the choice for income cut-out limits and cash asset test limits, including the value of the main benefit, and most importantly the maximum subsidy amounts. Also, the marginal rate of the subsidy is exogenous. In particular, the main benefit and thus entry thresholds are indexed to the annual CPI, cash asset limits along with subsidy maxima are kept stable whereas income limits are a function of annual median incomes.

A.S is surely partially endogenous, in theory, with rents but we can certainly test this for our data as well (limited by the testing restrictions obviously). Alternatively, we can begin by trying to understand that the setting of limits exogenously (as policy) plays an important role towards this phenomenon. The endogeneity issue may not be as severe or strongly enshrined within the rent data primarily based on the precise subsidy framework for the rental housing market.
Setting of maxima limits

When setting or designing the first part of the algorithm, that is the allowance part, the subsidy maxima limits (for each household category and geographical area) are chosen, so to speak, to make this part more of a benchmark or fixed variable within the algorithm. For this purpose, the policy makers identify a maxima value which would be reached with rents that are mostly near or below the lower quartile market rents of the day. Thus, any present market rent plugged into the A.S formula results in a subsidy value that is very close to the designated maxima limits under the policy for that category of household and area. The identified rent usually has been the lower quartile rent from two years ago under the previous policy shifts. This results in any future anticipated rise in nominal rents having a progressively lower effect on expenditures on A.S with a rapid saturation of a direct relationship between these two variables. In this way, the implicit endogeneity between rents and A.S is quickly eliminated.

In an effort to delink the two, the housing allowance policy makers in New Zealand, in the past, have typically used a value of 40 percent of median rents of a previous period (usually 2 years in the past) to set subsidy ceiling limits towards its intended capacity in assisting (rising) housing costs. In recent history, it has kept these subsidy limits stable for a period of 13 years. The Accommodation Supplement has been recently revised to reflect new limits and shifts that define a new geographic mix whilst keeping the total number of area divisions still four. These changes are effective 1st April 2018 and the new subsidy ceilings are based (again) on 40% of 2016 median rents. The previous adjustment was seen in 2005 where the subsidy ceilings were based on 40% of 2003 median rents. For comparison, similarly in the US, the voucher system uses an area’s Fair Market Rent (FMR) adjusted for number of bedrooms which is equal to the fortieth or fiftieth percentile of estimated local housing rents as determined by HUD during the prior year (Eriksen & Ross, 2015). And in the UK, the housing benefit (HB) has its local housing allowance rates based on the 30th percentile of local rent levels for the applicable property type (Brewer et al., 2019).

I attempt to show the relationship of any link between the two variables at the aggregate level in figure 6.1. Plotting the aggregate first difference for total rent revenue of the private rental sector of New Zealand and total A.S (rents) expenditure of the government one can see no significant correlation between the two at the outset. Although one would expect that rent changes would lead to A.S (rents) shifts as per the A.S formula and underlying objective, instead the figure provides evidence not in favour of any relationship. In effect, the implicit endogeneity in the structural form is not transferred into the data generating process for two very distinct reasons. Firstly, because of the presence of the exogenous element having the ability to set the policy limit arbitrarily and; secondly, the proximity of the set limits (by choice) that produce the subsidy maxima near lower quartile rents of a previous period in each jurisdiction.

Furthermore, this endogeneity within market rents is limited in its magnitude with respect to the proportion of Accommodation Supplement recipient households to total renting households in the residential rental housing market. Which is to say that any increases in market rents for non-recipient households do not translate into higher Accommodation Supplement payments for recipient households (renting below ceiling) as a matter of fact. A lack of rental market segmentation by landlords within Area Units with respect to recipients and non-recipient households also helps to undermine any argument for systemic capitalization of the

**Figure 6.1: Are rent changes leading Accommodation Supplement payments? Looking for endogeniety**

Source: Author’s own calculations using MSD and Census data.
Accommodation Supplement into higher rents in the rental housing market of New Zealand. In addition, another problem of endogeneity has been somewhat removed by identifying subsidy amounts based on family size and not the size of the rental dwellings (i.e. number of bedrooms). This typically removes the endogeneity by individual choice that could affect subsidy amounts (Viren, 2013).

### 6.3 Accommodation Supplement, housing, credit, and the household – Schematic view

I present a steady-state framework for household demand for consumption in an economy with a demand-side housing allowance cash transfer in a schematic diagram below. The system consists of the primary markets such as labour, product (consumption), housing, and credit markets.

My model shows how monies which are transferred to households as housing allowances under specific policy parameters can be consumed. Such monies do not alter market rents directly, as per policy regulations, for the rental households receiving them. The AS is a function of (types of) incomes (wages, benefit, other transfers), savings, market rents, and other housing policy parameters. The government disburses the funds that are an add on to the income flow of a household. And only households already renting and paying rent can get the AS. Rents are paid at market rates by all renters in the private rental sector whether a recipient of the AS or not.

It is argued that the Accommodation Supplement can affect rents via a possible mechanism if this excess cash is utilised to satisfy rising bid and offer matched pairs in a market resulting in revised equilibrium rents (Susin, 2002). Whereas (basic) incomes would determine your ability (and willingness) to afford given rents, it is argued that any transfers, pay raises, tax cuts and tax credits tend to influence your willingness (and ability) to match increases in rental bids with competitive matching offers resulting in bidding up the rents under such a bargaining game. This also suggests time consistency as bid and offer match to give new equilibrium price at any given point in time.
Figure 4.2: A demand-side steady-state household framework with an Accommodation Supplement

Exogenous

Labour Markets

HNZC

Government

Central Bank (OCR)

Endogenous

Bank marketing for home loans

“Push” demand for home buying and selling

Income (Y)

Transfers

Savings (s)

Households

Mkt. Rents

Mkt. Rents

Subsidised Rents

(b/4 + Y/2 above b ≤ mkt rent)

Mkt. Rents

Consumption (non-housing goods)

I.R.R.S

Demand creation

Product Mkts

State Housing (Crown)

Low-income Housing stock

Housing Mkts

Private Rental Mkt

Real estate buying

Effective demand creation via AS

Monetary policy (LVR limits + caps)

Int(r) + Principal (Y + Money destruction - double-entry)

Money Creation - Double-entry book keeping

Loan - Liability (credit entry)

Loan contract - Asset (Debit entry)

Reserve Ratio

Deposit

MONIES

House price (HP)

(HP = \lambda HP + (1-\lambda) HP

Loan/Credit + Deposit

where \lambda = 0 \leq \lambda < 1)
One argument can be that as cash transfers are a consumption variable and consumption data can have lagged effects, impacts can show up in the following period making lagged effects a consideration.

It is possible that such monies can affect the ‘effective demand’ for consumption of non-housing goods as any additional income may be utilized more efficiently for food, medicine, energy, and transport instead\textsuperscript{31}. It is similarly likely for such monies to go towards consumption of housing as well. And if so, they can impact demand for housing at the household or collectively at the aggregate level as an increase in overall disposable incomes and disrupt prices (discussed in detail in the following sections). Therefore, the Accommodation Supplement may possibly influence rents. Housing allowances are now a part of the economic landscape synonymous to income tax for example. Abolishment would certainly affect purchasing power and, in turn, can possibly reprioritize household budget constraints with respect to housing demand, especially for the low residual income households in particular.

As discussed, AS monies can have an effect on house prices due to the nature of the subsidy that is reserved for homeowners. One comprehensive empirical study by Grimes et al. (2013) found that the subsidy does affect house prices positively, consistent with what I present as a structural characteristic of the subsidy. Alternatively, a landlord is not in any position to choose a tenant from the market that can promise a stream of (partial) rental payments guaranteed by the state. This results in symmetric information for a transaction to acquire housing (to own via credit) within a subsidy framework in the case of a homeowner, and asymmetric information for a transaction to acquire housing (to rent) within the same subsidy framework in the case of a renting sub-cohort. And a symmetric information set under a housing allowance scheme favours subsidy capture.

This asymmetry in policy (in favour of credit lenders) is possibly price distortionary for house prices and, in turn, possibly rents. Thus, in the case of a new subsidy entrant into the housing markets, if they belong to the rental segment then the subsidy possibly follows the Pigou-Dalton (P-D) principle, whereas if they belong to the homeowner segment it can be assumed that the subsidy may not follow the Pigou-Dalton principle, where the unidimensional Pigou-

\textsuperscript{31} Food is the second largest item of expenditure in a household’s budget constraint following housing expenditure (rents) as seen in the data from the Household Economic Survey (HES) in New Zealand for various years.
Dalton transfer principle demands that a regressive transfer in income—a transfer from worse-off (poor) to better-off (rich)—decreases social welfare (Bosmans, Lauwers, & Ooghe, 2009; Viren, 2013).

**Private Banks, money creation and housing demand**

The banking system creates money in the form of bank deposits, when it makes loans. Using the double entry book-keeping, the bank debits “Loans” and credits “Deposits”. Deposits are, in effect, liabilities of banks to their customers. Whereas, loans, in effect, are a new asset which increases the value of its assets. These deposits are ‘backed’ by risk-bearing financial assets like mortgages etc., and a small amount of cash held at the central bank as reserves (Dyson, 2016). Which is to say, the ability to issue new loans also increases the capacity of the amount of new loans that the bank may issue, as these increase the value of ‘backed’ assets. Money creation is a function of new loans, and not a function of the banks’ reserve ratio and real cash deposits (Werner, 2014).

In theory, house prices are determined in the marketplace for housing. This property of house price determination suggests that future house prices may only be predicted and cannot be managed. Certainty about future house prices in any market is uncertain. Whereas for a ‘credit-driven induced-demand model’ for housing markets, one can assume future house price to be, in part, controlled by the credit lending industry in the market (Aalbers, 2018). This seems true in the case of New Zealand housing markets (see figure 6.3).
Banks can choose to increase their willingness to lend to a wider range of borrowers, and also weaken their lending criteria. This additional lending causes the economy to grow and house prices to rise, which, in turn increases confidence in the economy in a pro-cyclical, self-validating process. This behaviour of banks is most reflective in the housing market (Turner, 2015). In practice, credit lending markets tend to be oligopolistic. Under such conditions, the credit lending industry has greater control over future house price determination than if under competition. In addition, countries where central banks facilitate lending to commercial banks at promised rates, assist in effectively eroding competition among commercial banks within those economies.

Income levels, in the case of first home buyers, no longer seem an overriding driver for housing demand. Any required level of income in a system that may be sufficient to purchase a housing unit is a function of the loan-to-value ratio (LVR). Income in itself does not facilitate a transaction and therefore is a weak demand determinant in some sense. On the other hand, some housing transactions may require a zero-dollar deposit. Conversely, even if all sufficient requirements of income levels satisfy the LVR principals of the national housing finance system, the effective demand for housing is dependent on securing bank credit for that transaction. This effectively puts the demand determinant for housing to be a function of the decision-making process of the bank. This is formalized by the Central banks as well, under a
policy known as “window guidance” (Werner, 2015), whereby the Central banks direct commercial bank activity towards lending to specific industry/s at specific times with a level of lending exposure that is specifically defined in terms of the extent or level of exposure (the ‘window’). For example, Post COVID-19 the Reserve Bank of New Zealand introduced the NZ$ 28 billion Funding for Lending Scheme (FLS) to begin on 7th December 2020 for commercial banks to lend out cheap money (for housing)32. Although, the precise details of such internal banking decisions are often confidential. And such an economic practise detrimentally leads to mortgage slavery incentivised by homeownership (Wood, 2016).

Economic identity of income and consumption

Banks are not considered as mere financial intermediaries any longer and are essentially creators of money supply via avenues such as credit lending amongst others i.e. level of securitization etc. (Bush, Knott, & Peacock 2014; ECB, 2011; Werner, 2014). This should fundamentally require researchers to revisit the economic identity for incomes which we know is given by:

\[ Y + T = C + I - t \]  \hspace{1cm} (6.1)

Here total income equals total output for a given period, where earned income (Y) and transfer payments (T) equals consumption (C) plus investments (I) less taxes (t). This identity does not include the “access to credit” or “credit availability” (CA) by households which essentially introduces some quantity of new demand within the household budget constraint and the economy at large, which is in addition to any ‘effective demand’ that may have resulted as a consequence of general equilibrium constraints separate from the supply of this new money into the economy in this period. As credit equals debt plus servicing, all credit injections enter the identity as additive whereas debt plus servicing (D) can be included as a deduction. New money (via credit), such as consumer credit and housing credit, therefore, enters into the economy in that period whereas it can dampen all future consumption and savings (S) or investment (where D > S). For example, a house loan amount by a household enters the economy in that quarter by the full amount and is now part of the total income of the seller in

that quarter; as it was part of the income of the household that purchased the house via the loan amount (new money).

Now, within this paradigm, whereas all future consumption can always be increased with increasing access to credit, what this essentially means is that all future prosperity increasingly depends upon or is a function of the availability of new credit. This, in turn, results in boosting higher burdens of debt plus servicing as a requisite. This, in fact, is what a credit economy is essentially. This suggests that the proportion of ‘new money’ reflected as Bank Credit lending to households for residential real estate is seemingly a critical determinant of housing demand and therefore housing price. Therefore, the income identity, at the household level, under a credit economy may be expressed as:

\[ Y + T + CA = C + I - (t + D) \]  

(6.2)

Assuming the norm where a typical home loan is a 30 year mortgage, the CA value is 30 times greater than the value for D over a one year period. Therefore, each household that is approved for a home loan gets to inject CA and households that are utilising a home loan at present pay off an amount equal to D in that year. And looking at the time series of bank lending towards housing markets in New Zealand (see chapter 4, figure 4.4, 4.5) we see that this proportion of ‘new money’ is neither linked to incomes in the economy (GDP) nor construction of housing (housing stock). This is to say that a growing housing credit is neither a result of higher incomes nor is it a consequence of greater number of dwellings. Internal banking policy seems to drive this business practice within the banking sector itself, in effect, creating uncertainty in the markets for credit for housing and influencing and manipulating demand and more importantly price (ECB, 2011). This can result in markets that function more under mechanisms of induced demand and less on real demand. This could surely be a strong macro-determinant that drives rents which cannot be captured by a microeconometric study and therefore, if strong, can suggest less robust explanations for rent drivers at the micro-level.
6.4 Dynamics of the housing allowance and rents

6.4.1 Housing allowance, rents, and demand

It is argued that as there is more disposable income under an allowance scheme and rent can be a function of the relative size of disposable income, this can create a disequilibrium in the rental markets for space (Susin, 2002; Laferrère and Blanc, 2004; Gibbons & Manning, 2006; Fack, 2006; Viren, 2012). Other viewpoints argue that keeping constant the number of households and the number of rental housing units that are required to house them, an increase or decrease in the liquidity shifts effective demand levels for housing (Kemp, 2007). And these can push the market towards changes in the price for that good. Such an increase in price can be driven by two instances: an increase in rental demand for larger accommodation (increase in aggregate space for rent), and a higher level of rental demand seeking better accommodation (higher quality dwelling, increased amenities), or both. Note that demand for number of housing units is not being affected by both these scenarios. Any changes in the aggregate number of accommodation units (increase in aggregate demand for rental units via a split in family unit/housing unit etc.) will affect the subsidy as this would result in a change in household type possibly affecting participation rates as a result along with the cash value of subsidy. The theoretical literature on models of family structure generally supports the common-sense proposition that offering benefits only to one family type will increase the number of families of that type (Moffit, 2003). And the AS covers family type that at least includes singles, single parents, couples, and couples with children as a baseline, the modern housing allowance, a universal coverage scheme, does not seem to provide any incentives for family break-up in its present form. And under both scenarios, rents for each household would increase to reflect the higher level of rental accommodation. As such, the Accommodation Supplement, owing to design restrictions, would be more amenable, in principle, towards improving the living conditions of the household while keeping the demographic makeup of households that rent intact. This would suggest equilibrium is maintained under competition.

6.4.2 Rents and housing allowance at birth

If a housing allowance or subsidy is intended to target the private rental sector households facing high housing stress and the subsidy is introduced for the first time in the market- i.e. ‘birth’ of a subsidy- such an event, in effect, cannot increase the number of housing units
demanded in the private rental sector. It simply isolates a cohort within the rental sector at that point in time (and in any given period thereafter). Such a scenario does not increase the demand for rental housing units in the economy (assuming renting as inferior to ownership).

At birth all the cash goes into the pockets of the recipients. It is possible that a proportion of the aggregate may end up in the landlord’s kitty if and only if the landlords, in a parallel move, increase rents by a larger proportion than the previous period. This difference in rent rise from the previous period will include the ‘landlord’ capture among other determinants for such a change. For example, regular rent increases from T1 to T2 in an economy is say 5% and after the policy shift in T2, we see that the rent increase was 8% from T2 to T3. The 3% increase is the effective ‘landlord capture’ presuming no other variables influenced this rent increase. In other words, this is 60% over and above the regular rent increase of 5% \(\left(\frac{8-5}{5} \times 100\right)\). This unanticipated 3% increase over the trend (5%) would effectively be settled using the increased income (i.e. amount of the subsidy) which now is at the disposal of the recipient household.

This is what we may address as the ‘landlord capture’ of the subsidy presuming all else constant. In perspective, a rent of NZD 300 per week that usually experiences an annual rent rise of NZD 15 from T1 to T2, now may experience the increase to be NZD 25.2 (at 8%) from T2 to T3 (in place of NZD 15.75). The difference in increased rents comes to NZD 9.45. Assuming the household is a single person living in Auckland (Area 1) and receiving the maximum allowable subsidy, this would be NZD 145/week in 2017. An amount of NZD 9.45 in rents extracted by the landlord via a rent increase at birth of the policy reflects a 6.52% capture. The remaining NZD 135.55 goes towards the consumption function of the household for all other goods. The crucial point to understand here is that those monies do not enter the housing and rental markets in entirety. It is important to note that all other subsequent period rent increases (after birth) work very differently.

In the case where one does encounter a landlord capture at birth, all subsequent periods would be influenced by a move in T2 by landlords to capture the subsidy, as all future rents carry an element of this rent increase. This is, in effect, a structural break in the time series of an upward shift in trend for rent growth. This capture of the subsidy serves only to inflate dwelling prices. A capture of such a nature carries assumptions. The main assumption here being that in a competitive market all landlords would require to collude towards such behaviour. As most rental housing is owned by small scale individual investors this seems implausible. Although, one needs to be cautious when ruling out such a condition, as even though individual market
participant may not possess the network to collude, in practice, such a requirement for a vast network for symmetric information dissemination can piggyback on the shoulders of giants that are the real estate firms in the industry (Viren, 2013; Laferrère & Blanc, 2004).

6.4.3 Housing allowance and rents under a stable policy

This is the case where no subsidy policy change occurs, and it is argued that rents are eating away at the subsidy by other means. If one defines ‘provider capture’ as simply a transfer of payment from taxpayer to landlord via the housing allowance recipient in the shape of higher market rents, this would require the landlord having complete information with regards to the eligibility and receipt of any subsidy by a tenant. As the Accommodation Supplement scheme is designed to be asymmetric with regards to information, in theory, such a condition prevents landlords to collectively behave in a manner that would lead to any exploitation by means of “parallel” movements in rents in relation to any shifts in the amounts of the subsidy for any particular tenant/recipient.

Also trying to price different rents for dwellings with comparable facilities within a competitive market is difficult to execute and even more difficult to sustain. It seems highly improbable that rents by some landlords may drift away from their mean expected values for considerable periods (Fack, 2006). And as tenant turnover is high, especially in larger, more competitive areas, this further facilitates rent setting behaviour to fall in line with market forces. Although Viren (2013) argues that as subsidy recipient and non-recipients have different incentives to oppose high(er) rents, landlords could manage to carry out discriminatory rent increases in practice, at least at the “micro level”. This, I believe, can be possible as subsidy amount is not simply a function of the rent but various other attributes of the household which can possibly indicate to landlords the type of tenant they encounter and landlords that provide low-income housing take into account the possible presence of the housing allowance.

This is crucial as any inflationary pressures under a stable universal subsidy scheme suggest that the structural aspect of the subsidy can potentially affect market equilibrium. This is important as it can inform of whether the subsidy is inefficient as a redistributive policy instrument to some degree.

It may still be argued that one needs to look at both possibilities, market wide effects and effects of the subsidy at the sub-market level in particular cases. Even if the effect of the subsidy to
inflate rents at the sub-market level is absent in one sub-market, there is no reason to rule out price increase in other non-typical markets, particularly in the areas where recipients consume higher proportions of the allowance (Lowey, 1980). If the submarket for the recipient of a housing allowance is sufficiently insulated and small enough, it can be presumed that the programme could cause significant price increase for that (non-typical) submarket. In part, the price increase could also be attributable to quality increases. Such an argument was based on the housing voucher system where housing conditions are attached in some way to eligibility. Under a pure untied cash transfer the peculiarity of the sub-market cannot influence price in a similar way as constraints of a voucher system do not necessarily translate onto a cash transfer.

Consequently, if a market is characterised by frequent rent revisions under a stable allowance policy, this could easily reflect a sellers’ market as a more dominant feature than to suggest a demand-side cash subsidy as a basis for influencing rents. On the other hand, frequency of successful rent revisions could be influenced by the presence of the cash subsidy in the first place if one is to assume a large proportion of households rent below ceiling and thus are relatively less sensitive to rent revisions upwards compared to non-recipients.

Such arguments are mostly based on assumptions relating to perceptions of the workings and individual design attributes of housing allowances on rational behaviour within schemes in different countries. Certain universal design features will be addressed in the next chapter to clarify and provide a more consistent perspective on the said behavioural assumptions of households under a housing allowance scheme. The aim is to present more consistent arguments for the behaviour of clients of housing allowances and how their design may, in fact, impact theory and markets.

6.4.4 Rent setting versus rent rises

In order to grasp a better understanding of the housing allowance instrument, an intuitive explanation can help. I propose that rent determination carries two aspects, base rents and rent increases. Although base rents are determined by fundamentals such as cost of construction, real estate price, and the opportunity cost of investment, rent increases may be determined by factors in addition to these, such as negotiation and bargaining. Therefore, a 10 percent rent increase by a landlord may, in part, reflect some element that can be explained by tenant behaviour towards bargaining. In other words, base rents for properties are set in a particular
setting that does not necessarily completely overlap with settings that determine *rent increases* for property. New dwellings that enter the market, though, have a propensity to be ‘affected’ by both. They can be a function of the fundamental rent setting including some influence of ‘rent increase’ behaviour within the market in addition to negotiations possibly in their favour if recently constructed.

As noted earlier, the literature argues that subsidy recipients may be indifferent towards effective bargaining for lower rents. Note that every dollar increase in rents will also capture a proportion of the disposable income of the subsidy recipient as well as a non-recipient tenant albeit at a marginally lower rate in the case of a subsidy recipient until the subsidy maxima or rent ceiling is reached. This feature although does suggest that every recipient would tend to behave like every other non-recipient in the market. This overlapping incentive towards bargaining for both, recipients and non-recipients, is likely to decrease the extent to which landlords may capture the housing allowance. Also, a very small segment of the recipient market is found below the ceiling rent in most cases.

### 6.4.5 Housing allowance and equilibrium market rent

The aggregate amount of the subsidy to households in each period may not be going into the housing markets, although it may very well be maintaining the markets indirectly. This is to say, if the subsidy was to be suddenly abolished altogether, households that receive the subsidy would face an immediate and severe rise in housing stress levels. This would, in the short run, result in changes in the effective demand for non-housing consumption goods keeping quantity of rental housing constant, but may eventually lead to default in rental payments and losses that may decrease the rental housing stock as certain landlords move away from the sector. In practice, equilibrium is reached mostly by market adjustments in labour mobility and wage differentials to either cover the deficit in rental yields or shift rents.

### 6.5 Housing allowance and policy shifts

Policy shifts that affect “eligibility”, which in turn increases the recipient population, would have a tendency to influence (aggregate) housing demand but not in the same way as population pressure would impact demand, albeit for the low-income housing sector. The mechanism is explained as surely more people are pulled out of housing poverty/deprivation under the new
eligibility guidelines, there will be the same number of renting households in the market whereas now these households may search for a different set of dwellings from the same finite number of dwellings. For example, these households now may be shifting out of over-crowded housing and seeking other new larger units (family composition as constant). This scenario (eligibility change) has not played any part in the history of the AS since 2004\(^{33}\), as these shifts would result from relaxation of the means testing limits, income limits, and other criterion for inclusiveness.

Policy shifts in “Generosity” levels of the AS that aim to increase the maximum limits of the subsidy only affect residual incomes of households that are at present renting above ceiling rents whereas co-payment policy shifts in subsidy only tweak residual incomes although these are across the board increases.

The other case is how a ‘new’ subsidy recipient – household becoming eligible within the scheme’s existing parameters via demographic or socio-economic changes- now experiencing an increase in residual incomes that is much larger than the existing recipient’s periodical subsidy changes or increases will behave. The subsidy here is a function of present rent and income. If more housing is consumed, seeing that more income is available, and housing will be cheaper for the recipient incrementally due to co-payment rule until maxima, an increase in housing will nonetheless decrease this income gain. Assuming a move does take place, the new higher rent from increased housing will also provide the recipient with a further subsidy in addition to the initial amount (for all rents below ceiling). Even though the household will now have a larger cash transfer, it nonetheless ends up with less residual income for all other goods than if no more housing is purchased.

### 6.6 Housing allowance and tenure shifts

As we have noted that relative price change (represented by a demand-side housing cash subsidy) which is invisible for the existing renting cohort will tend not to induce increased demand for rental housing (more housing; same population – i.e. at the household level), whereas an incentive to move into the renting cohort due to the availability of the subsidy can

\(^{33}\) This was the introduction of “Working for Families” package in New Zealand.
produce increased demand for rental housing (more population seeking rental housing, by displacement – i.e. *at the aggregate level*).

It is useful to note that rental housing, within the tenure space, cannot be considered as a normal good, as any price fall does not necessarily induce more people into rental housing from homeownership. This is because renting (inferior good), although cheaper under a subsidy scheme as the marginal rate is higher for renters vs homeowners, is still not preferred over owning a home.

And assuming there is a situation where recipients shift tenure (owing to renting), assuming imputed rent for homeowners and market rent for rental dwellings remains constant, the household which was a home owner receiving a housing subsidy towards mortgage payments, after the shift into renting increases their disposable income by a fraction equal to the difference in compensation measured (strictly) by the differing marginal rate of subsidy for rental and own home recipients. Although this move is unlikely to happen in practice as renting being inferior to owning, the sale of the house would provide wealth that would not satisfy the cash asset test for eligibility for the housing allowance in most cases as well.

### 6.7 Accommodation Supplement and housing markets

The Accommodation Supplement, I believe, may actually assist in keeping rents low by targeting a subset of the country’s population that may fall or find itself in a situation of housing stress in its absence, which then would lead to increased poverty rates\(^\text{34}\) that can create an increased demand for low-income housing (a finite set of dwellings) which is expected to put pressure on rents (*demand inflation*) directly for low-income housing and possibly across the private rental markets, in general, due to interdependence of rents between low, middle, and high income rental markets.

If, for example, we take the supply curve for a certain segment of the market as shown in figure 6.4 i.e. the older stock and the low-income rental housing that is available at the lower-priced end of the market, this can help explain the situation faced by the market for low-income

\(^{34}\) On his war on Poverty in 1964, President Lyndon B. Johnson argued: “Very often a lack of jobs and money is not the cause of poverty, but the symptom. The cause may lie deeper in our failure to give fellow citizens a fair chance to develop their own capacities, in a lack of education and training, in a lack of medical care and housing…” See Collinson et.al, 2015 p. 4 (Footnote 4).
households. As income poverty rates rise in an economy, a larger proportion of population is to be housed by the flatter part of the supply curve. This increase in the proportion of the population that needs to be housed at lower rents will shift the minimum quantity demanded by the poor further to the right on the x-axis. As the aggregate minimum housing that is required/demanded by the poverty driven rising population shifts out and is now within the steeper part of the supply curve, additional low-income households now face a much higher rent than the households presently housed in the market. Now, let’s presume that the minimum quantity demanded for low income housing surpasses the supply curve on the diagram, we can see that for any given price “P”, the distance between the supply curve and the quantity demanded represents excess demand that landlords do not want to provide at this prevailing price. The distance between the two points can be explained by attributes such as “overcrowding”, “homelessness”, and a rise in other temporary forms of shelter, for example, a rise in people living in their cars; a real phenomenon in New Zealand. Transitions and policies that shift people into appropriate housing from homelessness and overcrowded homes will have a similar impact.

**Figure 6.4:** Supply for low-income private rental housing

![Supply for low-income private rental housing](image)

The relative steepness of this curve is dependent on the velocity of investment that is moving in the direction of low-income housing provision with respect to rising poverty. If alternatively, increase in poverty is controlled, then very quickly the situation is reversed as investment will
be increasing the overall stock relative to demand. Such investments towards low-income housing need to be part of the country’s housing policy, with a promise of ‘low-rent’ being paramount for such investments to be of any benefit. These can be more effective if coupled with income poverty reduction policies as well.

It is possible to witness rent trends in favour of tenants in geographical Areas Units with large subsidy communities, as these areas generally house poorer households that can easily influence rent growth as these low-income demographic groups are stubborn towards rent increases (as this would increase residual incomes). In addition, these tenants may experience tenure discounts as slum landlordism prevails in greater numbers. In the absence of new private provision of low-priced rental housing, housing sub-markets can adopt the primary default mechanism for the supply of such housing that is via the ‘filtering model’\(^{35}\) (Morrison, 1995). Such characteristics would show up as a negative sign for the coefficient for the Accommodation Supplement market share variable at the Area Unit level.

Another interesting aspect at the aggregate housing rental market level is that real rents for lower quartile households are on an upward trajectory since the inception of the AS (see figure 6.5). This can certainly point to some pressure present within the rental markets which is, in fact, resulting in an opposing trend in the rents between median and low-income renters. It is not a question of growth that is paced differently but rather in the opposite direction for the two rent indicators. In order to explain this phenomenon, I believe, the income-related rent subsidy (IRRS) for State housing may play some part towards assisting with rent inflation. The Crown’s housing stock, on average, is around 20% of the entire low-income rental stock of the country\(^{36}\), and as a player it is a price taker in the market i.e. accepts private market rents as given (even accepts increases in rents suggested by competitors which are other cooperatives and NGOs), and as any and all rent increases are accepted by the Crown’s asset holding company - Housing New Zealand (HNZ), this essentially may contribute towards rent inflation in this particular rental sector. Here, the rent bid (suggested market rents) is not countered by an offer which could essentially lead to a negotiated lower market rent in most cases by low-income renters. Remember that this is a housing stock that suffers from a plethora of

\(^{35}\) For a detailed discussion on the “Filtering model” see, (Sweeney, 1974).

\(^{36}\) This has been approximated by assuming that AS recipients occupy the low-income housing stock. Then, the average AS renting households and the average State housing homes over time combine to provide us with at least a minimum estimate for the Crown’s market share in the low-income rental housing market of New Zealand.
depreciation related attributes apart from age and un-timely maintenance which can amplify rent inflation via quality. If not at the micro level, this somehow may be contributing towards the divergence at the aggregate level as evidenced in figure 6.5.

Figure 6.5: Divergence in median vs lower quartile real rents for a typical 3 bedroom unit - In constant NZ$ 2006

Source: Authors own calculations.

6.8 Accommodation Supplement and labour markets

Income transfers can create work disincentives if employment, or additional employment, delivers only a marginal increase in income (if any) as it entails a loss in income from previous (multiple) means-tested subsidies. This discourages people from choosing to work or accept additional work (Boelhouwer & Haffner, 2002). The interaction of tax and targeted transfers means some taxpayers encounter abatement towards their assistance payments. Abatement can push effective marginal tax rates (EMTRs) considerably higher than statutory marginal tax rates (MTRs). This reduces the rewards of extra work even further. This is known as the marginal effective tax rate of the subsidy.

A recent Treasury document reinforces my claim that the Accommodation Supplement is simply an income injection (or tax cut) by suggesting that, “There is a risk that any transfer, such as (unemployment) benefit payments, Working for Families, and the AS, may result in increased house rental prices.”37. The AS is thus comparable to any other income transfer and

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this suggests that it would ‘affect’ markets in similar ways. It follows that, primarily the AS can work to alter ‘effective demand’ in the labour markets. That is, AS payments can alter relative costs between work and leisure for households. The same Treasury document details that the impact of an AS increase may likely reduce work incentives in total and create a situation where some sole parents already in work now end up working fewer hours (likely due to the increase in Family Tax Credit and AS)\textsuperscript{38}. As Howenstine (1985) argued that considerable work disincentives may be created if the cumulative benefits received under various income transfer programmes, including housing allowances, are greater than what the recipient can earn (the replacement ratio) in paid employment.

Although, the Accommodation Supplement effectively does lower the relative price of employment, however, it can be expected to promote greater supply of labour than main benefits for a given level of assistance\textsuperscript{39}. This is because it is better targeted and may result in less work disincentives than from an increase in main benefits. In New Zealand main benefits\textsuperscript{40} are specifically targeted at the very lowest income cohorts, but not necessarily to those with low residual incomes, whereas the AS aims to targeted those with low residual incomes. The incidence of low residual incomes is nearly five times higher among Accommodation Supplement recipients than non-recipients\textsuperscript{41}. This may also indicate that the main benefits and the Accommodation Supplement combine to provide a better mix of redistribution of income in New Zealand.

In conclusion, whatever effects the EMTR from the tax and transfers mix has in the end, the net result is reflected in the disposable incomes of households and therefore consequently their consumption decisions for housing, food, energy, transport and others. Note that labour markets are not the focus of my study and therefore analysis of the effects of the Accommodation Supplement relating to labour markets is not considered. Labour supply impacts of tax, Independent Earner Tax Credit and Family Tax Credit changes were modelled in aggregate using Treasury’s microsimulation, Taxwell, but Taxwell was not able to model the labour supply impacts of changes to the Accommodation Supplement. A moderately

\textsuperscript{38} Ibid
\textsuperscript{40} Main benefits include Jobseeker Support, Sole Parent Support, the Supported Living Payment, and Youth and Young Parent Payments.
negative impact on labour supply is expected for AS recipients. This can suggest lower incomes for the AS recipient population and therefore can reflect lower effective demand for rental housing as well.
7 Theoretical framework for demand for rental housing

7.1 Overview

Firstly, I argue that the demand for rental housing for low-income households is dependent loosely on the households rent to income ratio, a well-known housing affordability measure, with a particular emphasis on their residual incomes. Second, rental housing can be consumed at a minimum required level, or some level that is considered as a sufficient level of housing consumption as per requirements, or it can possibly be over consumed with respect to social or demographic requirements of a household. Third, rent costs can be assumed as a step-variable cost\footnote{A step variable cost is a cost that generally varies with the level of activity or income, but which tends to be incurred at certain discrete points and involve large changes in amounts when such a point is reached. Conversely, a truly variable cost will vary continually and directly in concert with the level of activity or income. https://www.accountingtools.com/articles/what-is-a-step-variable-cost.html#:~:text=A%20step%20variable%20cost%20is,with%20the%20level%20of%20activity.} at the household level than a continuous or (true) variable cost. Thus, large changes in incomes relative to residual incomes may only induce changes in demand for rental consumption. It may even be considered as a step-fixed cost for households that are poor, receive a housing allowance (for that level of housing consumption) including, in some cases, an unemployment benefit and in addition may be enjoying tenure discounts for their rental property. That is, such households do not have any reason to move house and incur costs and other tenure instability issues, including change of landlord, unless they require extra space in case of having another child or similar demographic or marital concerns. More importantly, preferences such as proximity to work, access to public transport, neighbourhood preference, climate etc. may be of limited or no concern for such households as their wages and rents are covered by State benefits. And as housing costs take up a larger share of a low-income households’ budget, rent costs reduce their residual income share left over for other essentials as food, travel, health and education. Therefore, residual incomes can follow a step variable characteristic as well, where larger jumps in residual income shift preferences away from non-housing consumption.
Under these circumstances, conventional assumptions of rational behaviour and rational choice need to be revisited. Under conventional micro-economic theory, an individual will make a rational decision when faced with the problem of choice across the entire spectrum of available menu of choices (prices), where all such individuals are homogenous consumers. Note, revealed preference ideology is anchored on the premise that all available choices are based only on prices for given incomes and ignores income levels and relative needs.

I believe demand for rental housing, in general, can encounter inconsistencies if considered a normal economic good across the renting spectrum of households. As an empirical social scientist, I develop and present an intuitive framework that fits household behavior under differing levels of income for rental housing consumption demand. And any empirical evidence that supports my framework takes us closer to forming a theoretical basis for shaping an augmented demand model for rental housing.

Second, as transfer incomes are not characteristically earned incomes, and specifically the housing allowance transfer payment supports people with high housing stress inversely to income levels therefore any unearned income which deteriorates with income growth should not induce behaviour similar to that for incomes. This is why, I believe, the housing allowance cannot impact housing consumption as a normal good as theorized in the literature. The housing allowance is neither a house price variable nor an income proxy in the conventional sense, that is, it is neither of the two variables that can impact demand (directly) for housing as per price and income theory.

More importantly, in the case of a housing allowance, the eligibility restricts assistance to only those households that suffer from housing unaffordability i.e., 25% or greater housing stress. The assistance amount at the household level does not shift the recipient into housing affordability. It can, in some instances, result in moving individual households at or near housing stress levels of around 25-23%, whereas it is argued that housing affordability may be considered more appropriately at levels around or below 20% of housing stress. In the case of NZ, recall that, around 94% of AS households are, as it is, at or above 30% of housing stress levels after receiving the allowance (Perry, 2016).
7.2 Background

It can be argued that the demographic profile of a population affects both the supply of labour and in particular, in terms of its income distribution, the demand for both private and public goods and services in the economy, such as for example, housing allowances. I attempt to describe the demand preference curves for the entire rental housing market with respect to three sub-markets, namely low-income, middle-income, and high-income rental households. I argue that at any given point in time the initial income level of each household type will reflect a different and unique preference towards demand for (more) housing. It is important to recognize that each household type has unique decision sets, each having (within that) their own individual menu of choices. These decisions and choices are influenced by their initial endowments whether belonging to low, middle, or high-income households and the level of residual incomes amongst others. This provides a setting for a hypothesis for a theoretical understanding of a modified behavioural model for demand for residential rental property. Note that high income earners within the rental markets can be presumed as some function or degree of the income level of middle income households and so on. That is to say, they are defined to be some fixed upper limit in percentage terms with respect to, say, middle income households and the middle income household being a certain degree greater to the low income household. This is a realistic assumption for the distribution of rental households (low, middle, high) with respect to income levels as, in general, high levels of incomes maybe associated with wealth accumulation resulting in homeownership and not renting. Thus, all renters can be considered poor where each sub-type of renter is income richer to each other sub-type in relative terms (from high to low)⁴³.

