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**The Impact of Residential Property Investors on House Price Escalation  
in Auckland, New Zealand**

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## 1.1 GLOSSARY OF ACRONYMS

APIA	Auckland Property Investors' Association
APRA	Australian Prudential Regulation Authority
AVM	Automated Valuation Model
CAGR	Compound Annual Growth Rate
CBRE	CB Richard Ellis (Consultancy)
CGE	Capital Growth Expectation
CGT	Capital Gains Tax
CPI	Consumer Price Index
CV	Capital Value
DCF	Discounted Cashflow Analysis
DPMC	NZ Department of Prime Minister and Cabinet of New Zealand
EMH	Efficient Market Hypothesis
GFC	Global Financial Crisis that commenced in 2008 in the USA
HPE	House Price Escalation
LVR	Loan-to-Value Ratio
MBIE	NZ Ministry of Business Innovation and Employment
MHUD	NZ Ministry of Housing and Urban Development
NZ	New Zealand
NZPIF	New Zealand Property Investors' Federation
OECD	The Organisation for Economic Co-operation and Development
OTI	Outgoings-to-Income ratio – methodology to measure affordability
RBNZ	Reserve Bank of New Zealand
REINZ	Real Estate Institute of New Zealand
RI	Residual Income – methodology to measure affordability
RMA	The Resource Management Act 1991
RV	Rating Valuation
UCEM	User-Cost Equilibrium Model
UK	United Kingdom
US	United States of America

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### 3 ABSTRACT

Affordability and home ownership in Auckland New Zealand has been in decline over the past decade. Since the Global Financial Crisis in 2008, house affordability has decreased at an unprecedented rate, largely attributed to house price escalation with some mitigation from wage growth and interest rate decreases.

The decline in the affordability of owner-occupation compared to renting has been particularly pronounced in Auckland and this has led to a decline in home ownership and political interest in the role of investors that could contribute to price escalation. This perceived role of investors has resulted in policy changes aimed at discouraging speculation.

This research investigates the pricing decisions of investors in the Auckland housing market and the link to house price escalation and affordability of housing. This research investigates whether this sustained escalation in prices can be explained by bounded rationality in pricing decisions by comparison to a normative model.

The methodology adopted is a mix of qualitative and quantitative methods. Qualitative methods are used to gather the stated preference of investors in relation to their investment motivations and pricing decisions was obtained via structured interviews with investors and institutional influencers, with reference to behavioural economic concepts and frameworks.

Quantitative methods are used to quantify at the aggregate market level the deviation from normative pricing, and to quantify for explanatory purposes those components of pricing decisions that contribute to overpricing, using the user-cost equilibrium model.

It is concluded that investors are inclined to over-price houses compared to what is predicted by a normative model, largely due to an over-estimation of capital gain expectations and an under-estimation of systemic risks. This over-estimation of capital gain expectation is self-reinforcing and leads to sustained over-pricing which influences the market in aggregate and therefore house price escalation.

## 4 INTRODUCTION

### 4.1 Research Statement

This research examines the motivations and behaviours of housing investors in Auckland since the global financial crisis in 2008 to determine whether an explanatory link can be demonstrated between investor activity and sustained house price escalation.

Investors in this context refers to the ownership of houses for the purposes of investment return rather than occupation/consumption.

The research commenced with a review of literature, to establish the context for the research, and to develop a conceptual framework upon which to seek an evidence base.

There are two components to this study. The first component of the research is a qualitative study of the *stated preference* of investors (obtained via structured interviews) , in particular their motivations and behaviours, with reference to existing behavioural economic theory and concepts. This qualitative study obtains evidence from investors, market intermediaries, influencers, and policy & practice institutions.

The second component of the research is a quantitative analysis of *observed preference* (house price transactions) to test for aggregate over-pricing, and to test the stated preference of investors compared to the normative model.

The research concludes with observations on the policy and practice influences of the institutions within which investors operate.

### 4.2 Research Aim

The aim of this research is to establish whether evidence exists that demonstrates a linkage between investor activity and house price escalation in Auckland, as a contributor to declining house affordability.

### 4.3 Research Questions

This research aim will be achieved by addressing the following two primary questions:

1. What conceptual frameworks can be used to demonstrate a linkage between investor activity and house price escalation, with a corresponding impact on declining affordability of ownership?

2. What stated and observed preferences can be empirically observed that demonstrate a linkage between investor activity and house price escalation, with a corresponding impact on declining affordability of ownership?

The literature on behaviours and motivations indicates that individual actions can occur within an institutional context, and that this institutional context may have an impact on individual actions. The consideration of the interaction between investors and the institutional context is considered in relation to the research questions provide a dual perspective on investment decisions.

In addition to these two primary research questions, consideration was given to the potential policy and practice implications for the institutional environment, that may impact upon activity that contributes to over-pricing. This is represented as a third secondary research question:

3. How do practice and policy institutions impact on the motivations and behaviours of investors that contribute to house price escalation, and declining house affordability?

#### 4.4 Research Approach

There are five methods that have been selected to address the research questions:

1. LITERATURE: Review and synthesise, by literature review, existing theory and studies on the motivations and behaviours of housing investors and the institutional context, and conceptual frameworks that link investor activity to house price escalation and declining affordability
2. CONCEPTS: Select theoretical concepts for qualitative testing with investors and the institutional context that may contribute to house price escalation and declining affordability
3. QUANTITATIVE FINDINGS: Undertake an analysis of the observed preference of investors in Auckland to identify the existence of sustained over-pricing compared to the normative model and the explanatory contribution of components of pricing decisions to this over-pricing
4. QUALITATIVE FINDINGS (1 & 2): Survey an indicative sample of investors and institutional influencers to test for evidence of motivational and behavioural concepts selected from the literature that contribute to over-pricing, house price escalation and declining affordability

5. DISCUSSION OF CONCEPTS AND EVIDENCE IN RELATION TO RESEARCH QUESTIONS:

Discuss the stated and observed investor preferences in the context of conceptual models and their explanatory contribution to house price escalation and declining house affordability in the Auckland housing market.

The Research Methodology chapter outlines the research strategy for the mixed methods approach. A summary of the justification for the research methods adopted is outlined in Table 1 below:

**Table 1: Summary Justification of Research Methods Adopted**

<u>Research Question</u>	<u>Research Method(s) Adopted</u>	<u>Research Method(s) Justification</u>
What conceptual frameworks can be used to demonstrate a linkage between investor activity and house price escalation, with a corresponding impact on declining affordability of ownership?	Literature review	This research is deductive, based upon existing theory.
What stated and observed preferences can be empirically observed that demonstrate a linkage between investor activity and house price escalation, with a corresponding impact on declining affordability of ownership?	Stated preference obtained by primary technique (semi-structured survey), obtained via Empirical Test 1. Observed preference obtained by reference to secondary datasets applied to UCCEM model, via Empirical Tests 2 and 3.	Stated preference requires a qualitative strategy, as the stated preference is a matter of interpretation by the subjects (Bryman, 2008). Observed preference is requires quantitative methods, because secondary data is being applied in relation to existing theory (Bryman, 2008)
How do practice and policy institutions impact on the motivations and behaviours of investors that contribute to house price escalation, and declining house affordability?	Stated preference obtained by primary technique (semi-structured survey), obtained via Empirical Test 1.	Stated preference requires a qualitative strategy, as the stated preference is a matter of interpretation by the subjects (Bryman, 2008).

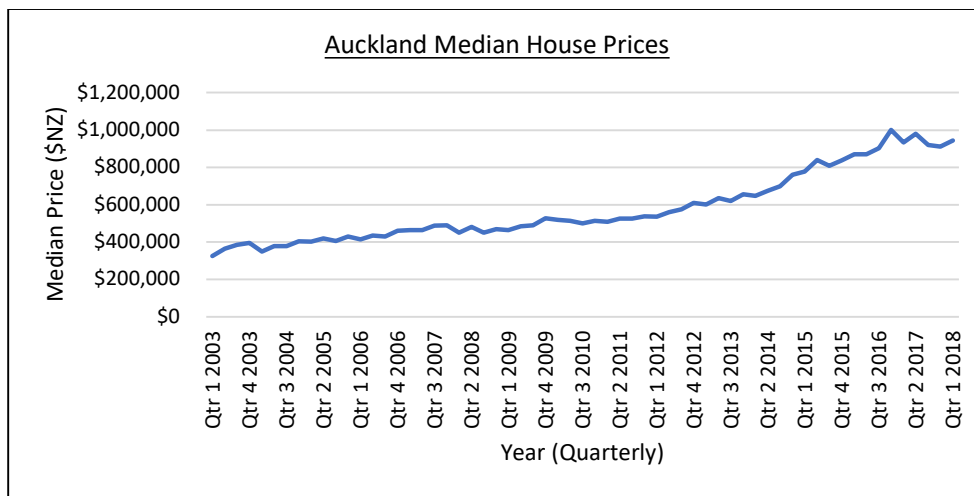
## 4.5 Importance of this Research

### 4.5.1 Affordability in Auckland

This research considers the investment decisions of residential property investors in Auckland in the ten years since the Global Financial Crisis (GFC) of 2008. The qualitative interviews were undertaken during 2020 and 2021 and quantitative analysis considers the dataset of house prices for the 15 years up to 2018. This period has seen unprecedented growth in house prices and decline in affordability by generally accepted measures. It is therefore of interest to both the property industry and to society more generally.

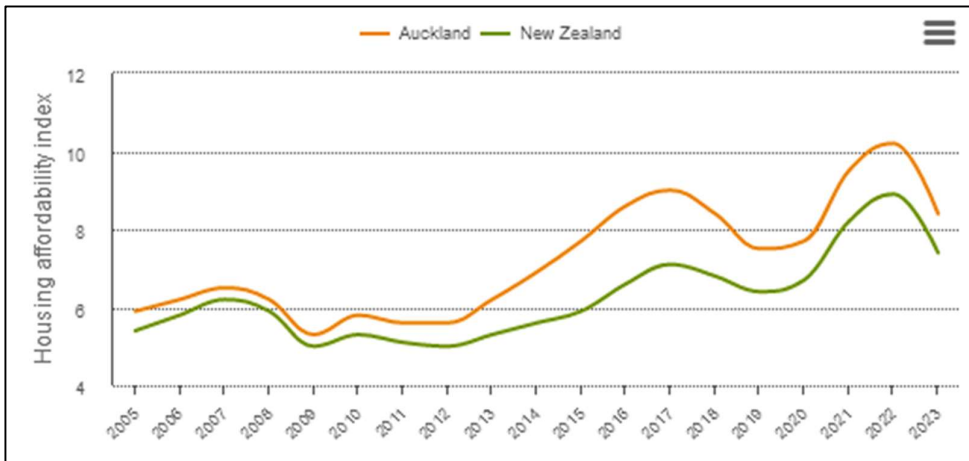
Housing is the single biggest expense for most New Zealand households and comprises the main share of both household assets and debt. Auckland is New Zealand's largest city and is a dominant business and finance centre and accounts for roughly a third of the national population and approaching 40% of the national economy. Auckland has seen a sustained and unprecedented rate of house price escalation since 2008 as shown in Graph 1 below:

**Graph 1: Auckland Median House Prices 2003-2018. Source: Real Estate Institute of NZ**



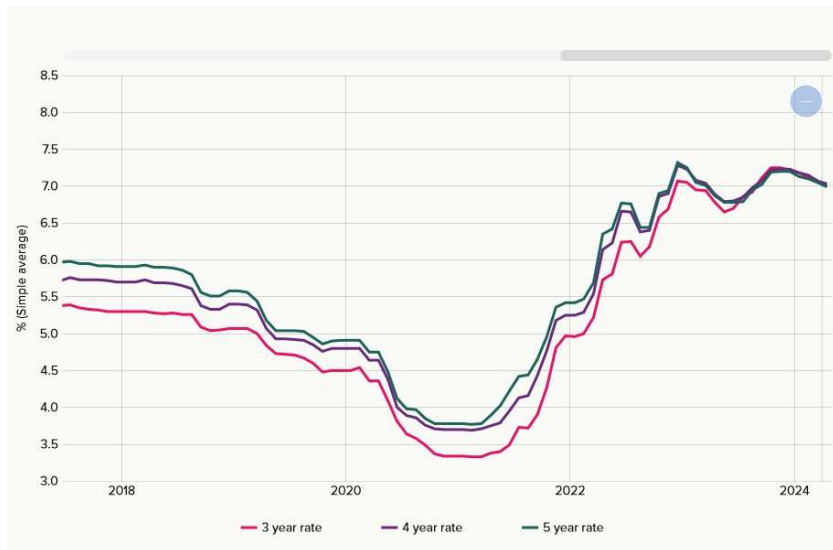
Using the commonly cited affordability measure of house price to income ratio Auckland has consistently been less affordable than New Zealand in aggregate, while reflecting the national trend of declining affordability (Infometrics, 2023):

**Graph 2: Housing Affordability Index 2005-2023. Source: Infometrics**



As can be seen from Graph 2, during the drafting phase of this research (2022 and 2023) the residential property market has entered a downward phase, and interest rates entered an upward phase, as shown below in Graph 3 (RBNZ, 2024):

**Graph 3: New Housing Loans Interest Rates 2018-2024. Source: RBNZ**



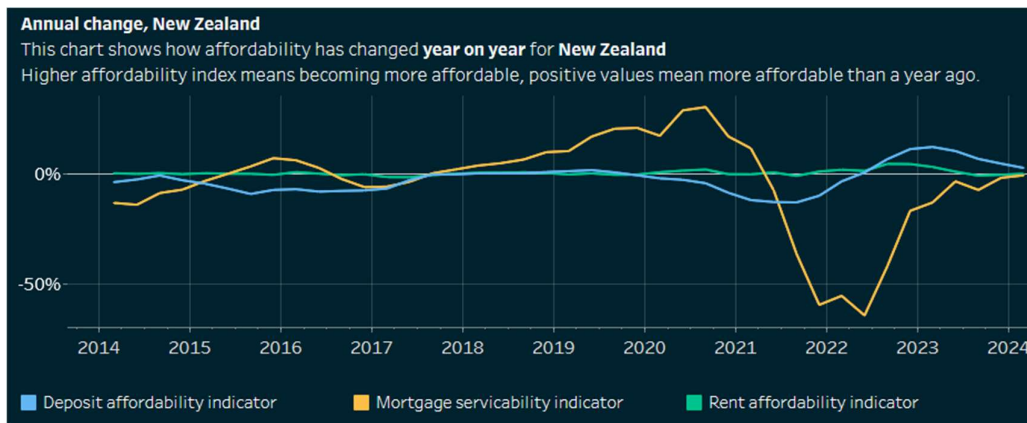
These changes in the economy occurred after the interviews were undertaken (2019 to 2021) and is therefore not represented in the interview data.

This subsequent cyclic decline in the market, though not specifically part of this study, appears to support the findings of this research. It supports the finding that there was overpricing inherent in the aggregate market, as well as the impact of affordability as a limit to continued house price escalation relative to incomes, noting the mitigating effect of low interest rates (which has now reversed). This cyclic risk was noteworthy in the qualitative

findings also, with investors considering the risk of house prices declining as not significant, preferring rather to price assets based on a continuation of recent house price growth. The institutional interviews, however, were cognisant of this risk.

This change in circumstances is indicated in Graph 4 below from the Ministry of Housing and Urban Development (MHUD) (MHUD, 2024), which shows the dramatic reversal in affordability for home ownership since mid-2021 when prices and mortgage interest rates began to reverse their previous trajectories:

**Graph 4: Housing Affordability Index 2014-2024. Source: MHUD**



The impact of housing affordability has been of significant societal and political interest since the GFC, with the NZ Government commissioning reports and studies into the issue from various entities including the Treasury (Stephens, 2022), The Reserve Bank of NZ (RBNZ) (Spencer, 2015), the Productivity Commission (NZPC, 2012), and the Department of Prime Minister and Cabinet (DPMC) (Unit, 2008).

In a press release on 9 September 2022, the Treasury noted: “The high price of housing, including rents, is one of the most important issues facing New Zealanders today. Access to affordable housing is a persistent long-term challenge that has far reaching consequences for wellbeing, inequality, homelessness, child poverty, financial stability, and the distribution of wealth. In 2020, New Zealand had the highest housing cost to disposable income ratio in the OECD. Despite that high base, over 2020 and 2021 New Zealand house prices rose 44%, a far bigger increase than was predicted” (Stephens, 2022, p. 1).

The terms ‘Investors’ and the ‘Investor Segment’ in the context of this research refer to those market participants who are engaged in the financial investment in residential property for the purposes of commercial return. Commercial return includes rental and capital returns from existing stock; as well as the production of new supply. Those market participants who

are engaged in the 'development' or 'investment' in residential real estate but for the purposes of occupation of the property (consumption of housing as a good) are excluded from these groups, and therefore this research.

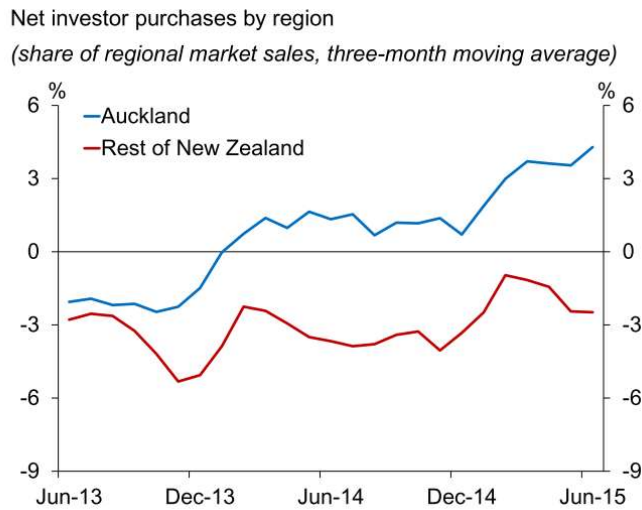
The assets within a property market can be understood as transferrable between the tenure sectors, and in this regard it is conceivable that the pricing decisions of the investor group may affect the owner occupier group and vice versa. As explained by Clapham "the market is divided into rental and ownership categories that are separate in their everyday functioning, though strongly linked because the prices in one will influence the prices in the other and these relative prices will influence the size of the respective categories" (Clapham, 2018, p. 174).

Within the literature are studies and discourse on the role of investors in house price escalation. The impact of investor behaviour in explaining house price escalation was examined in a paper by Alexiou as follows "to understand the drivers of the housing market and hence housing prices, it is imperative to focus on three different types of homeowners or buyers, namely, the occupants or household buyers, the investor-landlords or landlords, and the investor-speculators or speculators. Traditionally, studies have focused on the consumer's impact on housing prices, whereas recent research is considering investor motivations as well" (Alexiou et al., 2019, p. 438).

During the 2008-2018 period, successive governments have enacted policies which target housing investors (as distinct from owner occupiers), and the contribution that investor activity is perceived as contributing to housing escalation.

In a speech in August 2015, the deputy governor of RBNZ noted "Investor demand has become a growing factor in the Auckland market over the past year, and this has exacerbated price pressures arising from the underlying physical shortage" (Spencer, 2015, p. 4), and provided the following graph:

**Graph 5: Investor Share of House Sales 2013-2015. Source: RBNZ**



The Loan to value ratios (LVR) macroprudential limits imposed by the RBNZ since 2016 have a tighter restriction on new lending to investors, in that only 5% of new lending to investors may be higher than 70%, contrasted with owner occupiers at 20% of new lending to an LVR of 80% (RBNZ, 2018).

The Government also introduced a policy known as the 'Bright Line test' from 1 October 2015, targeted at speculation in houses. This policy was released by the Inland Revenue Department and clarifies the holding period (2 years) within which there is an expectation that tax will be payable on capital gains from the sale of residential property if sold within that holding period. This test excludes owner-occupied homes, and thereby targets residential investors. This test was extended in March 2018 to a holding period of less than 5 years and was reduced again in April 2024 (following the change of government in 2023) to 2 years (IRD, 2024).

On 17 April 2019, the Government announced that it would not be introducing a Capital Gains Tax (CGT) in New Zealand. However, prior to this decision, it was clear that a distinction would be drawn between owner-occupied and investment houses for the purposes of any CGT.

It is noteworthy that the COVID-19 pandemic occurred in the later stages of the qualitative phase of this research, and therefore the references to this significant economic event are limited herein.

#### 4.5.2 Policy Implications - Housing affordability

The measurement of housing affordability lacks a consensus in the New Zealand context (Robinson et al., 2006). In general terms, the term 'housing affordability' has become the

accepted terminology for expressing the relative ease or difficulty of households to consume housing. A household is considered to have difficulty when more than a particular percentage of its income is allocated to obtaining and retaining appropriate housing, whether owned or rented (Gan & Hill, 2009); (Hulchanski, 2013).

Although housing affordability usually refers to the ongoing costs of owning or renting, this research is concerned with home ownership affordability, and the impact of house price escalation on affordability in Auckland over the 2008 to 2018 period. As shown by the affordability measure in Figure 3 above, affordability can differ between tenures.

Households spend a significant and growing share of their income on housing and the quality of the home environment is a central element of family stability and social cohesion. As such, access to affordable housing is a key policy issue for New Zealand (NZPC, 2012).

In terms of Government policy, there is considerable interest being shown in the Auckland property market, affordability, land supply and intensification. Government policies which target investment in housing were covered in the previous section.

As noted by Murphy “policy-makers at both central and local government levels are key agents, or vested interests, actively creating and re-creating policy practice within an unfolding power dynamic” (Murphy, 2016, p. 2545), reiterating an earlier observation “Since 2000, Wellington-based central governments have taken increasing interest in the economic performance of Auckland, which dominates the national economy” (Lewis & Murphy, 2015, p. 102).

Whether bounded rationality could be a contributor to overpricing was raised more than a decade ago in the literature: “the argument that markets are not always efficient, that behaviour is not essentially rational, and that a better appreciation of the psychology of expectations and decision-taking could be used to improve model specification, is now firmly on the agenda” (Smith, 2011, p. 241). This limitation to efficient market pricing due to bounded rationality was reiterated by Boelhouwer who identified a number of traditional economic models which have been shown to be a good descriptor of house prices (in some markets depending on how they are structured) while conceding that behavioural impacts could be utilised to incorporate factors not captured in neo-classical approaches, such as speculation and subjective motivator aspects within house-type decisions (Boelhouwer, 2011).

Smith further noted that there are a number of refinements that have been made to the traditional quantitative models, to bring in factors that may not be strictly evident in rational

utility based pricing, for example relative bargaining power, pricing strategy, special and hedonic aspects. In summary they note that this refining of the traditional models “deals with that portion of the housing economy in which markets are efficient, buyers are rational, and prices are determined by the attributes of objects, mediated by the influence of economic fundamentals on the balance of supply and demand. Arguably, that is not enough” (Smith, 2011, p. 240).

From a New Zealand policy perspective, this research will contribute to the discourse on the reasons for house price escalation, and perhaps the potential policy responses that can affect the motivations and behaviours of investors in addition to traditional micro and macro economic policy responses in terms of supply, regulation and taxation.

#### 4.5.3 Academic significance

The role of behavioural economics in housing theory is still developing and the literature includes discourse on how or whether this emerging discipline should be applied within a housing context. A helpful answer to this debate is provided by Gibb: “So, how does one decide about the value or otherwise of a pragmatic approach using applied economics? Essentially, the application should be useful, insightful, interesting or novel and potentially testable” (Gibb, 2009, p. 26).

One of the pioneers of behavioural economics, Richard Thaler, goes further into this issue of testability and suggests that empirics have an increasing role to play in helping to better predict or explain market behaviours: “As for empirical work, the behavioural approach offers the opportunity to develop better models of economic behaviour by incorporating insights from other social science disciplines” (Thaler, 2016, p. 1577).

Thaler’s view is not without its detractors who consider more traditional approaches to be more methodologically robust and empirically established. Much of the debate surrounds the extent to which pricing is able to be explained by rational (fundamental) factors or the impact of non-rational (behavioural) factors. In a 2010 study, researchers accounted for more than one fifth of home price variation between 1996 and 2006, by reference the fundamentals of interest rates and credit constraints. They therefore suggested that there was a gap in the explanatory framework associated with the interplay between bubbles, beliefs and credit market conditions (Glaeser et al., 2010).

Similarly, Case & Shiller undertook a study in 2003 into what they defined as ‘glamour cities’ that are so named due to the existence of particular industries, universities or inhabitants such as celebrities. They determined that high house price growth was driven by a number

of irrational factors such as emotional impulses; by the economic fallacies people believe in and the mechanisms (word of mouth, media frenzies) which amplify these; and by the imprint of animal spirits (Case & Shiller, 2003).

It is apparent from the literature that the application of these behavioural concepts and the acceptance of departures from full rationality within the housing sector are becoming more established. A number of studies were identified into behavioural economics and housing relating to the purchase of residential real estate, however these have largely been confined to areas such as buyer search duration and location and tenure choice, for example (Anglin, 1997) and (Baryla & Zumpano, 1995) but this is from a consumption rather an investor perspective.

In a New Zealand context, studies have looked at the impact of the various members of the household on the purchase decision from a motivational rather than strictly rational / utility perspective (Levy & Kwai-Choi Lee, 2004); the existence of 'animal spirits' in the housing market has been considered (Shi & Kabir, 2018); and a survey of the behavioural aspects of housing investors (de Bruin & Flint-Hartle, 2003).

The application of behavioural and motivational theory to housing is developing within the literature, and academic discourse appears to be converging on the value that can be added to the more traditional economic approaches. In the words of Gibb: "In short, despite more or less effective criticisms, the behavioural school, partly by fashion, partly by the strength of its arguments and evidence, has come to play an increasingly important role in contemporary applied economics. Whether it is sustained remained to be seen, but it does seem likely that it can play a significant role within housing economics" (Gibb, 2009, p. 38).

The literature includes discourse on the incompatibility between traditional and behavioural approaches to economics, and how these can be synthesised. As noted by Thaler above, ideally a synthesis would mean how they can be used to best describe market behaviour and predict outcomes such as pricing.