Traditional neoclassical models do not take into account these complexities. In such models, the price of housing is demand determined as supply of housing seems to respond unproblematically, in the long run, to changes in demand conditions. One also witnesses that these models do not take into account factors that affect the supply of housing. Housing, in general, is not the typical consumption and investment good as it is a necessity as well for all individuals. And classical economic theory ignores relative income levels in order to form a universal demand function. I argue that, for the poor, the household residual income level is a critical demand determinant, especially for large expense items such as rental housing.

⁴³ This is most prevalent in Anglo-Saxon nations where the social security system is a marginal one (Esping-Anderson, 1980).
consumption where relative residual income levels would seem even more important when making decisions.

There are numerous issues with assuming rental housing as a normal good in general, and especially for low-income households. Housing may be considered as having a separate set of assumptions, applicable elasticities, and most importantly utility maximizing behavior. In a recent study on housing allowances in the UK researchers concluded heterogeneity in behaviour on demand for rental housing relative to needs (with respect to subsidy). Their likely explanation for such a significant heterogeneity between renters was ‘differences in their elasticity of demand for rented housing’ (Brewer et al., 2019). They believe housing is, although a necessity good, but is more likely a luxury good at the margin if housing consumption is already high (relative to needs).

7.3 Household behaviour for rental demand

7.3.1 An intuitive approach

It may be assumed that poor households face differing elasticity of demand for rental housing with respect to their residual income and their decision set (prices of non-housing goods) than simply on income elasticity. Renting may not be regarded as the atypical normal good by the consumer and under the conditions of ‘bounded rationality’ they may be ‘satisficing’ instead. The concept of “bounded rationality” as introduced by H.A. Simon (1957 p.23) states, “Bounded rationality is the idea that rationality is limited when individuals make decisions, that is, by the tractability of the decision problem, the cognitive limitations of the mind, and the time available to make the decision.” Whereas satisficing, in economics, is a behaviour which attempts to achieve at least some minimum acceptable level of a particular variable, but which does not necessarily maximize its value. Decision-makers, in this view, act as satisficers, seeking a satisfactory solution rather than an optimal one44. And as evidenced, most households entering the housing allowance programmes already spent nearly enough on rent to pay for sufficient housing (Rydell & Barnett 1982; Steele 1980).

44 The concept was first introduced by Herbert Alexander Simon which led to his Nobel Prize in Economics. See “Models of man; social and rational” by Herbert A. Simon (1957).
Moreover, housing for renting has been explained by Schwabe (1868) under the Schwabe’s law where this law states that, “The poorer any one is, the greater the amount relative to his income that he must spend for housing.” In other words, a low income leads to higher rent-to-income ratio, all else constant (Haffner & Boumeester, 2014). Indeed, Stigler (1954, p. 100) characterized this as “the second fundamental law of consumer behaviour”, where the first is the Engels law. The Schwabe's law also explains that need for housing weighs more on demographics than on socio-economic factors as societies achieve higher levels of economic development. In a weak sense, this suggests if households feel more affluent this does not increase their housing demand compared to when households grow in numbers. Haffner and Boumeester (2014) find that even in a rent regulated market like the Netherlands, where rents would mainly be below market rates, tenants appear to be subject to Schwabe's law. As housing is a ‘necessity’ good (Albouy, Ehrlich, & Liu, 2014; Houthakker, 1957), with income elasticity below unity (Albouy et al., 2014), rental housing can surely follow the Schwabe’s law of rent (M. Haffner & Boumeester, 2014). Singer (1937) in a critique on the Schwabe’s law not holding for a continuous inverse relationship between income and the percentage of income spent in rents nonetheless accepted that the law as applied to working-class households is well established i.e., low-income households. In conclusion, one may recall that the income maintenance experiments of the 1970’s in the US that were to be used to strengthen the case for a negative income tax themselves surprised the policy makers as income elasticities of housing for the poor were quite low than expected (Apgar, 1990). This result reinforces the point that different income groups have different elasticities, especially towards (rental) housing.

7.3.1.1 Conceptualising towards a demand function

Increases in income may not necessarily increase housing consumption, this is especially true in the case for rental housing. A move from low income to middle income level for any household may possibly shift rental housing consumption levels (space and quality) but this shift will be proportionately lower than the income change. This is essentially the “Schwabe’s law of rent” that was pointed out way back in 1868. In addition, this increase in households level of housing consumption can rapidly disappear as and when a satisfactory level of rental housing consumption is achieved, which is evidenced at the aggregate level as well within the

HES data for NZ (see next section). And under a fixed minimum housing standard a lower limit is set for housing that is built and consumption not divisible below this point which would interfere with the law as well.

Therefore I postulate assumptions that may be deterministic of renters preferences for demand for housing as most renters have low wealth levels, and of which, low income renters may be homogenous in most aspects. The arguments are limited to housing consumption by the poor which although limits my model to reflect preferences for one commodity but also lends robustness for the topic at hand.

I propose, therefore, in order to start we allow our process to use an idealised individual - not necessarily the rational “homo-economicus”\(^\text{46}\). I begin with an assumption that the amounts of ‘n’ economic goods are known i.e., empirically determinable under ideal conditions, that will be purchased at any given time by an individual faced with the menu of prices of these goods and with a given total expenditure, that is income in our model. It is assumed that prices are taken as given parameters not subject to influence by the individual.

I construct our budget constraint in a two commodity space with a specific criterion where we reflect the x-axis intercept for each type of household (low, medium, high) as their optimal level of housing consumption, which correspond to the relative assumptions for each household type (low, medium, and high income) with respect to their differing attitudes towards housing consumption. In equilibrium, a ‘necessary and minimum’ expense between two commodities, i.e. shelter and life (food, energy, transport) is undertaken by each type of renter.

The slope of our budget constraint is the relative price of the two commodities in our model, namely housing and (loosely defined) all other goods. Then the marginal rate of substitution (MRS) depends on the level of marginal utility (MU) of each good (X and Y) with respect to their dollar value (P). When this is equal for the two goods equilibrium is obtained. Their consumption optimisation can be represented as:

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\(^\text{46}\) Economic man, or the rational agent depicted in economic models. Such an agent has consistent and stable preferences; he is entirely forward-looking and pursues only his own self-interest. When given options he chooses the alternative with the highest expected utility for himself. It is controversial whether this figure is realistic, and if not, how much that matters to economic theory. (Oxford Reference) Retrieved 18 Dec. 2020, from https://www.oxfordreference.com/view/10.1093/oi/authority.20110803095943203. Also see Samuelson (1938).
\[
\frac{MU_x}{Px} = \frac{MU_y}{Py}
\]

(7.1)

In order to understand housing as a homogenous product we take housing as a non-negative consumption for all low-income households bound by a lower limit of a ‘minimum quantity’ of housing demanded for all sets of price and income, including any exogenous factors influencing demand preference. I assume that all housing in advanced nations are developed at or beyond the minimum level of shelter. Other exogenous factors are also considered, for instance, housing may very well be a spatially homogenous product, as well as a heterogeneous one simultaneously, within the same sub-market, dependent on the category of consumer type. Consumers that receive their incomes through social security (i.e. beneficiary households) may deem spatial considerations such as ‘neighbourhood’, for reasons of being close to work, and ‘distance from public transport’ for access to low-cost transport, irrelevant and therefore have no need to perceive houses with similar price in different geographical locations as differentiated. This, loosely reinforces that housing demand for (all) low-income households is more homogenous, especially ones on main benefit and / or transfer payments. The fundamental difference, at the outset, is that housing will be demanded whatever the price therefore, one requires a more flexible economic argument when considering to define housing for the three distinct households as a ‘normal good’.

As a minimum quantity of housing (commodity on x-axis) is required for survival and a minimum level of food, energy and transport (commodity on y-axis) is also required for survival, on a consistent basis, a logical assumption follows that most, if not all, of the income is needed in order to make ‘minimum condition’ choices towards consumption of the two commodities in our model (no savings) by low-income households.

Assumptions under my model for low-medium and high income household demand for rental housing are ‘characterised’ as:

i) All low-income households can be assumed to be homogenous with respect to decision-making for demand for rental housing, where housing allowance recipients can be assumed to be strictly homogenous as they are more tightly defined as ‘low-income and poor’ using means testing.

ii) All households in each category face a (homogenous) choice between two different commodities having a particular set of prices resulting in a specific residual income for the
household, where choice is homogenous in the sense that both commodities are ‘necessities’ and therefore are non-negative

iii) In addition, both commodities are required in ‘minimum’ quantities for survival

iv) The budget constraint is optimized under the conditions and assumptions of the model for a set of prices for the two commodities (and a corresponding demand function for each category of household can therefore be derived, in theory)

v) Any incremental shift in the quantity demanded of the principal commodity (housing) requires a potentially large change in either price or residual income as rent, which consumes the largest proportion of income (variable cost), and costs that are associated with demand shifts (fixed costs), both, are high in proportion to residual incomes.

**7.3.2 Heterogeneous demand preference for rental housing for low - medium - high income households**

In diagram ‘A’, the y-axis typically represents all households where high residual income households are represented nearer the origin and households that suffer a lower residual income are represented higher up. The framework is representative of three separate categories of households by income group i.e. low, middle, and high income renting household, and labelled as ‘W’, ‘X’, and ‘Z’ respectively. Each income category of household is conversely identified by their respective residual income levels as well on the preference curve labelled from low to high with respect to the level of housing quantity demanded individually by each category of household.

Any shifts (for a given household) along the y-axis representing different levels of residual incomes for the same income group or across groups is either a corresponding shift in the budget constraint of that particular household due to a change in any one of the exogenous or endogenous factors (i.e. incomes, rents, family structure, wealth). That is, a change in their decision set / consumption bundle.

Within an economy, I believe, households that have low residual incomes find themselves in a situation that is represented on the diagram from point B to C on the curve. Alternatively, households with large amounts of residual income after housing costs face a different demand preference with a very different decision set due to their budget constraint. I try to capture this fundamental dynamic in the context of rental housing demand theory and argument.
Assume that low-income households are at point B where they are consuming minimum sufficient housing quantity. We see that for low-income households, i.e. demand preference from B to C, any negative changes in rent (i.e. increase) or income (i.e. decrease) would push such households towards a situation where they may be consuming less than the minimum quantity of housing (assuming they consume the same bundle of non-housing goods), therefore effectively experiencing overcrowding (or low quality). Alternatively, keeping the housing consumption the same, they would lose residual income leading to reduced consumption of ‘other essentials’.

Households that suffer rent increases mostly suffer the later, at least in the short-run (Sanderson & Wilson, 2017), as moving houses is not instantaneous and involves adjustment costs (Apgar Jr, 1990). On the other hand, if such households experience a rent decrease or a residual income increase via a subsidy, by the same argument they would not move house (EHAP findings), at least in the short-run, and therefore do not move along the x-axis to reflect increased housing. Instead, their budget constraint shifts out in this case (keeping the household in the same income group nonetheless), and as quantity consumed is constant, they behave as if housing is perfectly price-inelastic. This behaviour can be different, if the increase in residual incomes is large enough to shift these households in terms of their category (low, middle, high). And under a housing allowance scheme any increase in housing will lead to a decrease in residual incomes due to co-payment requirements. Also, the subsidy does not amount to moving households from low income to a higher income bracket as it is provided to only households that suffer rent to income ratios of 25% and above. Therefore, if these households are at point B, they prefer to remain at point B with respect to housing consumption with transfer incomes that keep their residual incomes within the low range.
For middle income households, the demand preference between points A and B helps to explain their budget constraint in terms of quantity of housing demanded with respect to other goods. Such households have ample residual incomes therefore face a decision that helps them to choose the optimal amount of quantity of housing demanded according to their tastes and provides them an opportunity to increase, both, their quality and quantity for housing. This is referred to as upmarketing.

As to the high wage earners, their demand preference as per budget is represented by the portion between point A and D. Consider a household with substantial residual income at point D, which is also the maximum quantity of housing that a household needs before the quality and quantity of the house starts to have a negative externality. This is when the extra quantity of housing incurs unwarranted costs towards the maintenance of this extra quantity, and could include the upkeep of indoor and outdoor areas, and any extra space that may eventually lead
to a greater cost on top of rents, further lowering residual incomes which is deemed undesirable by the tenant. At this point a rational household no longer has a choice towards overconsumption of housing. As the household moves up the curve towards point A, each unit of forgone housing frees up a larger proportion of income relative to rents and as corresponding rents and other costs are high i.e. maintenance etc this can result in proportionately greater positive residual income change as well. The point where quantity of housing is sufficient for the average household, in line with market trends, social norms, and proper regulations and safety standards including extra amenities that reflect a level of comfort, I denote as ‘satisfactory’ quantity of housing, $Q_{sf}$.

In order to understand the ‘dynamics’ of the budget preference curve, let’s look at the portion of the preference curve that relates to households that have low residual incomes after choosing their quantity for housing. Say the household is below point B, for a given rent and income. Presuming their rent to income ratios are very high, which is why they can only afford to occupy below the minimum amount of accommodation required at best, any increase in housing quantity towards point B - the minimum housing requirement - would require a decrease in residual income, assuming a constant consumption bundle for non-housing goods. As the absolute quantity of residual incomes in dollar terms is low, a rental payment increase for such a family would be proportionately larger in residual income terms than for a family with higher wages for the same rent increase. This makes the curve steeper for low-income households for increased housing compared to households with greater incomes (and greater residual incomes). Housing increase choices are dearer for low-income households compared to middle and high income households.

Alternatively if one looks at the situation where the family is at the minimum quantity of housing and decides to cut back on its housing quantity *slightly below the minimum level*, the extra income gained would, similarly as in the above case, reflect a large proportionate increase in residual income (as at point B, high housing reflects low residual income). Whereas any further *incremental* decrease in housing would provide a proportionately smaller gain in residual income consequently as the household keeps decreasing their quantity demanded. This is because it is not possible to decrease rental obligations at the bottom of the market with large price and quantity shifts as it is already near the minimum price and household demographic requirements. In addition, the rental market has a floor that would sit near the minimum rental requirements surely.
In other words, first, the residual income increase is higher due to the initial drop usually being greater than subsequent drops in housing quantity and second, rent cannot be forgone completely therefore the more one sacrifices living conditions, the savings gained would incrementally decrease as gradual decreases in housing will be in smaller quantities and households would always have a positive minimum. On the other hand, for a household at minimum housing to begin with, any increase in income, keeping rents constant, may improve their quality and quantity of consumption of other goods. An increase in income may even put them in the part of the curve that provides an opportunity for upmarketing, depending on their level of residual income.

The budget preference curve from point B to A is a portion of the curve where the market may experience a possible space for manoeuvring of prices that have substantial consequences on demand decisions and therefore (sub)market equilibrium. Households that are at this level of residual income have the option for upmarketing and may choose to exercise this. This segment of the rental housing market has the most competition and therefore may provide better quality and maintenance for its clients. The upper end of the market, mainly for high-income households, that sits beyond the satisfactory quantity of housing ($Q_{sat}$) would essentially be steeper and any change in housing quantity would be proportionately much dearer which may instead reflect premiums for location, luxury, seclusion, privacy, and gentrification amongst others.

**Critique on the application of price theory on the housing allowance scheme**

And from the perspective of price (rent) impacting demand let us consider the following argument. Assuming equilibrium, where rental housing is an indivisible capital good, any income transfer keeps the MRS held constant (as prices remain constant). Now as the Accommodation Supplement enters the households budget constraint, there is no shift in either the market price of x or y (i.e., housing and all other goods). Technically, their (residual) incomes increase. Therefore, price theory cannot be applied under a housing allowance scheme. Even if you perceive that price of housing has decreased relatively or relative to all other goods, this is non-functional until and unless existing demand for housing is altered. It is time
inconsistent; discounted rents are not revealed until demand alters to a new level in the presence of an allowance which comes in the shape of cash beforehand and not in the shape of perceived price discounts for available rentals.

Now, the question is simple. Either the subsidy induces demand shifts in housing via perceived price changes or the subsidy induces demand shifts in housing by providing an increase in residual incomes. Here I analyse the impact on demand using price to clarify rent demand behaviour of low-income households in theory.

Recall under consumer maximization:

\[
\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = \text{constant utility/dollar} = \text{consumer equilibrium} = \text{MRS}
\]

(7.2)

The problem is that marginal rate of substitution (MRS) is only valid if price changes affect consumer behaviour and this is only possible at levels of marginal utility (MU) that are non-zero. In equilibrium (using utility only), it is consistent to assume that no more of the good is warranted which is to say that the M.U. for that good at that consumption level (equilibrium) maybe zero. Assuming a satisfactory level of housing consumption is usually achieved by the renting cohort (i.e., the poor) in developed countries that provide a basic level of housing, then under equilibrium (in utility terms only) any additional housing would not provide a positive or any incremental utility. Price changes, therefore, in theory may not attract changes in demand for rental housing for the poor. The present dwelling seemingly provides an efficient or satisfactory marginal and total utility (in utility terms) than would any other dwelling that is relatively cheaper than otherwise (only for below rent ceiling dwellings), although still dearer in total cost and would require inducing dis-utility via forgoing any tenure discounts, a change in immediate neighborhood, moving costs, and possibly sacrificing other social connections to local amenities, including neighborhood familiarity etc. Simply put, once housed the poor need not require an alternative for whatever reason (price or income). Demand preference is driven less by price or expenditure. Therefore, it can be argued that under a satisfactory level of housing consumption, more is not preferred to less which is in contrast to the law of transitivity or the fourth principle of indifference curve theory\(^{47}\).

\(^{47}\) This property states that more is preferred to less always if commodity is considered ‘good’ and less is preferred to more if ‘bad’.
In conclusion, keep in mind that, first, as housing is incrementally indivisible at the rental (household) level, second, that basic level of housing is (usually) achieved as a necessity especially in advanced nations, and finally, the forth property of indifference curve analysis cannot hold assuming satisfactory housing consumption levels have been attained by the renting poor; therefore, any relative price difference that may exist below rent ceilings is (probably) inconsequential theoretically under these assumptions for the existing renting poor subsidy recipient cohort. Any shifts in housing demand that may be theorized under a competitive market behavior framework led by (relative) price changes do not fit well because of the above reasons. More importantly, as this relative price change in the shape of subsidised rents is unknown to the recipient across the entire distribution of market rents, revealed preference theory does not fit the model as well. And, in practice, most if not all households most probably rent above ceiling rents, which seems to be a design objective of a housing policy scheme, making relative price difference redundant across most recipient populations.

7.4 Housing preference and incomes – an empirical investigation

It is important to understand that housing allowance may be argued to affect the income of the household and not the price of housing. It is for this reason that I strongly believe that anchoring this type of study on the theory of price elasticity of housing demand is flawed, at least in systems of housing allowance that are based on pure cash subsidies for tenants. More appropriately, analysis on any incidence of the presence of the housing subsidy is to be considered in the light of a pure income supplement. Therefore, in a sense income elasticities are of concern and not price elasticities. Using New Zealand household budget constraints I study the behaviour towards housing by extracting the proportional changes in housing demand with respect to incremental income (expenditure) shifts.

Data

The analysis draws on data from Statistics New Zealand’s Full Household Economic Survey (HES) from 2008, 2011, 2014, 2017. The (full) HES is a three-yearly cycle survey that collects income and expenditure information for a sample of approximately 3500 – 5500 (averaging 4700) private permanent households in each survey across New Zealand. The HES is also run across as an annual survey collecting the same information in each of the two years between the full HES which collects data on incomes only. According to the HES (income) 2015,
approximately 38 percent of New Zealand’s population was renting (under 65s in private and State housing). Of this renting population, 56 percent belonged to the bottom two income quintiles (equalised); meaning more than half of the renters are income poor. Of the entire bottom two income quintile population, approximately 57.5 percent was renting; meaning nearly 6 out of 10 income poor households rent.

The data for the full HES provides information on actual rentals paid at the quintile level along with data on total housing costs. As the survey does not report imputed rents, the data on actual rentals is misleading at the higher income quintiles as representative households at such income levels mostly own their dwellings. The data for total housing costs is more appropriate to capture true expenditure on housing preferences across all income groups.

Looking at figure 7.1, the data shows that households indeed depict behaviour analogous to the Schwabe’s law with respect to housing and Engel’s law with respect to food (i.e. downward sloping), whereas we see that the speed of the shift in budgetary proportions as income increases favours more flexibility towards housing than food. Interestingly, I dig deeper into the law just below the surface to extrapolate the responsiveness towards housing demand with each incremental shift in income. Consider this the marginal income elasticity measure.

The income groups are divided in quintiles (low to high) for all households in New Zealand (see diagram above). What this reveals is that in New Zealand any shifts in incomes upwards are quickly shifted to other goods relative to housing and as households move upwards from the lowest incomes levels, still considerably poor, their preference towards food seems to dominate housing demand as witnessed by the “marginal proportion of housing demand with respect to income”

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48 **Rents**: are rent payments paid by the household. Imputed rent (the estimated benefit value from homeownership of not having to pay rent, partly offset for homeowners by the expenses of home ownership) is not reported in this release.

**Total housing costs**: consists of expenditure from the following sources: mortgage principal repayments, mortgage interest payments, mortgage application fees, rent payments, other payments associated with renting (e.g. bonds paid in the last 12 months), property rates payments (both regional and local government), and payments associated with building-related insurance.
Table 7.2: Statistics New Zealand’s Household Economic Survey (HES) – 2017

<table>
<thead>
<tr>
<th>Income Group</th>
<th>year</th>
<th>Sub-group</th>
<th>Average exp./pw ($)</th>
<th>Marginal income ($)</th>
<th>Spent on housing pw ($)</th>
<th>Marginal rent ($)</th>
<th>Income spent on Housing, %</th>
<th>Marginal proportion of housing in income, %</th>
<th>Residual Incomes ($)</th>
</tr>
</thead>
</table>

Figure 7.1 (a): Schwabe's Law - Income behaviour towards Housing consumption, 2017
(Annual averages by income quintiles)

Proportion of income spent on housing - Schwabe's law
Marginal proportion of housing, %
Marginal Proportion of food, %
Spreading of ‘basic’ housing costs
<table>
<thead>
<tr>
<th>Expenditure quintile</th>
<th>Year</th>
<th>Housing</th>
<th>Residual Incomes ($) - 2008</th>
<th>Residual Incomes ($) - 2011</th>
<th>Residual Incomes ($) - 2014</th>
<th>Residual Incomes ($) - 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (low)</td>
<td>2017</td>
<td>Housing</td>
<td>398.1</td>
<td>398.1</td>
<td>139.5</td>
<td>139.5</td>
</tr>
<tr>
<td>2</td>
<td>2017</td>
<td>Housing</td>
<td>742.1</td>
<td>344</td>
<td>199</td>
<td>59.5</td>
</tr>
<tr>
<td>3</td>
<td>2017</td>
<td>Housing</td>
<td>1077.3</td>
<td>335.2</td>
<td>232.6</td>
<td>33.6</td>
</tr>
<tr>
<td>4</td>
<td>2017</td>
<td>Housing</td>
<td>1442.8</td>
<td>365.5</td>
<td>235.8</td>
<td>3.2</td>
</tr>
<tr>
<td>5 (high)</td>
<td>2017</td>
<td>Housing</td>
<td>2294.6</td>
<td>851.8</td>
<td>329.1</td>
<td>93.3</td>
</tr>
</tbody>
</table>

Table 7.3: Residual incomes by income quintile – HES data 2008-2017

<table>
<thead>
<tr>
<th>Income Group</th>
<th>Marginal proportion of housing in income, % - 2008</th>
<th>Marginal proportion of housing in income, % - 2011</th>
<th>Marginal proportion of housing in income, % - 2014</th>
<th>Marginal proportion of housing in income, % - 2017</th>
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<tr>
<td>Q 1 (low)</td>
<td>29.07</td>
<td>30.80</td>
<td>33.24</td>
<td>35.04</td>
</tr>
<tr>
<td>Q 2</td>
<td>16.00</td>
<td>19.21</td>
<td>16.86</td>
<td>17.30</td>
</tr>
<tr>
<td>Q 3</td>
<td>14.63</td>
<td>5.03</td>
<td>1.09</td>
<td>10.02</td>
</tr>
<tr>
<td>Q 4</td>
<td>-1.42</td>
<td>8.63</td>
<td>10.11</td>
<td>0.88</td>
</tr>
<tr>
<td>Q 5 (high)</td>
<td>6.49</td>
<td>9.13</td>
<td>4.39</td>
<td>10.95</td>
</tr>
</tbody>
</table>

Table 7.4: Marginal proportion of housing in income (%) by income quintile – HES data 2008-2017
Figure 7.2 (a): Over time, incremental rental burden rising for housing subsidy eligible population

Figure 7.2 (b): General trend towards housing expenditure across incomes over time 2008-2017
Figure 7.3: Residual incomes $ (LHS) and Marginal rent $ (RHS) – HES: 2008 – 2017

The marginal proportion of housing demand curve, showing the share of each additional dollar earned going towards housing is falling faster for all years (2008, 2011, 2014, 2017) for low income groups. The marginal income elasticity for housing demand nears zero. Although this behaviour cannot be distinguished solely on housing demand changes, as this could purely be housing and rent inflation. In which case, the real housing demand shifts would be even less responsive or more income elastic than suggested at present (certain income groups may be facing faster rent rises to incomes with unaltered demand for housing). And as we know that incomes are rising much slower than rents and asset (house) price inflation is a chronic phenomenon in New Zealand, any income shifts seem unlikely to shift housing demand. Whereas near the highest household income ranges we see that relative expenditure towards housing in proportion to incomes is favourable (for housing). This is in line with the motive of social distinction at work. The Schwabe’s law still holds.

Here I show that the ‘marginal’ income elasticity for housing demand approaches zero, in practise, for all time periods (i.e. 2008, 2011, 2014, and 2017). As rents rise for higher income groups, as seen in the household data, this increase could, to a degree, possibly reflect rising prices only and the size and quality of occupied dwellings for low and low to middle income
groups renting (Q1 up to Q3) remains constant or decreasing. This is most probable in the case for New Zealand as under the “filtering” model most of the rental stock has been transferred from the medium quality build housing stock which is now old and of inferior quality. The rental stock is considered to be suffering to a very large extent from dampness issues, lack of insulation in construction of roof and walls, without double glazing, and the stock also suffers from a peculiar issue known as ‘leaky’ homes and builds.

Generally, it seems that households in New Zealand start feeling comfortable spending proportionately more on housing as they reach a threshold of around NZD 1100 per week with respect to residual income levels. This is explained looking at the inflexion point for each survey around the Q4 households. If they feel that after housing costs their residual incomes would result in less than NZD 1100, it would seem that they do not prioritize housing and thus housing is increasingly inelastic up to such levels of residual incomes. In general, for all households below Q4, marginal housing is a decreasing function of income with a decreasing share in residual income. That is, it is possible that a decreasing proportion in housing can help to explain some proportion of residual income increase i.e. low-income households resist housing consumption in order to increase residual incomes when their incomes increase (see table 7.4). A move from Q1 to Q2 decreases the proportion of housing consumption to a high degree for all years. Although it seems that things are in the right direction as residual incomes are increasing over time (based on incomes) for these households (table 7.3:Q1-Q2) but once we see that the marginal proportion of housing in incomes is also increasing over time for the same household, especially for the poorer households (table 7.4:Q1), we conclude that the increase in rents is much more substantial with respect to incomes in absolute terms. This is similar to Hulse et al. (2019) findings for Australia.

For instance, a household may witness an increase in incomes by NZD 100 and rents by NZD 75 for the same period. This surely increases residual incomes but reflects a detrimental situation with regards to housing costs for the household (a 75% marginal increase with respect to incomes). And the contrast that is witnessed above this level is two-fold whereby a greater proportion of any incremental income increase goes towards better housing while simultaneously these households have rising residual income levels as well. Essentially, such households are seeking, as a rule, higher levels of housing all the while having more and more income left over after paying for such housing. In general, their marginal housing is an increasing function of income and, in addition, they also experience a declining share of
housing in their residual incomes which is much more rapid than compared to Q1 to Q4 households. The phenomenon can been seen easily by looking at the behaviour of Q3 to Q5 cohorts towards marginal consumption of housing. As incomes increase the proportion first falls and then increases to reflect attitudes towards maintaining social status; in other words ‘keeping up with the Joneses’ etc.

The analysis provides us with an important insight towards agent behaviour on housing consumption. Following the Schwabe’s law, overall housing consumption in New Zealand suggests different attitudes. For the poor up until median incomes, it is highly suggestive that housing costs are substantial and housing is not a priority. The rich have a different consumption behaviour towards housing than the poor. This distinction is important and can assist policy makers when deciding on income thresholds level within the Accommodation Supplement housing policy. Knowing how increasing incomes impact housing helps to understand any potential the AS transfer payments may possess towards market distortion in New Zealand.
8 Revisiting the housing allowance algorithm

8.1 Housing allowance scheme revisited

Literature, to date, has presented no attempt to deconstruct the modern housing allowance policy instrument in order to critically analyse the workings of the algorithm and how the housing and labour markets influence the subsidy at the household level. I attempt such an exercise in this chapter. I show that housing allowances are given to systemic poor households that already suffer from high housing stress levels. Also, housing allowances, by design, are delinked or less linked with housing markets and more linked with labour markets. They provide support in terms of increasing residual incomes of the very poor (renters) that are housed. Interestingly, the labelling effect on housing allowances has, it seems, had a more pronounced effect on researchers than recipients.

As mentioned in the introduction, being developed under the principles of the negative income tax, the housing allowance is more so an ‘income maintenance scheme’ for the target population that is already housed. The eligible renting poor have low to very low residual incomes which would not incentivize an increase in housing consumption if their intertemporal incomes are made less variable over a limited range of incomes well below median incomes and beyond which the allowance or cushion disappears. Also, the allowance therefore cannot be understood to increase permanent income of the recipient as per design. As all eligible households remain above the 25% measure of housing stress under a housing allowance scheme, the schemes eligibility criterion, it is highly unlikely to utilize income transfers such as housing allowances towards higher housing stress levels by this income and asset poor cohort (discussed in detail in chapter 7).

8.2 Housing allowance misconceptions

I begin with how housing allowances within the theoretical literature have mostly been characterised. Among other arguments, the following are the most common theories encountered on housing allowances and their impacts on household budgets and preferences:
1) Housing allowances shift price of housing for tenants altering housing demand (Fack, 2006; Gibbons & Manning, 2006; Grislain-Létrémy & Trevien, 2016; Hyslop & Rea, 2019; Viren, 2013).

2) Higher housing allowance (limits and amounts) reflect higher willingness to pay more rent (Viren, 2013; Hyslop & Rea, 2019; Treasury NZ, 2017).

3) Housing allowances are designed to be optimized for consumption (Loikkanen, 1988; Treasury NZ, 2017).

4) Housing allowance are additional income for recipients (Kangasharju, 2010; Rydell, Neels, & Barnett 1982; Hyslop & Rea 2019).

This first argument is strongly grounded within the literature that deals with housing allowance’s impact on rent price inflation. Assuming the subsidy to be a price reduction, it seems the literature argues rental market distortion as an objective of the allowance scheme. On the second point, there are two subsidy parameters that are of interest. First, the absolute amount of subsidy received by a household and the second, the policy parameter that sets the subsidy limit as per housing market location. Researchers use the second point (limits/ceilings) as instruments to argue the theory of higher willingness to pay more rent with a higher ceiling. The third viewpoint is that a higher subsidy is valued higher in utility terms by the recipient and therefore a rational consumer will surely upmarket to receive the highest subsidy. And forth, that these income maintenance transfers are similar to household incomes when it comes to housing consumption behaviour.

I study the structural design of the modern housing allowance to consider if the above-mentioned characteristics of a housing allowance are consistent ideas. I believe understanding the instrument would provide clarity towards understanding research to date and can inform future research on the theoretical and behavioural assumptions better suited for empirical applications. I deconstruct the modern housing allowance in an attempt to understand the objectives of the scheme.49

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49 For a discussion on the general design features of housing allowances, see Kemp (2000).
8.3 Key dimensions of the Accommodation Supplement

Recall the parameters that define demand-side housing policy in most advanced nations today. If one looks closely, the policy inherently has two dimensions. First, the *identification* dimension which defines the eligible population and, second, the *execution* dimension which disseminates the public funds in accordance to policy. The identification is simply a targeting tool that identifies the ‘*systemic poor*’ (defined below) within the housing markets (rental), whereas the execution (of funds) which follows is in line with the actual participation rate of the population under the housing policy. The housing allowance is open to all subject to means testing; private first home buyers having a mortgage and private renters and boarders with rent at any level above the entry threshold.

*Systemic poor households*: I define the ‘systemic poor’ household as the housing allowance eligible (low-income poor) household that is typically homogenous in all financial attributes. The eligible cohort, in general, has below median incomes, high housing stress, low cash assets, similar wealth levels (lack of homeownership), some or no financial market depth, and has access to some form of social security suffering stigma. In addition, they may end up living in similar conditions and neighbourhoods, depict similar health profiles, and mostly may suffer from low social mobility as well.

I argue that the housing allowance algorithm or parameter is a clear measure of poverty where the participation rate reflects the *systemic poverty* population levels of an economy that is housed. And as stigma mostly filters the households on or near the income limit for eligibility for a housing allowance i.e. 80% of median incomes (see section 8.4), it makes the housing allowance population closer to the OECD measure on poverty. In my view, housing allowance targets the poor population of an economy in a conceptually more precise manner than the conventional OECD measure as it defines the cohort’s financial position more clearly i.e., on both, an income and asset level. The OECD poverty measure of 60% of median incomes and below is used by Kemp (2011) in his work on housing allowances in order to identify low-income renters. Although, he uses low-income and poor interchangeably.
Policy History

As discussed, the evolution of the modern housing allowance renders it as not an entirely new source of public expense and, in part, may have been utilized in the past under other headings. Similar paths defined the housing policies in most other countries including France and Norway, to name a few (Laferrère & Le Blanc, 2004; Nordvik & Sørvoll, 2014). Moreover, 150,000 Accommodation Benefit recipients transferred over to the Accommodation Supplement in 1993, in addition to around 70,000 State home tenants that could now potentially apply for the AS. This makes the argument of a structural break in rents at inception of the modern housing allowance policy less credible. And more often than not the assisted households may have belonged to the same pool of poor households across time. Also, as they were poor, in all probability, they may have been renting as well in most cases. Such transfer payments could possibly be supporting effective demand of households over generations across time and policy shifts.

Disbursement

In New Zealand, the modern housing allowance is money given to poor tenants direct into their bank account. For new recipients, generally, an appointment to meet a social case worker is required for assessment. For recipients already receiving the subsidy, a desire to move or search for new rentals is done without any knowledge of how much money will be transferred once a potential rental dwelling is contracted. Moreover, tenants, in New Zealand, do not know at what rent levels the subsidy ceases to provide partial cover of additional housing as subsidy ceiling and not rent ceilings are explicit in policy. With respect to incomes and savings the recipient cannot translate their values into a rent discount at the outset as the formula is complex and adjusts to cash in bank and income levels of each recipient. A website provides a general idea of the possible amount of subsidy available but this in no way is a public guarantee.

51 https://www.workandincome.govt.nz/products/a-z-benefits/accommodation-supplement.html#null
**Demand and supply**

Under an entitlement policy, the supply of the subsidy is perfectly elastic with respect to eligibility, therefore, the participation rate in a housing market would reflect the equilibrium demand for the subsidy. There is no argument for simultaneity. Typically, the participation rate reflects, both, the demand for and supply of the subsidy irrespective of rent. And with the policy’s income thresholds for each household type, almost all renting household types tend to have an eligible housing stress ratio to begin with (i.e. rent to income ratio above 25%).

Assuming constant eligibility, if rental markets experience rising rents, participation rate is unaffected i.e. entitlement of non-recipients remains unchanged unless renting below entry threshold and a rent rise places them above this limit which is highly unlikely. Aggregate demand can shift via demographic changes such as shifts in family structure. Although such shifts need to lead to tenure shifts in rental markets first. Second, this has to result in more households becoming income and cash asset poor making them eligible. And third, whether if such households choose to participate in the scheme as well. A downturn in labour markets, whereas, can increase demand for the subsidy as more households become eligible either by loss of employment or drop in incomes, also increasing the cost for the subsidy directly. In short, housing allowance demand does not depend on rental market price fluctuations and instead depends mostly on labour and financial market volatility (savings), in addition to structural shifts in household demographics.

**8.4 Design features**

The most critical aspect of a housing allowance instrument may very well be the design element. Engineering an allowance instrument that can manage to direct the cash transfer away from inducing demand for the labelled good is paramount.

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52 Renters having housing costs below 25% of the after-tax benefit income are most likely sheltering outside the market as their rents would be extremely low therefore placed well below the entry market rent for say a studio or room in shared accommodation etc. This scenario is although possible in case of homeowners having a very low mortgage payment amount.
I calculate that the target population of the housing allowance scheme in New Zealand categorized by income distribution is approximately the bottom two quintiles (Q1 + Q2) populations.

I undertake this exercise by taking the income cut-out points for Accommodation Supplement for 2015 for a single worker household for all four geographical areas under the scheme and taking the mean to approximate the income limit for eligibility at the national level and applying an income tax rate of ‘M’ I get NZ$32,542. Now, referring to the Household Incomes Report (2016) tables for distribution of incomes by quintiles for New Zealand I see that for a one person single household the decile 5 range is NZ$32,000-NZ$36,000. The A.S. cut-off figure falls just at the bottom of the 5th decile range. Therefore, the target population accordingly categorised by income distribution is approximately the bottom two quintiles Q1 + Q2 populations. This amount is revised annually.

Interestingly, the annual revision of income cut-out limits within the housing allowance formula, on the other hand, may pose inconsistencies in the face of an (apparent) uniform policy regarding ‘eligibility’ for the subsidy. Any deviations of the income limits (some function of median incomes) that are not matched by the labour market wage indexation rates of the prospective subsidy eligible cohort may introduce variations – at the margin - in the total eligible population density functions. For example, as the income cut-out point for housing allowance for a family with children increases from NZD 78,832 (2016 value) to NZD 79,144 (2017 value) per annum, and at the same time, a proportion of the labour markets below median incomes, on the other hand reflect lower rates of change for incomes for that period (depending on, for instance, the proportion of ‘contract assignments’ in the labour markets that tend to dissolve annually and therefore are not indexed and other similar cases) this difference in either direction will increase or decrease the total eligible population density in the housing markets (renting and owning). In other words, all households that were earning NZD 79,000 last year were out of the system whereas they are eligible for the subsidy this year (due only to indexing/adjusting of some variables within the formula for the housing subsidy). Such events pose a difficulty in terms of assuming policy consistency as a given, when modelling for

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53 This, I believe is endorsed by The Treasury in their document which states “The Accommodation Supplement increase was set to the 40th percentile of 2016 rents” suggesting the 40th percentile as a benchmark measure in some sense. Source: Regulatory Impact Statement, NZ Budget 2017 Family Incomes Package, The Treasury.
incidence. As these shifts are at the periphery with households having incomes that are relatively higher (at the limit) and entry into the welfare system would reap minimal monetary benefits due to the abatement criterion with respect to incomes, we do not expect much variance in populations at the margin due to annual adjustments. Also, households at the margin tend not to engage in welfare mostly due to the stigma that prevails in political economic systems that primarily practice residual welfare regimes further dampening such effects.