Research into the existence of bounded rationality within housing markets has been undertaken in New Zealand and elsewhere. This research adds to the literature by linking this *existence* of behavioural factors (using qualitative methods), and then quantifying the *impact* of these factors as a departure from the normative (full rationality) model.

An understanding of the impact of behavioural factors on house pricing within the New Zealand context will contribute to our understanding of property investors, inform practice

and policy, but also contribute to the wider literature as a novel and replicable application of the theory.

## 5 LITERATURE REVIEW

In reviewing the literature surrounding the research questions, two broad areas were identified. The first is the theoretical approaches and methodologies for qualitative research into the behavioural and motivational aspects of investor activity. The second is the theory and supporting quantitative models that will enable a normative lens to be applied to the Auckland housing market. The literature review seeks to understand the contribution of motivational and behavioural approaches in explaining and identifying a departure from what would be expected from a normative model of full rationality, and the contribution of this to house price escalation and affordability.

This has enabled the development of the conceptual model outlined in Chapter 6, that establishes the linkages between the two fields of behavioural economics and traditional / normative economics for the purposes of empirical testing.

This is outlined below in three sections:

1. Motivational and behavioural approaches in a residential property context (theory and studies)
2. Rationality, pricing and market equilibrium in housing markets
3. The measurement and theoretical approaches to house affordability

The literature review concludes with a discussion on the contribution that this research will make to the literature.

### 5.1 Motivational and Behavioural Approaches in a Residential Property Context (Theory and Studies)

Classical economic models and utility maximisation theory assume that market participants have rational and considered preferences; full and complete information; and that decisions are fully rational. They typically assume that the decision maker is in a position to enumerate the range of options or prospects available at the choice point, assess the utility they will deliver, and assign probabilities to various possible future states of the world (Marsh & Gibb, 2011).

As outlined below, there are theoretical principles and empirical observations of actual behaviour that suggest this is not always true in many markets, particularly housing. DeBondt and Thaler argue that good theory will be grounded on psychological evidence about how people actually behave (De Bondt & Thaler, 1985).

Behavioural approaches represent a departure from classical and neo-classical economics in that they challenge the classical economic assumption of utmost rationality in behaviour, and pricing as an outcome of optimised utility between rational market participants. Behavioural economics has identified that this rationality must in many cases be considered bounded.

Behavioural economics is not separate from traditional economic theory, and nor is it new, though it is an evolving field. Adam Smith wrote a book entitled *The Theory of Modern Sentiments*, which laid out psychological principles of individual behaviour that are arguably as profound as his economic observations (Camerer et al., 2004).

The criticism often raised by economists against psychological theories is that, in a given economic setting, the range and extent of irrational behaviour is essentially unrestricted. Thus, it is sometimes claimed that allowing for irrationality “opens a Pandora's box of ad hoc stories that will have little out-of-sample predictive power” (Daniel et al., 1998, p. 1841).

The challenge for behavioural economics is to take these behaviours from anecdotes and ad-hoc exceptions to concepts that can be categorised and examined in different contexts. In the literature there is an increasing refinement and convergence of these concepts, many having their foundations in *prospect theory* of Kahneman and Tversky (Tversky & Kahneman, 1979).

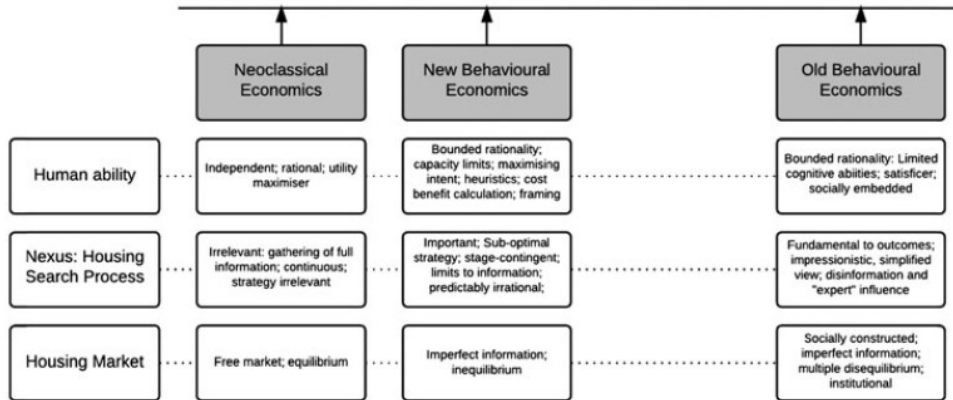
There are numerous studies including experimental work aimed at identifying the existence of these factors decision making, and determining the impact that these may have compared to the fully rational approach that is a fundamental tenet of the classical normative economic model.

The introductory chapter of *Advances in Behavioural Economics* holds an explanation of the intersect between traditional and behavioural economics: “At the core of behavioural economics is the conviction that increasing the realism of the psychological underpinnings of economic analysis will improve economics on its own terms... this conviction does not imply a wholesale rejection of the neoclassical approaches to economics based on utility maximisation, equilibrium, and efficiency” (Camerer et al., 2004, p. 3).

Some writers, for example Dunning, distinguish between ‘old’ and ‘new’ behavioural economics (Dunning, 2017). The distinction between the two views is that *old behavioural economics* is concerned with describing actual behaviour and providing empirical evidence of the shape of the utility function, while *new behavioural economics* is concerned with finding deviations from the neoclassical model of behaviour that may be used to enhance the predictive power of those models (Sent, 2004).

A useful distinction within the context of housing choice (as a consumption good) in a diagram by Tu and Goldfinch (Tu & Goldfinch, 1996) is shown in Diagram 1 below. These authors drew the distinction between the three approaches (in a housing choice context), as well as the Wong (Wong, 2002); March and Gibb (Marsh & Gibb, 2011), and Maclennan (Maclennan, 1982) perspectives on housing choice models:

Diagram 1: Three Schools of Economics. Source: Tu and Goldfinch (1996)



While both new and old behavioural economics use the term 'bounded rationality', their views of human ability in some cases lead to inconsistent approaches. This distinction is outlined by Dunning as follows: "the new behavioural economics human acts with limited knowledge to maximize their utility, perhaps through the use of a cost benefit calculation, albeit with computational limits or heuristics. By contrast the old behavioural economics human is a satisficer whose situation reflects a socially and culturally embedded notion of housing that is 'good enough' " (Dunning, 2017, p. 34).

The concept of bounded rationality is well supported within the literature as it related to property markets, not only empirically but due to the characteristics of housing markets, as breaching many underpinning economic assumptions of market efficiency. The apparent acceptance of this concept is outlined by Boelhouwer: "As many textbooks about the housing market underpin, the housing market can be characterised as an imperfect market. The lack of information, the complexity of the product, the long production time, the high investment costs and the site specificity are some important reasons for this statement" (Boelhouwer, 2011, p. 276).

Marsh and Gibb argue that rationality within the complexity of housing is likely bounded and that behavioural approaches will provide better understanding of the decision making of

households, in particular the concepts of loss aversion, anchoring, and adjustment bias. They propose that the complexity of the decision-making leads to the adoption of heuristics. In this way the traditional rational expected utility models may not adequately explain behaviour (Marsh & Gibb, 2011).

Mainstream economics has utilised various methodologies for the analysis of house prices and volumes that seek to model market responses to pricing signals in a traditional sense. This is a somewhat positivist and empirical approach with little regard for the interpretivist viewpoint that takes consideration of the complexities of the behaviour of market participants and the potential for rationality to be limited to an extent that is material to accurate modelling.

Clapham notes that many neo-classical economic approaches are difficult in a housing market context due to two main factors. First of these is the assumption of consumer behaviour: rationality, defined preferences, perfect information, budget constraints, and insatiability do not apply to housing. Clapham states “the important point here is that none of these factors hold true for housing. For example, it is clear that much household behaviour in purchasing housing is emotional as well as rational” (Clapham, 2018, p. 175). Secondly, Clapham notes the features of the housing market which challenge efficient market assumptions, such as infrequent and costly transactions, complexity, heterogeneity, and long lead times (Clapham, 2011).

Similar to the issue of generalisability of individual decision making (outside of strict rational optimisation assumption of classical economics) is the matter of whether the impact of individualised sub-optimal decisions is anomalous or can in aggregate affect the market overall and in the longer term. This is to question whether the market responds over the long term by squeezing out the sub-optimal pricing decisions and move to a more rational-based efficient equilibrium? This question of the impact of a market response was explored in the context of securities, and it was found that sub-optimal behaviours can endure and affect the market overall (Long et al., 1990).

A fundamental trait of property is heterogeneity which makes direct comparison exceptionally difficult and necessitating a level of interpretation and approximation in every pricing decision. In this regard, Maclennan noted that housing is a complex commodity, with essential characteristics distinguishing it from other commodities (Maclennan, 1982). Similarly, Gibb notes that housing is a durable good that is spatially fixed, it is inherently heterogeneous, and it is a joint good consumed along with the residential neighbourhoods

that it is located in. Gibb goes further to note that “Heterogeneity makes pricing housing in terms of some common quality benchmark or index fundamentally difficult” (Gibb, 2009, p. 31).

These defining traits are fundamental to property and one of the reasons that Marsh and Gibb approach the issue of fundamental uncertainty in decision making rather than a simplistic view of probabilistic risk surrounding pricing. Gibb states “Several other goods have aspects of these features but none have all of them; this renders housing a subject of study very different and challenging for the applied economist” (Gibb, 2009, p. 32).

Boelhouwer identified a number of traditional economic models which have been shown to be a good descriptor of house prices (in some markets depending on how they are structured) but also conceded that behavioural impacts could be utilised to incorporate factors not captured in neo-classical approaches such as speculation and subjective motivator aspects within house-type decisions (Boelhouwer, 2011).

Smith notes that there are a number of refinements that have been made to the traditional quantitative models, to bring in factors that may not be strictly evident in rational utility-based pricing, for example relative bargaining power, pricing strategy, special and hedonic aspects. In summary they note that this refining of the traditional models “deals with that portion of the housing economy in which markets are efficient, buyers are rational, and prices are determined by the attributes of objects, mediated by the influence of economic fundamentals on the balance of supply and demand. Arguably, that is not enough” (Smith, 2011, p. 240).

A paper which considered the previous 50 years of American house pricing and the government policies that underpin these, proposed that the expected utility and hedonic approaches appear not to adequately explain the boom-and-bust changes in house prices relative to underlying utility. The author of that study noted the role of psychological and behavioural approaches to enhance our understanding: “No one would disagree that there is more to the operation of the housing market than supply and demand and the setting of prices. There is genuine uncertainty in making choices in the housing market, and that uncertainty means that individuals are unlikely to behave in a completely rational manner” (Clark, 2011, p. 273).

It is evident from the literature that property markets by their nature are likely to exhibit bounded rationality, given the extent to which the market breaches the conditions of efficient market theory. In this regard, Boelhouwer notes the difficulties of applying

traditional economic pricing approaches to housing because it is characterised as an imperfect market due to reasons such as: the lack of information, the complexity of the product, the long production time, the high investment costs and the site specificity (Boelhouwer, 2011).

This acceptance within the literature that the characteristics of property markets is likely to contribute to bounded rationality is also supported by empirical studies. Studies within housing markets have considered behavioural economic concepts to determine their relevance to housing and their ability to explain decisions that lead to outcomes not explained by traditional models. This is explained by Gibb and Pryce “ housing economics has made much use of behavioural ideas such as loss aversion and herd or frenzy effects to help explain market bubbles and disequilibria and ideas such as mental accounting, hyperbolic discounting and concepts developed in relation to biases and heuristics in decision-making also have considerable scope for helping us understand housing and mortgage choices” (Gibb & Pryce, 2012, p. 278).

Of particular relevance to housing is the large scale of the house purchase decision to a household and the decision process having both a personal and social element and that the Household may be more akin to a firm or organisational decision-making process (Dunning, 2017). In a similar vein, from a New Zealand context, Levy and Lee have looked at the impact of the various members of the household on the purchase decision from a behavioural rather than strictly rational / utility perspective (Levy & Kwai-Choi Lee, 2004).

For most New Zealand households purchasing a house is the largest financial transaction that is undertaken, and it could be normatively assumed that a high level of analysis and rationality would be applied to the decision. However, there is an alternate view within behavioural economics as proposed by Thaler “The notion that people will pay more attention when the stakes go up is intuitively appealing. Certainly we pay more attention when buying a car than when deciding what to order for lunch. But rather than these two arguments working together, they actually go in opposite directions. The reason this is so is that, as a rule, the higher the stakes, the less often we get to do something” (Thaler, 2016, p. 1583).

A conclusion that can be drawn from the literature is that housing is a market in which the concept of bounded rationality is of relevance by virtue of matters such as: complexity, imperfect information, heterogeneity, and emotional / motivational aspects inherent in decision making by market participants.

### **Behavioural economics concepts as applied to housing markets**

As noted above housing markets have characteristics that are inconsistent with efficient market theory, and this can result in bounded rationality concepts applying. Conceptual definitions of behavioural factors such as biases and heuristics within the wider realm of behavioural economics is extensive. For the purposes of this research biases and heuristics were identified from the literature that have already been empirically observed within the context of housing.

The literature contains studies of housing markets which have tested behavioural economic concepts from both an owner-occupier and investor perspective. The focus herein is on the latter, to determine those concepts that have a precedent for this research.

Studies into behavioural impacts on housing markets and aggregate overpricing were more frequent following the GFC and housing market corrections that followed in many countries, some of which will be discussed subsequently.

However, two decades prior Case and Shiller undertook a survey of the behaviour and motivations of home buyers in order to understand the nature and causes of housing booms in three cities in the United States. Part of the rationale for the study was that from an earlier study by one of the authors within which it was suggested that housing booms cannot be attributed to rational fundamental factors. The paper concluded that it “provided some evidence that investors in housing markets do not know fundamentals. They tend to interpret events in terms of heresay, clichés and casual observations”, and “it is certainly plausible that expectations heavily influence the prices people are prepared to pay in these markets. Because these expectations do not appear to make much sense except as extrapolations of past price changes, we cannot expect prices to be rationally determined” (Case & Shiller, 1996, p. 17).

In a subsequent study, Case & Shiller examined what they defined as ‘glamour cities’, they determined that high house price growth was driven by sub rational matters such as irrational emotional impulses; by the economic fallacies people believe in; by the mechanisms (word of mouth, media frenzies) which amplify these; and also by the imprint of animal spirits (Case & Shiller, 2003).

A 2003 Massey University study considered the bounded rationality nature of housing investment in the New Zealand context. This research was undertaken by postal survey, supplemented by telephone interviews. The study identified a number of heuristics and motivations that suggested a limit to full analytical rationality, such as assumptions of capital

appreciation or emotional factors. The authors concluded “Evidence from our study of residential real estate investors gives credence to the behavioural assumption of bounded rationality”, and “more in-depth research in the relatively under-researched area of the motivations of private investors in the residential market is necessary and will of course test our belief [in bounded rationality]” (de Bruin & Flint-Hartle, 2003, p. 281).

A 2010 study of the North American housing bubble post GFC sought to determine the extent to which pricing could be explained by rational (fundamental) factors or was speculative including some element of non-rational (behavioural) factors. This study failed to account for more than one fifth of house price variation between 1996 and 2006, by reference the fundamentals of interest rates and credit constraints. They therefore suggested that there was a gap in the explanatory framework associated with the interplay between bubbles, beliefs and credit market conditions (Glaeser et al., 2010).

The impact of investor behaviour in explaining house price escalation was examined in a paper which noted “to understand the drivers of the housing market and hence housing prices, it is imperative to focus on three different types of homeowners or buyers, namely, the occupants or household buyers, the investor-landlords or landlords, and the investor-speculators or speculators. Traditionally, studies have focused on the consumer's impact on housing prices, whereas recent research is considering investor motivations as well” (Alexiou et al., 2019, pp. 437-438).

In a 2018 New Zealand based study the impact of non-rational factors or ‘animal spirits’ using the terminology of Keynes and the theory proposed by Akerlof and Shiller (Akerlof & Shiller, 2009), within housing markets was investigated. The study considered the use of auctions as a reflection of irrational exuberance and the relationship with house price to-rent-ratios as a measure of housing overpricing compared to fundamentals. As explained by Shi “In contrast to the classical economic theory, which is based upon rational behaviour of individuals, the animal spirits theory offers a new angle from the psychological perspective” (Shi & Kabir, 2018, p. 60).

Shi comments further within the New Zealand context to say that in comparison to the nature and transactions in other financial markets, the behaviour of the buyers bidding in the housing market provides us with a good opportunity to examine animal spirits for the following reasons. First, each property is unique. It has an idiosyncratic value for the homeowner as well as a common value for resale in the future. Second, there is no centralised market for real estate transactions. Most properties are sold through

negotiations. Third, there is information asymmetry in the housing market. The seller generally has more information about the physical nature of the property than the buyer, while the buyer is believed to have more information than the seller with respect to the market price of the property (Shi & Kabir, 2018).

These characteristics are exacerbated by the lack of a centralised register or homogenous pricing mechanism, with prices being established with reference to transactions undertaken in a competitive process. In the words of Shi: “Theoretically, the winner in a common value auction is the one who overestimates the value of the underlying asset the most. The phenomenon that the winner overbids in an auction is called ‘the winner curse’ in auction literature” (Shi & Kabir, 2018, p. 63).

If the least rational bidder sets the price, it is useful to understand the motivations, behaviours and information sources and advice relied upon the highest bidders in a process, because they create price signals that may lead the market. As noted above, other studies found that decisions were influenced by sentiment, heresay and beliefs rather than rational analysis (Case & Shiller, 1996).

A recent NZ study also considered the impact of sentiment: “Property purchasers are bombarded with messages suggesting the positive or negative performance of the real estate market daily. Buying a home is typically the most significant purchase most individuals will make in their lifetime and thus much time and effort is spent collecting and comparing a large amount of information which often includes market reports” (Levy et al., 2020, p. 86).

This impact of sentiment is strongly supported in the literature and is usually classified as a form of bias such as optimism bias, framing bias, loss aversion, herd bias depending on the context. As noted above, this is exacerbated by a lack of objective pricing information which would otherwise provide a balancing objective viewpoint.

The relevance of behavioural biases was identified by Simonsohn and Loewenstein who found that behavioural biases such as anchoring and framing were of relevance to housing decisions, as well as contextual effects (where expectations formed in one submarket influence prices paid in another) that could have an impact in the housing market (Simonsohn & Loewenstein, 2006a).

Anchoring occurs when an estimate is biased towards a pre-established point, in the absence of which the estimate would have a wider range of possibilities (Camerer et al., 2004). In a housing context this anchoring impact of previous prices appears closely associated with the

concept of reference levels and status quo bias. These behavioural principles may well work together when individuals are considering future prices in the context of past market activity.

This anchoring effect has been shown experimentally in the context of housing, showing that estimates tend to anchor around a starting figure, biasing towards the anchored status quo and minimise the magnitude of difference between alternatives (Kahneman et al., 1982). This bias toward a starting point or pre-existing viewpoint was reinforced by Mallard: "Anchoring involves deliberately altering our mind-sets as we make decisions, but through making a particular number salient at the start of the decision-making process rather than drawing our attention to a particular aspect of the decision in a different context" (Mallard, 2017, p. 86).

These biases within decision making can be seen as being directly affected by information and not always symmetrically. As noted by Soroka, "It is unlikely that individuals' responses to positive and negative information are symmetric. Mildly negative information can be responded to as very negative, or particularly informative, and react accordingly. Work in economics suggests a similarly asymmetric story. Prospect theory (Kahneman and Tversky 1979) is a theory of choice under uncertainty which contains a feature called loss aversion" (Soroka, 2006, p. 373).

There are examples within the literature of optimism or overconfidence biases, exacerbated by peers and selection of advisors that tend to reinforce the investor's current viewpoint. This effect of interdependence and a bias in selection of advisors was shown to boost confidence in the information seeker's estimate and was seen as a function of the advice's proximity to the participants' initial estimations, thereby indicating a social validation effect (Wanzel et al. (2017)). A similar observation was made in an earlier study which identified a form of overconfidence, an internal bias of overstating their own abilities resulting in exuberant behaviour, overpricing (relative to risk) and excess entry into markets (Camerer & Lovallo, 1999).

Another study established the concept of reference levels as a framing bias relates to the principle that perceptions are relative for the individual, rather than absolute. This is to say that in determining an individual's situation, it is often how their current situation compares to some reference level that is important (Frank, 2008).

In addition to specific studies, the literature includes summaries of those behavioural concepts that have support within a housing context. Gibb identified 5 behavioural economic principles of relevance to the housing market as follows: experienced utility and expected

utility; reference levels; loss aversion, endowment effects and the status quo bias; anchoring and adjustment bias; and preferences for improving over declining sequences (Gibb, 2009).

Smith proposes that the non-rational elements of housing market pricing can be broadly grouped into themes: “over-optimism and the risk of regret; momentum reasoning (e.g. the conviction that prices will continue to rise); inflation mistakes; and disposition effects (people dislike making losses more than they enjoy making gains)” (Smith, 2011, p. 246).

Akerlof and Shiller identify five aspects of what they refer to as ‘animal spirits’ being: over optimism; momentum reasoning; loss aversion; expectations formed around fairness; the impact of corruption and anti-social behaviour (Akerlof & Shiller, 2009).

Within the literature are a myriad of concepts and themes surrounding behavioural approaches to the decisions of individuals (and also groups of individuals such as households and corporates), with specialisation that appears to come from the field or author concerned. The most commonly encountered behavioural phenomenon within the literature that has the potential to impact materially on house prices is the inclination towards speculation without reference to ‘fundamentals’ such as land supply, interest rates, wage growth or credit supply. This phenomenon is categorised as irrational exuberance, optimism bias or anchoring. An example is Himmelberg, Mayer & Sinai who proposed that housing bubbles are “driven by home buyers who are willing to pay inflated prices for houses today because they expect unrealistically high housing appreciation in the future” (Himmelberg et al., 2005, p. 68).

Similarly, the expectation of speculative gains irrespective of a deviation from fundamental values was noted by Chaudhuri: “At some level, the pattern of behaviour seems obvious, given what we know about human decision making. The possibility of speculative gains unleashes “animal spirits” among inexperienced traders” (Chaudhuri, 2021, p. 383).

Thematically, the literature shows that behavioural approaches seek to explain decisions in terms of the social, emotional and cognitive context of the decision maker. These can be distilled and clustered into cognitive biases and heuristics that are often utilised to explain specific behaviours either experimentally or observationally. The concepts within the literature are often overlapping and there is inconsistent terminology, however the literature appears to converge on the following concepts that encapsulate the limits to full rationality, due to:

a) limits of analytical ability or information (Heuristics)

b) biases due to psychological factors (Biases)

c) motivational aspects (Expectations)

### **Heuristics**

The complexity and uncertainty inherent within the housing market have been identified within the literature as an aspect that can lead to the use of heuristics, a simplification of the complexity that operates as a 'rule of thumb' and therefore acts as a limit to full and complete rationality.

Housing is in the most part an infrequent transaction and this, combined with a dynamic market contributes to the complexity. For many market participants, it will be difficult to obtain and maintain comprehensive analytical skills that will ensure fully rational pricing. The use of heuristics in the face of complexity is potentially relevant to the majority of participants in the market.

A heuristic is described by Tversky & Kahneman as a rule of thumb that manages complexity in decision making. The use of heuristics is a key theme within the field of behavioural economics, because it places a limit on purely rational decision making from a traditional perspective inherent within Pareto efficiency assumptions (Kahneman et al., 1982).

The assumption of full rationality within traditional economic models is challenged when heuristics are adopted by individuals in order to simplify decisions within a frame of uncertainty. As identified by Gibb, these heuristics may not result in decisions that fully rational analysis would, and may "lead to outcomes and choices not predicted by the standard model" (Gibb, 2009, p. 36).

The literature shows that application of the concept of Heuristics has been tested in the housing context. For example, Pingle undertook experimental work that found that when making decisions with high trade-offs and high complexity, there is a tendency to generalise to heuristics to be more efficient in decision making, and that the outcome tends to be a less than optimal outcome. In this way, the decision relies on simpler rules of thumb, rather than a comprehensive analysis of alternatives (Pingle, 1992).

The heuristics that apply are somewhat circumstance specific. As observed by Baxter: "the nature of the heuristic used will vary from one set of circumstances to another, and is likely to vary from one individual to another... it may be that further research will enable a number of specially common, more than usually significant, heuristics to be identified or enable the available heuristics to be more closely integrated" (Baxter, 1993, p. 105).

In a New Zealand study of irrational exuberance, the concept of ‘disaster myopia theory’ from cognitive psychology literature was considered. This is a heuristic which can cause people to under-estimate the risk of low-frequency events such as economic downturns “The empirical and theoretical findings suggest that people are not good at taking into account all possible future risks when making their decisions” (Shi & Kabir, 2018, p. 65).

This concept was similarly referred to as an ‘availability heuristic’ in which people estimate the frequency of some event by the ease with which they can recall instances of that event. Using this heuristic is perfectly sensible since frequency and ease of recall are generally positively correlated. However, use of the heuristic will lead to predictable errors in those situations where frequency and ease of recall diverge” (Thaler, 2016, p. 1581). Similar findings are also presented in the economic theory regarding optimization for low-frequency events (Herring & Wachter, 1999).

### **Biases**

An example of the integration of methodologies can be seen in a study of American house prices which incorporated behavioural mechanisms previously identified by Shiller (Akerlof & Shiller, 2009) as ‘public expectations of future price increases’ and ‘speculative interest in the markets’. This study concluded that “the coefficient magnitude of the behavioural factors varies over time and in patterns consistent with the emergence and dissipation of the recent housing bubble” (Huston & Spencer, 2014, p. 219).

Simonsohn & Loewenstein provide a case study of migrants being slow to adjust (upwards or downwards) from established pricing benchmarks and therefore different pricing expectations compared to locals (Simonsohn & Loewenstein, 2006b). Similarly, another study found that anchoring can contribute to expectations in terms of price trajectories, and that there is evidence that a backward-looking expectation may be able to account for observed market behaviour (James et al., 1991).