*Wealth*

In 1988, the policy introduced upper limits for cash assets for ineligibility\(^\text{54}\). Initially, there were no explicit limits on the amount of cash holdings within the policy document although one could reach a dollar amount (as shown in table) that would result in a zero-payment as per the rules for abatement. The actual level of wealth was not explicitly targeted. The table 8.1 below informs of the policy’s attitudes towards wealth levels of recipients.

| Table 8.1: Cash limits for ineligibility for receiving housing allowance - 1975-2020 |
|---------------------------------|-----------------|-----------------|-----------------|
|                                 | 1975            | 1988            | 2020            |
|                                 | Single          | Couple          | Single          | Couple          | Single          | Couple          |
| Cash Limits                     | $2500           | $6600           | $8100           | $16200          | $8100           | $16200          |

*Source:* Author’s calculation

Households at or above this level of savings get zero housing assistance. Such households have to use their meagre savings towards high housing costs effectively running down their total savings further. This is the poverty trap implicitly laid out within the demand side housing policy regime in New Zealand. Similarly, in the UK, a Housing Benefit (HB) claimant is ineligible, whether single or a couple, if their capital amounts to £16,000 and above\(^\text{55}\).

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\(^{54}\) See Social Security Amendment Act (No 2) 1988 (1988 No 147).

\(^{55}\) [https://www.ageuk.org.uk/globalassets/age-uk/documents/factsheets/fs17_housing_benefit_fcs.pdf](https://www.ageuk.org.uk/globalassets/age-uk/documents/factsheets/fs17_housing_benefit_fcs.pdf)
Target population

In 2013, we see that a total of 453,135 households (HH) in NZ rented their home (i.e. paid rent)\(^{56}\), whereas the AS take up in the private rental market (PRM) totalled 260,131 households, where the eligibility rate is most certainly higher.

The AS scheme attributes reveal that a very large part of the population that rents in New Zealand is not just income deprived but is also deprived in terms of cash assets and sits below 80\% of median income levels. Accordingly, one can presume that New Zealand’s private rental housing mostly comprises of low-quality housing units. In 2013, around 70 \% of the entire rental market (private and state housing) comprised of low-income housing\(^{57}\). Hence, as a source of accommodation for low-income households, the private rental sector in New Zealand is not confined to a ‘residual role’. This situation is very similar to the UK rental market’s role for the poor (Kemp, 2011). And this makes the subsidy all the more critical.

Housing allowance and poverty

As discussed, the AS expenditure and rent revenue at the aggregate level is not correlated whereas I find that the Accommodation Supplement payments, in fact, track the poor in New Zealand (see figure 8.1). Here I graph the population having incomes that are 60\% or below the contemporary median income before housing costs on the total costs of the housing allowance. One can see a clear trend between these variables. This means that housing allowances may be a function of poverty and not rising rents by design. The drop witnessed in Accommodation Supplement costs near 2001 is (as pointed out in chapter 3) due to the government adopting a dualist housing policy that (once again) introduced an Income Related Rent Subsidy (IRRS) for tenants in State housing which now made them ineligible for the Accommodation Supplement.

\(^{56}\)Statistics New Zealand. 2013 Census Quick Stats about housing.(2014)

\(^{57}\)Since 1993 to present (2020), Crown has been the largest single landlord in New Zealand with ownership of over 60,000 state houses charging market rents.
Design features like non-indexation or lack of revision in subsidy ceilings on a regular basis suggest design elements that keep housing market influences outside of a housing allowance policy. A change in cash asset limits for eligibility, it seems, is not part of the housing allowance policy. And, in addition, their use as imputed income for abatement of subsidy for a range of cash levels has not been removed and this affects wealth levels of recipients which can influence tenure and housing decisions especially homeownership. Additionally, Weaver (2010) points to three important consequences from a lack of indexation, (1) it can reduce the number of households that would otherwise be entitled for assistance, (2) it reduces the real value of the benefit, and (3) it reduces the real cost of the scheme. In other words, retrenchment takes place automatically. Such a design feature would seem to surely limit direct exposure with rental markets aiming to prevent housing market distortions. Therefore, as per the algorithm, labour market policy predominantly seems to influence the housing subsidy value uncovering its objective to support income maintenance. Interestingly, indexing labour markets in the algorithm mechanically assists towards increasing generosity for the employed in the face of stagnant incomes, further indicating the income maintenance element of the AS scheme. And if an income loss is experienced, the result is the same whereas in times of rent increases, no change in generosity is provided for households at rents above ceiling, which is most renters (as discussed in later sections).
8.5 Heterogeneity under a housing allowance

In order to demonstrate the impacts of a cash transfer consider a two-commodity economy with housing and non-housing goods having a housing allowance present. Now consider three identical households in all other respects than the fact that their incomes differ as a result of the stochastic elements which have been involved in placing them in the labour markets (or out of them). Assume, for simplicity, cash assets of all subsidy recipient households are below the abatement thresholds. Note differing levels of assets create further heterogeneity in (price) subsidy. These households all rent at R1 as shown in figure 8.2. They now face three different relative price changes or income add-ons for the same rental housing relative to their incomes in the presence of a housing allowance scheme.

I use residual income levels on the y-axis to proxy the quantity of non-housing goods that each household can afford. Note points away from the origin represent falling residual incomes on the y-axis. And as households have differing incomes, I use $Y_i$ where $i= B, AS, NAS$ representing three different households (hh) namely, Beneficiary hh (B), Accommodation Supplement eligible hh (AS), and an Accommodation Supplement non-eligible hh (NAS) where their residual incomes are based on the given level of rent (x-axis) i.e. $Y_i - R$. This helps to demonstrate the effects on relative price changes of all three households with different incomes on the same graph.

In figure 8.2, the pre-allowance budget constraint and price line for housing is the part solid part long-dashed line AB. The post-allowance price line for housing for eligible households will be a kinked line. The kink points in the price line are located at the rent entry threshold and the allowance ceiling respectively. The kinked line reflects the relative price line of housing for a household for a given income under an allowance scheme. It is an increasing function with respect to rents until the subsidy maxima rent level, increasing function of household size (until 3 person household), increasing function with respect to policy parameters that define geographical areas based on local housing rents, and a decreasing function with respect to incomes and cash assets. The slope of the kink is constant with respect to the marginal rate of subsidy (MRS); where a steeper slope results from a lower MRS.
In the case of a housing allowance scheme present, if the household is a beneficiary household, they now have $Y_B$ level of residual income with the bold line as their relative price line for housing, ACDE. Such a household renting at $R_1$ would receive an income add-on equal to $WZ$ increasing their residual income levels. Similarly, the employed household would encounter some abatement in subsidy and be at $Y_{AS}$ conditional on their level of income anywhere above AB budget line of non-recipient and below CDE; for example, Cd and would have a different price line or, say, a different set of relative prices for housing to the price line, CD, for the beneficiary household. This household, while renting at $R_1$, would receive an income add-on

\[ 0.7 \left( R_h - \frac{B(i)_x}{4} \right) \]

\[ 0.75 \left( R_h - \frac{B(i)_x}{4} \right) \]

\[ 0.25(Y_{e(h)} - Y_{r}) \]

\[ 0.75(Y_{e(h)} - Y_{r}) \]

\[ 0.25(Y_{e(h)} - Y_{r}) \]

\[ 0.75(Y_{e(h)} - Y_{r}) \]

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\[ 0.25(Y_{e(h)} - Y_{r}) \]
equal to XZ. Whereas the non-eligible household (that either has a high income or a low-income with high cash assets) would be on the AB line having \( Y_{\text{NAS}} \) level of residual income and receive no subsidy i.e. pay the same rent with no income add-on to their budget constraint. The market rent is constant for all three income type households as they are assumed to be similar in housing characteristics (information that the landlord can extract; family size, specific requirements, area, etc.) whereas under the policy lens rent burdens may be considered different. Note that all three households have heterogeneous additional incomes (residual) under an Accommodation Supplement policy based on their labour market outcomes and not housing market participation, which is homogenous. Similarly, their relative price differences are different across the rental distribution as well.

If one is to consider the effects of policy changes in the subsidy parameters; for example, in case of a change in the MRS then the new price line becomes ACFE. The heterogeneity of subsidy still remains although the subsidy ceilings are now reached at a lower rent than before (see point R \( \text{Maxima 0.75 MRS} \)), in effect, tweaking the generosity level at each rent (below the new rent ceiling only) and further decreasing the subsidy’s reliance on the distribution of rents. And under policy shifts that increase the subsidy maxima, the new price line may be shown as AC\( \partial \)e’ which affects all renters renting above old maxima. Renters between rents corresponding to D\( \partial \) on the x-axis get a small incremental tweak, relative to rent increases, to their existing subsidy amounts whereas households renting at or beyond R \( \text{Maxima (high)} \) receive a flat increase regardless of rent levels dependent on income earned or unearned, cash assets, and tax rates.

An increase in the housing subsidy generosity required to increase the quantity demanded for housing, at the household level, can be said to be related to the degree of the subsidy’s generosity, in terms of residual incomes, in shifting the low-income household into a medium-income household so to say. That is, it would require the subsidy to substantially shift the housing stress level down below the 20% level for the household to feel the need and freedom for such a behavioural shift. Even if this was possible which it is not under the eligibility criterion, a permanent increase in housing stress based on a transitionary and diminishing income add-on seems irrational, especially for the poor.

The Accommodation Supplement has been recently revised to reflect new maxima limits and changes that define a new geographic mix whilst keeping the total number of area divisions
constant. These policy changes became effective on 1st April 2018. According to the Treasury, these changes will only affect recipients who are receiving the maxima, whereas I would like to point out that these changes will affect all renters that rent above their respective rent ceiling before the change. The term maxima refers to the subsidy ceilings per Area and household category which are restricted to recipients on job seeker support with no incomes.

In order to understand the AS housing allowance algorithm’s workings and design intent, the most important fact then is that points such as the ‘R_{\text{Maxima}}’ for each household type and the kinked part (and beyond) of the price line and the consequent budget constraints are not known to the renter under the subsidy scheme. As per design of the instrument, at each point in time, if a household decides to move, they have no knowledge during their search of how choosing one rental dwelling over another affects their access and amount of subsidy to be received upon renting. The tenant is not faced with a problem of choice in the rental market under a housing allowance scheme. The housing allowance (argued as a rent price decrease) is a function of the recipients’ cash assets, bank interest rates, incomes / income shifts, income tax rates, main benefit, tax credits and the range of rents that influence subsidy levels. Again, the household is not privy to their unique price line, a fact which undermines revealed preference theory.

Note that households with no income (unemployed) get a higher housing allowance (including a main benefit) when compared to similar eligible households with some source of income. And if such households consume high housing levels (at or beyond R_{\text{Maxima}}) they receive the maximum subsidy and have very low residual incomes before transfers. Here R_{\text{Maxima}} is the rent (ceiling) amount at which the subsidy reaches its maxima. Note that housing is only incrementally subsidised below ceiling rents; all housing above this rent is not subsidised. Above the subsidy maxima, housing is no longer incrementally subsidised for recipient households although the scheme still supplements residual incomes for recipients compared to non-recipient households. Moreover, the heterogeneity in the price of housing still exists above this level for the recipient population based purely on their incomes and assets. Note that when

58 Places that have moved up are those where housing costs have increased by significantly more than other locations in the same AS Area, i.e. those that have had the highest relative housing cost growth. This means that around 166,000 AS recipients live in a place that moves up an Accommodation Supplement Area (58% of total AS recipients). Note that only those receiving the maxima will benefit from this change, this is estimated to be around 89,000 recipients in these places (31% of total AS recipients, and 65% of the 136,000 gaining from the increase in maximum rates part of the package). Source: Treasury document titled “Project Pygmalion: Summary of straw packages to date” (Reference: 20170195: dated 3 August 2017).
taxable incomes increase, under a constant marginal rate of subsidy, the proportion of unsubsidised housing expenditure increases for the same dwelling i.e., constant rent.

Under all circumstances, the housing allowance subsidy is dependent on household income (and savings) as every dollar increase in the household’s income status will decrease the subsidy. Consequently, if households witness income losses, they receive 25 cents on each lost dollar. The allowance is variable with incomes. This is not the case with respect to household rents. Rising rents have no effect on subsidy in cases where households tend to be renting above the rent ceiling.

More importantly, for a given rent, the Accommodation Supplement amounts to a higher percentage of income as income decreases. The poorer the household the more generous the pay-out relative to income (although never offsetting the full income difference between two poor households by 100%). The subsidy is fundamentally not income even though it does increase residual income of recipients. This is due to the nature of how it is generated; the subsidy amount is generated inversely to incomes and cash assets at the household level. Under a stable policy, similar households with higher incomes experience greater purchasing power whereas households having a higher housing allowance, via either a rent increase or income decrease, are worse off in purchasing power. All else equal, a lower allowance reflects greater overall resources after housing costs at the household level. Policy shifts that increase subsidy generosity may increase overall purchasing power of all households, nonetheless, as a design feature the highest benefit increase will go to the poorest unemployed with a greater housing stress. On average, only a few dollars may be disbursed to the average recipient household under such a policy shift, and in most cases the number of households affected is low as well. The algorithm works more as an income generator that is bound by a level of income above which it is non-existent and below it the benefit works as an income maintenance measure. It can be viewed as a progressive bounded poverty alleviation measure, where the bounds are the income and cash asset limits that produce a transfer payment for the systemic poor that are not homeless.
8.6 Accommodation Supplement and the negative income tax formula

As per design objectives of the allowance scheme, all renters mostly rent above the rent ceiling (for their respective subsidy maxima) thus rendering the “rent” variable as quasi-redundant within the algorithm; as whatever the rent amount plugged into the equation above ceiling rents, the resulting value is a fixed dollar amount equal to the subsidy limit from which abatement for earned income and cash asset levels is undertaken to calculate the Accommodation Supplement amount.

Since 1st April 2018, the rent ceiling were revised upwards after 13 years of neglect. The rent ceiling now for a sole parent with one child (reflecting a two-bedroom dwelling) is NZD 458 in Area 1 (i.e. Wellington and Auckland among other cities). This is calculated using the algorithm by rearranging. Now if one looks at Trade Me data on available rentals for two-bedroom dwellings for these cities we see that only around 10% of available dwellings are below this rent ceiling effectively informing us that the entire market seems to be priced above the AS rent ceiling.

On Trade Me, total listings for Wellington for two-bedroom dwellings (all types) were 232 where only 27 were under $450. In Auckland, the total listings for two-bedroom dwellings (all types) were 1465 where only 157 were under $450 and total listings for two-bedroom (house) in Auckland stood at 226 with only 37 below $450. On average, these range around 10-12% and off these listings, some are one and a half bedroom (half bedroom can fit a baby cot only, for example) while others are extremely run-down quarters and car sheds and the rest are in remote or secluded neighbourhoods. Listings are from Sunday 30th August 2020. Note, due to COVID-19, rent freeze on new tenancies was introduced in the first quarter of 2020 in New Zealand. Furthermore, in some areas, rents even fell slightly during this period, especially for one-bedroom studios which is the higher demographic of AS recipients, which possibly means the percentage of available tenancies below ceilings would be lower than even 10% of the entire market in other times.

Such evidence informs us that the rent amount and therefore the ‘allowance’ part is a benchmark variable in the algorithm. It may be labelled as a housing subsidy but in practice is concerned with income and asset poverty of eligible renters. To the extent the AS is a partial
subsidy and not dependent upon the level of housing consumption, the recipients when spending the AS on non-housing consumption would always be able to increase their utility than if they spend it on housing consumption.

And this benchmark feature is what makes the housing allowance formula similar to the NIT formula where the benchmark can be argued to equal the benefit guarantee (G) as seen in equation 8.2. Morrison (1995) notes that the Accommodation Supplement (AS) formula was actually based on suggestions from American consultants and is:

\[ AS = p (FMR - (rI)) \]

where FMR is the fair market rent of the dwelling occupied by the eligible tenant, I is their net benefit income (plus first child family support, usually), r is the percentage of the household's income (I), and p is the proportion of the difference paid as the supplement. It seems the formula suggested was very similar to the benefit formula proposed by Milton Friedman for the negative income tax (NIT). The general formula for Friedman’s benefit is

\[ B = G - tY \]

where G is the guarantee, t is the tax rate, and Y is recipient non-transfer income.\(^{59}\)

Moffitt (2003 p. 1) reminds us that “The negative income tax (NIT) is one of the fundamental ideas of modern analysis of means-tested transfer (“welfare”) programs”. Moreover, Milton Friedman (1962), who proposed the negative income tax (NIT) scheme along with others, saw as an additional advantage that the negative income tax does not distort market prices like price supports do.\(^{60}\)

In order to understand the design of the AS within the Social Security system, it is suggested that the reader acquaint themselves with the NIT. In his chapter on “The Alleviation of Poverty” Friedman (1962 p.191) expresses the NIT design and believes two things seem clear,

\(^{60}\) The NIT was also championed by Lampman (1968), Tobin (1965), Tobin et al. (1967), and many others.
“First, if the objective is to alleviate poverty, we should have a program directed at helping the poor. … Second, so far as possible the program should, while operating through the market, not distort the market or impede its functioning. This is a defect of price supports, minimum-wage laws, tariffs and the like.”

Under the AS scheme, the means-test for incomes targets population in low to middle income households only (approx. income quintile 1 and 2). For example, in 2019 for Area 1, for a 3 person or more household the annual income cut-out point is NZ$96,668, whereas a similar 3 person beneficiary household that receives NZ$22,718 as income support will, if eligible, also receive the full housing subsidy which equals NZ$ 15,860. This essentially provides the floor as discussed by Friedman above. The combination of the main benefit and the AS now provide a floor below which no households income can fall. And, as incomes increase for the beneficiary over the benefit amount (in excess of NZ$80/week gross) the main benefit and subsidy is proportionately abated until reaching zero dollars at the cut-out point. Note that the subsidy decreases with higher incomes, higher savings and vanishes at very low levels of household savings altogether. In addition, housing allowance scheme variables that can increase the subsidy (i.e. subsidy ceilings and cash asset limits) are not regularly uprated or revised in New Zealand and, hence, inflation also erodes the housing allowances’ real value over time.

It is a simple formula based on two factors; (i) the marginal subsidy rate (MSR) that measures the proportion of the burden of rent on incomes to be subsidized and (ii) household income and assets. As per the algorithm, the first part is limited by a rent ceiling, where these ceilings are set so that their function is more as a ‘benchmark’ or a fixed variable in the algorithm in most cases. And as the marginal subsidy rate is constant for all rental household types, therefore, mostly the variation in household incomes (and cash assets) determines the subsidy for each household. It may be labelled as a housing subsidy but, in practice, is more directly an income and wealth subsidy that is inversely related to the level of both these parameters at the household level. In this sense, the Accommodation Supplement is specifically designed as a negative income tax scheme in New Zealand.

During the process for the introduction of the AS in New Zealand in the late 80’s and early 90’s the American consultant’s report largely reflected the conventional wisdom from the EHAP to follow, especially that a considerable ‘leakage’ from housing assistance to other areas is to be expected as recipients would spend the money on items other than housing (Brackertz
et al, 2015). This too informs us that the designers of the AS tweaked it as such that it functions to achieve allocative efficiency with respect to housing markets. Also, in NZ, the Family Tax Credit which is another transfer payment granted inverse to incomes for the low income employed family is considered as income when calculating the AS payment. This is further evidence of the AS instrument designed in line with the NIT as the incomes in the NIT are net of transfers in equation 8.2.

In short, the AS can be categorized as a regressive negative income and wealth tax. It is an ex-post housing consumption payment for the housed (not the homeless). It does not shelter from future rents as it is constant for 13 years (historically). It is a personal subsidy that is heterogeneous to individual income and wealth levels. Eligibility does not depend on housing decisions nor does the algorithm adjust to housing markets. Eligibility is only dependent on poverty. Moreover, the AS monies will proportionately diminish with respect to overall ‘guaranteed income’ from social welfare as unemployment benefit increases annually and the maximum AS money that can be received remains the same for 13 years.

### 8.7 Housing allowances vs price subsidies

Three crucial aspects differentiate a housing allowance subsidy to a traditional subsidy in addition to, obviously, being a cash transfer. For sake of argument, let me even presume that the housing allowance is a price subsidy synonymous to a price fall. Now, first, under a housing allowance scheme, assuming full participation, more households cannot enter the rental market due to eligibility restrictions. Therefore, any price changes can only affect demand at the household level limited in numbers to the specific cohort within the economy and not across the entire set of households in an economy at an aggregate level. Second, price changes affecting housing demand are restricted to an eligible cohort characterized as income and asset poor already consuming required levels of housing. Third, rental housing can be argued to be subsidised heterogeneously under an allowance scheme. That is, price change is heterogenous at the household level. Rental housing under an allowance scheme is cheaper for the eligible cohort mainly with respect to their taxable income levels and cash assets. Rental housing is increasingly cheaper for poorer households within the eligible cohort which is already poor. And the highest subsidy amount goes to the poorest household that is unemployed, has meagre cash savings, and consumes a high level of housing to begin with. In contrast, a traditional
subsidy may affect demand across all households regardless of income levels and the larger
economy, is not restrictive, and reflects a homogenous market price change for the product.

In short, housing allowance is neither a pure (relative) price change (nor does it behave similar
to income increments) therefore housing subsidies cannot be argued, a priori, to shift demand
for housing. Similarly, elasticity of supply of rental housing or supply rigidities cannot be
applied as an argument for rent inflation. Not unless one can establish that the subsidy is
increasing ‘effective’ demand for rental housing for low-income asset poor households. And if
the subsidy shifts demand then the relative size of the short-run and long-run housing
expenditure elasticities may depend on the size of subsidy relative to the transaction costs of
adjusting housing consumption as well.

8.8 Housing consumption under a housing allowance: Optimize or not?

In order to show the relationship between the subsidy and housing demand see figure 8.3. 
Consider two identical households in all other aspects than the fact that their housing (and non-
housing) consumptions can differ as a result of the stochastic elements which have been
involved in locating them into their dwellings. Say, in equilibrium, these housing consumption
levels are R₁, and R_{Maxima} with an identical budget constraint line AB reflecting exact same
incomes and costs of all goods for the two households. Take household having R₁ housing
demand. With the introduction of a typical housing allowance subsidy scheme reflecting a price
line ACDE, the household increases its residual income from M to N equal to the subsidy
amount FG. The budget constraint of the household is now JK where they can buy more of
both goods with this extra income add-on; for instance, BK for housing or AJ for other goods.
Note, here JK is the actual post-allowance budget constraint and AB is the pre-allowance
budget constraint for a household renting at R₁ with a given income. Here the proportion of
housing subsidised can be measured as FG/GM.

Alternatively, take household at R_{Maxima}, where we see that their subsidy is DH. This also shifts
their budget constraint to become LE affecting total possible consumption of housing with an
increase of BE and for all other goods possible by AL. The subsidy (DH) for household at R_{Maxima}
gives a larger income add-on and the proportion of housing that is subsidised is also
greater (DH/HQ). Now assume household R₁ decides to upmarket due to the (perceived)
relative price change for additional housing via the available subsidy scheme and chooses to optimize to receive the highest subsidy and moves into a dwelling similar to \( R_{\text{Maxima}} \). Moving to \( R_{\text{Maxima}} \) would decrease residual incomes from \( N \) to \( P \) and making the same household worse-off than before and even worse-off than if no subsidy was available at \( M \). It can be seen that any move above \( R_1 \) that increases rents as well as allowance also reduces residual incomes.  

**Figure 8.3:** Accommodation Supplement scheme showing households with same income but different levels of housing demand.  
*Optimize or not to optimize?*  

Upmarketing towards the optimal level of housing subsidy results in higher subsidy, higher rents, but leaves the household poorer in terms of after-housing-costs income which includes subsidy transfer payments. The subsidy neither warrants nor induces a house move as it is not
a requirement under the rules of the housing scheme to move into a better dwelling nor is it rational to forgo one’s residual income for something that is already serving its purpose. And if most recipients only rent above ceiling, dependent on the scheme design, the ‘optimization strategy’ argument is redundant under the price theory or revealed preference paradigm. In addition, this limits reverse causality issues between rent and subsidy.

In practice, the highest available subsidy can be received by a 3-person (+) household that is unemployed, living in Area 1 and consuming a high amount of housing. Note this household receives an unemployment benefit. For example, on 1st January 2018, an unemployed 3-person family\(^{61}\) renting at or above $439/week\(^{62}\) in Area 1 would receive $604.34 as their total cash transfer payments - $225 being the housing cash transfer ceiling and $379.34 as jobseeker support (after tax)\(^{63}\). This leaves the family with $165.34 per week as residual income for all other living expenses if rent at ceiling and each dollar above $439/week for rent would reduce residual incomes by the same amount. Assuming a couple with 2 children, this leaves them with $5.90 per day per person to live on after rent.

Policy shifts that took effect from 1st April 2018 increased the subsidy ceilings by an additional $80 per week for a 3-person (+) family renting in Area 1. This will provide much-needed additional residual income surely. A couple with 2 children now receives a higher housing cash transfer equal to $305/week amounting to an extra $2.86 per person per day. With extremely low residual incomes after transfers even with an increase in allowance ($8.76 per person per day in total to survive on) it is highly improbable to alter housing consumption upwards. And recipients with higher residual incomes (low rent or high income) would receive less than $2.86. And for rents at or above the ceiling rent, upmarketing increases the burden of rent which is not offset by the allowance suggesting a 100% drop in residual income, dollar for dollar.

In a Finnish study, Loikkanen (1988) explains that besides the allowance scheme’s objective of lowering the income share in housing expenditures, the obvious target is to direct housing

\(^{61}\) The rent value here corresponds to a family consisting of a couple with 1 child. The rent entry threshold is $12 lower for a family comprising a sole parent with 2 children thus reaching the maximum subsidy at a rent of $427/week.

\(^{62}\) To get rent ceiling values we rearrange the AS formula to get:

\[
R_{\text{max}} = \frac{s_{Lx}}{0.7} + E_T, \text{ where } R_{\text{max}} = \text{Maximum Rent, and, } E_T = \frac{\beta(n)lx}{4}
\]

\(^{63}\) A family with children is also eligible for other benefits such as ‘Family Tax Credit’ for each child from the Internal Revenue Department, NZ.
consumption towards the dwelling with the highest rental subsidy per recipient. This may be true where the marginal rate of subsidy is an increasing function of taxable income and family size. In Finland where such rates reached 90%, this could induce higher income households to target better housing, nonetheless such households are generally poor and increasing housing consumption would still decrease residual incomes by the unsubsidised (at least 10%) proportion of rents. The modern housing allowance schemes usually stabilize the MRS to a constant value, where in New Zealand this is 70% for renters across all incomes and family size. Further, the Housing Choice Voucher design in the US can push voucher holders to upmarket as “voucher holders whose initial rents fall below the local payment standard see no increase in rent burden as rents rise.” (Ellen & Torrats-Espinosa, 2020, p 280).

8.9 ‘Poverty’ as driver for housing demand

Case for trading down in times of rising rents

Economic principles, although useful, may sometimes be implicitly biased. For instance, in housing literature, when arguing housing demand, it is assumed that there exists a positive relationship between income and quantity of housing demanded under rational consumer behaviour. I have pointed out various limitations including the Schwabe’s Law as evidence contradicting the strength of such assumptions. It may equally be argued that any rational renter – whether or not receiving a housing cash subsidy – can decrease the quantity of housing demanded in certain situations e.g. higher rent causing very low residual income. It is indeed more rational to expect a behaviour that results in less housing in situations where rents are rising faster than incomes.

A household deciding to decrease their rent burden in the face of a rent increase by their landlord does not lose the subsidy. Rent levels that result in maximum subsidy levels provide no change in subsidy with any incremental increase in rent for the recipient household. In other words, the subsidy cash value would remain constant whereas the residual income would now effectively fall. Now if the household moves due to the rent increase, then, in cases where the new unit’s rent is lower than the old unit’s rent before the increase, this will leave the household with more money in hand to spend. There may be situations where the new rent for a smaller unit is still higher than the rent for the previous unit before the rent rise. In both situations, the residual incomes increase compared to no move under a rent rise with a housing subsidy. The
subsidy value can surely be affected depending on the rent relative to the ceiling value. The same household without the subsidy would increase their residual income by the amount of the decrease in rent but in the case of a subsidy that very household would experience a greater increase in residual income if it chooses to trade down housing. This amount is even greater than when the household was receiving a higher subsidy prior to opting to trade down.\(^{64}\)

This would suggest that households eligible for housing allowance may very well shift to cheaper housing (less coveted area, fewer amenities, or opt for less bedrooms even) when faced with rising rents in order to avoid falling deeper into (income) poverty. This argument would hold true more so for poorer households (with low income and low wealth levels and higher subsidy) and as most housing allowance programmes are efficiently targeting these very households via income and asset testing such a shift is more likely than not. Therefore, if households prefer increased residual incomes to adequate housing levels when faced with rising rents then one can equally expect the demand for housing (quantity) to fall (even) in the presence of demand-side cash subsidies for housing. Thus, housing subsidy, even where recipients are receiving the maximum subsidy they can, does not promise housing sustainability. In such a case, housing demand then is driven by levels of poverty.

Hulse, Reynolds, Nygaard, Parkinson and Yates (2019) argue that rising incomes amongst poor private tenants may not tend to result in increased housing demand if rents might be increasing non-commensurately to incomes thereby effectively increasing their housing stress levels. This is somewhat true for New Zealand. Analysing the Household Economic Survey (HES) over the period 2008 to 2017, I find that housing costs as a proportion of incomes showed a decreasing trend with increasing incomes following Schwabe’s law\(^{65}\), whereas, during the same

\(^{64}\) This is an interesting thought experiment. Suppose a household consisting of a couple with children has income (Y) NZD 780 and rent (R) NZD 465 and no Accommodation Supplement (A.S). Their residual income (R.I) is NZD 315. Now, the same household with a housing allowance has a R.I = NZD 511 (where AS=NZD 196). If landlord increased rent to NZD 545 giving an R.I of NZD 431 to a subsidy recipient household (as subsidy is still NZD 196 i.e. maximum allowable) then to avoid this drop in residual incomes the subsidy household may trade down to a rent of NZD 370 (NZD 95 less than old rent) would result in an R.I = NZD 558 where the revised Accommodation Supplement now is NZD 148 corresponding to Rent =NZD 370. This R.I is even higher than in the case where the A.S was higher (i.e. NZD 196) and obviously is higher than when trading down without a housing allowance.

\(^{65}\) This law states that the proportion of rent in income or expenditure is a continuously diminishing fraction of income. For details see, IA. Schwabe, Das Verhaltnis von Aliete und Einkommen, Berlin, 1868.
period the proportion of housing costs in income for the lowest income quintile population increased from 29% to 35% showing rising housing stress\(^{66}\) (detailed analysis in Chapter 7).

### 8.10 Housing allowance viewpoints

Empirical research, I believe, has run into problems based mostly on how theory was applied when setting a pathway for an argument for rental subsidies. The Treasury, NZ (2017) opines that it is unsure to what extent recipients understand the workings of the scheme and act which affects their housing and subsidy optimization strategy. This, I believe, compromises arguments for revealed preference demand theory. Overlooking the fact that the housing allowance is designed to delink the subsidy from direct housing consumption decisions is a critical drawback. The delinking is achieved by the absence of a shift in market prices and renders revealed preference inconsistent. For example, the equilibrium set remains the same under consumer choice theory. The housing allowance, in practice, does not change the ‘actual’ marginal rate of substitution because the market price of both goods (housing and non-housing) remains constant\(^{67}\). We also know that utility theory, specifically revealed preference, anchors on relative prices and not on (relative) income or wealth levels. More importantly, even if assuming subsidy as a price variable, homogenous consumers with homothetic utility functions would, in practice, face heterogenous relative price for housing where the HA algorithm would be difficult to integrate into their utility function. Again, as noted, researchers have pointed out that price of housing cannot simply be considered as independent; it is dependent on the cash transfers and the tax system (Trannoy & Wasmer; 2013).

Post EHAP, some suggested that as households need to relocate to increase housing expenditures, transaction costs may have inhibited short-run housing consumption adjustments, while others argued that recipients may not have considered this a permanent addition to their incomes as this was an experiment which kept demand low (Apgar Jr., 1990). Therefore, a housing allowance’s full effect may translate into housing consumption shifts over the longer run. Although a valid point, the experimental nature may or may not have been the

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\(^{67}\) Recall under consumer maximization:

\[ \frac{M.U_x}{P_x} = \frac{M.U_y}{P_y} = \text{constant utility / dollar = consumer equilibrium = marginal rate of substitution} \]
reason for such behaviour as typically, these cash transfers, in the long run, are neither a uniform add-on to earned incomes nor are they an increase in permanent incomes, especially for the employed, as the algorithm shows.

Researchers tend to discount the financial stress of assisted households when postulating behavioural assumptions for households with a subsidy. Also, a willingness to pay more seems counter intuitive to rationality, specifically for the poor. In addition, the (perceived) willingness to pay more rent is certainly directly related to the amount of the subsidy received. And as per most housing allowance policy schemes the means-test ensures that higher subsidies go to poorer households, and the highest amounts of the subsidy end up with the unemployed households where, in most cases, these households are suffering levels of severe housing stress.

At the aggregate level, this is true as well. In figure 8.5 I show that the recipient population, (Q1 + Q2) over time, has on average experienced a rising housing stress level despite the housing allowance compensating their residual incomes. Furthermore, the divergence between the cohorts (high and low income) has increased as well under a housing allowance scheme that is an entitlement. The housing allowance may have helped the recipient cohort to equalize or lessen residual income inequality amongst each other and compete less for different dwellings, but it simply cannot get the cohort out of housing poverty.

![Figure 8.5: Accommodation Supplement missing its target and objective. Low to medium income hh's with housing cost > 30% of disposable Income (subsidy added to income)](source: Perry (2016))

The gap in generosity (target population still facing high housing stress) is a result of the AS formula not altering rent ceilings between 2005 and 2018. The AS is not addressing housing
stress rather it is just providing an income add-on for the Q1 and Q2 cohorts. Although, it is believed that under its objectives, a well targeted AS should help to reduce OTI (outgoings to incoming) for the intended population to a greater degree.

**Dynamics of housing consumption**

An important issue when considering the impact of a housing allowance is the dynamics of consumption. Under high moving costs, adjustments may not be contemporaneous to circumstances, especially under housing (Hanushek & Quigley, 1979). Slow adjustments translate into analytical issues because substantial portions of the complete adjustment cannot be observed during an experiment. Lags, although, can be explicitly incorporated in any analysis, whereas the literature rarely has pursued these issues. This issue suggests that short-run effects might not adequately reflect longer-run effects observed in the steady state under a permanent and fully operational scheme (Hanushek, 1986)\(^6\).

There can be other factors that might affect a consumption response to such a scheme. First, understanding behavioural responses to differences in permanent income than responses to transitory changes are more easily understandable. Permanent incomes impact consumption positively, whereas transitory income changes are less predictable and less interpretable as these do not tend to shift budget constraints (Hanushek, 1986). Therefore, I argue, when households receive income supplements under a negative income tax type scheme, their responses would probably vary depending upon whether or not they considered this to be permanent or transitory income. Households that expect to remain on the main benefit for the long run may consider this as a permanent income increase whereas others may consider this a transitory change in incomes.

Housing allowances may not reflect consumer behaviour similar to income shifts as the subsidy is an adjustment relative to future incomes. An income increase is said to shift rent demand up along with a higher residual income as only a part of every dollar rise is spent on housing. An increase in subsidy or optimizing the subsidy, as argued, is achievable if one increases rental demand (limited to population renting below ceiling rent), and as housing is partially subsidised, every dollar rise in subsidy will require residual incomes to fall. Thus, housing allowances cannot be compared to incomes. Also, under the intertemporal impact of income

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increases on the allowance, agents are less likely to consider the subsidy absorbing adjustment costs in the long run.

8.11 Objective of an allowance and low-income rental behaviour

The allowance does not fit into standard demand theory with respect to either price or incomes. Moreover, we know relatively little about specific consumption patterns of households and how they vary, and, most specifically, about the overall pattern of spending by the poor as compared to the non-poor\textsuperscript{69}. The demand characteristics of recipients and design features of the allowance limit housing market distortions (Treasury, 2017). For instance, amongst the poor eligible cohort the less poor are expected to have a higher rental demand (due to higher incomes) coupled with a smaller subsidy. Also, households that are on the margin for eligibility tend not to participate in the scheme mainly due to small entitlements and stigma attached to social handouts, especially in the Anglosphere (Esping-Andersen, 1990). On the other hand, the ‘very poor’ among the poor may have a lower housing demand (low or no incomes) while having a greater subsidy compared to the poor. An argument does exist for these households to upmarket whereas such a move will nonetheless cost them mainly to lower food consumption levels (the next largest item of expenditure after housing in a household’s budget: Source HES, New Zealand). Although amongst these very poor households, for instance benefit income families, ones receiving a greater subsidy would already be renting higher as per the allowance algorithm. Recent empirical study revealed that housing for allowance recipients, although a necessity, may be functioning as a luxury good if housing consumption is already high relative to needs (Brewer et al, 2019).

The housing allowance reduces the perceived price for housing disproportionately. The subsidy, if argued as making housing cheaper, still remains conditional on the respective income and asset levels of each individual household in addition to rents. The relative price fall of housing, in general, is therefore heterogenous under a housing allowance scheme and is only available in the form of transfer payments. Market rents and household taxable incomes remain constant under a housing allowance policy for the household. In many cases, the variation in

the level of household incomes and cash assets solely determines the subsidy as most households rent above the ceiling.\(^70\)

The objective of the housing allowance policy has to be derived from the complex formula that defines it. It cannot be contrived by opinions. And it seems the formula was engineered with some precision to provide an income supplement to the most deprived cohort in the rental housing markets and to prevent market distortion at the outset for the labelled commodity.

**8.12 Generosity issues**

Looking at figure 8.6, we see that in 2015, around 52% of all Accommodation Supplement recipients that were renting were paying over 50% of their income towards housing costs, whereas 94% were paying housing costs that were above 30% of their incomes after the provision of the subsidy (Perry, 2016). And the situation has actually deteriorated over the period 2007-2015. This suggests that it would be highly unlikely that any increase in liquidity, especially via a housing allowance, would go towards increasing the quantity of housing by such households.

![Figure 5.6: Accommodation Supplement recipients' analysis of housing stress for renting households only](image)

Source: Brian Perry, 2016.

In addition, data for New Zealand suggests that the average life span of a subsidy recipient is 4 years (Rea & Thompson, 2017) whereas recent rent bond data of the MBIE for 2017 shows

\(^{70}\) Only 13% of households, for example, pay rent below the rental ceiling in France (Bozio et al., 2017).
the average tenancy is 2 years 3 months (Johnson, Howden-Chapman & Eaquub, 2018). In a sense one could presume that rent revisions seem, on average, more a function of the non-recipient population. It seems plausible to expect AS tenants are not moving and stay put, along with experiencing tenure discounts from longer tenancies as they tend to wean off the subsidy, on average, in 4 years.

In order to address the issue of generosity, as mentioned earlier, the AS ceilings can be framed in line with the state housing policy rent renewals. That is, a regular revision of rent ceilings at the Area Unit level can be carried out implicitly as a policy. The rates of subsidy parameters could, of course, be graduated just as are the rates of tax above the exemption amount handled.

To this end, I propose to develop a measure or index that can be used to identify and target Area Units that at present suffer high levels of housing stress within the housing allowance scheme where as we know some AS households suffer housing stress levels of 50% and above. The measure can allow the policy makers to choose the limits for the preferred levels of targeting in each quarter at the Area Unit level as well. In this regard, I propose that a measure be constructed that can assist as a metric quantifying the ‘Gap in the Accommodation Supplement Promise’ (GASP).

### 8.12.1 Future policy option – Developing an Index

The Accommodation Supplement, in general, is defined in terms of the measure of housing affordability and the general level of income. The policy is targeting a proportion of the rent burden over and above 25 percent of a household’s income. Specifically, the Accommodation Supplement policy aims to provide 70 percent of this gap in affordability for housing. It is not clear at the outset if the policy is achieving its target for all or by how much does the policy fall short of its intended or claimed target amount.

The index will provide us with an indication of the gap measure in the amount that the policy posits to provide a household and what the household actually gets. The difference in these two amounts effectively captures a measure of the gap in the Accommodation Supplement promise. This type of measure will effectively, on the outset provide an ordinal measure between Area Units across the entire country as to which Area Unit is being neglected more and which ones, in the aggregate, receive higher benefits with respect to relief in housing stress levels.
The index will use values at the AU level for incomes, rents, and the level of housing allowance received by the average rental household. The rents can be any level of rents ranging from median to lower quartile rents as per policy decision. Furthermore, implementing such a statistical exercise using aggregate levels prevents simultaneity in rents and supplement at the household level. If one was to take each households unique rent and solve for the gap in generosity it would lead to other issues that the policy needs to prevent i.e. high incidence of landlord capture. Keeping the benchmark characteristic functional and only dealing with variations in the general level of housing stress per Area Unit would be more helpful towards an objective of dealing with generosity issues, at least for extreme housing stress sufferers.

The amounts will be actual amounts received by the average households of the allowance available each quarter. The incomes strictly need to be disposable incomes but such a measure may include the amount of the Accommodation Supplement as disposable incomes are net of taxes and government transfers. The income value is surely dependent on the availability of such data at the AU level in this case. Options include looking at the HES surveys and using typical values for incomes and approximating for missing AU within the HES surveys. Another avenue could be to use census AU values and index them to the CPI. This is matter of internal access to administrative data and can be handled surely. I will be using as proxy gross incomes to denote the chosen income measure in my index equations. Similar parameters can be applied as for the AS algorithm i.e. 80% of median income and lower quartile rents or some percentage.

For the rent data the algorithm may be allowed to integrate with the MBIE rent bond data set on a quarterly basis to absorb the changing rental market conditions of tenants at the neighbourhood level across New Zealand. A similar approach already exists for state housing rents.

In a sense, the index is capturing the difference between the optimal amount of housing allowance that a household should be getting under the definition of the Accommodation Supplement policy and the amount actually received by households. Although, the aim is to handle this gap at the sub-market level and not the household level. The index is defined as:

\[
\frac{G.A.S.P_{AU}}{(O.A.S_{AU} - A.A.S_{AU})} = \frac{G.A.S_{AU}}{A.A.S_{AU}}
\]

(8.4)

where:
Towards measuring the gap in promise

To understand the mechanisms behind the motive for this index, it is necessary to expand the definition. A more formal functional form for the index may be defined as:

$$G.A.S.P. = \frac{\left\{ 0.7 \left( X_{au} - \frac{Y_{au}}{4} \right) \right\} - A.S._{au}}{A.S._{au}}$$  \hspace{1cm} (8.5)

where:
- $X_{au}$ = Rents/week for AU
- $Y_{au}$ = Income (gross)/weekly for AU
- $A.S._{au}$ = Mean Accommodation Supplement/week for AU

We can represent $A.S._{au}$:

$$A.S._{au} = \frac{\sum_{h=1}^{n} A.S. h \times x}{n}$$  \hspace{1cm} (8.6)

And substituting for $A.S. h \times x$:

$$A.S._{au} = \frac{\sum_{h=1}^{n} \left\{ 0.7 \left( R_{h} - \frac{B_{n,i}}{4} \right) \right\} - \left\lfloor 0.25 \left( Y_{g,h} - Y_{t,i} + Y_{ca,h,i} \right) \right\rfloor}{n}$$  \hspace{1cm} (8.7)

where:
- $h$ (household) = 1,……n
- $n$ = total households in area unit

Substituting eq. 8.7 into eq. 8.5 we get:
\[
GASP_{au} = \left\{ \left[ 0.7 \left( X_{au} - \frac{Y_{au}}{4} \right) \right] - \sum_{i=1}^{n} \left[ 0.7 \left( R_{hi} - \frac{B_{hi}}{4} \right) - \frac{0.25 \left( v_{p,hi} - v_{t,i} + v_{C,A,h_i} \right)}{n} \right] \right\}
\]

The index will provide us with an ordinal tool for policy-making. A value of zero will signify a completely fulfilled promise whereas a value of one for the index will represent a complete lack towards the fulfilment of the promise of the Accommodation Supplement.

\[
GASP_{au} = 0; \quad \text{Accommodation Supplement promise fulfilled}
\]
\[
GASP_{au} > 0; \quad \text{Accommodation Supplement promise un-fulfilled}
\]

The index essentially tries to pick up the shortfall in the policy at present. With the help of the index we can also show that once this shortfall is fulfilled or conversely if the Accommodation Supplement was at present fulfilling its promise, then low-income households housing stress would decrease by an amount that is the ratio between the gap and the income. Where the Gap in the Accommodation Supplement promise for area unit is simply measured as:

\[
GAP_{AU} = \left( O.A.S_{AU} - A.A.S_{AU} \right)
\]

Other parameters issues

As mentioned, allowing the algorithm to use current rents can address affordability issues. Other policy parameter issues such as family size can be revised up to a higher family size as well for example 5 + rather than keep 3 + to be the maximum category. Although income limits seem appropriate as evidence from mortgage interest deductions in the US indicate that if subsidies similar to cash transfers, in this case cash deductions in payments, are provided to the affluent it can result in asset price inflation (Kragh-Sørensen, 2020). Cash asset limits although need immediate revision, the new limits could reflect some proportion equal to, say, 70% of the minimum deposit amount required for the median house price according to household size/type, a similar rate to the marginal rate of the subsidy at present.
Other proposals of change have been recently discussed as well. In the troubled French housing allowance case, Trannoy & Wasmer (2013) provide an alternative where they lump the main benefit and the housing allowance together. In a recent study in New Zealand, the Accommodation Supplement has also been the target of reform although the suggestions are somewhat tedious and will be complex to integrate and implement, at least immediately (McAllister et al., 2019). My proposal hopefully can be implemented with minimal restructuring within government departments, can be speedy, and most importantly it provides flexibility for tweaking and choosing of policy parameters as a lever to control the gaps present in each Area Unit. This can be integrated into an automated software for automatic updating with changing incomes and rents for existing recipients.
9 Modelling the Accommodation Supplement on rents

9.1 Motivation and theory

Housing allowances to renters which form part of residual incomes of households (via unearned income) do not increase housing demand, a priori, and do not tend to influence rent upwards (pure rent inflation) and may even indicate attributes that dampen rents. Housing allowances are not rent dependent, they are poverty dependent. Cash transfers typically have attributes of an asymmetric information set between landlord and tenant. This inherently tends to make subsidy capture difficult tacitly and the co-payment makes collusion with the landlord inefficient for the tenant overtly. Moreover, a housing allowance can also be viewed as introducing a stabilizing flow of income in the face of fluctuating incomes, non-payment of rents, high rates of turnover, and similar aspects that may plague low-income housing markets. These can translate into long-term benefits for the market by reducing risks of landlords and to counterbalance any tendencies towards higher rents (Howenstine, 1986).

The argument is based on an intuitive framework that, in general, suggests that in accordance with how a housing allowance policy is formulated, higher subsidies essentially go to increasingly poorer households (income and cash asset). And any rational consumer would negotiate for a lower rent where every subsidy dollar saved in rents can be utilized to increase purchasing power as the marginal rate of subsidy is less than 100%. Low-income households are no different. As a matter of fact, due to having low levels of residual incomes to begin with, subsidy recipient households may even carry a higher probability to counter any rent revisions upwards. This is because they have relatively less after-housing-cost incomes needed for food and other essentials due to being poorer than non-recipients (Kangasharju, 2010). Landlords, when faced with poorer households that have difficulty with paying rents are less incentivized to increase rents and instead spend less on maintaining properties (Sanderson & Wilson, 2017). And where negotiations have occurred, in addition to reducing maintenance budgets, landlords have valued the continuity of retaining tenants, even if this means loss of some rental income and pressures on profit margins (Beatty et al., 2014; Lloyd, 2013). This supports a movement towards the filtering model for the rental housing stock as well (Sweeney, 1974). In addition,
retaining tenure discounts and not being asked to move out by landlords helps to lessen differential costs of contract termination under the bargaining model and search costs under a Search model for rental housing respectively (Hyslop & Rea, 2019). Rents can also be affected by the proportion of subsidy recipients to non-recipients in a sub-market as well (Gibbons & Manning, 2006; Susin, 2002; Laferrère and Blanc, 2004). At the neighbourhood level, a larger subsidy eligible cohort suggests a greater proportion of poor households that rent and as a result a larger low-income rental housing stock and low rents. And economists have long understood that the rent of a housing unit is directly linked to the neighbourhood conditions around it; that is, surrounding neighbourhood conditions are an amenity that is capitalized into the price of an apartment or house (Collinson et al., 2015).

Cash transfers vs earned incomes

I believe incomes via employment and incomes via welfare benefits, specifically transfers payments like housing allowances, not only differentiate populations in terms of the level of overall poverty (income, social, health) of recipients which can carry its own differentiating preference sets, but there are other structural differences as well. Intertemporally, incomes are mostly indexed to the CPI, increase with work experience, and professional, technical and managerial education levels whereas main benefits, transfers, unearned incomes and tax credits may or may not be indexed to the CPI, are neutral to work experience, and, in most welfare systems, they may not require education, technical or other skill enhancement in order to receive these and any increments thereafter. Unearned income increases require no effort whereas they are also mostly negative in real terms therefore provide no growth or security towards a long-term life cycle hypothesis of income (and consumption). In turn, incomes have growth potential over and above price levels (i.e. the CPI) and therefore can instil a very different behaviour towards short- and long-term perceptions towards consumption. The poor renter supported by transfers and /or benefit incomes which tend to decrease in real terms, I believe, will have a different behaviour set towards consumption expenditure relative to increases in residual incomes from a housing allowance transfer than low-income renters who earn wages and have high cash savings. Also, the growth potential, in real terms, of earned incomes is greater for populations that earn incomes and own a house. That is, in times of increased house price inflation (and rents) these households are argued to generate increased consumption via a ‘wealth effect’ that results from asset price inflation. This is important as there can be tenants in the rental sector that impact rents by renting whereas also renting out
their owned home. For example, a single person or couple could sell their old house and buy three smaller properties to rent out and rent themselves in times of appreciating house prices. And finally, the housing allowance algorithm and policy makes it neither a housing price variable nor a permanent income variable in order for it to influence demand for housing as a normal good.

### 9.2 Modelling cash transfers

The following points need to be considered when modelling such an instrument, that is: (i) Cash transfers are unearned income, (ii) Cash transfers alter residual incomes (not price of consumed good), (iii) Cash transfers may influence demand similar to a consumption variable, and (iv) Cash transfers can enter the structural model similar to incomes. Note that the New Zealand Government Statistician has also considered the Accommodation Supplement as income during each policy change.\(^{71}\)

As the housing subsidy is (extra) income (unearned) it may carry a tendency to affect ‘effective demand’ for overall consumption. As the subsidy is not a price variable one simply cannot, in principle, try to study the effects on the demand for rental housing exploiting pricing theory. In practice, this unearned portion of income may drive rents directly or indirectly via behaviour based on other income, attitudes towards income risk, negotiations etc, namely unmeasurable determinants so to speak, but caused by the presence of these monies. This suggests that the coefficient, if significant and positive, may be interpreted as a kind of income derivative variable. Where it is insignificant, it provides evidence that, as discussed, the subsidy is not a part of rent theory. As it is not a rent support, it can neither influence decision making (via revealed preference) nor can it influence existing rent via negotiations as it is ex-post. A finding where the effect of AS monies is insignificant on the rents of the recipients cohort provides evidence that the AS is not part of rent theory. As revealed, it is similar to a negative income tax transfer payment with its own peculiar design parameters that go beyond the traditional NIT feature. In theory, it is not an income equivalent or price support.

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9.2.1 Housing allowance cohort vs allowance monies: Debunking confounding of poverty and housing allowance cohort

In the case of the AS market share, a significant negative coefficient is possible. Why and how? The AS market share measure, in fact, is simply informing us that it can be interpreted as a signalling tool for relative poor neighbourhoods as the AS is a universal payment, an entitlement. The higher the participation rate for accessing the subsidy in an economy or city or other level of housing market under an entitlement, the greater the number of households that are poor and are restraint in terms of income and wealth combined in that economy or city or area. Under rent theory, the housing allowance target population will provide the researcher with a negative effect on overall market rents (if scheme is universal) as it is a measure of the overall number of poor households in that area. On the other hand, the AS dollar amount ($) of transfer monies will not determine rent or rent demand directly as it is not, theoretically, income. Tax and tax rates are not part of rent theory but rather their impact becomes an empirical question. In short, if you give an insufficient amount of money to the very poor while prices and the general state of the economy and living standards are way above that threshold, such monies will not cause a concern for inflation or suggest inflating housing outcomes of the poor and very poor.

Note, under the US housing choice voucher (HCV) system this is somewhat depressed as data on the supply of vouchers reflects the ‘stipulated quota’ of vouchers and not the eligible cohort in an area or the country as a whole. US Housing Voucher eligibility states that anyone who “be in need of decent, safe, and/or sanitary housing” having Very Low-income (mainly below 50% of median) and the Extremely Low-Income can apply for the voucher72. By law, 75% of the total number of new Housing Vouchers supplied need to go to recipients with Extremely Low-Income i.e., defined as incomes up to the poverty line or 30 percent of the local median, whichever is higher. Vouchers are administered locally by public housing agencies (PHAs). In 2021, 2.62 million households used HCV in over 3300 PHAs. In reality, the eligible number of the population that qualify for a HCV is much higher, whereas not all receive it as it is a quota. Around only 25% of eligible households actually receive a voucher, therefore 75% of

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72 This fact raises an interesting question whether the homeless can apply. At law, it seems that they can. In New Zealand, the homeless cannot receive the AS. US data evidencing this is available at https://www.cbpp.org/housing-choice-vouchers-sharply-reduce-families-housing-instability. https://www.benefits.gov/benefit/710. https://www.hud.gov/topics/housing_choice_voucher_program_section_8
the very poor and poor do not receive a voucher or any other federal rental assistance in the US\textsuperscript{73}. In New Zealand, all eligible households get the AS transfer money, therefore equating participation in the scheme (AS marketshare) to dissemination of money to household (which can, in theory, impact housing and non-housing consumption decisions).

In the US, supply of voucher and use of voucher have different impacts. The supply of voucher is simply identification of the poor and very poor, albeit with a mismatch of 75% in the actual number of ‘poor and very poor’ relative to the number of supplied vouchers. A study on the impact of the quantity of voucher supply on market rents before use will simply mirror how poverty impacts market rents, assuming all eligible receive the voucher. In the case of the US, the result most probably will show no such effect on market rents as 75% of the poor and very poor cohort is not represented by the voucher supply data (see Eriksen & Ross, 2015). Whereas, in New Zealand this would show up as a negative impact on market rents as the number of AS cohort participating (AS marketshare) would very near equal to the number of poor and very poor in an area, at levels of analysis (unit, Area unit, territory, region, country). And as it is an \textit{ex-post} money transfer, AS cohort (AS marketshare) have the ‘actual’ cash in their hand if they simply apply for it. Not so in the US, where they have the voucher in hand nonetheless, they still have to find a dwelling, negotiate with the landlord and then successfully use the voucher towards rent only. Note, in New Zealand, the AS recipient has to, beforehand, have a successful tenancy in order to receive the AS money. In contrast, in the US, the homeless can also receive a voucher to help them into accessing shelter. The AS does not provide access to housing.

Moreover, the voucher, probably in most cases, will impact rent demand upwards, at least for the eligible dwelling stock as it is tied to housing consumption. This can be via a move by a HCV recipient into a higher quality/quantity dwelling - either from eligible to eligible dwelling or non-eligible to eligible dwelling. The voucher can also impact rent inflation via simply inflating the asking rent of the occupied eligible dwelling. In contrast, as only 25% of households are supplied with the voucher in the US, whereas voucher recipient households that live in ineligible units cannot usually afford to move, they do not use the voucher, distorting supply and market impact. Moreover, a voucher supplied in one PHA can be used in some other PHA, distorting supply and its use relative to PHA. In New Zealand, an AS recipient gets the money after they rent therefore the Area Unit data for AS will reflect money sent to that

\textsuperscript{73} https://www.cbpp.org/research/housing/more-housing-vouchers-most-important-step-to-help-more-people-afford-stable-homes
Area Unit. Moreover, in an Area Unit the AS cohort will, similar to the voucher supply cohort in a PHA, simply reflect the poverty level and under the rent theory produce a lower average market rent. This may not be the case in the US, as the cohort supplied with the housing voucher is only 25% of the eligible cohort. In New Zealand, it is 100%. In conclusion, the AS cohort is, in effect, is a measure of poverty simply, nothing else and therefore will impact rents, in theory, identically as would poverty as ‘poverty’ is simply a monetary bound or threshold. AS eligibility is the same.

The confusion regarding the concept of endogeneity or confounding of poverty and AS cohort by researchers needs to be addressed and rectified. As discussed, the AS subsidy heterogeneity is not dependent on rents but on gross incomes, tariff incomes, transfer incomes, and income tax brackets of households at the household level. The rent benefit amount within the AS algorithm is a constant dollar amount with respect to rents and cannot move with the market as it is benchmarked. Historically, this AS ceiling is adjusted to rents every thirteen years to correspond to median rents of the policy year where the Area boundaries associated with the new AS maxima are identified using two-year prior lower quartile rents. In effect, the overall AS benefit heterogeneity is based on personal income and wealth levels, making it a ‘personal subsidy’ as discussed. This removes direct reverse causality. In addition, as it is not a price support, there is no revealed preference to impact endogeneity by simultaneity. And lastly, as the AS is not dwelling based in size or quality, endogeneity by choice is absent as well. In addition, aggregate Area Unit data is more amenable to testing than unit level data with respect to issues of endogeneity. I can, as well, test for the absence of endogeneity.

9.3 Research Question

In order to move ahead with the problem of how to ‘capture’ the incidence of the existence of housing allowances on rents, I wish to propose that rent determination carries two aspects, base rents and rent increases. Although base rents are determined by fundamentals such as cost of construction, real estate price, and the opportunity cost of investment; rent increases may be determined by factors in addition to these, such as negotiation and bargaining, which is argued can be influenced by levels of disposable incomes, among others (Rea, & Thompson, 2017; Brackertz et al., 2015; Laferrère, & Blanc, 2004; Susin, 2002). Thus, it can be said that the absolute size of the household subsidy level is some function of base rents (relative to income...
and wealth levels) at any given time, and periodical household subsidy revisions over time can impact the changing trends in rent.

We know that a particular rent level can generate more than one particular amount of subsidy dollars. This suggests that subsidy shocks can be independent of rent shocks under differing conditions, and surely within the exogenous policy boundary. This leads us to ask whether the cash subsidy really does drive rents. And if so, to what extent.

I draw upon a large increase in the uptake of the AS since its inception in 1993. This plausibly exogenous shock in demand for housing allowances by renters is analysed to estimate how this increase affected price of rental housing. More importantly, the essential question I ask is, “Did low-income landlords siphon housing transfers from this large increase in demand for AS monies?”

In other words, I test whether a $5.225 billion dollar AS cash injection into the poor renter’s average residual income during 2007-2013 inflate lower quartile rents in A.U.s?

In addition, my analysis provides insights into how the AS target population that participates in the scheme impacts overall A.U market rents and to what extent this personnel subsidy manages to explain rent variation?

It is argued that new subsidy recipients (either by becoming eligible via socio-economic shifts or choice to opt into the scheme or tenure shift from homeownership) are said to be less incentivized to negotiate and be a price taker in the market as their jump in residual incomes is substantial and sudden. I argue that it seemingly is a weak incentive especially for the poor ‘eligible’ households as all price negotiations downwards increase residual incomes under the AS. And if the proportion of subsidy eligible new entrants is high, then it is argued that rents in such sub-markets may have an upward bias. That is, the new entrants that are subsidy recipients can exhibit two distinct elements that can increase their rents. First the new rent lease in the case of tenure shift and, second, the extra disposable income in the case of a renting household becoming eligible. Note that an increase in eligibility numbers, although does increase access to the subsidy by an increased number of households, it still affects only the residual incomes of the very poor and the amount of increase in residual incomes is based on their unique situations in addition to the fact that apart from tenure shifts this does not increase demand for housing units. New entrants essentially could be getting either a very high subsidy
which suggests they have a very low income to begin with whereas a small level of subsidy means they have a relative better position in terms of housing stress (assuming similar level of housing consumption) in the rental markets compared to their poorer peers.

9.4 Methodology

My research design is typically quantitative in nature. It is an observational study that can be considered as a natural experiment. I employ a panel dataset in order to apply microeconometric techniques using census and administrative data for New Zealand.

This is the first of its kind study for New Zealand that looks at the sub-market level of analysis i.e., the census Area Unit level of geography in New Zealand, for the AS and has coverage over the entire set of sub-markets in the country for the study period. My identification strategy exploits heterogeneity of subsidy across Area Units (AU) at two levels; first, the average rental housing subsidy actually received by households in AUs, and second, the participation rate or demand for the subsidy in AU’s. In addition to this, heterogeneity in AS household type within Area Units also provides an element of exogenous variation as reflected within the AS dollar ($) amount for each household and not endogenous on the adjusted rent for dwelling size at the AU level as the subsidy is person dependent.

This unearned portion of income (i.e. subsidy) may influence rents directly or indirectly via an individual’s behaviour based on other income, attitudes towards risk, negotiation skills, saving preferences, etc., namely unmeasurable determinants so to speak, but caused by the presence of these monies. Such heterogeneity is precisely what is handled by a panel data set that adopts a fixed effects estimation methodology. Another interesting characteristic is the number of AS recipient households that may be at or above the subsidy ceiling. This data is not available to me at the AU level whereas the fact that I include the dollar value as well for the subsidy, the interaction term introduced in section 10.2.3 implicitly carries such information at the AU level.

The two cross-sections in my panel dataset for my study are pre-financial crisis and post financial crisis periods, which is, 2006 quarter 1 and 2013 quarter 1 data. The difference in the time period is 7 years. During this time, the subsidy expenditure increased at a much higher rate than the previous seven years as the subsidy’s demand experienced a much greater shock
than in the past seven years. This exogenous shock is akin to an experimental treatment, but since there is no randomization or control versus treatment groups, such a design is sometimes labelled a quasi-experiment (Ketokivi & McIntosh, 2017).

As discussed earlier, at the macroeconomic or aggregate country level, there seems weak or no evidence of the rental subsidy contributing to rental revenues (see figure 6.1). The analysis, in addition to first differences, also graphed the lagged values of AS on rents for up to two lags which captures rent renewals and any consequent moves as well. The mechanism is simply absent providing evidence of the exogeneity of recipient cohort movements and future rents. I, therefore, ask whether, at the Area Unit level, increases in subsidy expenditure and subsidy penetration rate influence rents upwards.

My identification strategy is to isolate the subsidy variability (shocks) from other shocks that drive housing rents at the neighbourhood level. Identification deals precisely with what can be learned about the relationships among variables given the population. Moreover, under the negotiation and bargaining hypothesis, current rents are reflective of effects of any AS quantum as part of the household budget set whereas, under the income-consumption hypothesis lagged effects of an AS quantum can be important in influencing rent negotiations. My panel data can be meaningful in capturing both models, as the AS rise tends to stabilize well before 2013 q1 and one can assume that private housing markets have fully adjusted towards equilibrium.

Moreover, at the individual level it can be argued that it may be somewhat problematic to analyze the effects due to the mechanical link between the housing allowance and rents hidden within the algorithm, although the eventual level of personal subsidy that is AS may very well not be much impacted. Whereas, at the submarket level, the analysis becomes more amenable.

9.5 Modelling

When spatial dimensions are used, for example, Area Units in my thesis, housing market segmentation can rely on pre-existing geographic (Adair et al., 1996) or spatial partitions based on socio-economic or environmental characteristics (Harsman and Quigley, 1995). In order to model at the spatial dimension of Area Units for the rent model, I follow Grimes et. al.(2013), Gete, P., & Reher, M., (2018), and Egner, B., & Grabietz, K. J., (2018), and assume a single aggregate housing market to exist within each spatial measure of location. In my study, I use the census Area Unit for this purpose and thus I do not differentiate between housing of
different quality within an Area Unit. The same rental market relationships, for example functional form and elasticities, are assumed to operate across all Area Units. However, specific features of individual Area Units are included in the model through inclusion of Area Unit specific values for exogeneous influences and through inclusion of Area Unit fixed effects (unobserved or unmeasurable) whilst I also test for the equality of a set of responses across subgroups of Area Units.

It is argued that an economist’s approach towards housing studies is somewhat of a reductionist viewpoint. It is understood that geographers and urban planners have difficulties in merging their concerns and concepts with the reductionist nature of economic models of housing markets (Maclennan, & Tu, 1996). It may or may not be that NZ Area Units are intended to emulate sub-markets (note submarkets can be spatially defined, but also defined as subsets of housing types). Maclennan and Tu (1996) and Bourassa, Hoesli and Peng (2003) provide starting points for looking at submarkets. In practice, researchers often fall back on predefined spatial units, but spatial modelling would enable including spatial elements (such as spill overs and geography/locational determinants) in a manner that standard panel models do not.

It is widely understood that within defined sub-markets, alternative measures of location are adopted to identify influences of any proximity or neighbourhood attributes (see detailed discussion on Measures of location in section 9.7). Analysing data at the sub-market level can make the quality of the neighbourhood a factor that affects value (Crook, & Hughes, 2001) and this can introduce concepts of spatial dependence and spatial heterogeneity or spatial autocorrelation in comparison to empirical estimation techniques that do not account for such variation. Such neighbourhood effects can lead to problems of omitted variable bias in sub-market analysis, in some cases. For this reason, GIS techniques were developed to define location and to structure data spatially in the use of hedonic techniques (Malpezzi, 2003).

### 9.5.1 Spatial interactions

The location variable can inform values in two different proximity effects. One is the distance to an amenity which is expected to influence the final price. The other can be explained when considering that not all neighbourhoods have the same house prices; some neighbourhoods may be systematically more expensive than others, regardless of their proximity to an amenity. If this is the case, we need some way to account for the fact that each neighbourhood may
experience these kinds of unique effects. One way to do this is by capturing spatial heterogeneity. At its most basic, spatial heterogeneity means that parts of the model may vary systematically with geography. For example, we know that under a fixed effect model changes to the intercept reflect the fact that different areas have different exposures to a given process. Slope changes, that is changes in $\beta$ may indicate some kind of geographical mediating factor that makes the relationship between the independent and dependent variables vary across space. This effect is the neighbourhood effect of spill over.

Traditional linear regression models including ‘fixed effects’ panel data models are inherently global in nature. They still rely on submarket dummies based on some predefined divisions, such as census tracts. In order to explain accurately any spatial variation in prices for homes or rents, absolute location is fundamental for price determination. Brunsdon et al. (1996), Fotheringham et al. (1998, 2002), amongst others, have advocated for Geographically Weighted Regressions (GWR) as a local variation modelling technique, as it allows for the exploration and testing of the significance of the variation of the parameters. As a technique GWR has expanded substantially across many disciplines. Within the property context, as a statistical technique, it enhances estimation of price with a given set of attributes taking into account the effects of location.

However, the GWR model possesses limitations (Helbich, 2015). There is strong correlation between the GWR parameters as repeated values are used in estimation. Second, multicollinearity in GWR can falsely induce parameter variability and inflates parameter variance. Finally, the resulting standard errors are simply an approximation, and the classical statistical test procedures are pseudo counterparts of traditional test procedures. For these reasons, I will be providing the traditional linear regression panel data parameter estimates as well as per Grimes et. al (2013), Gete, P., & Reher, M., (2018), and Egner, B., & Grabietz, K. J., (2018).

For the scope of this study, I primarily assume that our two time period panel data providing a medium to long run equilibrium post shock would not pose a location dependence. Often in applied research one finds weak evidence in favour of spatial interaction effects when time period fixed effects are also accounted for. The explanation is that most variables tend to move in tandem across spatial units along the national evolution of these variables over time. In the long term, post any shock effects, variables tend towards equilibrium. In equilibrium, neighbouring values tend to be more similar than those further apart, but this interaction effect
is often weaker than its counterpart over time. I, nonetheless, provide spatial autoregressive (SAR) panel data regression model analysis as well to extend the present model of Grimes et. al (2013), Gete, P., & Reher, M., (2018), and Egner, B., & Grabietz, K. J., (2018), and in addition, to compliment the overall analysis of rent formation to include spatial dependence.

9.6 Rent formation model

I focus on rental price drivers when considering a rental housing policy analysis. It is safe to expect that market rents implicitly carry the impact of negotiations and bargaining. This is similar to the established question of testing whether incomes do drive rents, and the more recent question being established of whether mortgage credit supply (borrowed income) drives rents and to what extent (Gete & Reher, 2018).

In its simplest form, the hedonic equation for the rent determination model takes the form of (Bibby et. al., 2007):

\[ R = f(S, N, L, C, T) \]  \hspace{1cm} (9.1)

Where

- \( R \) = rent
- \( S \) = Structural characteristics
- \( N \) = Neighbourhood characteristics
- \( L \) = Location within the market
- \( C \) = Contractual conditions
- \( T \) = Time of rent observation

Theory says little about the precise functional form of a rent model and it is up to the researcher to justify the adoption of a specific functional form, including whether to use additive or multiplicative models as appropriate (Hughes & Lowe, 2007). This study employs the simplistic additive functional form to develop the rent model following Grimes et.al., (2013), Gete, P., & Reher, M., (2018), and Egner, B., & Grabietz, K. J., (2018).
9.6.1 Key determinants of rent

The key variables to consider in rent formation model, which explains where people choose to live, include structural characteristics, neighbourhood characteristics, location within the market, contractual conditions, and timing. Following Bibby et.al (2007), I identify individual determinants that can have an impact on rental prices within my study context. These constitute my independent variables which will be used for setting up the formal model. The purpose is to explain the overall level of rent within the Area Unit or neighbourhood in comparison to other Area Units or neighbourhoods, not individual choice of rental unit within a specific market. In the spirit of model building, it is generally accepted that a parsimonious approach is welcomed. I also adopt this approach.

9.6.1.1 Structural, neighbourhood, and contract characteristics

The most critical hedonic price requirements include property characteristics. The main physical characteristics of individual properties have a bearing on the rent values accordingly. Typically, these are property size, property type, etc. At the Area Unit level, the proportion of dwellings with respect to the number of bedroom within each dwelling can be used an indicator of size and type. This variable is therefore, positively related to rent and is expected to have a meaningful and strong impact on rental values (Rhodes & Kemp, 2002).

Apart from determinants that are directly related to market structure configurations, aspects of population characteristics interacting with market configurations are believed to have an impact on rent prices as well. Although this may be truer in the case for cities than neighbourhoods as mobility across neighbourhoods, amongst others, may help to explain equilibrium prices in such a case; although ‘search theoretic’ models deal with mobility and costs associated with moving in order to fully explain this phenomenon. For my purpose, I assume that market rents reflect prices for post ‘search’ population levels for an Area Unit i.e. equilibrium rents. The first obvious population determinant is the number of housing units per capita as it may be perceived as a proxy for supply levels in the face of the level of demand in the market. Less units per inhabitant means a tighter housing market with renters competing for housing. Another measure is the population density at the neighbourhood level as a proportion of rental dwellings. This, in a sense, captures the specific market (rental) segment effect than the overall housing market effect which can be misleading. For instance, in any two periods, housing units
per capita can remain constant for an Area Unit, whilst market segmentation may have altered, say, by the presence of interconnected markets where renters can become home-owners by buying the unit they rent. In such a case, the average household size will fail to capture the true presence (and shift) of the rental sector. Using population density with respect to rental dwelling share (rent dwellings in AU / population in AU) within an Area Unit i.e. rental housing per capita, is expected to have a negative sign. And if such a variable is significant (statistically) this means that population pressure is affecting rents which in turn suggests rental supply constraints are present in the housing markets, assuming all else constant.

Another very common misrepresentation that is part of housing models is that population is used as a determinant in house price equations effortlessly. I would argue that population increase in itself can have less of a bearing on prices rather the extra money that the population may possess or produce is a factor nonetheless. For example, an increase in the number of people demanding to stay in an apartment building would not increase the rents unless they had money to offer over and above the prevailing rents. The additional burden of population has no direct bearing on prices. Prices are only affected directly by money. Thus, pooling of incomes and not individuals can impact rents. This theory can be easily understood by considering the affluent neighbourhoods of London that consist of an increasing proportion of ‘ghost’ apartments; in such neighbourhoods one witnesses depleting population numbers with inflating prices of property (Platt, 2015; Simone & Barthropp, 2015). This is because investors park their money in lucrative assets that is real estate and are less concerned with rental incomes than capital gains.

Notably, my argument is that investment or money flows i.e. money is what fundamentally secures a rent agreement or purchase agreement to determine the price of property and not necessarily population levels. Therefore, trading of ownership rights has the ability to influence prices and develop inflationary pressures and outcomes within asset markets such as property, stocks and derivatives (financial and commodity) markets. Therefore, money (incomes), access to money (credit) and wealth are a more appropriate variable than population for understanding pricing. Thus the ‘population’ in a housing market is in a sense not directly related to (setting of) house prices; they both share a common attribute, a token for negotiation namely ‘money’. The relationship between population and house prices observed is somewhat coincidental – even spurious, especially in a credit economy with deregulated international financial markets; this is most common in the developed world. For this reason, I also use the number of
households (as household’s proxy population in my study) with positive incomes (i.e. employed) rather than simply total population and consider it to be a more robust indicator for modelling rents (Meen, 2001). Although I appreciate that an argument can be made that this anomaly is mostly possible for house prices and less for determining rents as rental dwellings are usually consumed once rental contracts are executed i.e. in use and occupied. Still in times of rapid house price appreciation, this may not hold true either as investors may buy and hold houses for renting purpose but do not rent them out. This approach although does not affect rents directly as no rental contract is executed whereas it may affect rents indirectly via supply constraints and house prices.

An increase in rental dwellings within an Area Unit, using conventional arguments would suggest that rents would tend to be less competitive assuming homogenous rental housing products across Area Units. Whereas if rates of tenure shift are showing an increasing trend towards rental dwellings then these arguments will pivot more so on the speed of the shifts in tenure with respect to demand for rental units in that Area Unit, assuming house prices as constant. In other words, if at the macro level i.e. in the aggregate, more home owners are selling their property and converting the market into a rental market (tenure shift) whilst also witnessing increasing demand for rental units by structural shifts in household size (family split, children moving out etc.) and, in the short to medium run, the rental dwellings size remains relatively unchanged (number of bedrooms etc.) resulting in a net effect of increased demand than supply, where simultaneously some homeowners are converting part of the existing housing stock into holiday homes (vacant homes) as well, further affecting rental supply, such behaviour would certainly show up as pushing rents up. I, thus, measure the proportion of the rental sector in the Area Unit with respect to the total rental sector of the country. In other words, home ownership rates would reflect the inverse. Thus through tenure shifts that reflect rising rents, less homeownership is a result of investor behaviour in favour of rental units.

Socio-economic determinants that are named in the literature to have an impact on rental prices are mainly the share of unemployment and average wages, at least at the city level. This can be argued for the neighbourhood as well where incomes in an area are said to determine rent via labour markets fundamentally (Susin, 2002). Also, wages reflect both, demand and supply, as high wages bring in demand and also reflect construction costs which affect supply (Susin, 2002). An increase in household income level in an area increases willingness to pay for house
rent, which pushes up house rent price (Selim, 2011). Also, within the rental market segment a higher share of unemployed people increases the demand for housing units in the lower priced market segment (Egner & Grabietz, 2018). Therefore I include unemployment rate when considering lower priced rental markets.

With respect to inclusion of contract attributes in the rent formation model, it is understood that retaining tenure discounts and not being asked to move out by landlords helps to lessen differential costs of contract termination under the bargaining model and search costs under a Search model for rental housing respectively (Hyslop & Rea, 2019). Therefore, I include two variables that measure the percentage of usual tenancies in an Area Unit below one year and between 5-9 years to control for contract attributes.

With respect to time, the data retrieved from MBIE is actual rent contract data, therefore, it is based on the particular dwelling and the exact contract between the tenant and the landlord, which is reflecting the true value of market rents that are generated in the market and extracted from the income of renting households.

### 9.6.1.2 Spatial characteristics – Measures of location

Real estate property values are mainly conditioned by several aspects, which can be summed up as intrinsic and extrinsic. Intrinsic characteristics are specific goods (i.e. appliances, floor area etc.) and are positional (e.g. orientation, front), technological or productive, while the extrinsic characteristics relate to a diversity of goods, where the value function is indifferent to the location variable. In other words, especially in the case of urban areas, the spatial context, in the opinion of market actors, is uniform in terms of infrastructure (accessibility to public services, accessibility to public transport, the presence of basic commercial services, etc.) and environment (social context, absence of noise, building density, clean air, etc.). Extrinsic features are the determinants of the market price which geographically identify the property (The Institute for Urban Land Use and Housing Studies, Columbia University, 1993). Therefore, an extremely close correlation between ‘rigidity location’ of property (fixed location) and its value exists (Manganelli, Pontrandolfi, Azzato, & Murgante, 2014).

In general, real estate data are typically collected and organised by region and then by town or city. Where data are collected for levels below the town or city level, researchers will often use pre-defined neighbourhoods or construct such definitions and organise the data into distinct
groupings (Hughes & Lowe, 2007). Sub-market categorisation has been used to attempt to minimize the effects of location. Sub-markets attempt to capture collections of dwellings in a city or neighbourhood which might be considered close substitutes. This is to say that consumers may regard these properties as having attributes that make them closely equivalent to each other (Adair, McGreal, Smyth, Cooper, & Ryley, 2000). Within such sub-markets, each unit is considered substitutable in terms of its general location. Within a set of pre-defined sub-markets, alternative measures of location are adopted which attempt to identify the influences of the neighbourhood attributes (Hughes & Lowe, 2007).