The most commonly encountered behavioural phenomenon with the potential to impact materially on aggregate house prices in the literature is that of the inclination towards speculation without reference to ‘fundamentals’ such as land supply, interest rates, wage growth or credit supply. Similarly, other factors such a pure hedonics or social/geographic basis may produce localised pricing effects.

Genesove and Mayer studied loss aversion in apartment transactions and concluded that both investors and owner-occupiers behave in a loss-averse fashion, although investors exhibit about one-half of the degree of loss aversion as owner occupants, reflecting

differences in motivations and decision frameworks for each group (Genesove & Mayer, 2009).

The concept of discounted 'time inconsistent preferences' and 'hyperbolic discounting' was noted as being applicable to housing, though less on transactions and pricing than life-cycle matters such as maintenance and improvements and the timing of these and relocation decisions (Gibb, 2009).

### **Motivations**

Motivation is the precursor to action, it is the intention and willingness to act, rather than the action itself. It is in this way that motivations as a precursor to action become relevant. The term "motivation" has been defined in a number of ways, and has been used in both everyday language and in academic literature, but simply, it is the concept of 'why people do what they do' (Turner, 2006).

Thaler & Sunstein note that many behaviours are more automatic and intuitive, rather than deliberate or conscious (Thaler & Sunstein, 2008). In this way, stated motivations as a precursor to action may indicate the existence of unconscious biases of which the individual is not directly aware.

In a 2019 study the motivations of investors was studied using quantitative measures of ex-post house price data from 34 countries, and concluded that there was evidence of capital appreciation in the motivations of investors in house prices: "Overall, the fact that households continue buying houses even when affordability and rental yields drop could reflect irrational behaviour, which might be explained by bounded rationality". (Alexiou et al., 2019, p. 444). This study also found that housing demand is partly driven by individuals believing in the future appreciation of housing prices in the hope of making a profit, such individuals being known as speculators (Alexiou et al., 2019).

The nature of behavioural economics and motivational theory is that it examines the stated and observed preferences of individuals, resulting in a focus on qualitative (as well as experimental) methods. As Gibb notes "A key feature of the behavioural school is the identification from survey and experimental data of anomalies or other decision-making heuristics which require a rethinking of standard economic problems and a hope of re tooling of advice and analysis by economists" (Gibb, 2009, p. 35).

Behaviours occur within a social construct, are specific to the individual and perhaps also to the circumstance. This is an issue for the wider application of behavioural economics, not just housing (Fudenberg, 2006). In this regard the literature suggests that motivations can

be seen to have an internal and an external component. In a paper looking at the motivations of home owners to undertake energy efficiency measures, it was proposed that there was an interaction between internal and external factors in the process. (Organ et al., 2013).

The most frequently encountered motivation of investors within the literature is that of capital gain as an investment return, as discussed under the sections on heuristics and biases above. This view is shared by RBNZ, which concluded that “The low level of Auckland rental yields suggests that expectations of capital gains and /or tax relief have been an important factor in investors’ purchase decisions” (Spencer, 2015, p. 10).

## 5.2 Rationality, Pricing and Market Equilibrium in Housing Markets

Classical economic approaches assume ‘homo economicus’ levels of rationality, in order to assume that a market is at its equilibrium price and that pricing signals can be relied on by other market participants (Thaler, 2016). For a market to be in equilibrium, the price must reflect the rational pricing decisions of the market participants, neither over-priced nor under-priced compared to a fundamental value.

This assumption of efficient pricing within well-functioning markets is attributed to Efficient Market Hypothesis (EMH), a fundamental conceptual framework of traditional economic thought that has had assumptions and conditions refined and tested since the early 1600’s, with the EMH name being coined in 1967 by Harry Roberts (Sewell, 2011).

As noted previously in relation to housing markets the literature includes several breaches of the assumptions within EMH that would enable the market to be assumed as efficient. According to EMH if all assumptions are not met then pricing may not be efficient and reflect underlying fundamental value.

### **Equilibrium pricing of housing**

EMH asserts that when the assumptions hold (such as perfect information and costless transactions) pricing information can be relied on as efficient, and that the market will be in equilibrium over the short to medium term (depending on the market) and prices will reflect fundamental value. There is an implicit assumption that aggregate prices will be efficient due to the rational actions of well-informed participants: “the assumption that mispriced stocks cannot long exist because if they did, ‘smart money’ investors/arbitrageurs would already have eliminated them” (Lowenstein, 1994, p. 926).

EMH holds that the housing markets may not represent efficient pricing in aggregate but cannot confirm that the market is or is not in equilibrium. To test for over or under-pricing, an alternate methodology is required.

The literature includes several accepted methodologies for determining whether aggregate pricing reflects the fundamental value of housing and therefore whether the market is in equilibrium.

Econometric models can be used to compute the long run fundamental price, as determined by demand which is based on factors such as real disposable income, real interest rates and demographic developments; and supply which is based upon factors influencing the available housing stock (Girouard et al., 2006).

Two further common measures of overvaluation of housing assets are the price-to-income ratio and the price-to-rent ratio (income yield). An increase in these ratios above the long term average can be interpreted as an over-valuation of the asset (Nathalie et al., 2006). The price-to-income ratio has been seen as less consistent over time due to the limited supply of land and demand being price-inelastic leading to prices rising faster than incomes (Fox & Tulip, 2014).

Regression models have been used to identify the relationship between prices and rental yields and imputed capital gain (speculation), which can be seen as a measure of deviation from fundamental asset value (Yang & Rehm, 2021). This study includes analysis of the Auckland house investment sector and concludes that speculation was causal to house price growth.

The value to the user of a durable good is represented by the present value of buying it, using it for one period, and then selling it (Hicks, 1939). In this regard, in a rational sense the value of housing should reflect the utility it provides. Housing in New Zealand may be consumed in both the owner-occupied and rental tenures. As noted previously owner-occupation tenure has been on the decline, with a corresponding increase in rental tenure. Consumers with the sufficient means can be seen to make a rational pricing choice between owning and renting the utility of a house.

The User-cost Equilibrium Model (UCEM) is based upon the assumption that a rational purchaser of the utility of a dwelling will consider the respective utilities and prices of each tenure option (renting or owning). This rational behaviour will ensure that house prices do not become overpriced relative to their underlying utility value. This model proposes that

assets will be equilibrium priced when market participants rationally consider the relative user costs of the ownership and rental tenures.

This is to say that equilibrium in the housing market occurs when the expected annual cost of owning a house equals that of renting, while overvaluation is characterised by an actual price-to-rent ratio greater than that calculated with the user cost, suggesting that it is cheaper to rent (Nathalie et al., 2006).

The UCEM has been widely used to test for equilibrium in housing markets, using a range of approaches, assumptions and adjustments, including New Zealand (Hill & Syed, 2016).

The methods above are able to be utilised to determine whether there is a disequilibrium in the market and thereby conclude as to whether the market is efficient, i.e. whether aggregate pricing reflects underlying fundamental (normative rational) value.

Determining the reason for this deviation from fundamental value and the link to individual decisions is also of importance to this research, and the literature in this regard is outlined below.

#### **Sustained deviation from fundamental value**

Traditional normative rational models assume that deviations from rational pricing will not hold at the market level but rather will be counteracted by the market overall, and at the aggregate level the standard assumptions of rationality represent effectively our average behaviour and the market itself will serve to counteract the behavioural anomalies at the level of the individuals (Mallard, 2017).

The literature includes many studies of sustained over-pricing within markets, including housing markets. For individual decisions to have an impact on the market overall there must be a mechanism by which the market fails to return to a normative state (of fundamental value) in order for persistent over or under pricing to occur.

A prolific author in this regard is Joseph Stiglitz who proposed that if individuals are fully rational then they would identify that prices were excessive and that a bubble exists, foresee this burst and by way of arbitrage, sell the asset ahead, lowering prices and thereby counteract the aggregate overpricing. However he noted that there are many instances in market where this is not the case and bubbles do occur due to bounded rationality within the market (Stiglitz, 1990).

Similarly, Scherbina & Schlusche suggested that a bubble is incompatible with an assumption of fully rational behaviour where there is a high level of substitution available in the product.

In a housing market context, they suggest that when prices become too high and substitutes are available, a rational participant will substitute (say to a different location) and therefore demand will balance out and regional pricing bubbles will not exist. However, these authors found that bubbles did exist in parts of rural Cheshire and London (Scherbina & Schlusche, 2012).

The literature includes many studies of periods of sustained over-valuations within markets, particularly those that were characterised as a 'bubble' market that had dramatically corrected. A paper that discusses this phenomenon within various markets including housing asserts: "Deviations from the efficient markets hypothesis seem well documented. Yes, prices do eventually converge to the fundamental value but it is a stretch to suggest that this is the equilibrium outcome; prices may diverge from the fundamental value for extended periods of time. Second, part of this bubble-and-crash pattern is driven by the potential for speculation and capital gains" (Chaudhuri, 2021, p. 387).

In the same paper, the impact of individual sub-rational decisions on the market in aggregate was considered by posing the question: "given that prices in most, albeit not all, markets eventually crash back down toward the fundamental value, why are traders not able to anticipate this crash?" The author proposed that once the price begins to deviate from the fundamental value, traders seem to believe that the fundamental value is no longer the primary concern but base their future forecasts on current prices. proposed that in forming their price expectations, the traders are not taking all salient information into consideration, such as the fundamental value or the length of the time horizon, but are myopically basing their future forecasts on current prices alone (Chaudhuri, 2021, p. 384).

This is consistent with the view of Thaler, who concluded that the impact of sub-rational decisions at the individual level can result in aggregate over pricing in the market: "The conclusion I reach from research in behavioural finance is that even these most efficient of markets often lead to empirical results that are inconsistent with theories based on rational investors making choices in markets with tiny transaction costs. In other words, the results we obtain are not consistent with the hypothesis that investors behave 'as if' they were rational" (Thaler, 2016, p. 1591).

Studies within housing markets support the above financial market studies. Finding that aggregate pricing can reflect an extrapolation of past returns rather than more fundamental and rational pricing considerations that is proposed by normative approaches. An example from the US found that homeowners over the 2000–2005 period in which there was

considerable house price growth expected house prices to continue to rise at double-digit rates for the next decade (Case et al., 2012). This study supported the findings from a study three decades earlier, suggesting that this approach to house pricing is pervasive. The earlier study found “While the evidence is circumstantial, and we can only offer conjectures, we see a market largely driven by expectations. People seem to form their expectations from past price movements rather than having any knowledge of fundamentals” (Case & Shiller, 1988, p. 10).

There is support in the literature for the role of bounded rationality in houses being over-valued in aggregate relative to fundamental value (such as the years following the GFC correction). This was noted by Whittle, et al “whether those investors are correct or incorrect, their beliefs reject fundamental assumptions of neoclassical economics (that every person is equally effective in assessing prices). Behavioural biases affect the rise and expansion of bubbles, such as overconfidence from speculative perceptions of house price rises” (Whittle et al., 2014, p. 22).

This limit to rationality that would otherwise enable market participants to anticipate this over-pricing and respond (perhaps by substitution of location or tenure) was identified in the post-GFC period in many nations (including the UK), and it was noted that the bursting of the house-price bubble led many people into a ‘mobility trap’, in which they could not relocate to jobs more favourable to their skill set (Stephens, 2012).

The existence of housing bubbles, driven by speculation, was identified in the Auckland housing market by Yang and Rehm, wherein they proposed that expectations of capital gain can be reinforced in pricing decisions, despite a departure from fundamental values (Yang & Rehm, 2021), reflecting the international findings of Alexiou et al in 2019 cited above.

The literature suggests that pricing bubbles can occur within housing markets, with several studies undertaken post the GFC housing market corrections, and more recently in a New Zealand context.

### 5.3 The Measurement and Theoretical Approaches to House Affordability

Declining house affordability is a likely contributor to declining home ownership in NZ, which is considered counter to socio-political preference. Since 1990, housing policy and a proxy for the prevailing political sentiment, reflects a desire for house ownership “At a general level, housing policy in New Zealand has long supported the expansion of home ownership... and social rented housing, or state housing, has assumed a role as a tenure of last resort for those who are unable to access housing from the private market” (Murphy, 2014, p. 898).

Housing affordability usually refers to the ongoing costs of owning or renting, and there are methodologies and indices for each regularly published in New Zealand most prominently by Massey University and the Ministry for Housing and Urban Development, as well as private research firms.

The measurement of housing affordability lacks a consensus in the New Zealand context (Robinson et al., 2006). This point was reiterated by Murphy: “Despite the availability of simple ratio measures (such as the price to income ratio), there is no single measure of housing affordability” (Murphy, 2014, p. 896).

In general terms 'housing affordability' has become the accepted terminology for expressing the relative ease or difficulty of households to consume housing. A household is considered to have difficulty when more than a particular percentage of its income is allocated to obtaining and retaining appropriate housing, whether owned or rented (Hulchanski, 2013). In this regard, affordability represents a constraint on a household to purchasing (renting or owning) property without undue pressure on other commitments.