Alternatively, recent developments in statistical techniques, principally Geographically Weighted Regression (GWR) have been adopted in analysing the housing markets, in order to identify homogenous areas and to define the marginal contribution that a single location (outlined by these areas) gives to the market value of the property. The decomposition of urban areas in homogenous zones market is a crucial element for both local authorities and private organisations active in processes of city management and transformation (Goodman & Thibodeau, 2003). Moreover, the definition of a homogenous market area is definitely dependent on the specific purpose or use (Islam & Asami, 2009). For mass appraisal purposes of real estate property, a homogenous area should include only properties that differ by intrinsic characters, which are specific to the individual property. The presence of position effects cause residuals that are spatially correlated and thus the basic requirements of a hedonic price analysis are violated. Zoning also allows for a better analysis of price dynamics in time and space (Alkay, 2008).

Many processes have been used and tested in the segmentation of the real estate market employing techniques such as hedonic pricing, cluster analysis, GIS, cointegration analysis, fuzzy clustering, spline functions, neural networks, regression trees, and household mobility patterns (Manganelli et al., 2014). These studies showed that the size of a homogenous market area depends on structural factors. The value of an area is dependent on the presence of infrastructures, services and it is influenced by the possibility to experience unique landscapes. On the other hand, this value also reflects the perception of market operators about location, neighbourhood, area where the property is located and inhabitants characteristics, in practice place identity (Manganelli et al., 2014).

This posits a potential problem of spatial dependence or spatial autocorrelation that, if present, is overlooked by linear regression models. This issue is equally present in sub-market
segmentation or pre-determined sub-market boundaries such as utilised by the census tracts as much as it can be found in individual unit’s dependence on spatial or locational properties. Examples of this can be certain housing units having a curb appeal and are charged higher than nearby units or, another case may be that a unit could be a direct contiguous neighbour of a celebrity and can fetch a higher rent or price than a unit in the same vicinity and not a direct neighbour. Such issues are dealt with by a specialised branch of econometrics known as spatial econometrics.

**Figure 9.1(a):** Choropleth map showing clustering of rents by census Area Units in 2013, New Zealand.

I include, in my analysis, regressions to model at the spatial level that include an independent variable for spatial dependence between adjoining Area Units. Inclusion of a Geographically Weighted Regression (GWR) using Area Unit polygons in the space dimension allows for
controlling for neighbourhood effects of adjoining Area Units that may impact rents of individual Area Units.

The clearest way to see this sort of interaction is to look at a choropleth map for the Area Units of New Zealand with data of median rents for 2013. Figure 9.1(a) shows the impact of rents does spill over to neighbouring Area Units as high rent areas tend to cluster near each other and low rent area depict the same. This is why including a spatial parameter can assist towards the omitted variable bias in studies with statistically significant regressors.

### 9.6.2 Location data and operationalization

New Zealand is divided into 2,020 Area Units which includes waterways, water inlets and other categories that may or may not contain residential housing. Area Units are aggregations of Meshblocks. They are non-administrative geographic areas that are in between Meshblocks and Territorial Authorities in size. Area Units must either define, or aggregate to define, Regional Councils, Territorial Authorities, and Urban Areas. Area Units within urban areas normally contain a population of 3,000–5,000 people (see figure 9.1(b) showing a snapshot of central Auckland Area Units). A Meshblock is a defined geographic area, varying in size from part of a city block to large areas of rural land. Meshblocks are contiguous: each Meshblock borders on another to form a network covering all of New Zealand, including coasts and inlets.

As at 1 January 2018, the Area Unit classification will be replaced by the Statistical Area 2 (SA2) classification.

The SA2 geography (formerly Area Unit) aims to reflect communities that interact together socially and economically. In populated areas, SA2s generally contain similar-sized populations. As classified by Statistics New Zealand (Stats NZ) the SA2 should:

- form a contiguous cluster of one or more SA1s (which are made up of one or more Meshblocks)
- excluding exceptions below, allow the release of multivariate statistics with minimal data suppression
- capture a similar type of area, such as high-density urban areas, farmland, wilderness areas, and water areas
- be socially homogeneous and capture a community of interest. It may have, for example:
  i. a shared road network,
  ii. shared community facilities
  iii. shared historical or social links, or
iv. socio-economic similarity

Figure 9.1(b): Snapshot of central Auckland Area Units

Source: Generated using ArcGIS software. Data courtesy Koordinates.com

9.7 Data

I will be using panel datasets. Panel datasets are where a large number of observational units are observed over time. These are referred to as longitudinal datasets also. With longitudinal data, one can often alleviate issues of endogeneity by eliminating some of the effects of one of the leading causes of endogeneity, unobserved heterogeneity (Roberts & Whited, 2013). Longitudinal data do not of course solve the endogeneity problem (because it cannot be solved), but panel datasets have many notable advantages over cross-sectional data. In short, when longitudinal data are available on the observational units, researchers can add to their models unit-specific fixed effects (FE), which will control for all differences that cannot be modelled and are both stable over time and that may even correlate with other predictors of interest (Ketokivi & McIntosh, 2017).
I will be utilising census and administrative dataset from Ministry of Social Development (MSD) which are population-wide and the Ministry of Business, Innovation and Employment (MBIE) MBIE dataset. The main data sets I use are the New Zealand Statistics (NZ Stats) Census data sets for 2006 and 2013 at the Area Unit level, and the Ministry of Business, Innovation and Employment (MBIE) rent bond data set at the AU level. For the housing allowance, I use the administrative dataset of the Ministry of Social Development (MSD) for the Accommodation Supplement. This is a proprietary dataset to which I have exclusive access. It is a time series at quarterly intervals between June 1996 and December 2016 providing a snapshot of the AS weekly amount which is the sum of the payments made to all clients and the corresponding number of households in receipt of the subsidy. This data is disaggregated at each tenure i.e. renting, boarding, home-owner, for each Area Unit for all receiving households across the entire country.

As mentioned, the census data represents New Zealand divided into 2,020 Statistical Area Units. Area units within urban areas normally contain a population of 3,000–5,000 people. Meshblocks across the country total 46,629 places or neighbourhoods. The optimal size for a meshblock is 30–60 dwellings. When meshblocks exceed 80 dwellings, they are reviewed for splitting. Meshblocks should be no larger than 120 dwellings (unless they contain a large apartment block or other multi-dwelling building). The census dataset is for all households in the country.

The MBIE dataset is a quarterly rent time series available to the public dating from June 1993 to present at various geographical levels. Under New Zealand law private landlords are required to deposit rent bonds with the MBIE reflecting a multiple of 2 to 4 weeks of the actual rent agreed upon in the rental contract with the tenants. The rent bond dataset uses the final negotiated weekly rent for each dwelling and is provided as a geometric mean for an Area Unit and is adjusted for size, stratified by bedroom number and then derived using the weighted average for each bedroom category. This data is housed in their tenancy bond database, which records all new rental bonds that are lodged with them each month. The MBIE also provides synthetic lower quartile (SLQ) rent values for dwellings at the Area Unit level.

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74 This dataset was sourced by my supervisor, Dr. Michael Rehm, Department of Property, University of Auckland from the Ministry of Social Development, New Zealand.
Census data is compiled using a survey by New Zealand Statistics (NZ Stats) and is produced every five years. Although, the census was delayed post 2006 census and was not conducted until 2013, which provides a seven year gap in place of the usual five year interval for all other census data sets. The rent data in the census is the adjusted median rent value for each Area Unit.

The presence of State houses within an Area Unit will reflect on the median values for rents for the Area Units as these data sets are from questionnaires. They include the actual rents paid by the survey participants. In the case of State house tenants filling a questionnaire, it is the rent that they pay which is reflected in these data sets. State housing tenants pay only an income-related-rent (IRR), in effect, biasing the median rent values for an Area Unit downwards. To control for this, I include a variable to reflect the ratio of State houses to rentals in an AU. This is expected to extract the effects of the bias somewhat. Although the higher the proportion of State houses to total dwellings in an Area Unit, the lower the proportion of private dwellings and subsidy households as well reducing the bias. Also, as stated by NZ Stats, around 18% of error may exist when counting overall State housing in the census which increases the bias somewhat as well. Also, data on Accommodation Supplement recipient households marketshare is a proportion of total rental households in the AU that includes state houses in the case of median rents. Whereas when using geometric and SLQ rents the proportion of AS households is a fraction of rental households minus state houses in the AU as these rents reflect the private sector (AS marketshare_{MBIE}).

The synthetic lower quartile (SLQ) is a measure created by MBIE to address some problems with lower quartile rent data. Rents tend to cluster at specific dollar values (for example many rental properties have a $200 rent, but few have a $197.50 rent). This is a problem because, unlike an average, a lower quartile has to be an actual number taken from the data. This means the lower quartile value for rents ends up fluctuating from cluster to cluster. Instead of moving smoothly over time, there can be long periods where it does not change, followed by a sharp jump up or down, or periods where the lower quartile swings up and down from month to month. Either case makes interpreting the changes in lower quartile rents difficult. The SLQ is the point dividing the bottom 25% of rents from the top 75%, so long as rents are lognormally distributed. Internal research conducted by MBIE suggests that rents are approximately lognormally distributed. Also MBIE data cannot distinguish between furnished and un-furnished
rentals. This is not a problem under my methodology if one presumes that the furnished dwellings remain as furnished in the rental market over time; which usually is the case.

Within my study period from 2006-2013, the amounts from 2007 to 2013, of the total cost of the Accommodation Supplement housing subsidy specifically for the rental sector stood at NZ$ 5.225 billion (see figure 9.2). This is in contrast to the cost for a similar period in the past spanning from 2001 to 2007 standing at NZ$ 3.226 billion; a rise of almost 62%. Similarly, the mean national rent for private residential dwellings for all property types increased from NZ$306 to NZ$365 for the same period, a 19.3% increase.

Table 9.1 - Total New Zealand household (hh) numbers and total households covered under study – Census data. 2006 and 2013.

<table>
<thead>
<tr>
<th>item</th>
<th>Private households</th>
<th>Renting households</th>
<th>Social housing</th>
<th>AS renting households</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study hh#</td>
<td>1374006</td>
<td>1304994</td>
<td>405147</td>
<td>351246</td>
<td>63036</td>
</tr>
<tr>
<td>NZ hh#</td>
<td>1549890</td>
<td>1454175</td>
<td>453135</td>
<td>388272</td>
<td>69180</td>
</tr>
<tr>
<td>Study %</td>
<td>88.7</td>
<td>89.7</td>
<td>89.4</td>
<td>90.5</td>
<td>91.1</td>
</tr>
</tbody>
</table>

Notes: Census data is collected by Statistics New Zealand using a questionnaire. In 2006 it was on 7th March and in 2013 it was 8th March. Private households represent all households that occupied a private dwelling on that night. Rental households consist of all occupied private households that pay rent. Social housing is a part of occupied private households that pay rent. AS households that rent are extracted from the MSD dataset and represent 2006Q3 and 2013Q1 values in my panel.

My datasets are aggregated at the Area Unit level weighted using total households. The two time periods for my panel dataset are 2006 and 2013 as detailed in table 9.1. Total households surveyed and reflecting the dataset are 1,374,006 households in 2013. Each Area Unit value is arrived at from survey data gathered at the household unit level and aggregated at various levels by Statistics NZ to create the Census dataset. On average, my dataset can be said to represent 922 households per AU of which 272 are rental households of which 112 are subsidy recipient households. The combined merged datasets using Census and Accommodation Supplement
variables at the Area Unit level converge to give 1489 Area Units reflecting a coverage of approximately 90% of all households in the country. Subsidy recipient data covers the entire rental population accessing the subsidy, where the exact number of households demanding the subsidy along with the exact total dollar amounts are available for each AU in the country.

To summarize, there are 1489 Area Units with a full set of control variables, rent data, and Accommodation Supplement dollar amounts and Accommodation Supplement demand data which I use in the core panel regressions.

9.7.1 Data adjustments

My data set on the Accommodation Supplement is provided by the Ministry of Social Development (MSD). It suffers from unallocated amounts at the Area Unit level in dollar terms for the period in my study. On average, about 7 percent of the total amount of the subsidy remains unallocated with respect to a specific geography i.e., Area Unit. Aggregate totals for Area Unit level data can be understated.

I undertook an exercise to appropriately assign these unallocated amounts across all Area Units. I essentially take the total allocated subsidy amount at the AU level as a proportion of the aggregate (allocated) total subsidy amount for all AU as the respective weight for each AU. This weight is then used for allocating the total unallocated amount of the subsidy to each Area Unit to provide me with a value of the ‘estimated Accommodation Supplement’ for each quarter for the respective AU. A similar exercise was carried out for the number of households that received the Accommodation Supplement and were not allocated to any specific geographic area in our dataset. I nonetheless use both values for the subsidy as recorded in the dataset and the estimated values as per weights in my baseline regression and find no significant difference in the results and therefore will be using the allocated values for my analysis. Furthermore, my data set for the present study relies heavily on census data for all Area Units within New Zealand. The census data suffers from minimal data measurement error approximating 5 to 7 percent levels, on average.

75 These values are representative of the second time period for my study i.e. 2013 Q1.
9.7.2 Data period characteristics

Looking at figure 9.2 one can see the Accommodation Supplement’s total expenditure experienced a spike near 2005 and then stabilized (discussed in next section).

The second feature of this time period shows that the Accommodation Supplement’s total expenditure to the State was highest since inception as seen in figure 9.2. Third, the number of uptake of subsidy recipients saw a movement that shows an increasing trend, which previously had remained stagnant for many years. Forth relates to the GFC, which amongst others, certainly initiated a tenure shift from homeownership into renting due to falling housing values and corresponding debt payment issues, leading to an upward shock in ‘real’ housing demand for rental housing. All these factors combined, certainly can deem to present valuable data with respect to the study parameters and controls, especially in a fixed effects methodology framework. I argue that this period provides useful variation in my study parameters for, both, the total expenditure and participation rates for the Accommodation Supplement and rental housing in general. The growth in numbers and consequent cost for the subsidy are assumed to be related less to rents and more to other structural changes like shifts in income, employment and other GFC related aspects. This reduces selection bias issues within the dataset specifically for the sub-sample analysis. This provides further credence to my study. It constitutes a microeconometric natural experiment at the population level. Furthermore, It is assumed that
participants accessed the scheme randomly across the entire country and the uptake was not endogenous on any policy as the scheme is an entitlement.

In figure 9.2, between 2007 to 2013, the aggregate cost for the Accommodation Supplement for renting stood at NZ$ 5.225 billion. This is in contrast to the cost for a similar period over 2001 to 2007 that stood at NZ$ 3.226 billion. This is a rise of almost 62%. The uptake in subsidy recipients that rent privately spiked from 153,538 in 2006Q2 to 196,790 in 2013Q2, which previously had remained between 143,041 and 153,538 over 2001Q2 to 2006Q2. This rise represents one of the largest increases in the demand for AS since the inception of a dualist housing policy in 2001. Prior to 2001, the AS, which was introduced in 1993, was available to public and private housing tenants. The rise in AS tends to stabilize well before 2013Q1 and one can assume that private rental housing markets have fully adjusted towards equilibrium from the increase in demand for subsidy.

The period for my study is immediately after an upward revision in the subsidy ceiling levels that took place in 2005. This can lead to greater than average expenditure levels or a spike in costs (as seen in fig. 9.2) compared to a period that is towards the end of such a policy cycle, where the history of the housing policy reflects changes every 13 odd years or so. For my analysis, I want to understand if there was any parallel increases in rents either via ‘landlord capture’ or simultaneous determination of subsidy due to rents in the aggregate following the subsidy maxima policy shift in 2005, prior to my study period. Simply put, I run a crude visual test on the time series data in nominal NZ dollars (NZD) for lower quartile rents for New Zealand and the AS costs before and after the policy shift. If the data suggests that there exists a structural break within the time series on the low-income renters rents then one can conclude that landlords, in anticipation of the subsidy being increased, revised their rent price upwards by more than the expected rent increase explained by the trend (past increases). Visually there was no evidence of landlord capture using aggregate and average weekly amounts (see figures 9.3, 9.4) in both, the overall rental market and the low-income rental market. Interestingly, weekly average sees a drop in growth which can suggest that amounts for some households may have increased slightly, whereas increasing number of households dampened the average growth in costs. And there could be a weak argument that market rents see a lagged impact in growth from a shift in AS generosity in 2005 as there seems a slight shift in slope in figure 9.4 post 2006 although if lagged effect are the reason the impact would reverse as the aggregate
AS costs start decreasing post 2006. Therefore, there seems to be no danger of an ensuing or lingering short-run impact on rents from a past policy shift creeping into my study period.

Figure 9.3: Do average weekly AS/household costs impact lower quartile rents with a policy shift in 2005?

Moreover, with regards to the subsidy, the socio-economic demographic of the subsidy population remains structurally stable over time (see figure 9.5). This provides a valuable insight into the recipient population which is income deficient with only 20%, on average, being gainfully employed. The demographic stability over time for the employed cohort suggests that employment does not manage to elevate household wealth status to levels that overall result in ineligibility. The poor remain poor, probably due to low-wage unskilled jobs coupled with rising costs for living, specifically as cash asset thresholds have remained unchanged for over three decades. Here the increase in participation rates over the period seems...
more uniform than leaning to the unemployed. Minor transitions revert back to their mean it seems for all categories of recipients by income source.

**Figure 9.5:** Profiles of Accommodation Supplement Recipients by Main Income Source - 2006-2012

*Source: MSD, Author’s own calculation.*

**Accommodation supplement and residual incomes**

In the scatter plots (figure 9.6, 9.7) I show, using census and administrative data (details provided in data section), the average residual incomes calculated using median incomes and median rents for all Area Units in New Zealand and plot them on the average subsidy per recipient household at the Area Unit level. I do not have the average incomes of the subsidy cohort and so use median incomes of AU as a proxy. Whereas median rents seem a suitable proxy as rents of recipient cohort would gravitate near the median for a larger number of recipients than at any higher percentiles of the rent distribution. I find a consistent relationship over the two time periods reflecting lower residual income households tend to have more subsidy dollars. In the case of incomes, the eligible cohort is below 80% of median incomes. In effect, my proxy of median incomes can have an upwards bias therefore the true residual incomes would surely be lower for the subsidy cohort thus making the line steeper. The subsidy, in practice, helps to put recipient households closer, in terms of disposable income, with households having higher residual incomes or conversely with similar income poor households but cash asset rich.
Parallel trends – an intuitive approach

Before addressing the question econometrically, I show a simple intuitive first step for an approach towards investigating what to expect from the Difference-in-Differences (D-I-D) estimation technique for our data (see figure 9.8). I attempt to identify Area Units that are exposed to extremely high levels vs very low levels but not entirely without the subsidy as we are trying to investigate the intensity of the presence of a varying degree of marginal or
incremental incomes (a subsidy) effects on consumer behaviour towards rents over a period. I show a graphical representation of rent growth rates (log of rents) of four (4) Area Units that displayed the highest frequency consistently over a decade (2006-2016) for total A.S weekly payments exceeding $50,000 (for an Area Unit), consider this the treatment group, and compare that to rent growth rates of three (3) Area Units with a consistently high frequency for A.S weekly aggregate payments below $1000 over the same time period, consider this the control group. The Area Units that displayed the highest frequency for the $50,000 above value simultaneously had high levels of subsidy per recipient household (above $150 per recipient household) and high total proportion of recipient households in the sub-market (above 500 recipient households). A similar argument was followed when choosing the low AS level Area Units. I see that rent growth trends do not show any bias with respect to variation in A.S monies within these rental sub-markets. That is, AUs that get high subsidy per recipient and
simultaneous have a larger presence in that rental market are no different to low subsidy recipient households that take up a very small share of the rental market with respect to rents growth trends. The evidence in figure 9.8 leads me to suspect that determinants other than the quantum of the cash subsidy seem to dominate the rental contract price levels even at the micro level as rent trends do not display any bias with respect to variation in the quantum of subsidy across Area Units. Also, the common trends assumption seems to be met. Both populations (high and low) have similar trends with the trend in rents. What essentially the D-I-D will provide us with is that after an injection of transfer incomes and a spike in recipients over the study period, and assuming rent contract revisions take place numerous times over the period (within various sub-markets in the shape of new entrants or revolving renters or simply just annual rent revisions within sub-markets) it is expected that rents for sub-markets with an increasing number of subsidy households along with high total subsidy outlay should exhibit faster growth rates as it is argued that these households may be more neutral to bargaining and negotiation on rent bids or rent revisions i.e. price takers. We know that base rents may very well be higher within these different groups (High and low) due to either area fixed effects or even different subsidy levels at inception, but the rate of rent growth is very much dependent upon growth in incomes (including transfers) that lead to securing successive rent contracts which define sub-market (equilibrium) rent levels.

The core variables of interest are presented in the table 9.2 below. This is the summary statistics for the panel data set which provide information on the within variation specifically. For a complete summary statistic table that includes all variables in my model, see Appendix 2.

Table 9.2 - Descriptive statistics of selected variables. Panel dataset where T = 2006 & 2013.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median rent, $/week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall</td>
<td>230.64</td>
<td>90.36</td>
<td>50</td>
<td>800</td>
<td>N = 2978</td>
</tr>
<tr>
<td>within</td>
<td>39.92</td>
<td>69.35</td>
<td>530.64</td>
<td>T = 2</td>
<td></td>
</tr>
<tr>
<td>Geo-mean rent, $/week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall</td>
<td>300.18</td>
<td>91.90</td>
<td>103</td>
<td>735</td>
<td>N = 1872</td>
</tr>
<tr>
<td>within</td>
<td>44.63</td>
<td>137.68</td>
<td>462.68</td>
<td>T = 2</td>
<td></td>
</tr>
<tr>
<td>SLQ rent, $/week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall</td>
<td>247.69</td>
<td>74.43</td>
<td>54</td>
<td>567</td>
<td>N = 1872</td>
</tr>
<tr>
<td>Metric</td>
<td>Overall</td>
<td>Within</td>
<td>T</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------</td>
<td>------------</td>
<td>----</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>Median income, $/week</td>
<td>1111.61</td>
<td>131.06</td>
<td>2</td>
<td>2978</td>
<td></td>
</tr>
<tr>
<td>AS(weighted)/hh, $/week</td>
<td>28.13</td>
<td>5.34</td>
<td>2</td>
<td>2978</td>
<td></td>
</tr>
<tr>
<td>AS market share, %</td>
<td>39.88</td>
<td>6.62</td>
<td>2</td>
<td>2978</td>
<td></td>
</tr>
<tr>
<td>AS market impact</td>
<td>13.71</td>
<td>4.90</td>
<td>2</td>
<td>2978</td>
<td></td>
</tr>
</tbody>
</table>

*Notes:* The sample dataset is aggregated at the Area Unit level for each independent variable weighted using total households in census survey respectively. Where applicable, total stated households in category are instead used as weights. Data sets include Census, MSD, and MBIE. The two values in my panel are 2006 Q1 and 2013 Q1.
10 A micro-econometric analysis

10.1 Fixed effects model

I use a panel data setting that allows me to add Area Unit-specific fixed effects to my model, which will control for all differences that cannot be modelled and are both stable over time and that may even correlate with other predictors of interest (Ketokivi & McIntosh, 2017). The FE model explores the relationship between the independent and dependent variable within an Area Unit or entity. Each entity has its own individual characteristics which may or may not influence the independent variables. When using FE it is assumed that something within the individual may impact or bias the predictor or outcome variables and therefore one needs to control for this. This is the rationale behind the assumption of the correlation between a unit’s error term and the predictor variables. FE models remove the effect of those time-invariant characteristics which allows researchers to assess the net effect of the predictors on the dependent variable. Essentially, an individual’s time fixed effects are differenced out in a fixed effects model.

Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individuals. Each entity is different therefore the entity’s error term and the constant (which captures individual characteristics) should not be correlated with the others respectively. Under the fixed effects model the beta coefficient here gives us any effects that are happening over time within an Area Unit (with regards to the housing subsidy and rents) after controlling for any explanatory variables within the hypothesized model. The fixed-effects model controls for all time-invariant differences between the individuals, so the estimated coefficients of the fixed effects models cannot be biased because of omitted time-invariant characteristics like culture, religion, gender, race etc. Therefore fixed-effects models are designed to study the changes within a unit or entity and cannot be used to investigate time-invariant causes of the dependent variables. Note that the fixed-effects model is fully efficient as $N$ gets large even if the true model is random effects. For analyzing variation over space, the *Between effects (BE) model* estimator exploits the cross-sectional dimension of the data by regressing the individual averages of $y$ on the individual averages of $x$ (averaged across all cross-sections) and a constant using conventional OLS methodology.
10.2 Empirical strategy

To address previous identification concerns, I create a panel data series of Statistical Area Units (AU) using Statistics New Zealand Census datasets (Stats NZ) from 2006 to 2013. By including a separate intercept, or fixed effects, for each Statistical Area Unit in the panel I am able to control for unobserved (omitted) variables or rather include them due to fixed effects estimation procedures. In regression form, I estimate

\[ R_{it} = \alpha_i + \beta_1 AS_{it} + \beta_2 ASmkt_{it} + \varnothing_K X_{kit} + c_i + \mu_{it} \]  

(10.1)

where \( i \) indexes individual Area Units (AU), and \( t \) indexes census year. \( R \) is the dependent variable, weekly rents, \( AS \) is the average subsidy per rental household in the AU and \( ASmkt \) is the marketshare of the subsidy recipient households to total renters in the AU or the subsidy participation rate. \( X_K \) represents a vector containing \( K \) observed time-varying determinants of rent and \( \mu_{it} \) is an idiosyncratic AU specific error term. Also \( c_i \) are year fixed effects to control for common unobserved determinants of rent. Given the presence of individual AU fixed effects, \( \alpha_i \), the \( \beta \) coefficients give the effect on rents of the two different variations in Accommodation Supplement within AUs over time.

The average incomes (\( Y \)) at the AU level including subsidy transfers that determine equilibrium rents can be approximated as:

\[ Y = (1 - \eta) Y_{n(au)} + \eta (Y_{n(au)} + AS_{n(r)}) \]  

(10.2)

where \( Y_{n(au)} \) and \( AS_{n(r)} \) represent average household income of renter and average subsidy per rental household in an AU respectively, where \( \eta \) = share of subsidy households to total rental households. This income equation is the essential measure of the average market income in each Area Unit that influences and determines equilibrium market rents. Simplifying the above equation gives us:

\[ Y = Y_{n(au)} + \eta (AS_{n(r)}) \]  

(10.3)

In the above equation (6), the term \( \eta (AS_{n(r)}) \) is the precise term or variable of interest. It reflects the true impact or overall depth of the subsidy within each sub-market that may influence to generate equilibrium market rents. This is the interaction between AS marketshare
and average AS per rental household (or average weighted AS per recipient household). Modifying Equation (4) to include the interaction, I estimate:

$$ R_{it} = \alpha_i + \beta_1 AS_{it} + \beta_2 ASmkt_{it} + \beta_{21} AS_{it} \ast ASmkt_{it} + \varnothing_k X_{kit} + c_i + \mu_{it} \quad (10.4) $$

Here $\beta_{21}$ is the coefficient estimate of the interaction labelled ‘AS market impact’. This non-linear relationship between the subsidy and rents at the Area Unit level facilitates my model.

When dealing with interaction terms, any endogeneity bias can be reduced to zero for the OLS estimator (Bun and Harrison, 2018). Angrist and Pischke (2008) suggest avoiding estimation via instrumental variable when models contain interactions. Nonetheless I test for endogeneity of the suspect variable, AS.

### 10.2.1 Spatial autoregressive (SAR) model

An extension of this model to include spatial interactions is also presented. The standard reasoning behind spatial specific effects (as discussed in chapter 9) is that they control for all space-specific time-invariant variables whose omission could bias the estimates in a typical cross-sectional/panel study. When specifying interaction between spatial units, the model may contain a spatially lagged dependent variable or a spatial autoregressive process in the error term, known as the spatial lag and the spatial error model, respectively. In my case, the spatial lag model is of importance where the model posits that the dependent variable depends on the dependent variable observed in neighbouring Area Units and on a set of observed local characteristics.

$$ y_{it} = \delta \sum_{j=1}^{N} W_{ij} y_{jt} + X_{it} \beta + \mu_i + \epsilon_{it} \quad (10.5) $$

---

76 The monetary AS variable can be argued to suffer from (implicit) partial simultaneous determination via the data generating process for certain periods following policy change in ceilings making studies that model at the individual recipient household level requiring additional assumptions. Explicitly, the AS is determined on the idiosyncratic characteristics of households socio-economic levels. A fixed effects model at the aggregate sub-market rent level employing an interaction term for AS is, in my opinion, more amenable as it is an amalgam of many rental units.

77 Using the rank order as an instrument I test for endogeneity via the Hausman test between total AS expenditure on total rent revenue at the AU level. Generating a random sample of the rank ordering of 307 observations the test reveals a p-value of 0.43 therefore at the ten percent probability level endogeneity is not seemingly a problem, at least, with regards to its statistical distribution.
where $i$ is an index for the cross-sectional dimension (spatial units), with $i = 1, \ldots, N$, and $t$ is an index for the time dimension (time periods), with $t = 1, \ldots, T$. $y_{it}$ is an observation on the dependent variable at $i$ and $t$, $X_{it}$ a 1-by-$K$ row vector of observations on the independent variables, and $\beta$ a matching $K$-by-$1$ vector of fixed but unknown parameters. $\epsilon_{it}$ is an independently and identically distributed error term for $i$ and $t$ with zero mean and variance $\sigma^2$, while $\mu_i$ denotes a spatial specific effect. Here $\delta$ is called the spatial autoregressive coefficient and $W_{ij}$ is an element of a spatial weights matrix $W$ describing the spatial arrangement of the units in the sample. It is assumed that $W$ is a pre-specified non-negative matrix of order $N$. According to Anselin et al. (2006, p.6), the spatial lag model is typically considered as the formal specification for the equilibrium outcome of a spatial or social interaction process, in which the value of the dependent variable for one area is jointly determined with that of the neighbouring area. In that respect, a GWR can be viewed as a locally weighted least squares regression model where the weights associate pairs of data points.

The spatial autoregressive model (SAR) with panel data and fixed effect implements the quasi–maximum likelihood (QML) estimator in Lee and Yu (2010) to fit the model. A transformation is used to eliminate the fixed effects from the equations, cancelling $c_n$. Panel effects, which are effects that are constant within panels, are conditioned out of the likelihood. Only covariates that vary within panels can be fit with this estimator.

**10.2.2 Testing the model**

All Area Unit boundaries remain the same over the period of my study (2006-2013) - i.e., time-invariant. In addition, the Accommodation Supplement policy parameter that defines spatial variability for the subsidy ceilings using Geographical Areas (Area 1, Area 2, Area 3, Area 4) that cover the entire country too remain unchanged during the study period i.e. policy parameters remained time-invariant.

I test for model selection. The Hausman Durbin Wu (Wald) test for choosing between random effects and fixed effects model was carried out and the null of no systemic difference between the coefficients of the two models cannot be accepted and therefore I use the fixed effects
model to explain my model parameters over time. As heteroscedasticity is an issue, I run all my main regressions using cluster robust heteroskedastic consistent standard errors, so our Gauss Markov assumptions are not relaxed in any way.

A parameter test was carried out (using time dummies) to see if time fixed effects are needed for each time period (t) where t = 2 in my case. The null of time effects was not rejected. Therefore time fixed effects are suggested. Although this takes away explanatory power from the other variables and it does not add explanatory power to the overall model. This means that the time effect represents large parts of what the model already has in the other data.

Sample sensitivity was executed by running regressions for the full sample using Census median rents and the smaller or restricted sample dataset, where MBIE geometric mean rent data covers fewer AU’s for each cross-section (2006 & 2013). The MBIE rent sample AU’s are seemingly more favourable to tenancy renewals in addition to using the actual negotiated rents and therefore could show different effects of the subsidy on rents than for the full population sample. The results are quantitatively similar as can be seen when comparing Table 10.1 and Table 10.2. This makes it unlikely that the results are due to idiosyncratic behaviour by recipients.

As we do not have any good instrument for the Accommodation Supplement this does pose a challenge. Although it is possible to rank order the endogenous variable and use the rank ordering as an instrument. In the case of measurement error, one could use the rank of X as an instrument (i.e. order the variable X by size and use the number of the order rather than the actual value). Clearly the rank order variable is correlated with the original value but because it is a rank it is assumed that it should not be affected with any measurement error. Note that this assumes that the measurement error is not so large as to affect the (true) ordering of the X variable. Furthermore, instrumental variables by functional form of the structural equation having an endogenous variable can also provide us with valid instruments that can be tested using identification robust instrumental variable inference, especially for models with

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78 Test: H 0: difference in coefficients not systematic. Chi² (9) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B = 182.87. Prob>chi² = 0.0000. Therefore, I reject the null hypothesis as the test suggests that the coefficients for the two models are systemically different. I use Fixed Effects model for my analysis as a result. Asymptotically, this also indicates that the BE and FE estimates will be different i.e., equation tends to behave differently over time and across space.

79 Modified Wald test for group-wise heteroskedasticity in fixed effect regression model. H0: sigma (i) ^2 = sigma^2 for all i where: chi² (1489) = 4.7e+37. Prob>chi² = 0.0000. Therefore, we reject the null of homoscedasticity.
interaction terms (Bun & Harrison, 2018). I choose rank ordering in place of altering the functional form of my equation. In order to execute my Hausman test\(^\text{80}\), I create the rank order for the suspect variable, and following this I take a random sample of the rank ordering to avoid identical rank orderings as the rank jumps proportional to the number of times an identical value is encountered. The sample was generated by the software to run my test for endogeneity. The software returned a random sample of 307 observations from my data set. The test reveals that the estimates for the estimated residuals from step 1 have a p-value of 0.43 suggesting that they are not significantly different from zero and therefore it is not possible to reject the null of zero for coefficient of the residuals at the ten percent probability level. This shows that endogeneity is not seemingly a problem, at least, with regards to the statistical distribution for our data sets.

10.3 Review of results\(^\text{81}\)

The estimation results for eq. 10.4 and eq. 10.5 are presented in Tables 10.1 – 10.4. Table 10.1 deals with the full sample of sub-markets i.e. 1489 Area Units in New Zealand in my study. This is the ‘Full sample for market rents’. Table 10.2 deals with a sample of AU using MBIE actual rent agreements data. The rent data from MBIE is presumably reflecting the ‘sample with active rental markets’ of New Zealand as MBIE regularly updates the data quarterly as the rent bonds roll in. the Area Unit with high turnover are thus captured by the MBIE tenancy bond database. Table 10.3 presents the sample of rental turnover ‘active’ sub-markets for which we have SLQ rents. Assuming that the lower quartile rents represent rents of the AS cohort that rents, where I argue that as the AS is an entitlement, the participation rate and the eligibility rates would seemingly be near identical. This sample is restricted to the ‘sample with Accommodation Supplement market segment’. Table 10.4 mimics table 10.3 using the Geographically Weighted Regression (GWR) estimation method.

---

\(^{80}\) Process for testing for endogeneity
Step 1: To test endogeneity first regress the suspect variable on the instrument and any exogenous variables in the original regression
Step 2: Save the residuals
Step 3: Include residuals as additional regressor in the original equation

Now added residual is not statistically significantly different from zero, so conclude that there is no endogeneity bias in the OLS estimates. Hence no need to instrument. Note: This test is only as good as the instruments used and is only valid asymptotically. This may be a problem in small samples and so you should generally use this test only with sample sizes well above 100.

\(^{81}\) All econometric regressions are run using STATA. The outcomes of all analysis and procedures for spatial weight matrices and spatial autoregressive panel modelling are provided in Appendix 3.
10.3.1 Full sample for rental markets: Median rents

The estimation results in Table 10.1 report the full sample temporal impact of AS on median market rents of 405,147 rental housing units across 1489 AUs in 2013. In addition to the listed control variables in the table, the estimates also include area-specific and time fixed effects. Robust standard errors are clustered at the AU level and reported below each coefficient estimate to allow for non-independence of idiosyncratic errors within AUs.

Table 10.1 - Effects of the Accommodation Supplement on market rents. Full sample.


<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1) Median rents</th>
<th>(2) Median rents</th>
<th>(3) Median rents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median income, $ /week</td>
<td>0.147***</td>
<td>0.078***</td>
<td>0.138***</td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.013)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>AS marketshare, %</td>
<td>-0.807***</td>
<td>-0.847***</td>
<td>-0.795***</td>
</tr>
<tr>
<td></td>
<td>(0.228)</td>
<td>(0.230)</td>
<td>(0.156)</td>
</tr>
<tr>
<td>AS market impact</td>
<td>-1.119**</td>
<td>-0.840</td>
<td>-1.108***</td>
</tr>
<tr>
<td></td>
<td>(0.506)</td>
<td>(0.521)</td>
<td>(0.318)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,978</td>
<td>2,978</td>
<td>2,978</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.791</td>
<td>0.806</td>
<td>0.7086</td>
</tr>
<tr>
<td>Number of Area Unit</td>
<td>1,489</td>
<td>1,489</td>
<td>1,489</td>
</tr>
<tr>
<td>Area Unit FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Time FE</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Spatial Interaction Effects</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Total hh in sample</td>
<td>1,374,006</td>
<td>1,374,006</td>
<td>1,374,006</td>
</tr>
</tbody>
</table>

Notes: All regressions are using the full set of covariates. The full set includes a total of 11 covariates in addition to the AS variables. Estimates in column (3) are the SAR panel model with queen contiguity of order 1 with a weights matrix consisting of 1489 defined places. All specifications include a constant. Total households denote 2013 values. Robust standard errors clustered at the Area Unit level in parentheses and asterisks indicate statistical significance at the following levels: *** Significant at 1 percent level, ** Significant at 5 percent level, * Significant at 10 percent level.

Table 10.1 uses the full set of covariates. Column (2) introduces time fixed effects, and we see that although this takes away explanatory power from other variables, it adds minor explanatory power to the overall model as the R² increases. Median incomes explain around 7.8% to 14.7% increase in weekly rents and are statistically significant.

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82 The inclusion of time fixed effects is supported through conducting a parameter test.
The AS market share is statistically significant with a negative coefficient at the 1 percent level in all three specifications. Although economically seemingly insignificant, the fact it is negative coincides with my theoretical prediction. On average, column (1), (2), and (3) coefficients show that, whether we control for time fixed effects over our study period, a one percentage point increase in the subsidy’s uptake in an AU from 2006 to 2013 puts a downward pressure of NZ$0.80 cents per week on rents (0.35 % of rent). The coefficient on the interaction term, AS market impact, is negative in all specifications. It is economically significant as it implies that the efficacy of an increase in subsidy, keeping participation rate constant, in generating increased demand for renting, as theorized, does not exist as the association with price is negative. Column (3) is a regression that reflects the inclusion of spatial interactions between AU’s. The coefficient on the AS interaction term has a higher significance, whereas the general flavour of the results remain the same. That is, variation in AS monies does not seem to be influencing rents via spill overs from neighbouring AU’s in the absence of time fixed effects.

In table 10.1 we see that the AS market impact’s statistical significance is sensitive to model selection, which implies that the monetized variable is less predictive than the AS marketshare variable at the AU level. This can be viewed as a more economically reasonable estimate as it represents the monetization element of a personal subsidy that may or may not operationalize into housing outcomes. Although economically insignificant in magnitude, my estimate implies that, all else constant, a NZ$ 1 increase in the average household subsidy in an AU over my study period will coincide with a NZ$ 1.10 (or 0.48 %) decrease in weekly rents (column 3). An increase in AS essentially comes from a decrease in income and wealth levels which can either manifest in increased eligibility or the AS cohort losing purchasing power. This can economically translate into slowing an otherwise rising rental market. More importantly, as the AS market impact variable is negative, this is counter to how incomes affect rents in the literature i.e., positively correlated. As the rent variable is weighted and stratified for bedroom size the rent fall can probably be attributed to quality than quantity.

The coefficient on the AS market share independently informs of its precise impact on rents whereas the interaction uniquely informs whether heterogeneity in the average AS monies affects the overall rent given the AS marketshare impact within an AU. Note, under the AS scheme the subsidy is adjusted up to a three-person household limit, therefore the heterogeneity in the AS would be more reliant on household financials for larger families. On introducing the
monetary aspect of the subsidy, the coefficient is marginally larger (in the absolute). In column (3) the change in the coefficient between the AS marketshare and AS market impact is -0.31 [i.e., (-0.79 – (-1.1)]. Under the AS allowance scheme there is a high correlation between costs and participation, although less in the voucher system of the US, therefore it would be fair to say that the variation in the AS marketshare variable would be a sufficient parameter for analysis as well. Moreover, the AS scheme is designed not to allow clustering of rents on or just below the maximum rent ceiling as the scheme does not create a constraint (incentive) explicitly via quality or dollar for dollar subsidy for rents. Therefore, no such behavioural rent limits exist under the AS scheme that can arguably be analysed83.

10.3.2 Sub-sample with active rental markets: Geometric mean rents

Utilizing the MBIE rent data as the dependent variable and merging with census data my sample is restricted to 936 AUs84. I present my regression results in Table 10.2. The coefficient for the AS market impact is negative and statistically significant across all specifications (using geo-mean rent) at the 1 percent level.

When using census median rents in the restricted sample, in column (4), with the full set of covariates, the statistical significance and the economic impact on rents drops for AS market impact whereas the relationship remains as per argument presented for housing allowances in my paper. This is to be expected as the census median rent data is less precise than the actual rent data acquired from MBIE. This provides a test of sensitivity for my results. The significance is greater surely in the sample with actual average rents within active rental markets. The bivariate regression in column (3) provides a robustness check with regards to whether if any covariates were correlated with a variable in the interaction term. That is, if AS marketshare is correlated with other variables then including linear terms of those correlated

83 I generate a new variable, ‘Ratio of AS generosity to rents’ and use it in place of the AS interaction to further test for robustness in the full sample panel regression using the full set of covariates. Avoiding spurious association, I choose not to use AS generosity relative to residual incomes as incomes are a part of the AS algorithm. Instead, I simply divide the AS market impact variable with median rents for each AU. The general direction of the effect remains negative (i.e., -1.6 at one percent significance). The statistical significance of the coefficient for the ratio of AS generosity to rents is consistent with the results on the parameter estimates from the interaction term.

84 Note, when using MBIE data the AS marketshare is a fraction of rental households minus state houses in an AU as MBIE rents reflect the private sector landlords only. State homes charge private rents, are privately owned by the Crown, but are not required to place a bond with MBIE.
Table 10.2 - Effects of the Accommodation Supplement on market rents. Sub-sample with active rental markets. Panel regression and Geographically Weighted Panel Regressions - 2006Q1 and 2013Q1.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geometric mean rent</td>
<td>-0.254</td>
<td>-0.309</td>
<td>-0.224</td>
<td>-0.399</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.268)</td>
<td>(0.263)</td>
<td>(0.141)</td>
<td>(0.261)</td>
<td></td>
</tr>
<tr>
<td>Median rent</td>
<td></td>
<td></td>
<td>-0.338*</td>
<td>-1.034***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.205)</td>
<td>(0.219)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1,872</td>
<td>1,872</td>
<td>1,872</td>
<td>1,872</td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.765</td>
<td>0.784</td>
<td>0.717</td>
<td>0.911</td>
<td></td>
</tr>
<tr>
<td>Number of Area Unit</td>
<td>936</td>
<td>936</td>
<td>936</td>
<td>936</td>
<td></td>
</tr>
<tr>
<td>Area Unit FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>Time FE</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>Spatial Interaction Effects</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>Total hh in sample</td>
<td>1,100,073</td>
<td>1,100,073</td>
<td>1,100,073</td>
<td>1,100,073</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Estimates are from regressions using the full set of covariates. The full set includes a total of 11 covariates in addition to the AS variables. Estimates in column (3) are from a bivariate regression. All specifications include a constant. Estimates in column (5) are the SAR panel model with queen contiguity of order 1 with a weights matrix consisting of 936 defined places. Total households denote 2013 values. Robust standard errors clustered at the Area Unit level in parentheses and asterisks indicate statistical significance at the following levels:
*** Significant at 1 percent level
** Significant at 5 percent level
* Significant at 10 percent level
terms will not prevent my interaction from spuriously picking up the effect of the interaction of some of those variables. In column (3), the coefficient for the AS market impact is statistically significant at the 1 percent level and is -0.502 and the R² is 71 percent. Overall, the AS market impact estimates from the restricted sample are quite similar to the full sample estimates. Including spatial interactions does not impact our estimates. The coefficients on AS market impact (barring bivariate estimates) in Table 10.2 range from -1.03 to -1.14 whereas for the full sample rounded to one decimal point the average is -1.1.

10.3.3 Sub-sample with active rental markets: SLQ rents

I now investigate how the subsidy might affect low-income rental housing across AU’s. Assuming incomes reflect rent demand, one can assume that the AS cohort (having Q1 + Q2 incomes) competes, in most part, for the lower quartile rental housing markets thus making SLQ rent a good proxy.

AS being an entitlement, one can assume that near full participation rates prevail under the scheme. Assuming the cohort, in most part, competes for lower quartile rental homes, the variable of interest then becomes the average subsidy per subsidy recipient household for each Area Unit in each time period (AS per AS hh). Merging the census data and MBIE synthetic lower quartile (SLQ) rent data, my panel sample has 936 AUs. An analysis using SLQ rents as the dependent variable can approximate a direct impact of changes in recipients average subsidy monies on the lower end of the rental market.

The interaction term is not required as the entire lower quartile rental market is the subsidy recipient market by assumption. All specifications in Table 10.3 show a statistically insignificant coefficient for the average AS per AS recipient household value. Introduction of time fixed effects improve the model fit. Comparing column (3) and (4) one can see that both, linear and double log specifications, inform of a similar negative association - economically - with respect to AS monies in the hands of recipient households that compete for homes in the lower quartile rental market.

85 On the supply side, Susin (2002) found that voucher recipients tend to rent in the lowest tercile market. Whereas, Hulse et al. (2019) found that many renters with high incomes, in reality, choose to rent low rent dwellings.
Researchers claim that new entrants will increase their housing consumption as the newly received AS increases their residual incomes and simultaneously decreases their relative price of housing compared to non-recipients and also for additional housing for themselves. This is not the case here as AS market impact (AS monies) is economically negative in both, linear and double log specifications. The findings reported in Table 10.3 clearly show that landlords in the lower quartile of the rental housing market do not extract any revenue from housing transfers that are redistributed via taxation to the poor renter.

Table 10.3- Effects of the Accommodation Supplement on synthetic lower quartile rents.
Sub-sample with active rental markets.
Panel regressions - 2006Q1 and 2013Q1.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SLQ rent</td>
<td>SLQ rent</td>
<td>SLQ rent</td>
<td>Log SLQ rent</td>
</tr>
<tr>
<td>AS per AS hh, $/week</td>
<td>-0.018</td>
<td>-0.081</td>
<td>-0.107</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.232)</td>
<td>(0.226)</td>
<td>(0.227)</td>
<td></td>
</tr>
<tr>
<td>AS market share 'MBIE', %</td>
<td></td>
<td></td>
<td>-0.286*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.150)</td>
<td></td>
</tr>
<tr>
<td>Log AS per AS hh, $/week</td>
<td></td>
<td></td>
<td></td>
<td>-0.053</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.066)</td>
</tr>
<tr>
<td>Log AS market share 'MBIE'</td>
<td></td>
<td></td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.023)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,872</td>
<td>1,872</td>
<td>1,872</td>
<td>1,872</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.688</td>
<td>0.703</td>
<td>0.704</td>
<td>0.680</td>
</tr>
<tr>
<td>Number of Area Unit</td>
<td>936</td>
<td>936</td>
<td>936</td>
<td>936</td>
</tr>
<tr>
<td>Area Unit FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Time FE</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Spatial Interaction Effects</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Total hh in sample</td>
<td>1100073</td>
<td>1100073</td>
<td>1100073</td>
<td>1100073</td>
</tr>
</tbody>
</table>

Notes: Estimates in all regressions use the full set of covariates. The full set includes a total of 11 covariates in addition to the AS variables. Column (4) regression, for controls uses log of income, where all other controls remain the same. All specifications include a constant. Total households denote 2013 values. Robust standard errors clustered at the Area Unit level in parentheses and asterisks indicate statistical significance at the following levels:
*** Significant at 1 percent level
** Significant at 5 percent level
* Significant at 10 percent level
Table 10.4 presents results that use a more sophisticated econometric modelling technique for hedonic rent pricing for the lower quartile section of the rental market. In doing so, we see that the results virtually mimic that of table 10.3. That is, the money given to the poor and the very poor relative in magnitude to their individual level of income and wealth poverty does not operationalize into impacting their rental markets nor does it affect recipients housing outcomes.

Table 10.4- Effects of the Accommodation Supplement on synthetic lower quartile rents. Sub-sample with active rental markets. Geographically Weighted Panel Regressions (GWR) - 2006Q1 and 2013Q1.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SLQ rent</td>
<td>SLQ rent</td>
<td>Log SLQ rent</td>
</tr>
<tr>
<td>AS per AS hh, $/week</td>
<td>-0.023</td>
<td>-0.054</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.184)</td>
<td>(0.184)</td>
<td></td>
</tr>
<tr>
<td>AS market share ‘MBIE’$, %</td>
<td></td>
<td>-0.323**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.141)</td>
<td></td>
</tr>
<tr>
<td>Log AS per AS hh, $/week</td>
<td></td>
<td></td>
<td>-0.054</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.058)</td>
</tr>
<tr>
<td>Log AS market share ‘MBIE’</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.020)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,872</td>
<td>1,872</td>
<td>1,872</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.534</td>
<td>0.5180</td>
<td>0.4341</td>
</tr>
<tr>
<td>Number of Area Unit</td>
<td>936</td>
<td>936</td>
<td>936</td>
</tr>
<tr>
<td>Area Unit FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Time FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Spatial Interaction Effects</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Total hh in sample</td>
<td>1100073</td>
<td>1100073</td>
<td>1100073</td>
</tr>
</tbody>
</table>

Notes: Estimates are the SAR panel model with queen contiguity of order 1 with a weights matrix consisting of 936 defined places. Estimates in all regressions use the full set of covariates. The full set includes a total of 11 covariates in addition to the AS variables. Column (3) regression, for controls uses log of income, where all other controls remain the same. All specifications include a constant. Total households denote 2013 values. Robust standard errors clustered at the Area Unit level in parentheses and asterisks indicate statistical significance at the following levels:

*** Significant at 1 percent level
**  Significant at 5 percent level
*   Significant at 10 percent level
10.4 Accommodation Supplement and food expenditure

So, if the cash subsidy is not going towards the purchase of more housing and is not being lost to higher rents (prices), where lies the incidence of the subsidy? If residual incomes increase with subsidy, then recipients have more money to spend on, say, food and this might show up as a spike in the food price. Availability or variability of this supplementary income can produce similar effects on the demand for food.

![Figure 10.1a: Accommodation Supplement and food consumption expense patterns](image)

Within the Household Economic Survey (HES) data (2008, 2011, 2014, 2017), food type with the highest weight with respect to expenditure for the bottom two income quintiles is grocery items. And this food type is also the most susceptible to variation with respect to income levels as (i) Meats and (ii) Vegetables tend to be more consistent items within food budgets as ‘necessity’ items and following Engel’s law. Whereas grocery items may be a luxury item, especially for poor households i.e., better dairy and school meal items for children etc., having an income elasticity greater than unity. This leads us to analyse whether the Accommodation Supplement has any effects on the consumption patterns of households with respect to food. Seeing that average total

![Source: HES, MSD. Author’s own calculation](source)
expenditure on grocery is less than rents specifically for the lower two income quintiles across all HES, the subsidy amount can have substantial effects on grocery prices reflected by demand shifts, which essentially will be changes in ‘effective demand’ for food (grocery) due to subsidy.

In figures 10.1 (a) and 10.1 (b) using data on Food Price Index at quarterly intervals from 2002Q1 to 2016Q3 for all three food categories i.e., Meats, Fruits and Vegetables, and Grocery, I find that growth rates for expenditure on ‘grocery’ items to be strongly correlated with the growth rates for changes in expenditure on the Accommodation Supplement payments at the macro-level. This is consistent with my argument that the housing cash subsidy affects ‘effective demand’ for non-housing goods. In New Zealand, the housing cash subsidy seems to be leading to more consumption of grocery food items (in the aggregate). The correlation coefficient also suggests that this can provide researchers with an instrumental variable for the housing allowance that is not essentially a determinant of rent thus making it a good instrument if and when required. Looking at the economics of the household, the AS and grocery correlation suggests that agents
look at the extra incomes from the housing allowance as a cash component for better food consumption whereas rents are covered and cushioned by incomes.

10.5 Discussion

Findings show that the subsidy does not, on average, increase the overall rents in the market, instead and in contrast to previous findings, the subsidy dampens overall market rents. That is to say, the presence of subsidy recipients informs us of rental markets being impacted negatively over time and across space. This can be understood simply by knowing that the monies received by households under the subsidy are not being used towards (increased) housing consumption. Higher subsidies, by design, mostly are reflective of beneficiary households, where in most cases 100 % of rents of such households are paid via transfers. One may conclude that any consequent disruptions in the labour markets that increase housing allowance payments seem not to affect the effective demand for rental housing.

There can be no way to find out if they are sustaining rents or sustaining high rents although as transfer incomes are not a fundamental rent determinant, and, in the long run, house prices determine rents, we can safely discard the notion that transfer incomes to renters via housing allowances drive rents and more so higher AS transfers drive greater rents. The income redistribution policy of a housing allowance is typically non-distortionary to rental markets directly via recipient households (renting).

As the AS market impact variable is significant whereas, say, the main benefit or domestic purpose benefit is not, it can suggest that the AS algorithm is playing some indirect role which is significant in the rental markets (as it targets renters specifically). Under this assumption, the presence of housing allowances could be argued actually as a market correction mechanism, via substituting consumption expenditure and impacting income risks, and instead lends assistance towards achieving an equilibrium price in the rental markets that otherwise would suffer from persistent disequilibrium. As discussed, it has been in circulation for over 50 years therefore one cannot strictly say it is creating effective demand so much so as it now is sustaining housing demand which may or may not be a result of effective demand creation on inception.
Revisiting empirical literature for re-evaluating the housing allowance

As pointed out, past studies indicate that researchers did not manage to model and theorize the housing allowance well. Price discrimination is based on the concept of the “Law of one price”. If one was to study the impact of housing allowance on rents via the behaviour of households that do receive housing allowances (treatment group) and those that do not (control group), it must be assumed that the two groups are distinguishable in the rental markets and therefore data on each specific group is publicly available. This assumption appears to be unrealistic as the housing allowance is paid to the tenant and not the landlord and price discrimination in the rental markets is prohibited by law as well (Viren 2013). At the “micro level”, for example, Viren (2013) argues that private landlords which would certainly act as landlords may manage to indulge in some asymmetric behaviour for the two different groups, recipients and non-recipients, because they have different incentives to oppose higher rents. In my study I unravel that the incentives for both are similar, at least under the AS scheme. And Viren (2013) found that the law of one price did actually hold for the recipient and non-recipient cohort in his study.

When using a dummy variable approach (Kangasharju, 2010; Viren 2013) which simply separates the recipient from the non-recipient households one can possibly encounter issues. First, this does not measure the heterogeneity between the different dollar amounts in income transfer levels of such households affecting rents. Second, dummy variable coefficient could include or reflect altogether other effects than a subsidy under the housing allowance model. For example, if one researcher defined the dummy as ‘subsidy recipients’ and the other researcher, who is studying poverty issues, defines the cohort as ‘income and asset poor renting households’, in both these cases the cohort is identical to a great degree. A positive coefficient for the dummy could simply conclude that poor households suffer rent inflation due to facing proportionately higher moving and search costs (as they are poorer than other households in study where dummy=0). Poverty, by inducing a larger degree of impatience, adversely affects bargaining power and thus may lead to paying higher rents (Muthoo, 2000). In addition, the coefficient does not inform us of the effects of the magnitude of the subsidy affecting the rent level by how much. It is entirely plausible that if no housing subsidy existed in the economy under study the results would be identical.
The problem here lies in the fact that the two cohorts, the recipients and the non-recipients are fundamentally different populations. This is because recipients, in most cases, have relatively less after-housing-cost incomes needed for food and other essentials due to being poorer than non-recipients (Kangasharju, 2010). Therefore, it is highly likely that recipients are much poorer and dependent on social security and may face other detrimental social, work, and health disadvantages.

For the US, Eriksen and Ross (2015) simply use the supply of vouchers (at MSA level) only and not the exact amount of expenditure by the government to reimburse the landlords. Subsidy costs could be less correlated directly to the supply of vouchers and more to the decisions on moving and choice of dwelling or landlord pursued by the tenant. This may be why they discover heterogeneity in the effects of the supply of vouchers on MSA unit rents where rents were near the FMR. Therefore, the financial incidence to the taxpayer of the change in the supply of vouchers cannot be independently accurately analysed. For example, an increase of 100,000 vouchers across MSA’s could cost different amounts to the taxpayer (and therefore rents) depending on the endogenous choice of the tenants in such a scheme, which is not picked up by the study. In addition, the use of supply of vouchers is not entirely representative of the effect on rental markets as vouchers expire as well, which too shifts their incidence away from rents. Expiry can take place in two scenarios; one, if a tenant chooses not to move out from a non-eligible home where they are renting at present but has the voucher, and two, if a voucher holder is searching to move but cannot find a suitable rental home before the voucher’s expiry date. In the extreme case, there can be a situation where the supply is positive in an MSA whereas the cost is zero i.e. no movement and no new eligible households that are already renting a qualified rental dwelling in the MSA. As Ellen and Torrats-Espinosa (2020, p 280) state, “In the most recent national study of voucher utilization, Finkel and Buron (2001) report that roughly one in five voucher holders nationally did not succeed in using their voucher to rent a home in 2000”. That is a 20% mis-match at the least between supply and market impact.

Studies that aim to analyse the effects of a cash subsidy using non-monetary variables (continuous or otherwise) in order to provide evidence if such non-monetary variables are inflationary on a monetary variable such as rent may surely present a case of omitted variable bias at the outset as
it is widely believed and advocated by the monetary historian Milton Friedman that inflation is always and everywhere a monetary phenomenon (Friedman, 1963).

Viren (2013) uses heterogeneity in subsidy ceilings for different locations as an indicator or instrument in order to avoid endogeneity problems. In the case of Viren (2013) it seems the instrument variable used may be inappropriate as higher ceilings with respect to location at the policy level do not necessarily indicate higher subsidies at the household level. It is equally likely that an entire set of households that is in a zone with a higher ceiling or a household that is characteristically eligible for a higher subsidy may still be getting a lower amount than any other type of household belonging to a lower ceiling as the subsidy depends upon their employment status, taxable income level, cash assets, family tax credit, and to a very limited extent their prevailing rents. And households that are better off would be generally renting high, have better or secure jobs and will be living in good areas (i.e. higher ceiling) which will decrease their subsidy (due to high income and rents way above ceiling to affect subsidy increases) making maximum ceiling level a highly inappropriate variable of measure/instrument for such an analysis. Ceiling levels help to indicate differently priced housing markets with respect to rents adjusted for household size and nothing else. Subsidy levels tend to indicate relative poverty levels within the cohort. And if used as an instrument variable, subsidy ceilings will tend to reflect higher rents. This is even more probable in smaller samples.

Other studies use spatial or regression discontinuity design experiments. Regression discontinuity design experiments were similarly utilized by Eerola & Lyytikäinen (2019), Grislain-Letrizemy & Trevien (2016), and Hyslop and Rea (2019). Grislain-Letrizemy & Trevien (2016) in their study utilize a very delicate argument when equating two agglomerations from two different zones in France simply based on population similarity. Furthermore, they execute their analysis using a hedonic price model therefore having greater possibility of omitted variable bias with respect to other pricing attributes that may define the variation in subsidy for the zones. Furthermore, as mentioned earlier, instrumenting the subsidy using spatial discontinuity is tricky as Grislain-Letrizemy & Trevien (2016) themselves mention that the subsidy is “in a very limited extent, (based) on the rent level”. Thus, zone subsidy variation (manifested as discontinuity in research) based on rents and housing and land values may not translate into household level subsidy variation which is more so based on taxable income levels and wealth of poor households and consequently may
not suffice as a valuable instrument. Moreover, spatial discontinuity designs are less likely a good fit for housing models as gentrification, zoning, and especially when looking at apartments, one can encounter different regression lines for different apartment floors as prices increase with increasing the level of floor which reflects in the price of body corporate charges and thus rents.

Housing allowance as cash subsidies in the private sector may act similar to investments into social housing, where both such public expenditures depress rents in sub-rental housing markets. Also, they are utilized, notably, by asset poorer households than social housing households, at least in New Zealand (see section 3.7.2). The negative price effect can be explained from both perspectives. On the demand side, the cohort having low residual incomes, being asset poor, and most being on a main benefit can help to explain rent dampening. On the supply side, dwellings of recipients gradually becoming low in quality via lowering maintenance costs may become part of the filtering model by landlords and so rents rise less for these homes than others.

On the other hand, housing benefits seem a more flexible tool compared to social housing and better suited to help poor households without also discouraging geographic mobility (Flambard, 2013). Cash transfers seem not to play a role towards determining rent prices directly as much as they may be assisting directly towards housing sustainability for the poorest housed. In the case of the US housing voucher, even though it is not an entitlement and requires a move due to housing quality requirements, Ellen and Torrats-Espinosa (2020) find that vouchers may help low-income households remain in neighbourhoods as rents rise. Fields (2018) looks at how residential rental property has been financialised and made into an asset class, which I believe (now) influences rents from outside the renting population and distorts the rental markets against the poor including the subsidy eligible cohort further affecting housing affordability not related to fundamental rental demand analysis.
11 Conclusion

11.1 Overview of the study

The key aim of this thesis has been to provide a counter narrative to the prevalent discourse in the housing allowance literature. In that light, my thesis has demonstrated that the most prevalent arguments relating to a housing allowance do not sit well with the design and objectives of the housing allowance policy instrument in general. The common myths have been challenged in chapter 5 and alternative explanations provided. The most critical one being that, although a monetary instrument, the housing allowance is not engineered as a price variable/subsidy. The other common notions debunked include concepts where higher housing allowances reflect a higher willingness to pay more rent by the recipient cohort, and that allowances are designed to be optimized, i.e., households would increase housing consumption towards maximum subsidy levels, and more so, the notion that the allowance is, in effect, (permanent) income. All these have been demystified to reveal counter narratives as per design of the Accommodation Supplement algorithm.

I have clearly chalked the evolution of the present day housing allowance policy instrument since its inception in the late 1960’s to date in the context of New Zealand. I have outlined the Accommodation Supplement’s design to be a derivative of the negative income tax (NIT) formula. This argument can be traced back to the similarity in the initial formula provided to the government in the 1980’s by American consultants. And as Moffitt (2003 p. 1) points out that the modern means-tested transfer (“welfare”) programmes are fundamentally based on the negative income tax (NIT). Moreover, I remind the audience that Friedman (1962) specifically saw as an additional advantage of such a transfer payment as the negative income tax not to distort market prices like minimum wages, tariffs and farm subsidies do.

In my thesis, it is informed that the data generating process (DGP) of the housing allowance scheme for renters aims to maintain some level of equality in disposable residual incomes for the same household over time and seemingly aims, as well, to lower income inequality amongst the pool of households that are in the two lowest income quintiles that suffer from cash asset poverty in an economy at any given time. In short, the housing allowance scheme equalizes residual
incomes of the renting poor found at the bottom of the income distribution within the economy over time and space. Moreover, I find that rent ceilings under the Accommodation Supplement that are set exogenously are, in principle, designed to mechanically delink future rising market rents with AS payments as per algorithm. Rent ceilings function more as a ‘benchmark’ or a fixed variable in the algorithm in most cases. Unravelling the AS scheme to reveal it as a consumption variable at the household level, inversely related to income of households and albeit diminishing intertemporally for the household has contributed to the understanding of the dynamic nature of such an allowance.

I also discuss that the subsidy manages to provide us with a more robust measure of overall economic poverty which I label ‘systemic poverty’. The algorithm, having a more precise metric in comparison to the OECD poverty measure, informs of a population with greater relative poverty within the economy that suffers, in addition to low incomes, a higher housing stress level and no wealth. Therefore, in practice, the allowance recipient cohort should dampen markets rents where a higher subsidy signals greater overall relative poverty.

In short, the subsidy is not generated as an economic variable outside of the algorithm. Dependent on the bounds defined by the policy makers, the subsidy will surely inform of the behaviour of the target population, in this case income and asst poor households behaviour to demand for housing. The housing allowance policy for rent in New Zealand is arguably structured efficiently. I find that it has no deterministic influence on inflating rents over time. It increases residual disposable incomes, and its supply or availability, albeit an entitlement, assists in housing sustainability and therefore market stability as the extra cash could be used to provide relief towards other essentials. The allowance design holds the P-D principle, provides welfare gains, and achieves to partially de-commodify rental housing. Nonetheless, at present the AS falls short on the extent of alleviating housing stress levels to near levels of housing affordability.

11.2 Academic contribution

Another objective of this thesis was to empirically investigate the effects of housing allowance subsidies in the residential rental markets as they are contextualized, in general, as inflationary. This thesis’s approach informed both, the New Zealand literature on housing allowances, and on
the nature and mechanism of the modern housing allowance scheme in general. In more detail, this thesis contributes to the aforementioned overall objective on three different levels, each of which I discuss in this section.

On the mechanism of a housing allowance, my thesis presents a steady-state framework for household demand for consumption with a demand-side housing allowance cash transfer such as the AS present in the economy in a schematic diagram in chapter 4. My model shows how monies which are transferred to households as housing allowances under specific policy parameters can be consumed and how they can impact, specifically, housing markets. Only households that already pay rent can get the AS. Rents are paid at market rates by all renters in the private rental sector whether a recipient of the AS or not. The schematic is complemented with detailed explanations of how incomes, credit, benefits, and AS together form to create consumption demand at the household level using an income consumption identity. In addition, in chapter 3, I compared the various peculiarities between state housing and the AS cash subsidy. The state housing being a price taker and having a massive presence in the low-income rental housing space in New Zealand can impact rents upwards due to its market rent setting policy. Empirical evidence supports this argument. The inherent bias in the different approaches within the AS scheme towards renting and home owning can also have negative effects on house prices and therefore rents structurally. The cash asset test limits and boundaries within the AS scheme can ‘lock in’ and, moreover, even incentivise perpetual poverty for recipient households. On the evolution of such housing policy instruments, it can be seen that such cash payments have been disbursed since the 1960’s to the poor, destitute and needy households under different labels.

On the theoretical contribution, my thesis challenges that the subsidy is not a price or income variable and cannot distort market equilibrium as a given. I posit that the housing allowance instrument is not designed to inform and therefore influence decision making processes. The design aspect of the allowance makes the cash injection to residual incomes elusive to quantify by recipients and, at best, it is simply opaque. The recipient household cannot in anyway inform itself of the discounted price for housing they encounter when considering market rents for properties. Furthermore, the recipient cannot in anyway inform itself of changes in and eligibility for future discounted price of housing (perceived rents) that result as a consequence of shifting market rents, incomes, income tax rates, first child tax credit, savings, in addition to other demographic changes
such as marriage, separation etc. The modern housing allowance policy instrument cannot inform the rational consumer in clear and precise terms in order for them to form preferences. It would seem that intertemporal utility functions reflecting recipient preferences cannot be formed. The distribution of rents cannot reveal preferences of the housing allowance recipient’s decisions influenced by the parameters of the scheme. Price theory of demand is not valid under the scheme in the absence of the revealed preference principle. And the basic argument that ‘price subsidies raise the price of the subsidised good’ (Koning & Ridder, 1997 p. 5) does not stand under the design of the Accommodation Supplement, at least directly.

In addition, my thesis challenges the commonly held notions in literature on how housing allowances impact behaviour. My theoretical contribution posits that housing allowances are not a permanent income add-on to a household’s intertemporal budget constraint. I show that the AS functions similar to a negative income (and wealth) tax (NIT) where the subsidy, in general, is generated inversely to income and wealth and diminishes over time with higher savings and incomes. Moreover, such subsidies are not designed to be optimised towards increased consumption nor does this payment, in general, suggest that the recipient cohort increases its willingness to pay more rent simply because the payment increases their residual incomes in comparison to non-recipients.

Theory eludes us under the housing allowance context. To this end, my thesis introduces an augmented demand framework for rental housing at the household level in an intuitive setting to assist in understanding consumption behaviour for rental housing for three types of renting households identified by income levels, low – medium – high. To complement this, I analyse the Household Economic Survey (HES) data for various periods at the income quintile level and find that housing demand in New Zealand, at the aggregate level, follows the Schwabe’s law. Insights are drawn from this analysis on how marginal housing consumption decisions and how housing consumption decisions, in general, by the poor change and are affected over time.

Housing allowances are constitutionally very different to incomes and are designed to serve more as an income maintenance tool for and amongst the systemic poor population relative to their poverty levels i.e., very poor and the less poor, and to an extent their housing consumption levels, where the housing allowance cannot fundamentally determine the housing consumption level.
Accommodation Supplement algorithm reveals that the allowance is progressive towards income whereby the subsidy amounts to a higher percentage of income as income decreases and vice versa, although regressive towards rents above subsidy ceiling. This makes the modern housing allowance more of an income adjustment supplement.

On my empirical contribution, I employ a microeconometric ‘fixed-effects’ model using New Zealand Census panel data (2006 and 2013) by aggregating nearly 1,500 census Area Units (AU) to cover over 90% of households in the country. To this effect, I merged all datasets based on census year at the geographical Area Unit level and controlled for an array of local shocks whilst performing a battery of tests as well. I controlled for omitted variable bias confounding rents, at the micro-level, by constructing a panel of geographical neighbourhoods for the entire population of the country. And for this reason, I extend my empirical estimation methods to include highly sophisticated regressions modelling to control for spatial interactions and also estimate my regressions using Geographically Weighted Regressions (GWR).

Moreover, I include multiple variables controlling for supply elasticity as well. My population or universe level aggregate data, especially for the Accommodation Supplement, and fixed effects methodology add, to a substantial degree, robustness to the existing literature on the topic via external validity using panel data. My thesis identifies how to include the subsidy in the structural model for rents as well. In the discussion part of my empirical analysis, I addressed concerns that may have biased earlier research that found a significant increase in rents from housing subsidies via choice of methodology.

As the fixed effects methodology is conducive to aggregate econometric modelling, this makes the difficulties of modelling such an endogenous parameter more amenable. More importantly, past empirical studies have approached the topic in various forms, in general, adopting the idea that the subsidy is a rent price variable and designing their models as such. Studies that use pricing theory can simply reach to misleading conclusions. For example, it is quite possible that the subsidy’s effects are already somewhat predetermined due to omitted variable bias if not modelled correctly, to some extent, and can exhibit rent inflation at the household level as a result of low cash assets than the subsidy itself. Moreover, a fixed effects methodology tends to overcome omitted variable bias that may lurk within a hedonic or individual dwelling rent level model, as wealth levels, which
seem to be the core differentiating attribute between the two populations i.e., the recipient and non-recipient low-income renter, overtime tend to remain constant for the eligible cohort within an Area Unit.

I find statistically significant results for the increase in the subsidy’s demand and cost at the AU level over 2006-2013 to affect market rents negatively across rent markets in New Zealand (temporal variation). For low-income renters the subsidy, over time, did not have a statistically significant impact on their rents. That is, the total cost of the Accommodation Supplement housing subsidy specifically for the rental sector which stood at NZ$ 5.225 Billion from 2007 to 2013, and was disbursed to these poor households, did not affect their market rents (Synthetic lower quartile rents). Moreover, the overall negative impact explains that a greater presence of these income and asset poor households in an AU that are averse to income risks influences the overall market rents downwards. The same negative impact is not true for low-income rental sub-markets as the subsidy monies do not alter housing decisions of the recipient cohort therefore their rental market equilibrium is intact. As mentioned earlier, many renters with high incomes, in reality, choose to rent low rent dwellings (Hulse et al., 2019).

11.3 Study limitations

This study, as for any other research project, faced challenges and limitations that could be a basis for further inquiry. There were some shortcomings from the study design and nature of the sample used. The quantitative research design has enabled an in-depth analysis of the subject that can now inform theory from its findings as it is tested over a large population. The findings of this study can be regarded as generalizable, but with caution. The design similarities between any two housing allowance schemes in two different countries can have very different policy boundaries and other exogenous parameter limitations. These variations impact the study results and can therefore restrict the study to internal validity as per the housing allowance scheme analysed in this study. Despite this, a theoretical proposition has been established which helps to better understand the behaviour of housing allowance schemes and specifically the impact of transfer incomes within rental markets. The limitation here being that Census Area Units are good geographical representations for residential rental market models.
That is, the limitation of the fixed effects estimation methodology is that it does not consider independence between the Area Units i.e., it assumes that all AU have the same rent model. Another limitation is that as the within-unit variation is always smaller (or at least, no larger) than the overall variation in the independent variable, one should use within-unit variation to motivate counterfactuals when discussing any impact of a treatment. One should avoid discussing the effect of changes in X that are larger than any changes observed within units in the data. (King and Zeng 2006).

Additionally, this study has only examined the housing allowance scheme for renters. The study findings are therefore limited to views on its impact on rents and not house prices. It has not captured or quantified what can happen in the residential housing market that carry a housing allowance scheme as a consequence of changes in the market conditions or scheme parameters. Moreover, a general limitation for a study on housing allowances impacting rents is the impossibility of answering questions requiring quantifiable answers whether if overall rents would be lower or segmentally higher in different rent markets if no subsidy was available tomorrow.

An overall limitation that may plague any analysis on rents at the micro-econometric level is that such a study captures only the effects at the micro-econometric level from within the specified model, whereas rents could very well be confounded by macro variables outside the model, especially post residential capitalism in New Zealand (as discussed in chapter 8). These can be triggered by financialisation of the rental sector. Generally speaking, financialisation is part of and key to structural transformations of advanced capitalist economies (Fernandez, & Aalbers, 2016). And as residential rental housing has become the new asset class (Fields & Uffer, 2016; Fields, 2018) this can lead to price inflation via effective demand from outside the tenant population seeking housing. In addition, incomes no longer determine demand for housing, it is the supply of and demand for credit which underpins this behavior and even with relatively stable populations and income levels, it is not merely possible but highly likely that house prices (and rents) will go up if the supply of housing finance goes up (Aalbers & Haila, 2018).
11.4 Policy recommendations and implications

The overall research within this study not only informs us of the impacts of a demand-side housing allowance scheme. It attempts to understand the role and structure of state housing within New Zealand as well, albeit in a narrow aspect that looks at their impact on low-income housing rents and the process of setting of state housing rents by the government amongst others. To that end, the narrative is strongly being pushed that the modern housing allowance for rental accommodation is inflationary. This is leading to a push towards the traditional or rather conventional redistributive policies that encourage a greater supply of housing that is social housing. This change of narrative is now being made mainstream thinking, at least in New Zealand. Knowing that each social house costs around three times more to the taxpayer for housing a typical family, this inefficiency is not the only worry. This political shift within the housing policy of the state will provide the Crown, which is the largest private landlord in New Zealand, with ownership of more real estate land and housing units, which are to be financed by the present generation of taxpayers. And as state housing is no longer a Public owned entity the higher costs of housing a family go to the Crown as revenue from charging market rents for homes that once were Public goods. In addition, the Crown reaps rewards indirectly from higher taxes that this generation will have to pay for building these state houses which effectively will not be under the ownership of the New Zealand citizen. Although the Income related rent subsidy (IRRS) is paid by the Crown (to the Crown) it will be interesting to inform that legal scholars now recognise that the Crown, as a metonym for government and the state, is a ‘shapeshifting symbol’ (Shore, C., & Kawharu, M. 2014 p. 17). The Crown ‘has different meanings according to context,’ as even the Supreme Court of New Zealand now acknowledges (2010)\textsuperscript{86}.

In my thesis, I have constructed a simple tool, the GASP index, that can assist policy makers within the present setup of the AS scheme to better target housing affordability objectives of the housing allowance scheme for recipients similar to state housing objectives for the Crown. The challenge is not to make it an inflationary instrument. For that, my analysis using the HES data in chapter 7 helps to understand how incomes at the quintile level affect housing demand. As argued, higher

allowance amounts (i.e., generosity) that assist to adjust housing stress levels near the affordability level i.e. 25-30 percent would, in practise, seem to keep the housing demand level of the recipient cohort unchanged. And as the AS is not income or price, this is surely true in theory. And as evidence across housing allowance literature and indeed from my study suggests that AS renters do not increase their housing consumption under these schemes, increasing the allowance with respect to households housing stress levels may not be market distortionary. It most probably would assist these households to either decrease their food consumption of inferior goods, and for the most needy, it could even wean them off ‘Giffen’ goods.

On the issue of increasing the cash asset limits (i.e., eligibility) this will increase the size of the cohort, although still low-income. Rent contracts remain the same at time of policy intervention, future rent renewals of the cohort too will be negotiated under the same rational behaviour where the landlord is not privy to the subsidy to the tenant, and it will introduce increased horizontal equity. This will surely increase the cost to the tax payer although for assisting the low-income tenants and not the landlord i.e., Crown.

The GASP measure can allow policy makers to choose the limits for preferred levels of targeting in each quarter at the Area Unit level to provide objective led policy interventions immediately by the government. Whereas the inflationary effects of a housing allowance are true for France, it is not the case for NZ and possibly other nations that have similarity of design with the scheme in NZ. Other countries may learn from the intricate design features of the NZ scheme as the AS is non-inflationary.