Ownership affordability is based on income, house price and debt servicing costs, such as Outgoings to Income (OTI) ratio and Residual Income (RI). An example of the former is the Massey University Home Affordability Index, which provides a longitudinal perspective on affordability (University, 2022).

Many measures use median house prices and incomes, though other measures such as the lower quartile house price and lower quartile incomes have been used (CHRANZ, 2007). The most prevalent indices (Massey University and The Ministry for Housing and Urban Development) both use median house prices.

The annual international Demographica survey, discussed below, utilises a median house price multiple approach, which over the past 10 years has received significant publicity, in part due to the scale of the survey, and in part due the association with high profile New Zealand economic commentators such as Don Brash and Hugh Pavletich. As noted by Murphy: “the simplicity of the median multiple as a measure of affordability, in combination with the international ranking of over 300 cities, constitutes a powerful discursive device that can be used within political and public debates” (Murphy, 2014, p. 902).

Auckland is ranked by Demographica as one of the least affordable cities in the world, with a rank of 88 (the least affordable city being Hong Kong ranked at 94) with a multiple of 10.8 (median house price: median household income), up from 8.8 in 2008 (Demographica, 2023).

Although the simplicity in the calculation and ease of comparison of the house price to income measure is likely to be a key reason for its popularity as identified by Murphy above, it does not take account of the outgoings experienced by homeowners, and comparisons between countries is difficult without a deeper understanding of the economic differences. As was noted above, the price-to-income ratio can be seen as less consistent over time due to the limited supply of land and demand being price-inelastic leading to prices rising faster than incomes (Fox & Tulip, 2014).

A key component of affordability measures (from an ownership perspective) is house prices. In Auckland, median house prices have increased significantly, and although ameliorated in part by reductions in interest rates, has seen a decrease in affordability over the past ten years. The price to income ratio, though popular does not take account of these factors which have a direct impact on affordability, if defined according to Hulchanski to be the relative ease of a household to consume (Hulchanski, 2013). In this regard, those indices that take account of the ongoing costs of ownership more accord with this definition.

MHUD have noted that in the past decade, the measures of affordability of the ownership tenure has been expanded to include the Deposit Affordability Index and the Mortgage Serviceability, which distinguishes between what was defined by Treasury as the 'initial conditions' required to enter the market (Robinson et al., 2006), and the ongoing affordability of ownership once in the ownership tenure, similar to the Massey University affordability Index which is largely driven by changes in house prices and mortgage interest rates, and incomes which in the past 20 years have been more stable in NZ (MHUD, 2024).

In terms of ownership tenure, it can be summarised that house price escalation which outstrips income growth is a contributor to declining affordability albeit that other home ownership cost factors such as interest rates, and other household cost growth can ameliorate these to some extent, and in this regard, the MHUD and Massey University ownership indices are likely more relevant to the decisions of housing market participants than the house Price to income approach adopted by Demographica as cited above, though the latter is frequently cited in the media, as noted by Murphy above.

The relationship between incomes and housing related costs is a practical measure of affordability in terms of housing policy, in determining whether households are likely to be experiencing an undue burden of housing costs relative to income. In NZ, the threshold for affordability is taken to be 30% by both DPMC and Statistics NZ (Bentley, 2021), though this is based upon median incomes.

#### 5.4 Summary of Literature and Impact on this Research

The review to date has provided the context for the research, established the theoretical and methodological frameworks that will be tested, and identified the contribution that this research will make to the academic and wider body of knowledge.

In summary, the literature supports the contention that motivational and behavioural approaches can provide insights to the mechanics of housing decisions by individuals, including the contribution of these to individual and aggregate overpricing, and therefore sustained house price escalation.

These approaches are framed within the literature as enhancing rather than replacing quantitative modelling by considering the bounded nature of rationality and limits to efficient market theory. There is considerable discourse, theory and studies that show acceptance by many of the limits of the assumption of complete rationality in housing markets.

The literature includes research into the motivational and behavioural aspects of housing decisions in a range of markets and aspects of the housing decisions. These include geospatial, neighbourhood, quality, sales approach and price setting. There is considerable precedent research to consider the contribution of motivational and behavioural factors in housing decisions using both quantitative and qualitative methods.

The evidence for motivational and behavioural factors within housing markets has been explored in New Zealand using both qualitative and quantitative methods, as has the existence of aggregate over-pricing by quantitative methods including the UCEM.

There remains a gap in the literature to study the evidence for motivational and behavioural factors in the decision making of investors in a mixed methods case study approach, and to quantify the effect of behavioural limitations to rationality on the pricing of housing. This research contributes to the literature by considering this, with applicability to other geographic locations and time periods.

#### 5.5 Academic Contribution of this Research

Within the literature there is an acceptance that markets are not always efficient, and that behaviour is not always completely rational. A better appreciation of the psychology of expectations and decision-taking could be used to improve model specification (Smith, 2011).

Clapham reiterated the concern of Smith for more empirical work in the application of behavioural approaches to housing markets: “rather than being based on simplified a priori assumptions of behaviour, frameworks need to be based on empirical findings of the

behaviour of agents in specific markets” (Clapham, 2011, p. 291). This research is based on that suggestion. It builds a framework that quantifies the departure from the normative expectations of pricing by testing the stated preference (bounded rationality) within the normative UCEM framework.

The academic contribution of behavioural approaches to our understanding of the functioning of housing markets was reiterated by Boelhouwer: “Both Smith and Marsh and Gibb argue that psychological, behavioural economics, social psychology, cultural economy and ethnopolitics should be investigated in more depth. I agree with these authors that research in this direction will be useful to understanding more fully how housing markets in different circumstances are really functioning” (Boelhouwer, 2011, p. 279).

This enhancement of rational pricing models with behavioural concepts to provide findings of a more explanatory nature was noted by Huston and Spencer: “Both rational and behavioural influences have likely contributed to wide swings in asset prices, but it is only recently that scholars have begun to incorporate the behavioural side into their explanatory models” (Huston & Spencer, 2014, p. 215).

From a practical policy perspective, Dunning notes that the use of behavioural approaches in the housing context has increased in a number of countries including the UK, coinciding with political interest in housing market interventions, citing the example of UK ‘New Homes Bonus’ program (Dunning, 2017). In this regard, this thesis concludes with a chapter on policy observations and recommendations from the institutional context of investors.

The role of behavioural economics in housing theory is still developing and within the literature is discourse on whether and how this emerging discipline should be applied. A helpful answer to this debate is provided by Gibb: “So, how does one decide about the value or otherwise of a pragmatic approach using applied economics? Essentially, the application should be useful, insightful, interesting or novel and potentially testable” (Gibb, 2009, p. 26).

Similarly, Richard Thaler proposes that behavioural economics will become more mainstream when it supplements existing theory and enables economists to better describe and predict market behaviour: “On the theory side, the basic problem is that we are relying on one theory [traditional normative models] to accomplish two rather different goals, namely to characterize optimal behavior and to predict actual behavior. We should not abandon the first type of theories as they are essential building blocks for any kind of economic analysis, but we must augment them with additional descriptive theories that are derived from data rather than axioms” (Thaler, 2016, p. 1577).

Thaler goes further to suggest that: “Explicit tests of rational expectations per se are uncommon because we rarely observe or elicit actual expectations data. When we do, we often find that actual expectations diverge from what would reasonably be called rational” (Thaler, 2016, p. 1593).

This research contributes to the literature by comparing the stated and observed preference of investors through both rational and bounded rationality frameworks and providing an explanatory framework. This approach will have applicability to other countries and time periods.

## 6 CONCEPTUAL FRAMEWORK

### 6.1 Applicable theoretical concepts

This research is placed within the context of the following three theoretical concepts:

1. EMH and efficient pricing
2. Equilibrium pricing model
3. Bounded rationality and behavioural economics

The relevance of these concepts to this research, as identified from the literature, is outlined below.

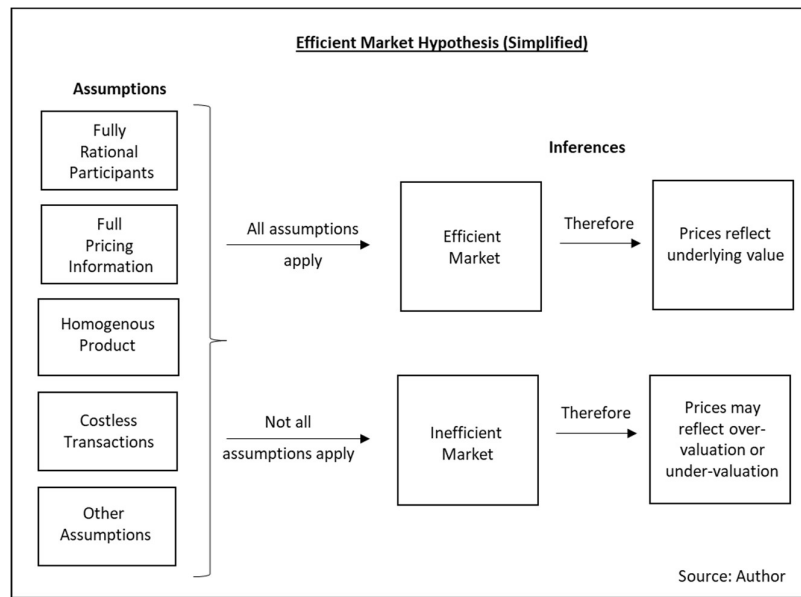
#### *6.1.1.1 EMH and efficient pricing*

EMH hold that for markets to be efficient certain conditions (assumptions) must hold, such as good pricing information, low transaction costs, well informed participants and good competition without dominant buyers or sellers. These are stated as assumptions until shown to not apply, and by inference the market cannot be assumed as efficient.

The literature suggests that these assumptions are unlikely to hold true for many (if not all) housing markets, for two key reasons. The first reason is the inherent features of the housing product, and the numerous differences by comparison to a hypothetical perfectly competitive market. This is explained by Clapham, who make note of the features of the housing market which challenge efficient market assumptions, such as infrequent and costly transactions, complexity, heterogeneity, and long lead times (Clapham, 2011). The second reason is the assumption of full rationality, discussed subsequently.

Diagrammatically, a simplified view of housing markets can be shown within the EMH construct in Diagram 2 below:

**Diagram 2: Efficient Market Hypothesis (simplified)**



This theoretical framework proposes that the efficiency of the pricing within a market is based upon a number of assumptions, which are a mix of subjective measures (rationality and full pricing information), and objective measures (homogeneity, cost of transactions).

Efficient market hypothesis allows for testing of these assumptions; but does not in itself provide a testable measure of the corresponding impact on aggregate prices compared to underlying value. Nor does it allow for the impact on pricing of any particular breach of these assumptions.

EMH allows for the testing of the assumptions and the inference of these on whether market pricing is efficient but does not quantify the impact on pricing of this inference.

#### 6.1.1.2 *Equilibrium pricing model*

The UCEM was selected as the normative test in relation to fundamental value for this research.

In selecting a model for determining over-or under valuation of houses, two aspects were considered. The first is whether the model has support within the literature to be used for housing and (ideally) within the NZ housing context. The second criteria is whether the model allows for explanatory findings to developed rather than simply determining whether a deviation from fundamental value in aggregate.

Models that seek to determine whether market deviate from an underlying value are numerous, including UCEM. The deviation of the price of housing from fundamental value can be assessed using a range of methodologies that consider long run perspective on house

price growth, price to rent ratio; price to income ratios; and user-cost (including variation in these over time), and imputed to actual rent ratios (Himmelberg et al., 2005). This purports to assess whether any particular point represent a departure from a fundamental state over the long run. This long run view of fundamentals such as user-cost or affordability ratios is helpful in noting relative changes over time, it is less explanatory over shorter periods. Those models which consider prices (and other factors) in aggregate do not allow for testing against the behaviour of investors. This research seeks an explanatory perspective that links investor behaviour to prices.

A 2016 NZ based study considered various econometric models to assess a deviation from underlying house values. It applied a number of cited econometric method to data on regional real estate prices, rents and incomes in various metropolitan centres of New Zealand, and found evidence for Auckland to be overpriced relative to rental and incomes in particular “The application reveals how prices have evolved relative to rent (as well as income) fundamentals over the last two decades, considers evidence relating to the existence of house price bubbles”(Greenaway-McGrevy & Phillips, 2016). Although these models find an element of overpricing, the explanatory value is limited. A similar study of Auckland identified a deviation from fundamental value due to house price speculation based on mathematical causality, but is not explanatory as to the factors which cause this over estimation of CGE (Yang & Rehm, 2021). The conceptual model for this research requires a framework that demonstrate a linkage between investor behaviour and can be empirically tested.

Examples of user-cost models within the NZ housing context include Westpac Bank which used a modified NPV approach to consider the effects of taxation, but still reflected the underlying assumption that “equilibrium between rents and house prices requires that the benefit of owning a rental property (rent and capital gain after taxes) must equal the cost of owning a rental property” (O'Donovan & Stephens, 2009, p. 2), and a RBNZ paper on housing taxation (Hargreaves, 2008).