In conclusion, understanding the need for such housing allowances then becomes more crucial. And the gap in incomes and housing stress (via house price and thus rents) that is required to be filled by such income transfers is a symptom of political will and not economics. New Zealand can either grow its economy and accumulate wealth via interest rate manipulation and credit policy towards residential housing or it can achieve prospective economic growth via productive and digital capital. The former comes with equivalent debt burdens whereas the latter comes with real opportunity that forms part of prolonged economic growth in the form of infrastructure and more so, lies in the digital capital market share as it potentially can harness the entire globe and is much more scalable than the meagre scalability of the sheer number of housing units.
Appendix 1.

Di-Pasquale-Wheaton (D-W) Framework for real estate markets – A pedagogical exercise

The model comprises of four separate diagrams all combined into one large depiction of the real estate sector. The diagram allows one to study the way in which changes in one market may affect other markets and help understand the feedback mechanisms built in the model. For a detailed understanding of the model see, “The markets for real estate assets and space: a conceptual framework” by DiPasquale and Wheaton (1992). I will briefly explain the outline of the model and then continue to use the model to illustrate the effects of financialisation within the asset markets.

The diagram A.2(i) has four quadrants, namely northeast (NE), northwest (NW), southwest (SW), and southeast (SE). The northeast and southeast represent the property markets, whereas the northwest and southwest show the asset markets. The most important feature of this model is the interaction of the markets. The property market presents the physical stock of built property described as a vertical inelastic supply curve on the horizontal axis and “rent” on the vertical axis. The household demand for space depends on income and the cost of occupying that space relative to the cost of consuming other commodities. For firms and households, the cost of occupying space is the annual outlay necessary to use real estate – its rent (DiPasquale & Wheaton, 1992). Rents are determined in the short run in the NE quadrant. In equilibrium, demand for space, \( D \), which is part of the property markets and is in quadrant NE, is equal to the stock of space, \( S \). Demand is a function of rent, \( R \), and conditions in the economy, where the supply is fixed.

\[ D (R, \text{Economy}) = S. \]

Rents are determined by assuming a fixed supply by taking a straight line from the x-axis to the demand curve and then over to the vertical axis.
Asset markets reflect the yield levels where investors are willing to hold real estate assets, for a given rent. This is the capitalization rate and may be affected by long-term interest rates, expected rental growth, risks in rental incomes, and tax regime shifts. An increase in capitalization rate would suggest a shift to other assets and will depict a clockwise shift in the curve in the NW quadrant. The cap rate is taken as exogenous depending on returns in other capital markets for all
assets (stocks, bonds, short-term deposits). Therefore, the rents determine the price for real estate assets using a capitalization rate in the D-W model. The next quadrant, SW, determines how much new construction takes place at the prevailing asset price and costs for construction. New construction will be viable until the price of any further construction outstrips asset price. Therefore, increasing asset prices here will increase the level of new construction. The fourth quadrant, SE, shows the level of construction that is needed and should be provided by the asset markets for maintaining a constant stock, that is to say, at the very least the level of new construction should be able to replace the depreciated quantity in the present stock.

**Financialisation of real estate**

In the case where I study the effects of financialisation of real estate sector, the effects of an investment directed towards the financial side of the property markets eventually decreases the level of new construction, resulting in restricting the market for supply of space that pushes equilibrium rents upwards. In diagram A.2(ii), I start by showing a situation for an economy having equilibrium, E, in the real estate markets for assets and space respectively. I then introduce the real economy where asset markets lead the decisions of investors towards new construction, which depend upon the level of financialised real estate in addition to other capital markets. As the markets for real estate are increasingly financialised, the shifting capitalization rates influence property markets for space. The link between the two markets for assets and property within the financialised paradigm occurs at two junctures. First, the present state of asset market equilibrium is central in determining the changes in stock of property. The amount invested in asset markets will determine the future income and wealth streams of the investor. Such an equilibrium, E, is shown as the starting point in our analysis by the dotted-line square covering all four quadrants. The asset markets for property now comprise of ‘real’ investment that is directed towards construction, and an element of ‘speculative’ investment that is in the direction of real estate derivatives investment. The proportion that is invested in derivatives essentially is an amount that
Diagram A.2.(ii): The D-W Model: Effect of financialisation of real estate leading to higher rents.

LEGEND:
D=demand  
S=supply  
P=real property price  
R=rent  
i=capitalization rate  
C=replacement costs  
S=long-run stock  
δ=depreciation rate
exits the ‘real’ property markets and therefore decreases the amount of investment towards new construction, at each level of price. As more real estate is financialised and leveraged, this amount increases significantly. The share of capital from asset markets towards real construction, in our model, is now a proportion of total asset market valuation. If the proportion that is ‘crowded out’ towards the financial sector is $\Omega$, then the asset market now contributes $(1-\Omega)P_t$ towards new construction. This amount is less than the total asset market valuation under the D-W model without financialisation. This aspect within the real estate market now creates a shift from within the model and our curve in the NW quadrant shifts clockwise to a new curve shown as $P^s$. With the prevailing rents, asset prices now adjust to equal price on the horizontal axis at point $E^s$. Due to the internal shifts, investors find less incentive towards new construction, which is reflected by the new $P^s$ curve. Such investor behaviour in the capital market adjusts the amount for new construction downwards with $P^E$ in the SW quadrant, where $P^s=E^s$. This results in a less than proportional increase in stock or consequently, a negative change in the supply of stock, decreasing the market for space substantially. The situation in the market for rent determination due to this ‘shift’ pushes rents to $R^s$, initially. Higher rents help shift asset prices in favour of an increase in new construction. If we follow the arrow from $R^s$ to the curve $P^s$ and then down to the new $P^E$ cost function, we see the interim process or dynamics between the various real estate markets. We should note that as there was a substantial decrease in the supply of stock, this essentially dampens construction activity in the industry and any future projects face an initial higher cost curve to begin with. This shift is reflected by the new $P^E$ curve in the SW quadrant. This increase in new construction paves way towards a new long-run equilibrium that the market seems to be moving towards. This new construction provides a reprieve to the depreciating stock of property in the market for space and helps increase the available stock. The final equilibrium price now in the market for space is settled at $R^{E'}$. At this rent level the new curve in the asset market, $P^{E'}$, provides just enough capital towards new construction in order to keep the long-run stock of real estate property equal to its depreciation rate, essentially keeping the stock constant. A fundamental difference here with respect to the D-W model is that previously only exogenous factors affected the capitalization rate which adjusted rents to dictate asset prices, now, the price in the asset markets for property itself drives the demand for (broader) assets within the financialised model and may not be (solely) driven by the rents determined in the property markets (as in the D-W model). This inherent behaviour that comes with financialisation of the industry can further
decrease investment in new stock as higher asset prices may lead to higher levels of internal shifts within the sector towards financial real estate assets as the market reinforces itself and ‘crowds out’ once again investment into the ‘real’ real estate for space. Thus, equilibrium price in the asset markets determines the level of new construction in the economy, and any shocks to the asset markets \textit{immediately} affect the demand for new construction. This may limit the quantity of ‘property stock’ available for the future, resulting in perpetual restricted supply of space and higher rents, even in the long run.

In short, changes in the asset markets fundamentally in the shape of investor behaviour away from ‘real’ investment within the real estate sector and fluctuations in development costs for new construction (kick starting the construction sector etc.) that reduce profitability play an important role in determining the equilibrium price in the property markets for space.

My analysis therefore begins within the asset markets as opposed to the property markets for space as in the D-W framework and attempts to understand the mechanics underpinning the overall industry. This adjustment or dynamic behaviour is mostly for illustrative purposes, as the exact process would require a dynamic system of equations that would change the scope of this exercise. I have attempted to show the intermediate adjustments for such analysis that, as a generalization, fit the D-W model neatly.
### Appendix 2. Summary Statistics

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median rent, $/week</td>
<td>2,978</td>
<td>230.6</td>
<td>90.36</td>
<td>50</td>
<td>800</td>
</tr>
<tr>
<td>Geo-mean rent, $/week &lt;sub&gt;MBIE&lt;/sub&gt;</td>
<td>1,872</td>
<td>300.1</td>
<td>91.90</td>
<td>103</td>
<td>735</td>
</tr>
<tr>
<td>SLQ rent, $/week &lt;sub&gt;MBIE&lt;/sub&gt;</td>
<td>1,872</td>
<td>247.6</td>
<td>74.44</td>
<td>54</td>
<td>567</td>
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<tr>
<td>Housing unit density</td>
<td>2,978</td>
<td>0.373</td>
<td>0.0492</td>
<td>0.152</td>
<td>0.655</td>
</tr>
<tr>
<td>Median income, $/week</td>
<td>2,978</td>
<td>1,112</td>
<td>379.8</td>
<td>396.2</td>
<td>2,740</td>
</tr>
<tr>
<td>Unemployment rate, %</td>
<td>2,978</td>
<td>5.815</td>
<td>4.059</td>
<td>0</td>
<td>34.04</td>
</tr>
<tr>
<td>Access to Internet, %</td>
<td>2,978</td>
<td>66.71</td>
<td>14.87</td>
<td>16.16</td>
<td>96.97</td>
</tr>
<tr>
<td>Rental hh per capita</td>
<td>2,978</td>
<td>0.0987</td>
<td>0.0462</td>
<td>0.0117</td>
<td>0.378</td>
</tr>
<tr>
<td>One bed, %</td>
<td>2,978</td>
<td>34.76</td>
<td>6.481</td>
<td>9.013</td>
<td>60</td>
</tr>
<tr>
<td>Two beds, %</td>
<td>2,978</td>
<td>16.11</td>
<td>3.030</td>
<td>1.333</td>
<td>28.57</td>
</tr>
<tr>
<td>Three plus beds, %</td>
<td>2,978</td>
<td>25.93</td>
<td>10.231</td>
<td>0</td>
<td>58.27</td>
</tr>
<tr>
<td>Employed full time, %</td>
<td>2,978</td>
<td>49.24</td>
<td>8.276</td>
<td>6.847</td>
<td>80.12</td>
</tr>
<tr>
<td>Usual resident 0 Years, %</td>
<td>2,978</td>
<td>22.68</td>
<td>7.323</td>
<td>6.061</td>
<td>85.08</td>
</tr>
<tr>
<td>Usual resident 5to9 Years, %</td>
<td>2,978</td>
<td>18.96</td>
<td>3.900</td>
<td>1.300</td>
<td>39.89</td>
</tr>
<tr>
<td>Avg. AS per AS hh, $/week</td>
<td>2,978</td>
<td>69.48</td>
<td>25.86</td>
<td>2.333</td>
<td>163.7</td>
</tr>
<tr>
<td>AS marketshare &lt;sub&gt;MBIE&lt;/sub&gt;, %</td>
<td>1,872</td>
<td>49.36</td>
<td>20.71</td>
<td>0.971</td>
<td>100</td>
</tr>
<tr>
<td>Avg. weighted AS per rental hh, $/week</td>
<td>2,978</td>
<td>28.13</td>
<td>17.21</td>
<td>0.128</td>
<td>97.40</td>
</tr>
<tr>
<td>Avg. AS Market Impact</td>
<td>2,978</td>
<td>13.72</td>
<td>13.13</td>
<td>0.00173</td>
<td>81.50</td>
</tr>
</tbody>
</table>

This table presents summary statistics of the full set of key variables and other control variables in my analysis. All data is from the Statistics New Zealand census dataset unless otherwise stated. All variables are at the Area Unit level and weighted at the household level. Median rents are based on Stats NZ data, and geometric mean rents and synthetic lower quartile (SLQ) rents, both, are provided by the MBIE. All rent variables are in weekly dollar terms at the household level adjusted.
for household size for each Area Unit respectively. All Accommodation Supplement data is provided by the MSD. Avg. AS per AS hh, $/week denotes the total expenditure on AS payments in a typical week in a quarter by the MSD divided by the number of recipients of the transfer payment in the respective period. Avg. weighted AS per rental hh, $/week denotes the total expenditure on AS payments in a typical week in a quarter by the MSD divided by the number of recipients of the transfer payment in the respective period weighted by the share of the recipient households in the rental sector in that period. AS marketshare, % denotes the number of Accommodation Supplement subsidy recipient households divided by total rental households, including state houses, in an AU in percentage points. AS marketshare MBIE, % denotes the number of Accommodation Supplement subsidy recipient households divided by total private sector rental households (excludes state houses) in an AU in percentage points. Median income is from the census and provides income details in band ranges or as a median based on those bands. The census surveys everyone in New Zealand about their income from all sources, so is not subject to the sample error inherent in sample surveys. Housing unit density is a ratio of total dwellings to total population in an AU. Rental hh per capita is a ratio of total renting households to total population in an AU. All other variables are in units of percentage points unless otherwise stated.
Appendix 3

Panel Fixed Effects (2006-2013) – 1489 Area Units - Median rents

. use "~/Users/wasaymajid/STATA_2022/Census_parsi_1489.dta"

. xtreg median_rent housing_unit_density Median_wage Access_to_Internet
rental_hh_percapita_AU one_bed two_bed three_plus_bed Employed_Full_time_
Usual_resident_0_Years Usual_resident_5to9_Years Unemployment_Benefit AS_per_rental_hh
AS_marketshare AS_MARKET_IMPACT, fe vce(robust)

Fixed-effects (within) regression

Number of obs     =      2,978
Group variable: A_U
Number of groups  =      1,489

R-squared:
  Within = 0.7912
  Between = 0.7032
  Overall = 0.7196

F(14,1488)        =     479.32
corr(u_i, Xb) = -0.1151

(Std. err. adjusted for 1,489 clusters in A_U)

|                      | Robust                          | Coefficient | std. err. | t    | P>|t|   | [95% conf. interval] |
|----------------------|---------------------------------|-------------|-----------|------|-------|----------------------|
| median_rent          |                                 | -50.24396   | 85.84022  | -0.59| 0.558 | -218.6247            | 118.1367             |
| housing_unit_density_|                                 | .14726      | .0094263  | 15.62| 0.000 | .1287696             | .1657503             |
| Median_wage          |                                 | 1.509287    | .172473   | 8.75 | 0.000 | 1.170971             | 1.847603             |
| Access_to_Internet   |                                 | 179.3709    | 96.19871  | 1.86 | 0.062 | -9.328633            | 368.0704             |
| rental_hh_percapita_AU_ |                              | -2741842    | .5010515  | -0.55| 0.584 | -1.257027            | .7086582             |
| one_bed              |                                 | -5204218    | .618549   | -0.84| 0.40  | -1.733742            | .6928988             |
| two_bed              |                                 | -191967     | .6022727  | -0.03| 0.975 | -1.20059             | 1.162197             |
| three_plus_bed       |                                 | -1.024016   | .38108    | -2.69| 0.007 | -1.771527            | -2.76505             |
| Employed_Full_time_  |                                 | -0.0266831  | .3776536  | -0.07| 0.944 | -0.7674732           | .714107              |
| Usual_resident_0_Years |                              | -0.6248761  | .4769826  | -1.31| 0.190 | -1.560506            | .3107537             |
| Usual_resident_5to9_Years |                        | .6891608    | .7550334  | 0.91 | 0.362 | -0.7918822           | 2.170204             |
| Unemployment_Benefit_ |                                 | 2.835623    | .6661947  | 4.26 | 0.000 | 1.528842             | 4.142403             |
| AS_per_rental_hh     |                                 | -8.069716   | .2279414  | -3.54| 0.000 | -1.254092            | -0.359851            |
| AS_marketshare       |                                 | -1.119214   | .5062726  | -2.21| 0.027 | -2.112298            | -0.12613             |
| AS_MARKET_IMPACT     |                                 | 12.77628    | 63.38983  | 0.20 | 0.840 | -111.5666            | 137.1192             |
| cons                 |                                 | 44.537715   |           |      |       |                     |                     |
| sigma_u              |                                 | 25.91653    |           |      |       |                     |                     |
| sigma_e              |                                 | 25.91653    |           |      |       |                     |                     |

258
xtreg median_rent housing_unit_density Median_wage Access_to_Internet
rental_hh_percapita_AU one_bed two_bed three_plus_bed Employed_Full_time
Usual_resident_0_Years Usual_resident_5to9_Years Unemployment_Benefit AS_per_rental_hh
AS_marketshare AS_MARKET_IMPct i.time, fe vce(robust)

Fixed-effects (within) regression
Number of obs     =      2,978
Group variable: A_U
Number of groups  =      1,489

R-squared:
Within          = 0.8060
Between         = 0.5131
Overall         = 0.5644

F(15,1488)        = 523.16
corr(u_i, Xb)    = 0.1570
Prob > F          = 0.0000

(Std. err. adjusted for 1,489 clusters in A_U)

<table>
<thead>
<tr>
<th></th>
<th>Robust</th>
</tr>
</thead>
<tbody>
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<td>Coefficient</td>
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<td>0.9271126</td>
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<td>Usual_resident_5to9_Yrs</td>
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<td>AS_MARKET_IMPct</td>
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<td>2.time</td>
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<tr>
<td>_cons</td>
<td>100.4075</td>
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</tbody>
</table>

sigma_u | 57.716971
sigma_e | 24.994419
rho    | 0.84208145 (fraction of variance due to u_i).

name: <unnamed>
log: /Users/wasaymajid/Desktop/Do Files/Panel regressions_LOG.smcl
log type: smcl. closed on: 3 May 2022, 13:03:48 log close

. xtreg geo_mean_rent housing_unit_density Median_wage Access_to_Internet rental_hh_per_capita_AU one_bed two_bed three_plus_bed Employed_Full_time Usual_resident_0_Years Usual_resident_5to9_Years Unemployment_Benefit AS_per_rental_hh AS_marketshare AS_MARKET_IMPACT, fe vce(robust)

Fixed-effects (within) regression

Number of obs = 1,872
Number of groups = 936

R-squared:
Within = 0.7652
Between = 0.7431
Overall = 0.7421

|                  | Coefficient | std. err. | t   | P>|t|   | [95% conf. interval] |
|------------------|-------------|-----------|-----|-------|---------------------|
| geo_mean_rent    | 1.872       | 3.872     | 0.48| 0.633 |                     |

(Std. err. adjusted for 936 clusters in A_U)
| Variable                  | Coefficient | Std. err. | t     | P>|t| | [95% conf. interval] |
|--------------------------|-------------|-----------|-------|-----|------------------------|
| geo_mean_rent            | -371.7926   | 184.5807  | -2.01 | 0.044 | -734.033 -9.552278     |
| Median_wage              | 103.8848    | 222.2320  | 0.465 | 0.650 | .0608087 .147689      |
| Access_to_Internet       | -1.879674   | .4457295  | -4.22 | 0.000 | -2.75442 -1.004928    |
| rental hh percapita AU   | -333.7402   | 161.6119  | -2.07 | 0.039 | -650.9043 -16.57606   |
| one_bed                  | -445.6156   | .9095627  | -0.49 | 0.624 | -2.230636 1.339405    |
| two_bed                  | -130.6511   | 1.055696  | -0.12 | 0.902 | -2.202459 1.941157    |
| three_plus_bed           | .312061     | 1.177946  | 0.26  | 0.791 | -1.999664 2.623786    |
| Employed Full time       | 1.659447    | .6627906  | 2.50  | 0.012 | .3587179 2.960177     |
| Usual_resident 0_Years   | .0876802    | .5859494  | 0.15  | 0.881 | -1.062248 1.237609    |
| Usual_resident 5to9_Years| -.7253235   | .5170169  | -1.40 | 0.161 | -1.739971 .2893243    |
| Unemployment_Benefit     | .6672237    | .8051281  | 0.83  | 0.407 | -.9128437 2.247291    |
| AS per rental hh         | 1.401917    | .3592592  | 3.90  | 0.000 | .696869 2.106965      |
| AS marketshare MBIE      | -.3087135   | .2632258  | -1.17 | 0.241 | -.8252954 .2078684    |
| AS MARKET IMPACT         | -.1146302   | .2074613  | -5.53 | 0.000 | -.1553446 -.7391582   |
| 2.time                   | 86.51877    | 11.69139  | 7.40  | 0.000 | 63.57436 109.4632     |

Fixed-effects (within) regression

Number of obs = 1,872
Number of groups = 936

Obs per group:
  min =  2
  avg =  2.0
  max =  2

F(15,935) = 226.43
Prob > F = 0.0000

(Std. err. adjusted for 936 clusters in A_U)
\texttt{xtreg geo\_mean\_rent AS\_MARKET\_IMPACT i.time, fe vce(robust)}

Fixed-effects (within) regression

\begin{tabular}{l|lllll}
\hline
 & Coefficient & Std. err. & t & P>|t| & [95\% conf. interval] \\
\hline
\texttt{geo\_mean\_rent} & -0.502378 & 0.1283816 & -3.91 & 0.000 & -0.7543282 & -0.2504295 \\
\texttt{AS\_MARKET\_IMPACT} & 76.70461 & 1.589604 & 48.25 & 0.000 & 73.585 & 79.82421 \\
\texttt{time} & 271.9279 & 2.535317 & 107.26 & 0.000 & 266.9523 & 276.9035 \\
\texttt{cons} & 80.158173 & & & & & \\
\hline
\end{tabular}

\texttt{xtreg median\_rent housing\_unit\_density Median\_wage Access\_to\_Internet rental\_hh\_percapita\_AU one\_bed two\_bed three\_plus\_bed Employed\_Full\_time Usual\_resident\_0\_Years Usual\_resident\_5to9\_Years Unemployment\_Benefit AS\_per\_rental\_hh AS\_marketshare AS\_MARKET\_IMPACT i.time, fe vce(robust)}

Fixed-effects (within) regression

\begin{tabular}{l|lllll}
\hline
 & Coefficient & Std. err. & t & P>|t| & [95\% conf. interval] \\
\hline
\texttt{sigma\_u} & 80.158173 & & & & & \\
\texttt{sigma\_e} & 33.625035 & & & & & \\
\texttt{rho} & 0.85036439 & & & & (fraction of variance due to u\_i) \\
\hline
\end{tabular}
Within = 0.9113  
min = 2

Between = 0.5971  
avg = 2.0

Overall = 0.6551  
max = 2

F(15,935) = 767.59  
Prob > F = 0.0000

corr(u_i, Xb) = 0.2189

(Std. err. adjusted for 936 clusters in A_U)

| Coefficient  std. err. | t   | P>|t| | [95% conf. interval] |
|------------------------|-----|------|--------------------|
| median_rent_           | -145.0034 99.0983 | -1.46 | 0.144 | -339.4843 49.47741 |
| housing_unit_density_  | .1019627 .0126346 | 8.07 | 0.000 | .0771672 .1267582 |
| Median_wage_           | -.7412921 .3047862 | -2.43 | 0.015 | -.1.339436 -.1431479 |
| Access_to_Internet_    | 145.181 89.48335 | 1.62 | 0.105 | -.30.43043 320.7925 |
| rental_hh_percapita_AU_| .5588421 .547197 | 1.02 | 0.307 | -.5150345 1.632719 |
| one_bed                | 1.063891 .6390842 | 1.66 | 0.096 | -.1903149 2.318096 |
| two_bed                | 1.23145 .6767665 | 1.82 | 0.069 | -.0967073 2.559607 |
| three_plus_bed        | -.1186486 .3686062 | -0.32 | 0.748 | -.8420398 .6047427 |
| Employed_Full_time_    | .2107607 .3007133 | 0.70 | 0.484 | -.3793906 .8009119 |
| Usual_resident_0_Years_| -.8796044 .340837 | -2.58 | 0.010 | -.1.548498 -.2107103 |
| Usual_resident_5to9_Years_ | -.3384458 .5492174 | -0.62 | 0.538 | -.1.416287 .7393957 |
| Unemployment_Benefit_  | .8050997 .2033729 | 3.96 | 0.000 | .4059794 1.20422 |
| AS_per_rental_hh_      | -.2236949 .1405837 | -1.59 | 0.112 | -.4996146 .0522249 |
| AS_marketshare_MBE_    | -.337722 .204952 | -1.65 | 0.100 | -.7399412 .0644972 |
| AS_MARKET_IMPACT_      | 61.3425 7.377917 | 8.31 | 0.000 | 46.8633 75.82169 |
| 2.time                 | 140.6683 67.56747 | 2.08 | 0.038 | 8.066837 273.2698 |
| _cons                  | 49.401672 |
| sigma_u                | 17.072912 |
| sigma_e                | .89330772 | (fraction of variance due to u_i) |
| rho                    | 263 | Panel Fixed Effects (2006-2013) – 936 Area Units – Synthetic lower quartile rents (SLQ rent)

.xtreg SLQ_rent housing_unit_density Median_wage Access_to_Internet rental_hh_percapita_AU one_bed two_bed three_plus_bed Employed_Full_time_ Usual_resident_0_Years Usual_resident_5to9_Years Unemployment_Benefit AS_per_AS_hh_ fe vce(robust)
Fixed-effects (within) regression

Number of obs     =      1,872
Group variable: A_U
Number of groups  =        936

R-squared:
Within = 0.6884
Between = 0.5774
Overall = 0.5961

Obs per group:
min =          2
avg =        2.0
max =          2

F(12,935)         =     178.96
corr(u_i, Xb) = -0.3554
Prob > F          =     0.0000

(Std. err. adjusted for 936 clusters in A_U)

|               Robust | Coefficient  | std. err.  | t    | P>|t|  | [95% conf. interval] |
|-------------------+----------------+-------------+-------+-------+----------------------|
| SLQ_rent          |               |             |       |       |                      |
| housing_unit_density_ | -205.9063     | 146.9391    | -1.40 | 0.161 | -494.275  82.4624   |
| Median_wage_      | .1545391      | .0143849    | 10.74 | 0.000 | .1263087  .1827694  |
| Access_to_Internet_ | 1.402826      | .2778557    | 5.05  | 0.000 | .8575333  1.948119  |
| rental_hh_percapita_AU_ | 200.0327      | 157.6009    | 1.27  | 0.205 | -109.2597 509.3252  |
| one_bed           | -1.076799     | .838011     | -1.28 | 0.199 | -2.721399 .5678013 |
| two_bed           | -.7528832     | 1.073699    | -0.70 | 0.483 | -2.860022 1.354256  |
| three_plus_bed    | -.079354      | .9956701    | -0.08 | 0.936 | -2.033361 1.874653  |
| Employed_Full_time_ | -1.347736     | .5658224    | -2.38 | 0.017 | -2.458165 -.2370368 |
| Usual_resident_0_Years_ | .0870002     | .5612651    | 0.16  | 0.877 | -1.014485 1.188485  |
| Usual_resident_5to9_Years_ | -.7722141    | .5190432    | -1.49 | 0.137 | -1.790839 .2464105 |
| Unemployment_Benefit_ | 1.422256      | .7297792    | 1.95  | 0.052 | -.0099389 2.854451  |
| AS_per_AS_hh_     | -.0183053     | .2324443    | -0.08 | 0.937 | -.4744784 .4378677 |
| _cons             | 154.6967      | 100.7714    | 1.54  | 0.125 | -43.06768 352.4611  |

sigma_u | 45.180588
sigma_e | 30.378572
rho     | .68865957 (fraction of variance due to u_i)

.xtreg SLQ_rent housing_unit_density Median_wage Access_to_Internet rental_hh_percapita_AU one_bed two_bed three_plus_bed Employed_Full_time Usual_resident_0_Years Usual_resident_5to9_Years Unemployment_Benefit AS_per_AS_hh i.time, fe vce(robust)

Fixed-effects (within) regression
Number of obs     =      1,872
Group variable: A_U
Number of groups  =        936
R-squared:
Within = 0.7027
Between = 0.4148
Overall = 0.4900

Obs per group:
min = 2
avg = 2.0
max = 2

F(13,935) = 170.65
Prob > F = 0.0000

corr(u_i, Xb) = 0.0506

(Std. err. adjusted for 936 clusters in A_U)

|               | Robust |                   | t     | P>|t| | [95% conf. interval] |
|---------------|--------|-------------------|-------|------|----------------------|
|               |        | Coefficient       | std. err. |    |                     |
| SLQ_rent_     |        |                   |       |     |                      |
| housing_unit_density_ | -196.1 | 151.0124 | -1.30 | 0.194 | -492.4624 | 100.2624 |
| Median_wage_  |        | 0.073996         | 0.0204036 | 3.63 | 0.000 | 0.039539 | .114038 |
| Access_to_Internet_ | -5605195 | .4487818 | -1.25 | 0.212 | -1.441256 | .3202168 |
| rental_hh_percapita_AU_one_bed | -169.4478 | .1667316 | -1.02 | 0.310 | -496.6593 | 157.7637 |
| one_bed       |        | -4.1984          | .8343429 | -0.50 | 0.615 | -2.057242 | 1.217562 |
| two_bed       |        | -0.0175866       | 1.03567 | -0.02 | 0.986 | -2.050093 | 2.01492 |
| three_plus_bed|        | 1.111949         | 1.008818 | 1.10 | 0.271 | -0.8678614 | 3.091759 |
| Employed_Full_time_ | .7176313 | .6309152 | 1.14 | 0.256 | -.5205426 | 1.955805 |
| Usual_resident_0_Years_ | .5002717 | .5594408 | 0.89 | 0.371 | -.5976333 | 1.598177 |
| Usual_resident_5to9_Years_ | -.8289292 | .5009137 | -1.65 | 0.098 | -1.811974 | .1541162 |
| Unemployment_Benefit_ | .6050401 | .7349582 | 0.82 | 0.411 | -.8373187 | 2.047399 |
| AS_per_AS_hh_  |        | -.0812751        | .2262396 | -0.36 | 0.719 | -.5252713 | .3627211 |
| 2.time        |        | 62.75876         | 11.27447 | 5.57 | 0.000 | 40.63256 | 84.88495 |
| _cons         |        | 214.847          | 104.7082 | 2.05 | 0.040 | 9.356665 | 420.3374 |

sigma_u | 48.974885
sigma_e | 29.689708
rho | .7312663 (fraction of variance due to u_i)

xtreg SLQ_rent housing_unit_density Median_wage Access_to_Internet rental_hh_percapita_AU one_bed two_bed three_plus_bed Employed_Full_time_ Usual_resident_0_Years Usual_resident_5to9_Years Unemployment_Benefit AS_per_AS_hh_ AS_marketshare i.time, fe vce(robust)
F(14, 935) = 159.59
Prob > F = 0.0000

(Std. err. adjusted for 936 clusters in A_U)

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<th>Robust</th>
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</thead>
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<tr>
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</tr>
</tbody>
</table>

sigma_u | 49.348918
sigma_e | 29.640806
rho     | .73488059  (fraction of variance due to u_i)

Fixed-effects (within) regression
Number of obs = 1,872
Group variable: A_U
Number of groups = 936

R-squared:
Within = 0.6803
Between = 0.3650
Overall = 0.4145

Obs per group:
min = 2
avg = 2.0
max = 2

F(14, 935) = 160.13
Spatial Autoregressive Fixed Effects Panel Regression (SAR): Median rent.
1489 Area Units defined in weight matrix for queen contiguity of order 1.

spset

Sp dataset: area-unit-2013.dta
Linked shapefile: area-unit-2013.shp.dta
Data: Cross sectional
Spatial-unit ID: _ID    Coordinates: _CX, _CY (planar)

. describe

| Robust       | Coefficient | std. err. | t    | P>|t| | [95% conf. interval] |
|--------------|-------------|-----------|------|------|----------------------|
| log_Median_wage_ | .1986617    | .1024922  | 1.94 | 0.053 | -0.0024797 .3998031 |
| housing_unit_density_ | -0.8538102  | .0609383  | -1.41 | 0.160 | -2.044929 .3373089 |
| Access_to_Internet_ | .0001296    | .0017299  | 0.07 | 0.940 | -.0032653 .0035245 |
| rental_hh_percapita_AU_ | -.3676006   | .6557908  | -0.56 | 0.575 | -1.654593 .9193918 |
| one_bed | -.0030828    | .0035403  | -0.87 | 0.384 | -.0100306 .0038651 |
| two_bed | -.0048312    | .0043173  | -1.12 | 0.263 | -.0133039 .0036414 |
| three_plus_bed | -.0013365    | .0038857  | -0.34 | 0.731 | -.0089622 .0062891 |
| Employed_Full_time_ | .0047783   | .0024886  | 1.92 | 0.055 | -0.0001056 .0096622 |
| Usual_resident_0_Years_ | .0047783    | .0024886  | 1.92 | 0.055 | -0.0001056 .0096622 |
| Usual_resident_5to9_Years_ | -.0002064   | .0021165  | -0.10 | 0.922 | -.00436 .0039472 |
| Unemployment_Benefit_ | -.0027569   | .0032223  | -0.86 | 0.392 | -.0090806 .0035668 |
| log_AS_per_AS_hh_ | -.0528281   | .0662418  | -0.80 | 0.425 |-.182828 .0771718 |
| log_AS_marketshare_MBI_E_ | .0001863   | .0227907  | 0.01 | 0.933 | -.0445405 .0449131 |
| 2.time | .2430919    | .0373786  | 6.50 | 0.000 | .1697362 .3164477 |
| _cons | 4.412643    | .8062933  | 5.47 | 0.000 | 2.830289 5.994997 |

sigma_u | .22023349 |
sigma_e | .12348645 |
rho | .76080786  (fraction of variance due to u_i)
Contains data from area-unit-2013.dta

Observations: 2,004
Variables: 8

Variable name Storage Display Value
name type format label Variable label

_ID int %12.0g Spatial-unit ID
_CX double %10.0g x-coordinate of area centroid
_CY double %10.0g y-coordinate of area centroid
AU2013_V1 str6 %9s AU2013_V1
AU2013_V_1 str34 %34s AU2013_V_1
AREA_SQ_KM double %24.15f AREA_SQ_KM
LAND_AREA double %24.15f LAND_AREA
Shape_Leng double %24.15f Shape_Leng

Sorted by: _ID

.spset _ID, modify replace
(_shp.dta file saved)
(data in memory saved)

Sp dataset: area-unit-2013.dta
Linked shapefile: area-unit-2013_shp.dta
Data: Cross sectional
Spatial-unit ID: _ID
Coordinates: _CX, _CY (planar)

.use Census_parsi_1489_2, clear

.xtset _ID time

Panel variable: _ID (strongly balanced)
Time variable: time, 1 to 2
Delta: 1 unit

.spbalance
(data strongly balanced)

.merge m:1 _ID using area-unit-2013

Result Number of obs
----------------------------------------
Not matched 515
from master 0 (_merge==1)
from using 515 (_merge==2)
. Matched 2,978 (_merge==3)

-----------------------------------------

. keep if _merge==3
(515 observations deleted)

. drop _merge

. save, replace
file Census_parsi_1489_2.dta saved

. describe

Contains data from Census_parsi_1489_2.dta
Observations: 2,978
Variables: 41

-------------------------------------------------------------------------------------------------------------------------
---
> ------------------------------------
Variable Storage Display Value
name type format label Variable label
-------------------------------------------------------------------------------------------------------------------------
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> ------------------------------------
_ ID float %9.0g group(A_U)
A_U long %10.0g Area_Unit
time byte %10.0g
False_rents_ int %10.0g
median_rent_ int %10.0g
housing_unit_ double %10.0g
very_poor_hh_ double %10.0g
Median_wage_ double %10.0g
unemployment_ double %10.0g
Rental_sector_ double %10.0g
rental_sector_ double %10.0g
Access_to_Int_ double %10.0g
rental_hh_per_ double %10.0g
one_bed double %10.0g
two_bed double %10.0g
three_plus_bed float %9.0g
Employed_Full_ double %10.0g
Usual_0_Years_ double %10.0g
Usual_9_Years_ double %10.0g
Unemployment_ double %10.0g
Sickness_Benefit double %10.0g
. Domestic_Purposes_Benefit double %10.0g
. Invalids_Benefit double %10.0g
. AS_marketshare double %10.0g
. AS_per_rental double %10.0g
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. log_Median_wage float %9.0g
. log_median_rent float %9.0g
. log_AS_market float %9.0g
. log_AS_per_rent float %9.0g
. log_AS_MARKET float %9.0g
. Rental_ASmarket float %9.0g
. Res_income float %9.0g
. Ratio_ASMktim float %9.0g
. _CX double %10.0g x-coordinate of area centroid
. _CY double %10.0g y-coordinate of area centroid
. AU2013_V1 str6 %9s AU2013_V1
. AU2013_V_1 str34 %34s AU2013_V_1
. AREA_SQ_KM double %24.15f AREA_SQ_KM
. LAND_AREA double %24.15f LAND_AREA
. Shape_Leng double %24.15f Shape_Leng
.
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> ------------------------------------
Sorted by: _ID time
.
. ssc install spmap
. checking spmap consistency and verifying not already installed...
. installing into /Users/wasaymajid/Library/Application Support/Stata/ado/plus/...
. installation complete.
.
. search spmat
.
. spmat use contiguity_W using W
. cannot open W
. r(498);
.
. spmat use W using W.spmat
.
.
. xsmle median_rent_housing_unit_density_Median_wage_unemployment_rate_
. Access_to_Internet_rental_hh_percapita_
. ___AU___one_bed two_bed three_plus_bed Employed_Full_time_Usual_resident_0_Years_
. Usual_resident_5to9_Years_Unemplo
. yment_Benefit_Sickness_Benefit_Domestic_Purposes_Benefit_Invalids_Benefit
. AS_marketshare_AS_per_rental_hh_AS_MARKET_IMPACT_time, wmat(W) model(sar) fe
type(both) vce(cluster A_U) nolog
.*: 3200 conformability error
  _xsmle_est(): - function returned error
  <istmt>: - function returned error
  r(3200);
.
.
  . spxtregress median_rent_ Median_wage_ Access_to_Internet_ rental.hh_percapita_AU_ one_bed two_bed three_plus_bed 
    Employed_Full_time_ Usual_resident_0_Years_ Usual_resident_5to9_Years_ Unemployment_Benefit_ AS_marketshare_ AS_per_rental.hh_ AS_MARKET_IMPACT_, fe 
  dvarlag(W)
  weighting matrix W not found
  r(111);
.
  . spmatrix dir
  (no weighting matrices found)
  . . spmat use W using W.spmat
  object with name W already exists
  r(498);
.
  . spmat dir
  dir unknown subcommand
  r(198);
.
  . spmatrix create contiguity W if time == 1
  weighting matrix in W contains 35 islands
.
  . spmatrix save W using contiguity_W
  (matrix W saved in file contiguity_W.stswm)
.
  . spxtregress median_rent_ Median_wage_ Access_to_Internet_ rental.hh_percapita_AU_ one_bed two_bed three_plus_bed 
    Employed_Full_time_ Usual_resident_0_Years_ Usual_resident_5to9_Years_ Unemployment_Benefit_ AS_marketshare_ AS_per_rental.hh_ AS_MARKET_IMPACT_, fe 
  dvarlag(W)
  (2978 observations)
  (2978 observations used)
  (data contain 1489 panels (places))
  (weighting matrix defines 1489 places)
.
  Performing grid search ... finished
.
  Optimizing concentrated log likelihood:
.
  Iteration 0:  log likelihood = -6944.1169
Iteration 1: log likelihood = -6943.2819
Iteration 2: log likelihood = -6943.2819

Optimizing unconcentrated log likelihood:

Iteration 0: log likelihood = -6943.2819
Iteration 1: log likelihood = -6943.2819 (backed up)

Fixed-effects spatial regression
Number of obs = 2,978
Group variable: _ID
Number of groups = 1,489
Obs per group = 2

Wald chi2(14) = 5737.21
Prob > chi2 = 0.0000
Log likelihood = -6943.2819
Pseudo R2 = 0.7086

| median_rent | Coefficient Std. err.  z  P>|z|  [95% conf. interval] |
|-------------|----------------------|---------|--------|-------------------------|
| Median_wage_ | .1377467  .0073548  18.73  0.000  .1233315  .152162 |
| Access_to_Internet_ | 1.371176  .14761  9.29  0.000  1.081866  1.660487 |
| rental_hh_per_capita_AU | 139.4471  74.34634  1.88  0.061  285.1632  74.27468 |
| one_bed | -.1472703  .3872166  -0.38  0.704  -0.9062008  .6116602 |
| two_bed | -.3939833  .4549848  -0.87  0.387  -1.285737  .4977706 |
| three_plus_bed | .2099319  .3697949  0.57  0.570  -.5148528  .9347167 |
| Employed_Full_time | -.9532315  .3113031  -3.06  0.002  -1.563374  -.3430887 |
| Usual_resident_0_Years | .0913142  .2982849  0.31  0.760  -.4933134  .6759418 |
| Usual_resident_5to9_Year | -.558693  .2644062  -2.11  0.035  -.107692  -.0404663 |
| Unemployment_Benefit | .7125893  .4403381  1.62  0.106  -.1504575  1.575636 |
| AS_marketshare | -.7951835  .1558656  -5.10  0.000  -.1100675  -.4896925 |
| AS_per_rental_hh | 2.748777  .3310195  8.30  0.000  2.099991  3.397563 |
| AS_MARKET_IMPACT | -1.107594  .3178347  -3.48  0.000  -.1730538  -.4846489 |

<table>
<thead>
<tr>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>median_rent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>/sigma_e</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.62295  .4695936  24.7189  26.56007</td>
</tr>
</tbody>
</table>

Wald test of spatial terms: chi2(1) = 18.59  Prob > chi2 = 0.0000

Spatial Autoregressive Fixed Effects Panel Regression (SAR): Geo-mean rent.
936 Area Units defined in weight matrix for queen contiguity of order 1.
name: <unnamed>
log: /Users/wasaymajid/MBIE_LOG.smcl
log type: smcl
opened on: 2 May 2022, 22:42:30

. use area-unit-2013, clear
. spset

   Sp dataset: area-unit-2013.dta
Linked shapefile: area-unit-2013_shp.dta
   Data: Cross sectional
Spatial-unit ID: _ID
   Coordinates: _CX, _CY (planar)

. spset _ID, modify replace
(_shp.dta file saved)
(data in memory saved)

   Sp dataset: area-unit-2013.dta
Linked shapefile: area-unit-2013_shp.dta
   Data: Cross sectional
Spatial-unit ID: _ID
   Coordinates: _CX, _CY (planar)

. use MBIE_parsi_936_2, clear

. xtset _ID time

Panel variable: _ID (strongly balanced)
Time variable: time, 1 to 2
   Delta: 1 unit
. describe

Contains data from MBIE_parsi_936_2.dta
Observations: 1,872
   Variables: 40
2 May 2022 22:40

---------------------------------------------------------------------------------------------------------------------
Variable      Storage   Display    Value                           Variable label
name         type    format    label      Variable label
---------------------------------------------------------------------------------------------------------------------
_ID             float   %9.0g                 group(A_U)

273
```
A_U     long     %10.0g      Area_Unit
time    byte     %10.0g
geo_mean_rent  int     %10.0g
SLQ_rent   int     %10.0g
median_rent  int     %10.0g
housing_unit~_ double  %10.0g
very_poor_hh double  %10.0g
Median_wage  double  %10.0g
unemployment~_ double  %10.0g
Rental_sector  double  %10.0g
rental_sector~_ double  %10.0g
Access_to_Int~_ double  %10.0g
rental_hh_per~_ double  %10.0g
one_bed      double  %10.0g
two_bed      double  %10.0g
three_plus_bed float  %9.0g
Employed_Full~_ double  %10.0g
Unemployed   double  %10.0g
Usual~0_Years double  %10.0g
Usual~9_Years double  %10.0g
Unemployment~_ double  %10.0g
Sickness_Bene~_ double  %10.0g
Domestic_Purp~_ double  %10.0g
Invalids_Bene~_ double  %10.0g
AS_per_AS_hh~_ double  %10.0g
AS_marketshare~_ double  %10.0g
AS_per_rental~_ double  %10.0g
AS_MARKET_IMP~_ float  %9.0g
log_geo_mean~_ float  %9.0g
log_median_re~_ float  %9.0g
log_SLQ_rent~_ float  %9.0g
log_Median_wa~_ float  %9.0g
log_AS_per_AS~_ float  %9.0g
log_AS_market~_ float  %9.0g
log_AS_per_rent~_ float  %9.0g
log_AS_MARKET~_ float  %9.0g
Res_incomeslq float  %9.0g
Ratio_ASpe~_slq float  %9.0g
Ratio_ASpe~Islq float  %9.0g

---------------------------------------------------------------------
-----------------------------------------------------
------------------------------------------------------------
Sorted by: _ID  time
.. spset _ID, modify replace
data not spset
r(459);
```
save "MBIE_parsi_936_2.dta", replace
file MBIE_parsi_936_2.dta saved

use area-unit-2013, clear
sp

Sp dataset: area-unit-2013.dta
Linked shapefile: area-unit-2013_shp.dta
Data: Cross sectional
Spatial-unit ID: _ID
Coordinates: _CX, _CY (planar)

spset _ID modify replace
(_shp.dta file saved)
(data in memory saved)

Sp dataset: area-unit-2013.dta
Linked shapefile: area-unit-2013_shp.dta
Data: Cross sectional
Spatial-unit ID: _ID
Coordinates: _CX, _CY (planar)

use MBIE_parsi_936_2, clear

xtset _ID time
Panel variable: _ID (strongly balanced)
Time variable: time, 1 to 2
Delta: 1 unit

spbalance
(data strongly balanced)

merge m:1 _ID using area-unit-2013

<table>
<thead>
<tr>
<th>Result</th>
<th>Number of obs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not matched</td>
<td>1,068</td>
</tr>
<tr>
<td>from master</td>
<td>0 (_merge==1)</td>
</tr>
<tr>
<td>from using</td>
<td>1,068 (_merge==2)</td>
</tr>
<tr>
<td>Matched</td>
<td>1,872 (_merge==3)</td>
</tr>
</tbody>
</table>
. keep if _merge==3  
(1,068 observations deleted)
. drop _merge
.
. . save, replace
file MBIE_parsi_936_2.dta saved
.
. spset

  Sp dataset: MBIE_parsi_936_2.dta
Linked shapefile: area-unit-2013_shp.dta
  Data: Panel
Spatial-unit ID: _ID
  Time ID: time (see xtset)
  Coordinates: _CX, _CY (planar)
.
. spset _ID, modify replace
data do not contain observations for all spatial units
  File area-unit-2013_shp.dta defines places not in the data in memory. You can drop the extra
places from the _shp.dta file using spcompress.
r(459);
.
. describe
Contains data from MBIE_parsi_936_2.dta
Observations:         1,872
Variables:            47                  2 May 2022 23:07
---------------------------------------------------------------------------------------------------------------------
------------------------------------------------------------
Variable      Storage   Display    Value
name         type    format    lab     Variable label
---------------------------------------------------------------------------------------------------------------------
------------------------------------------------------------
 _ID             float   %9.0g                 group(A_U)
  A_U             long    %10.0g                Area_Unit
  time            byte    %10.0g
geo_mean_rent   int     %10.0g
SLQ_rent        int     %10.0g
median_rent     int     %10.0g
housing_unit    double %10.0g
very_poor_hh    double %10.0g
Median_wage     double %10.0g
unemployment ~ double %10.0g
Rental_sector~_ double %10.0g
rental_sector~_ double %10.0g
Access_to_Int~_ double %10.0g
rental_hh_per~_ double %10.0g
one_bed double %10.0g
two_bed double %10.0g
three_plus_bed float %9.0g
Employed_Full~_ double %10.0g
Unemployed ~ double %10.0g
Usual_ _0_Years ~ double %10.0g
Usual_ _9_Years ~ double %10.0g
Unemployment ~ double %10.0g
Sickness_Bene~_ double %10.0g
Domestic_Purp~_ double %10.0g
Invalids_Bene~_ double %10.0g
AS_per_AS_hh~_ double %10.0g
AS_marketshare~_ double %10.0g
AS_per_rental~_ double %10.0g
AS_MARKET_IMP~_ float %9.0g
log_geo_mean~_ float %9.0g
log_median_rent~_ float %9.0g
log_SLQ_rent~_ float %9.0g
log_Median_wa~_ float %9.0g
log_AS_per_AS~_ float %9.0g
log_AS_market~_ float %9.0g
log_AS_per_rent~_ float %9.0g
log_AS_MARKET~_ float %9.0g
Res_incomeslq float %9.0g
Ratio_ASpe~slq float %9.0g
Ratio_ASpe~slq float %9.0g
_CX double %10.0g x-coordinate of area centroid
_CY double %10.0g y-coordinate of area centroid
AU2013_V1_ str6 %9s
AU2013_V_1 str34 %34s
AREA_SQ_KM double %24.15f
LAND_AREA_ double %24.15f
Shape_Leng double %24.15f

---------------------------------------------------------------------------------------------------------------------
------------------------------------------------------------
Sorted by: _ID  time

. . use area-unit-2013, clear

. spset
Sp dataset: area-unit-2013.dta
Linked shapefile: area-unit-2013_shp.dta
Data: Cross sectional
Spatial-unit ID: _ID
Coordinates: _CX, _CY (planar)

. spset _ID, modify replace
   (_shp.dta file saved)
   (data in memory saved)

Sp dataset: area-unit-2013.dta
Linked shapefile: area-unit-2013_shp.dta
Data: Cross sectional
Spatial-unit ID: _ID
Coordinates: _CX, _CY (planar)

. use MBIE_parsi_936_2.dta, clear

. save, replace
   file MBIE_parsi_936_2.dta saved

. spset _ID

Sp dataset: MBIE_parsi_936_2.dta
Linked shapefile: <none>
   Data: Panel
Spatial-unit ID: _ID
   Time ID: time (see xtset)
   Coordinates: <none>

. xtset A_U time

. spbalance
   (data strongly balanced)

. xtset _ID time
Panel variable: _ID (strongly balanced)
Time variable: time, 1 to 2
   Delta: 1 unit
. spset _ID
data already spset
  Use spset, clear first or use spset, modify.
r(459);

. spset, modify shpfile(area-unit-2013_shp)
  (creating _ID spatial-unit id)
  (creating _CX coordinate)
  (creating _CY coordinate)

  Sp dataset: MBIE_parsi_936_2.dta
  Linked shapefile: area-unit-2013_shp.dta
  Data: Panel
  Spatial-unit ID: _ID
  Time ID: time (see xtset)
  Coordinates: _CX, _CY (planar)

. spxtregress geo_mean_rent_ Median_wage_ Access_to_Internet_ rental_hh_percapita_AU_ one_bed two_bed Employed_Full_time_ Usual_resident_0_Years_ Usual_resident_5to9_Years_ Unemployment_Benefit_ Sickness_Benefit_ Domestic_Purposes_Benefit_ Invalids_Benefit_ AS_per_rental_hh_ AS_marketshare_MBEIE_ AS_MARKET_IMPACT_ time, fe dvarlag(W) force
  (1872 observations)
  (1872 observations used)
  (data contain 936 panels (places) )
  (weighting matrix defines 1489 places)
  (you specified -force-)
  (weighting matrix matched 936 places in data)
  (weighting matrix W_s001 created)

Performing grid search ... finished

Optimizing concentrated log likelihood:

  Iteration 0:  log likelihood = -4492.2251
  Iteration 1:  log likelihood = -4491.9497
  Iteration 2:  log likelihood = -4491.9497

Optimizing unconcentrated log likelihood:

  Iteration 0:  log likelihood = -4491.9497
  Iteration 1:  log likelihood = -4491.9497 (backed up)

Fixed-effects spatial regression
  Number of obs    =   1,872
  Group variable:  _ID  Number of groups =    936
Obs per group = 2
Wald chi2(17) = 3387.22
Prob > chi2 = 0.0000
Log likelihood = -4491.9497
Pseudo R2 = 0.5208

--------------------------------------------------------------------------------------------
|geo_mean_rent_ | Coefficient  Std. err.      z    P>|z|     [95% conf. interval] |
|----------------|--------------------------|---|-----|---------------------------|
|Median_wage_    | .1133233  .015687       7.22  0.000   .0825773   .1440694 |
|Access_to_Internet_ | -1.579748  .3955382    -3.99  0.000   -.2354989   -.8045079 |
|rental_hh_percapita_AU_ | -549.6166  140.5279    -3.91  0.000   -825.0463   -274.187 |
|one_bed        | -1.115278  .6096687    -1.83  0.067   -2.310207   .0796505 |
|two_bed        | -.2025494  .797542   -0.25  0.800   -.1765703   1.360604 |
|Employed_Full_time_   | 1.779765  .6193996    2.87  0.004   .5657639   2.993766 |
|Usual_resident_0_Years_ | .1738904  .5262651    0.33  0.741   -.8575703  1.205351 |
|Usual_resident_5to9_Years_ | -.7581501  .465138    -1.63  0.103   -1.669804   .1535037 |
|Unemployment_Benefit_   | .8978001  .8917341    1.01  0.314   -.8499667  2.645567 |
|Sickness_Benefit_     | 1.069826  1.269736     0.84  0.399   -.841812   3.558463 |
|Domestic_Purposes_Benefit_ | 1.767397  1.064482    1.66  0.097   -.3189499  3.853744 |
|Invalids_Benefit_     | -.5694624  1.167083   -0.49  0.626   -2.856904  1.717979 |
|AS_per_rental_hh_     | 1.354493  .3328166     4.07  0.000   .702184    2.006801 |
|AS_marketshare_MBI_E_ | -.3809903  .2619754   -1.45  0.146   -.8944527  .132472 |
|AS_MARKET_IMPACT_time_  | -1.125629  .2158909   -5.21  0.000   -1.548767  -.7024905 |
|time           | 77.55022  9.414279    8.24  0.000   59.09857   96.00186 |
--------------------------------------------------------------------------------------------
W_s001
|geo_mean_rent_ | .134419  .0463542    2.90  0.004   .0435665   .2252716 |
--------------------------------------------------------------------------------------------
/sigma_e
| 29.36202  .6786925  28.06148  30.72282 |
--------------------------------------------------------------------------------------------
Wald test of spatial terms:   chi2(1) = 8.41   Prob > chi2 = 0.0037

. spxtrreg geo_mean_rent_ Median_wage_ very_poor_hh_ Access_to_Internet_ rental_hh_percapita_AU_ one_bed two_bed Employed_Full_time_ Usual_resident_0_Years_ Usual_resident_5to9_Years_ Unemployment_Benefit_ Sickness_Benefit_ Domestic_Purposes_Benefit_ Invalids_Benefit_ AS_per_rental_hh_ AS_marketshare_MBI_E_ AS_MARKET_IMPACT_ time, fe dvarlag(W) for > ce
(1872 observations)
(1872 observations used)
(data contain 936 panels (places) )
(weighting matrix defines 1489 places)
(you specified -force-)
(weighting matrix matched 936 places in data)
(weighting matrix W_s001 created)

Performing grid search ... finished

Optimizing concentrated log likelihood:

Iteration 0: log likelihood = -4489.9633
Iteration 1: log likelihood = -4489.7212
Iteration 2: log likelihood = -4489.7212

Optimizing unconcentrated log likelihood:

Iteration 0: log likelihood = -4489.7212
Iteration 1: log likelihood = -4489.7212 (backed up)

Fixed-effects spatial regression

Number of obs  = 1,872
Group variable: _ID
Number of groups = 936
Obs per group  = 2

Wald chi2(18)     = 3407.76
Prob > chi2      = 0.0000

Log likelihood = -4489.7212                     Pseudo R2         = 0.5239

| Coefficient  Std. err.      z    P>|z|     [95% conf. interval] |
---------------------------+---------------------------------|
geo_mean_rent_ | .1086842   .015803     6.88   0.000     .0777108    .1396576 |
Median_wage_   | 1.102519   .5216115   2.11    0.035     .080179    2.124859 |
very_poor_hh_  | -1.265905   .4216116  -3.00    0.003    -2.092248   - .4395611 |
Access_to_Internet_ | -546.0709 140.2059  -3.89   0.000   -820.8694   -271.2725 |
rental_hh_percapita_AU_one_bed | -1.061387   .6087628 -1.74   0.081    -2.25454   1.1317658 |
two_bed_ | -1.965301   .7956623 -2.53   0.011    -3.49228   -1.438321 |
Employed_Full_time_ | 2.238337    .6549185  3.42   0.001     .9547201   3.521953 |
Usual_resident_0_Years_ | .3852324   .5343062  0.72   0.473    -6.636976   1.430744 |
Usual_resident_5to9_Years_ | -.6500011  .46685   -1.39   0.164    -1.56501    .2650081 |
Unemployment_Benefit_ | .8732459   .8897025  0.98   0.326     -.205389   2.617031 |
Sickness_Benefit_ | .6300143   1.283717   0.49   0.624    -1.860205   3.146054 |
Domestic_Purposes_Benefit_ | 1.649556   1.06343  1.55    0.121    -.434729    3.733841 |
Invalids_Benefit_ | -.5902317  1.164367  -.51   0.612    -.287235   1.691886 |
AS_per_rental_hh_ | 1.279099   .3339393  3.83    0.000     .6245895   1.933608 |
AS_marketshare_MBIE_ | -.3987422  .2614918 -1.52   0.127    -.9112566   .1137723 |
AS_MARKET_IMPACT_time | -1.034357   .2196657  -4.71   0.000   -1.464894   -0.6038204 |
W_s001 |
. spxtregress log_geo_mean_rent_ log_Median_wage_ very_poor_hh_ Access_to_Internet_rental_hh_percapita_AU_ one_bed two_bed Employed_Full_time_ Usual_resident_0_Years_Usual_resident_5to9_Years_Unemployment_Benefit_Sickness_Benefit_Domestic_Purposes_Benefit_Invalids_Benefit_log_AS_per_rental_hh_log_AS_marketshare_MBIE_log_AS_MARKET_IMPACT_time, fe dvarlag(W) force

(1872 observations)
(1872 observations used)
(data contain 936 panels (places) )
(you specified -force-)
(weighting matrix matched 936 places in data)
(weighting matrix W_s001 created)

Performing grid search ... finished

Optimizing concentrated log likelihood:

Iteration 0:  log likelihood =  899.81695
Iteration 1:  log likelihood =  900.41966
Iteration 2:  log likelihood =  900.41967

Optimizing unconcentrated log likelihood:

Iteration 0:  log likelihood =  900.41967
Iteration 1:  log likelihood =  900.41967  (backed up)

Fixed-effects spatial regression
Group variable: _ID

Number of obs  = 1,872
Number of groups = 936
Obs per group   = 2

Wald chi2(18)  = 3426.73
Prob > chi2     = 0.0000
Log likelihood =  900.4197
Pseudo R2       = 0.3740

|        | Coefficient | Std. err. | z    | P>|z| [95% conf. interval] |
|--------|-------------|-----------|------|-----------------------|
| log_geo_mean_rent_ |             |           |      |                       |
| log_Median_wage_    | 0.2228917   | 0.0805092 | 2.77 | 0.006                 |

Wald test of spatial terms:  chi2(1) = 8.16  Prob > chi2 = 0.0043
very_poor_hh_ | .0019252 .0017333 1.11 0.267 -0.001472 .0053223
Access_to_Internet_ | -0.0015758 .0013277 -1.19 0.235 -0.004178 .0010264
rental_hh_percapita_AU_ | -1.178124 .4117088 -2.86 0.004 -1.985058 -3711895
one_bed | -0.0017781 .0019148 -0.93 0.353 -0.0055311 .0019749
two_bed | .0007991 .0025142 0.32 0.751 -0.0041285 .0010264
Employed_Full_time_ | -.0065229 .0020747 3.14 0.002 -0.0024566 .0105893
Usual_resident_0_Years_ | .00362 .0016899 2.14 0.032 .0003078 .0069322
Usual_resident_5to9_Years_ | .001663 .0014785 0.11 0.910 .0027316 .030641
Unemployment_Benefit_ | -0.0022222 .0028128 -0.79 0.430 .0077351 .032907
Sickness_Benefit_ | -.0025448 .0040527 -0.63 0.530 .0104879 .053983
Domestic_Purposes_Benefit_ | .0026297 .0033613 0.78 0.434 .0039583 .092176
Invalids_Benefit_ | -.004641 .0036798 -1.26 0.207 .0118533 .025712
log_AS_per_rental_hh_ | .0197765 .0516033 0.38 0.702 .0813642 .1209172
log_AS_marketshare_MBIE_ | .1302911 .0515831 2.53 0.012 .0291902 .231392
log_AS_MARKET_IMPACT_ | -0.09513 .0252932 -2.75 0.006 -1.190867 -0.019932
time | .2619193 .0261915 10.00 0.000 .2105849 .3132537

-------------------------------------

W_s001
log_geo_mean_rent | .0497512 .0452815 1.10 0.272 -0.038999 .1385014

-------------------------------------

/\sigma_e | .0924593 .002137 1.10 0.272 -0.038999 .1385014

-------------------------------------

Wald test of spatial terms: chi2(1) = 1.21 Prob > chi2 = 0.2719

. spxtregress median_rent_ Median_wage_ Access_to_Internet_ rental_hh_percapita_AU_ one_bed two_bed three_plus_bed Employed_Full_time_ Usual_resident_0_Years_ Usual_resident_5to9_Years_ Unemployment_Benefit_ AS_marketshare_MBIE_ AS_per_rental_hh_ AS_MARKET_IMPACT_, fe dvarlag(W)
(1872 observations)
(1872 observations used)
(data contain 936 panels (places) )
(weighting matrix defines 1489 places)
weighting matrix defines places not in estimation
Excluding observations excludes the spillovers from those observations to other observations which are not excluded. You must determine whether this is appropriate in this case and, if it is, specify option force.

r(459);

. spxtregress median_rent_ Median_wage_ Access_to_Internet_ rental_hh_percapita_AU_ one_bed two_bed three_plus_bed Employed_Full_time_ Usual_resident_0_Years_ Usual_resident_5to9_Years_ Unemployment_Benefit_ AS_marketshare_MBIE_ AS_per_rental_hh_ AS_MARKET_IMPACT_, fe dvarlag(W) force
(1872 observations)
(1872 observations used)
(data contain 936 panels (places) )

283
Performing grid search ... finished

Optimizing concentrated log likelihood:

Iteration 0:  log likelihood = -4034.4226
Iteration 1:  log likelihood = -4033.9398
Iteration 2:  log likelihood = -4033.9398

Optimizing unconcentrated log likelihood:

Iteration 0:  log likelihood = -4033.9398
Iteration 1:  log likelihood = -4033.9398  (backed up)

Fixed-effects spatial regression
Group variable: _ID

<table>
<thead>
<tr>
<th></th>
<th>Number of obs</th>
<th></th>
<th></th>
<th>Wald chi2(14)</th>
<th>Prob &gt; chi2</th>
<th>Pseudo R2</th>
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<tr>
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<td>Prob &gt; chi2</td>
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<tr>
<td>Log likelihood</td>
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<td></td>
<td></td>
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</tbody>
</table>

| median_rent_         | Coefficient  | Std. err. | z    | P>|z| [95% conf. interval] |
|----------------------|--------------|-----------|------|----------------------|
| Median_wage_         | .1773269     | .0067709  | 26.19| 0.000 .1640561 .1905977|
| Access_to_Internet_  | 1.059485     | .165987   | 6.38 | 0.000 .7341567 1.384814|
| rental_hh_percapita_ | 468.2412     | 79.52407  | 5.89 | 0.000 312.3769 624.1055|
| one_bed_             | .1573501     | .4487941  | 0.35 | 0.726 -.722701 1.03697|
| two_bed_             | .8634941     | .5152412  | 1.68 | 0.094 -.14636 1.873348|
| three_plus_bed_      | .8607292     | .4051265  | 2.12 | 0.034 .0666958 1.654763|
| Employed_Full_time_  | -1.92784     | .3308778  | -5.83| 0.000 -2.576348 -1.279331|
| Usual_resident_0_Years_ | -.1173755   | .3196543  | -0.37| 0.713 -.7438863 0.5091353|
| Usual_resident_5to9_Years_ | -8141683   | .2851704  | -2.86| 0.004 -1.373092 -0.2552446|
| Unemployment_Benefit_ | 2127798     | .5445699  | 0.39 | 0.696 -.8545576 1.280117|
| AS_marketshare_MBIE_  | -.1659634    | .1616145  | -1.03| 0.304 -.482722 0.1507953|
| AS_per_rental_hh_    | .9190419     | .2025756  | 4.54 | 0.000 .5220011 1.316083|
| AS_MARKET_IMPACT_     | -.2971284    | .1300282  | -2.29| 0.022 -.551979 0.0422777|

| W_s001               | median_rent_ | .071238 | .0292688 | 2.43 | 0.015 .0138721 .1286038|
Wald test of spatial terms: \( \text{chi}^2(1) = 5.92 \quad \text{Prob} > \text{chi}^2 = 0.0149 \)

**Spatial Autoregressive Fixed Effects Panel Regression (SAR): Synthetic lower quartile (SLQ) rent. 936 Area Units defined in weight matrix for queen contiguity of order 1.**

```
. spxtregress SLQ_rent_ Median_wage_ Access_to_Internet_ rental_hh_percapita_AU_ one_bed
two_bed Employed_Full_time_ Usual_resident_0_Years_ Usual_resident_5to9_Years_
Unemployment_Benefit_ AS_per_AS_hh_time, fe dvarlag(W) force
(1872 observations)
(1872 observations used)
(data contain 936 panels (places) )
(weighting matrix defines 1489 places)
(you specified -force-)
(weighting matrix matched 936 places in data)
(weighting matrix W_s001 created)

Performing grid search ... finished

Optimizing concentrated log likelihood:

Iteration 0:  log likelihood = -4498.7915
Iteration 1:  log likelihood = -4498.7781
Iteration 2:  log likelihood = -4498.7781

Optimizing unconcentrated log likelihood:

Iteration 0:  log likelihood = -4498.7781
Iteration 1:  log likelihood = -4498.7781 (backed up)

Fixed-effects spatial regression  Number of obs  =  1,872
Group variable: _ID  Number of groups  =  936
   Obs per group  =  2

Wald chi2(12)  =  2190.44
Prob > chi2  =  0.0000

Log likelihood = -4498.7781  Pseudo R2  =  0.5348
### Table 1: Coefficients and Standard Errors

| SLQ_rent_ | Coefficient | Std. err. | z   | P>|z|   | 95% conf. interval |
|-----------|-------------|-----------|-----|--------|---------------------|
| Median_wage_ | .0854513   | .0155064  | 5.51| 0.000  | .0550593    - .1158433 |
| Access_to_Internet_ | -.3118568 | .3694764  | -0.84| 0.399  | -1.036017  - .4123037 |
| rental_hh_percapita_AU_ | -.3162364 | .136485   | -2.32| 0.021  | -5.837421  -48.73078 |
| one_bed_ | -1.426616  | .6077471  | -2.35| 0.019  | -2.617779  - .235454 |
| two_bed_ | -.3648415  | .7903841  | -0.46| 0.644  | -1.913966  1.184283 |
| Employed_Full_time_ | .7729581  | .6152824  | 1.26| 0.209  | -0.4329733 1.978889 |
| Usual_resident_0_Years_ | .5400378  | .5281868  | 1.02| 0.307  | -0.4951892 1.575265 |
| Usual_resident_5to9_Years_ | -.8628744 | .461748   | -1.87| 0.062  | -1.767884  .421352 |
| Unemployment_Benefit_ | .9598692  | .8775212  | 1.09| 0.274  | -.7600407  2.679779 |
| AS_per_AS_hh_ | -.0234833 | .1838881  | -0.13| 0.898  | -0.3838973 0.3369307 |
| time_ | 53.19983   | 9.174757  | 5.80| 0.000  | 35.21764  71.18202 |

### Table 2: Additional Coefficients

<table>
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<th>W_s001</th>
<th>SLQ_rent_</th>
<th>.1089335</th>
<th>.0545578</th>
<th>2.00</th>
<th>0.046</th>
<th>.0020021  .2158648</th>
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</thead>
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<tr>
<td>/sigma_e</td>
<td>29.58162</td>
<td>.6837622</td>
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<td>30.95259</td>
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</tr>
</tbody>
</table>

### Wald Test of Spatial Terms

Wald test of spatial terms: chi2(1) = 3.99  Prob > chi2 = 0.0459

```
. spxtregress SLQ_rent_Median_wage_Access_to_Internet_rental_hh_percapita_AU_one_bed
two_bed_Employed_Full_time_Usual_resident_0_Years_Usual_resident_5to9_Years_
Unemployment_Benefit_AS_per_AS_hh_AS_marketshare_MBIE_time, fe dvarlag(W) force
(1872 observations)
(1872 observations used)
(data contain 936 panels (places))
(weighting matrix defines 1489 places)
(you specified -force-)
(weighting matrix matched 936 places in data)
(weighting matrix W_s001 created)
```

Performing grid search ... finished

Optimizing concentrated log likelihood:

Iteration 0:  log likelihood = -4496.1754
Iteration 1:  log likelihood = -4496.1683
Iteration 2:  log likelihood = -4496.1683

Optimizing unconcentrated log likelihood:

Iteration 0:  log likelihood = -4496.1683
Iteration 1: log likelihood = -4496.1683 (backed up)

Fixed-effects spatial regression

Group variable: _ID

Number of obs = 1,872
Number of groups = 936
Obs per group = 2

Wald chi2(13) = 2207.87
Prob > chi2 = 0.0000

Log likelihood = -4496.1683
Pseudo R2 = 0.5180

--------------------------------------------------------------------------------------------
| SLQ_rent_ | Coefficient  Std. err.      z    P>|z|     [95% conf. interval] |
|-----------|--------------|----|-------|--------------------------|
| Median_wage_ | 0.0791504   0.0157067     5.04   0.000     0.0483659    0.1099349 |
| Access_to_Internet_ | -0.3505959   0.3688413 -0.95   0.342 -1.073512    0.3723198 |
| rental_hh_percapita_AU_ | -0.377.5196   138.7185 -2.72   0.006 -649.4028 -105.6364 |
| one_bed | -1.365547   0.606651 -2.25   0.024 -2.554561 -1.765331 |
| two_bed | -3.928036   0.788288 -5.0    0.000 -1.937821 1.152213 |
| Employed_Full_time_ | 0.6424839   0.162214 1.04   0.297 -5.652878 1.850256 |
| Usual_resident_0_Years_ | 0.5325817   0.5267332 1.01   0.312 -0.499764 1.56496 |
| Usual_resident_5to9_Years_ | -0.851856   0.4604938 -1.85   0.064 -1.754407 0.506953 |
| Unemployment_Benefit_ | 1.266508   0.8852948 1.43   0.153 -0.4686374 3.001654 |
| AS_per_AS_hh_ | -0.0539006   0.1838599 -0.29   0.769 -1.4142593 0.3064581 |
| AS_marketshare_MBIE_ | -0.3236299   0.141575 -2.29   0.022 -0.6008816 -0.0463783 |
| time | 58.04491   9.391525 6.18   0.000 39.63786 76.45196 |

--------------------------------------------------------------------------------------------
| SLQ_rent_ | Coefficient  Std. err.      z    P>|z|     [95% conf. interval] |
|-----------|--------------|----|-------|--------------------------|
| W_s001 | 0.0791504   0.0157067     5.04   0.000     0.0483659    0.1099349 |

--------------------------------------------------------------------------------------------
| /sigma_e | 29.49964   0.6818645 28.19303 30.86681 |

Wald test of spatial terms: chi2(1) = 3.83  Prob > chi2 = 0.0505

.spxtregress SLQ_rent_ Median_wage_ very_poor_hh_ Access_to_Internet_ rental_hh_percapita_AU_ one_bed two_bed Employed_Full_time_ Usual_resident_0_Years_ Usual_resident_5to9_Years_ Unemployment_Benefit_ Sickness_Benefit_ Domestic_Purposes_Benefit_ Invalids_Benefit_ AS_per_AS_hh_ AS_marketshare_MBIE_ time, fe dvarlag(W) force
(1872 observations)
(1872 observations used)
(data contain 936 panels (places) )
(weighting matrix defines 1489 places)
(you specified -force-
(weighting matrix matched 936 places in data)
Performing grid search ... finished

Optimizing concentrated log likelihood:

Iteration 0:  log likelihood = -4490.3294
Iteration 1:  log likelihood = -4490.3177
Iteration 2:  log likelihood = -4490.3177

Optimizing unconcentrated log likelihood:

Iteration 0:  log likelihood = -4490.3177
Iteration 1:  log likelihood = -4490.3177  (backed up)

Fixed-effects spatial regression

| Coefficient  Std. err.      z    P>|z|     [95% conf. interval] |
|---------------|--------------------------|------|--------|------------------------|------------------------|
| SLQ_rent_     | .0752912 .0157167     4.79   0.000     .0444871    .1060953 |
| very_poor_hh_| 1.043374 .5115821     2.04    0.041     .0406915    2.046056  |
| Access_to_Internet_ | -0.931662 .3923448     -0.24    0.812  -.8621486 .7581568 |
| rental_hh_percapita_AU_ | -38.63569 139.0772   -2.78 0.005  -658.9433 -113.7706 |
| one_bed_    | -1.153382 .6065891    -1.90 0.057  -2.342274 .0355111 |
| two_bed_     | -0.7339531 .7963087   -0.92 0.357  -2.29469 .8267833 |
| Employed_Full_time_ | 1.342917 .6600655    2.03 0.042  .049212 2.636621 |
| Usual_resident_0_Years_ | .7904498 .5343651    1.48 0.139  -.2568866 1.837786 |
| Usual_resident_5to9_Years_ | -.7358385 .4625058   -1.59 0.112  -1.642333 .1706562 |
| Unemployment_Benefit_ | 1.029572 .8886224    1.16 0.247     -.7120958 2.77124 |
| Sickness_Benefit_ | 2.209422 1.272061    1.74 0.082  -.2837723 4.702616 |
| Domestic_Purposes_Benefit_ | 1.294984 1.069786    1.21 0.226  -.8017591 3.391727 |
| Invalids_Benefit_ | -.3617717 1.154867   -0.31 0.754  -.2625269 .1901726 |
| AS_per_AS_hh_ | -.1013666 .1851522   -0.55 0.584  -.4642583 .261525 |
| AS_marketshare_MBIE_ | -.3668711 .1430167   -2.57 0.010  -.6471787 -.0865634 |
| Time_         | 63.05851 9.54058     6.61 0.000  44.35931 81.7577 |

W_s001

| Coefficient  Std. err.      z    P>|z|     [95% conf. interval] |
|---------------|--------------------------|------|--------|------------------------|------------------------|
| SLQ_rent_     | .1082938 .0542271    2.00 0.046  .0020106   .2145771 |

(weighting matrix W_s001 created)
Performing grid search ... finished

Optimizing concentrated log likelihood:

Iteration 0:   log likelihood =   635.9522
Iteration 1:   log likelihood =  636.15498
Iteration 2:   log likelihood =  636.15498

Optimizing unconcentrated log likelihood:

Iteration 0:   log likelihood =  636.15498
Iteration 1:   log likelihood =  636.15498  (backed up)

Fixed-effects spatial regression

Number of obs  =      1,872
Group variable: _ID
Number of groups =        936
Obs per group     =          2

Wald chi2(17)     =    1988.14
Prob > chi2       =     0.0000
Log likelihood =   636.1550
Pseudo R2         =     0.4341

--------------------------------------------------------------------------------------------
  /sigma_e |   29.31554   .6776105                      28.01708    30.67417
----------------------------------------------------------------------------------------------
Wald test of spatial terms:   chi2(1) = 3.99       Prob > chi2 = 0.0458

. spxtregress log_SLQ_rent_ log_Median_wage_ very_poor_hh_ Access_to_Internet_rental_hh_per_capita_AU_one_bed two_bed Employed_Full_time_ Usual_resident_0_Years_Usual_resident_5to9_Years_ Unemployment_Benefit_Sickness_Benefit_Domestic_Purposes_Benefit___Invalids_Benefit_log_AS_per_AS_hh_log_AS_marketshare_MBIE_time, fe dvarlag(W)

(1872 observations)
(1872 observations used)
(data contain 936 panels (places) )
(weighting matrix defines 1489 places)
(you specified -force-)
(weighting matrix matched 936 places in data)
(weighting matrix W_s001 created)


Performing grid search ... finished

Optimizing concentrated log likelihood:

Iteration 0:   log likelihood =   635.9522
Iteration 1:   log likelihood =  636.15498
Iteration 2:   log likelihood =  636.15498

Optimizing unconcentrated log likelihood:

Iteration 0:   log likelihood =  636.15498
Iteration 1:   log likelihood =  636.15498  (backed up)

Fixed-effects spatial regression

Number of obs  =      1,872
Group variable: _ID
Number of groups =        936
Obs per group     =          2

Wald chi2(17)     =    1988.14
Prob > chi2       =     0.0000
Log likelihood =   636.1550
Pseudo R2         =     0.4341

--------------------------------------------------------------------------------------------
  log_SLQ_rent_ | Coefficient  Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------------------------------------------------------------------
  log_SLQ_rent_ |  .267881    .106335     2.52   0.012     .0594683    .4762937
  log_Median_wage_ |   .0018862    .002299     0.82   0.412    -.0026197    .0063921
  very_poor_hh_ |   .0018862    .002299     0.82   0.412    -.0026197    .0063921


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<th>Coefficient 1</th>
<th>Coefficient 2</th>
<th>Coefficient 3</th>
<th>Coefficient 4</th>
<th>Coefficient 5</th>
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</tr>
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Wald test of spatial terms: chi2(1) = 0.41 Prob > chi2 = 0.524

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log: /Users/wasaymajid/MBIE LOG.smcl log type: smcl
closed on: 3 May 2022, 09:05:00
References


Apgar Jr, W. C. (1990). Which housing policy is best?


Barr, N. (2020). *Economics of the welfare state* Oxford University Press, USA.


Grislain-Letrémy, & Trevien. (2016). *The impact of housing subsidies on the rental sector: The French example*


Kemp. (1997). *A comparative study of housing allowances: A report of research carried out by the centre for housing research and urban studies university of Glasgow, on behalf of the department of social security* Stationery Office.


Rea, D., & Thompson, Evan. (2017). *The impact of rising housing costs on accommodation supplement recipients*