Internationally, UCEM models have been used to assess deviations from fundamental value in the UK (Miles & Monro, 2021) and in the US (Himmelberg et al., 2005). In an international comparison study, the OECD considered a number of econometric models as well as user-cost models to determine deviation from long run fundamental values in a range of countries including NZ (Girouard et al., 2006).

The UCEM was adopted for this research because it uses a methodology that allows for adaption of the input variables to test scenarios rather than simply an observation of the aggregate deviation from fundamental value.

It has been noted that stated preference is rarely observed (Thaler, 2016) but is important to provide more explanatory or predictive models and the departure from what is predicted by traditional models (Sent, 2004). This has also been noted in respect of the CGE input of the UCEM which must be estimated from past market performance (Himmelberg et al., 2005) and (Flavin & Yamashita, 2002) .

The mixed methods approach of this research enables stated preference to be collected via quantitative methods and applied to the normative model in a way not possible with other aggregate pricing models. The UCEM input variables can be derived from the market (observed preference in particular GCE) but can also be obtained via qualitative methods and used to test the difference between stated and observed preference.

Other pricing models that have been adopted in NZ and overseas to test for a deviation from fundamental house value NZ do not allow for stated preference to be tested (Empirical Test 3 within the conceptual model).

Using the UCEM within the conceptual framework enables the impact of the behavioural factors that have been previously identified in the NZ housing market (Shi & Kabir, 2018) (de Bruin & Flint-Hartle, 2003), and providing explanatory and predictive ability, taking forward the challenge from these earlier studies that there is evidence for behavioural factors at play, but no framework to assess the impact (de Bruin & Flint-Hartle, 2003).

The UCEM compares the cost of renting and the cost of owning properties of similar quality, and states that the housing market attains equilibrium when these costs are equal. The UCEM indicates that when these costs differ the market prices of properties are either over-valued or under-valued. While understanding this is of great importance to this research, we can also conduct a secondary analysis from an affordability perspective by comparing the UCEM-implied prices with incomes.

The UCEM considers the relative cost of the tenures and the impact of a deviation in pricing upon decisions of rational individuals to move between the tenures. On this assumption of rationality of market participants the model holds that markets will be in equilibrium, and therefore the price of ownership (house prices) will be in equilibrium with the price of rental tenure (rentals), or as explained by Nathalie “This approach to consumer behaviour is based upon rationality. If the cost of ownership rises too high compared to the cost of renting,

demand will reduce for the purchase of houses placing downward pressure on house prices” (Nathalie et al., 2006, p. 16).

This approach is consistent with the current political and social narrative within New Zealand, as noted in the introduction to this paper. As affordability of houses declines, there has been a shift towards rental tenure.

New Zealand’s housing market is comprised predominantly of housing which is largely indistinguishable by typology between the owner-occupied and rental investment tenures. It is a market in which both the housing stock and the market participants move between the two segments readily. In this regard, the UCEM appears to be an appropriate theoretical model upon which to test the stated preference of market participants such as investors.

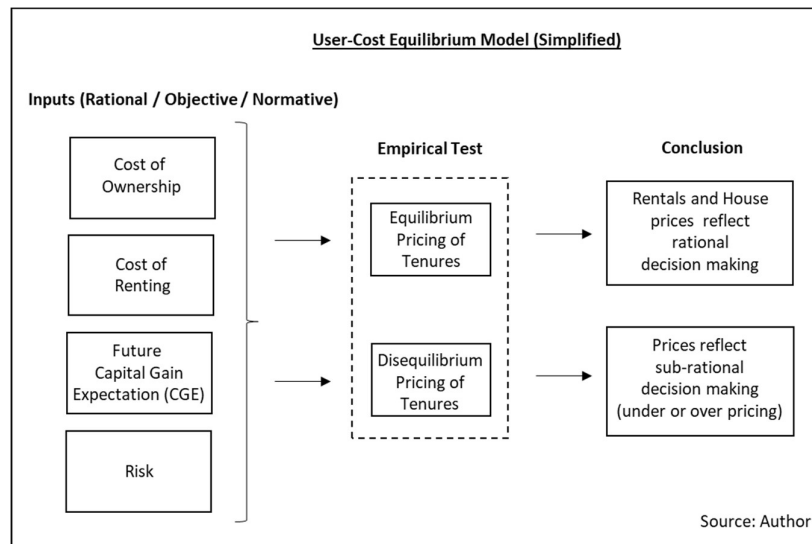
The literature indicates that the UCEM may not be appropriate to model housing markets within countries that have regulatory, taxation or banking restrictions which limit transfer between tenures. (Nathalie et al., 2006) The UCEM has been previously used and considered appropriate to the New Zealand context. (Hill & Syed, 2016)

There is evidence of over-pricing of houses within the New Zealand housing market, based upon the user-cost equilibrium model (Nguyen et al., 2022a). It suggests at an aggregate level the existence of sub-optimal pricing decisions, but not the rationale for these decisions.

The UCEM enables an empirical test for a deviation from equilibrium between the tenures. This deviation implies that one of the tenures is over-priced relative to the other and therefore there is a deviation from rational pricing.

According to the UCEM, the factors which contribute to this disequilibrium in pricing (under-pricing or over-pricing of the tenures) relate to the relative pricing of the tenures by market participants (Hill & Syed, 2016). A disequilibrium implies sub-optimal rationality in pricing from a normative perspective. The UCEM can be shown diagrammatically in Diagram 3 below:

**Diagram 3: User-cost Equilibrium Model (simplified)**



In this regard, the UCEM is an empirical test for whether prices reflect that which should normatively be observed under an assumption of fully rational decision making. This is to say that the pricing of ownership and rental of the asset reflect underlying utility and are neither over-priced or under-priced relative to the other tenure.

The model can provide insights into which inputs are likely to contribute to this over-pricing or under-pricing, but not the reason for this deviation from equilibrium.

The UCEM identifies the existence of a departure from efficient market pricing at an aggregate level but is not explanatory in itself. It may identify whether the market is out of equilibrium, suggesting under or over pricing, but not the reasons for this departure.

The third part of the conceptual framework looks at the mechanism by which these pricing decisions could be shown to influence the market equilibrium, by the mis-pricing of either tenure. Behavioural economics provides a framework to consider the factors that may contribute to a bounded rationality resulting in this mis-pricing of the tenures compared to the normative approach.

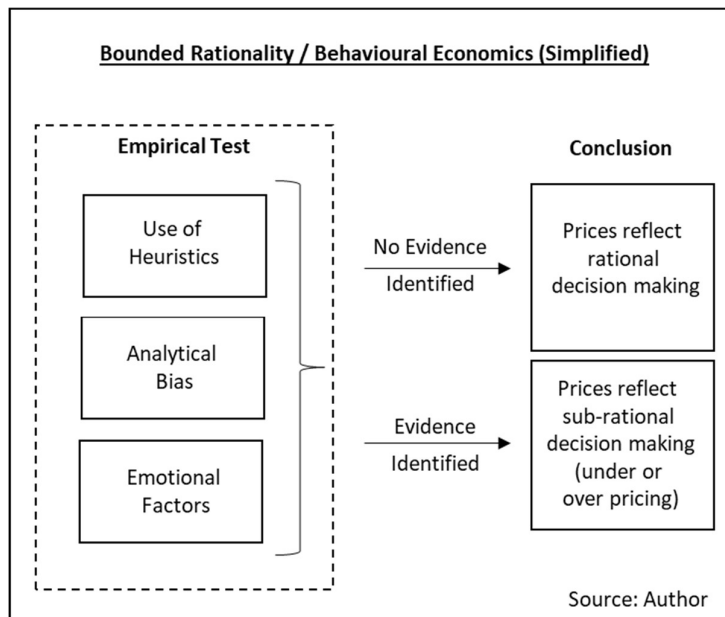
#### *6.1.1.3 Bounded rationality and behavioural economics*

The assumption of full rationality is inherent in classical economics and underpins both the efficient market hypothesis and the UCEM model. This assumption is challenged in the literature by the introduction of the concept of 'bounded rationality'.

The literature identifies that in many markets, there are observations of heuristics, biases and emotional matters which place limits on the extent to which individual pricing decisions can be considered fully rational, efficient, and reflective of underlying economic value. These

bounded rationality factors were found to exist in housing markets also, with a corresponding impact on prices. In an study of a United States housing market for example it was determined that high house price growth was driven by irrational factors such as emotional impulses: by the economic fallacies people believe in; by the mechanisms (word of mouth, media frenzies) which amplify these; and also by the imprint of animal spirits (Case & Shiller, 2003). These factors, as they apply to housing markets, can be shown diagrammatically as follows in Diagram 4:

**Diagram 4: Bounded Rationality / Behavioural Economics (simplified)**



## 6.2 Conceptual Model for Empirical Testing

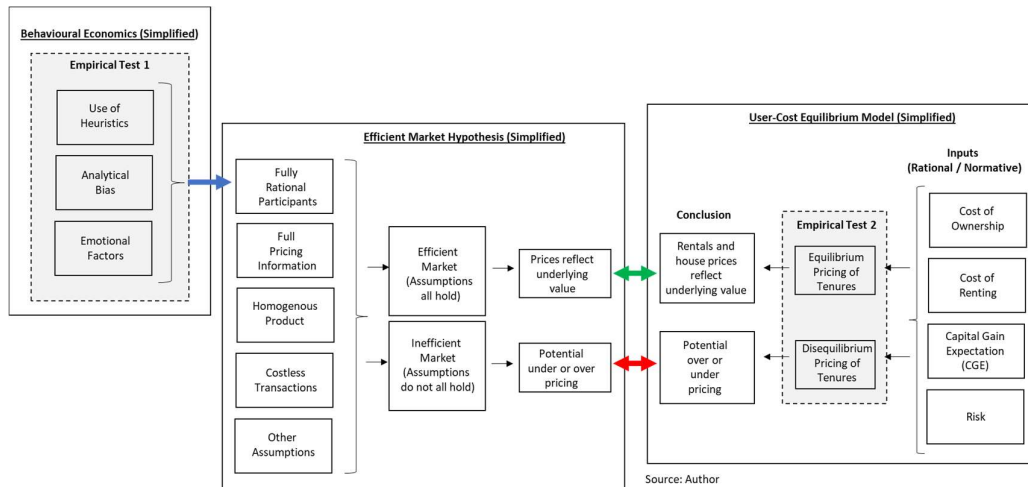
Housing markets are noted within the literature as not meeting many of the assumptions required for an efficient market and therefore equilibrium pricing. These efficient market assumptions which may not apply to housing markets relate to the product (heterogeneity), the structure of the market (thin trading, expensive to transact, poor information), and the market participants (bounded rationality). Examples of bounded rationality within housing markets are found within the literature.

The measurement of equilibrium pricing (and the existence of over-pricing or under-pricing as a deviation therefrom) in housing markets via the UCEM also has support in the literature.

Below is a diagrammatic representation of the conceptual framework within which this research is based. It brings together the three theoretical frameworks above. Behavioural economics provides a framework for testing the existence of bounded rationality, while the

UCEM provides a test for a disequilibrium in the pricing of assets indicating whether the market prices of properties reflect their underlying values. Both of these theories operate within the conceptual framework of efficient market hypothesis as shown in Diagram 5 below:

**Diagram 5: Conceptual Framework (Empirical Tests 1 and 2)**

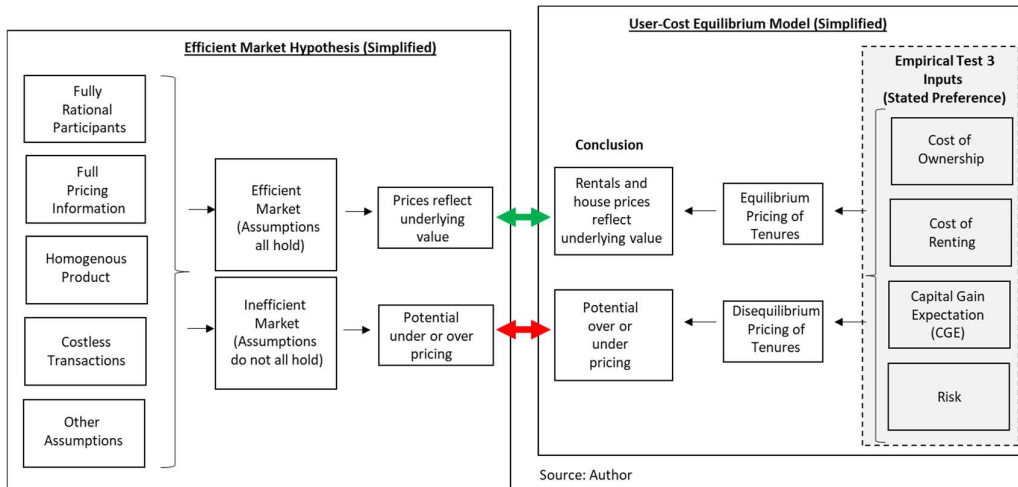


This conceptual framework allows for the empirical testing of both the cause and effect of a breach of the underlying rationality assumptions of efficient market hypothesis, as it applies to housing markets.

This research brings together the two conceptual streams of bounded rationality and UCEM within the construct of efficient market hypothesis to provide an explanatory element to the mechanism by which individual decisions may deviate from efficient pricing and therefore at an aggregate level, over-pricing or under-pricing.

The framework allows for three empirical tests. Test 1 (shaded at left in Diagram 5 above) seeks evidence of heuristics, biases and emotional influences in the decision making of investors. Test 2 (shaded at right in Diagram 5 above) seeks evidence for the under or over-pricing of houses. Empirical Test 3 is shown shaded in Diagram 6 below:

**Diagram 6: Conceptual Framework (Empirical Test 3)**



Empirical Test 3 compares the stated preference of investors to the normative inputs within Test 2. This enables the impact of these stated preferences by comparison to the normative model. It enables the impact of the stated preference to be quantified as providing an upside or downside bias compared to the normative model, thereby quantifying the impact of the bounded rationality on pricing decisions.

## 7 RESEARCH METHODOLOGY

### 7.1 Philosophical approach

#### 7.1.1 Ontology

Objectivism is an ontological position that asserts that social phenomena (such as property markets and the institutions within) and their meanings have an existence that is independent of or separate from social actors (Bryman, 2008). However, this research seeks evidence of the motivations and behaviours of individuals within the social construct of the property market (and wider institutional constructs) and is therefore the subjective interpretation of individuals, rather than a shared objective reality. This lack of an objective reality independent of the social actors implies a constructionist ontology wherein different individuals potentially construct meaning in different ways in relation to the same phenomenon (Crotty, 1998).

This research considers the behaviours and motivations of individuals and looks for evidence of theoretical constructs within the stated preference of those individuals. In this regard, the gathering of this evidence and interpretation of the findings is not Positivist in ontology.

#### 7.1.2 Epistemology

Epistemology is concerned with providing a philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate (Crotty, 1998).

Epistemology considers the nature of the knowledge being sought, and the extent to which it can be objectively and independently observed or requires subjective interpretation by the researcher. If the knowledge is considered as hard, objective and tangible then the researcher can take an observational role together with the use of the positivist methods of natural science. However, if the knowledge is considered personal, subjective and unique, then this imposes on the researcher a rejection of the methods used by natural science and a greater level of involvement with their subjects (Cohen et al., 2007).

This distinction will determine the methods that should be adopted to obtain that knowledge.

The motivations of investors cannot be directly observed, as they are an internal process to the individual. Motivation is the precursor to action, it is the intention and willingness to act, rather than the action itself, the concept of 'why people do what they do' (Turner, 2006).

Behaviours can be independently observed but require an element of judgement to derive meaning. A positivist approach is not appropriate in this instance as it should only be applied where the knowledge is deemed to be objective, value-free, generalisable and replicable (Wellington, 2015). The observed preference (market pricing) and the other inputs to the user-cost equilibrium model do largely meet the requirements for a positivist approach, albeit with an element of subjectivity.

Interpretivist methodologies should be applied when “access to reality (given or socially constructed) is only through social constructions such as language, consciousness, and shared meanings. Such interpretive research does not predefine dependent and independent variables, but focuses on the full capacity of human sense making as the situation emerges” (Myers, 1998, p. 233).

This motivational and behavioural knowledge that is being sought as part of this research is the subjective view of individuals and cannot be directly observed, but rather must be conveyed to (and interpreted by) the researcher.

This research therefore has two epistemological perspectives, due to the combination of objective and subjective knowledge required to undertake the empirical tests outlined in the conceptual model.

## 7.2 Research Strategy

The fields of behavioural economics and equilibrium pricing have an established body of theory and empirical studies upon which to build. This research applies this body of knowledge to evidence within the New Zealand context, as a case study.

This research seeks a theoretical and evidential basis for the development of a conceptual model that links investor behaviour to house price escalation. This study is therefore described by Hart as being both *explanatory research*, looking to establish the cause of non-occurrence of a phenomenon or to show the causal connections and relationships between two variables; and also *applied research*, because existing theory is being applied to real world situations, being the stated and observed preference of investors (Hart, 1998).

This research therefore requires more than one research strategy.

In order to explain the causal relationship between investor behaviours and house prices, the evidence obtained needs to be sufficiently detailed to allow for an interpretation and understanding. In this regard, Bryman suggests that qualitative approaches should be applied where the data being sought is in relation to the way individuals interpret their social

world or social reality as an emergent property of the individual's creation (Bryman, 2008). The adoption of qualitative approaches within an interpretive epistemology is well supported within the literature, examples include Yin who suggested that qualitative approaches better allow researchers to work closely with participants and collect information pertaining to their personal thoughts and experiences (Yin, 2003); and "when the goal of research is to develop a conceptual model for the purpose of building theory around a particular phenomenon or process, an interpretive approach utilising a qualitative methodology may be more appropriate" (Levy, 2006, p. 370).

On the basis outlined above, Empirical Test 1 requires a qualitative strategy. By contrast, Empirical Tests 2 and 3 are the application of secondary datasets to an existing theoretical framework, being the UCEM.

In general terms within the social science, Bryman notes that a quantitative research strategy should be applied when data is being collected and analysed in a deductive manner in relation to existing theory (Bryman, 2008). This generalised view was also identified in relation to property research: "if the primary goal of the research problem is to test the validity of a model where all the variables which influence a phenomenon or process is already known, then a quantitative methodology may be more appropriate" (Levy, 2006, p. 370).

Consistent with these authors and studies identified within the literature from New Zealand and overseas (that similarly applied prevailing theory to secondary data), a quantitative and deductive strategy was applied to Empirical Tests 2 and 3.

### 7.3 Research Methods

Research methods are a set of procedures, tools and techniques used to generate and analyse data (Bryman, 2008). The research methods adopted and the basis for the adoption of these are outlined below.

#### 7.3.1 Qualitative Methods

Empirical Test 1 sought evidence of bounded rationality in investor motivations and behaviours. In this regard it is the investor's stated preference (and as observed via institutional influencers for reasons outlined subsequently). As outlined above, this requires a qualitative strategy and methods.

This qualitative dataset must be obtained using methods that allow the individual responses to be compared to the theoretical concepts that were developed from the literature, as outlined in Table 2 below:

**Table 2: Evidence Sought (Empirical Test 1)**

<u>Theme</u>	<u>Evidence sought</u>
Heuristics	<ul style="list-style-type: none"> <li>• Use of analytic techniques or heuristics in decision making and relative importance (deviation from rationality / fundamentals)</li> <li>• Sources of information and justification for use (use of approximations and opinions rather than data)</li> <li>• Heuristics consciously being used in practice ('rules of thumb' in common use and level of influence)</li> <li>• Perceptions of complexity in decision making (use of unconscious heuristics)</li> </ul>
Biases	<ul style="list-style-type: none"> <li>• Use of reference levels in determining investment decisions such as asset types, timing and pricing (reference/linking bias)</li> <li>• The key comparative factors that determine whether price is appropriate (anchoring bias)</li> <li>• The influence of other market participants, use of lead and lag indicators, influence of perceived market sentiment (herd instinct bias)</li> <li>• The type of risks that are actively considered and monitored (loss aversion, disaster myopia)</li> <li>• Timeframes under active consideration, and relevance of factors within these timeframes (temporal distortion bias)</li> <li>• Benchmarks used to assess performance (framing bias)</li> <li>• Factors that influence assessment of past performance and influence on future decisions (choice framing, status quo bias, endowment effects)</li> </ul>
Motivations	<ul style="list-style-type: none"> <li>• Stated preference in terms of motivations for investment decisions</li> <li>• Extent of endogenous or exogenous influence and locus of control on motivations</li> </ul>
Framing of expectations	<ul style="list-style-type: none"> <li>• Identification of the institutions that provide information that influence expectations</li> <li>• The extent to which this information influences expectations</li> </ul>

	<ul style="list-style-type: none"> <li>• The basis of determining the reasonableness of return (hedonic framing of expectations)</li> </ul>
Influence on decision processes	<ul style="list-style-type: none"> <li>• Identification of the institutions that have the most influence investment decisions</li> <li>• Identification of the policy and practice levers can influence investor decisions</li> </ul>
Constraints on behaviour	<ul style="list-style-type: none"> <li>• Identification of the investor behaviours are subject to constraints by institutional influence</li> <li>• Identification of the policy and practice levers can influence investor behaviour</li> </ul>

Research into behavioural factors identified within the literature is dominated by qualitative (as well as experimental) methods. Gibb notes: “A key feature of the behavioural school is the identification from survey and experimental data of anomalies or other decision-making heuristics which require a rethinking of standard economic problems and a hope of re tooling of advice and analysis by economists” (Gibb, 2009, p. 35).

The literature includes many qualitative studies into behavioural factors, using a range of survey and interview methods. In a 2018 study, Shi notes in terms of methodology that “Animal spirits are more about human psychology. Survey methods are often used by researchers to estimate social contagion” Shi and Kabir (2018, p. 63). Cited in the same paper, Case and Shiller (1988) used the questionnaire survey method to examine household buyers’ expectations of future price increases (Case & Shiller, 1988).

Questionnaire survey methods have also been used in a study of behavioural factors in housing investment in New Zealand. In this study, a postal survey was used followed by in depth interviews. In summarising this approach, the authors noted “Qualitative analysis overlays the quantitative data, to enable better exploration of the constraints within which individual investors operate” (de Bruin & Flint-Hartle, 2003, p. 271).

An earlier study within the property sector made a similar observation in respect to the limitations of surveys over interview methods that appeared to not sufficiently describe the complexities of the client-valuer relationships. The authors noted that respondents “may have been influenced by something which we were not able to capture using an anonymous mail survey approach” (Worzala et al., 1998, p. 427).

In a journal article advocating for qualitative methods, a similar perspective was suggested: “In order to understand many behavioural aspects of property markets, the real estate academic community should embrace research that does not merely produce empirical descriptions of markets but also moves to understanding and interpreting them” (Levy, 2006, p. 369).

The literature supports the adoption of methods such as interviews that allow for a greater level of understanding of the decision-making process of investors.

Bryman proposes that the structured interview promotes standardisation in both the asking of questions and recording of answers, reducing variation in the asking of questions and accuracy in coding and comparing responses while allowing some latitude for further questions in response to what are seen as significant replies (Bryman, 2008).

A structured interview with open-ended questions provides a greater opportunity for respondents to organize their answers within their own frameworks. This increases the validity of the responses and is best for exploratory and in-depth work but does make coding and then analysis more difficult (Aberbach & Rockman, 2002).

A structured interview method was adopted for Empirical Test 1. The detail of how this method has been utilised in this research and supporting rationale are outlined below.

#### *7.3.1.1 Structured interview design*

In determining who should be interviewed for this research, I considered two factors. Behavioural and motivational theory notes the potential impact of the social context on the individual. Whereas heuristics tend to be internal to the individual, biases are sociological in nature, external to the individual and can induce decision-making biases by way of believing what others think and following what others do (Ahmad et al., 2017). An example of a potential bias within housing markets that is well supported in studies is the impact of market sentiment.

The second factor is the potential to utilise a triangulation approach. Triangulation is defined by Bryman as the use of more than one method or source of data in the study of a social phenomenon so that findings may be cross-checked (Bryman, 2008). The value of triangulation techniques within qualitative property research was noted in the literature: “this second group’s perceptions can then be ‘triangulated’ with the data collected from first group’s interviews by determining the perceptions of both players in the process. Triangulation provides support for the trustworthiness of the research” (Levy, 2006, p. 382), and also in other fields: “within method source triangulation involves the collection of data

from different types of people, including individuals, groups, families, and communities, to gain multiple perspectives and validation of data using the same methodology” (Thurmond, 2001, p. 254).

The literature includes references to the influence of third parties and the use of advice by investors of housing, but there was insufficient evidence from the literature to determine which institutions were of most influence. The composition of the second group was determined by asking investors which institutions were influential in their decisions. Based on the responses of the investor group, a second group of institutional interviewees was selected.

#### *7.3.1.2 Sample size and composition*

In determining the sample size, the literature contains many factors that could be taken into consideration. The most directly comparable study identified (New Zealand housing investor decision-making) had a sample size of 35 qualitative interviews in a mixed methods study (de Bruin & Flint-Hartle, 2003). The literature includes discourse on the validity within qualitative studies of determining sample size *a priori* or whether this is inherently problematic in qualitative research, given that sample size is often adaptive and emergent, and should be based upon adoption of a principle of saturation (Sim et al., 2018).

This principle of saturation is that data should be collected until each category is saturated, and the sample size is determined when the outcome of the interviews becomes repetitive and no new themes emerge (Corbin, 2015).

Taking into account these factors an initial sample size of 40 interviews was selected, with a balance between the two groups, i.e. 20 investors and 20 from the institutional environment of the investors.

In selecting the composition of the investor group and the validity of the responses, I considered the principle that the group should be indicative of the population to ensure generalisability of the results (Bryman, 2008). A sample of 20 investors is statistically small number of the estimated 200,000 residential property investors (NZPC, 2012). However, with qualitative research the most pertinent statistical matter is that of generalising findings from the sample to the underlying population (Onwuegbuzie & Leech, 2007).

The size of the portfolio held by residential investors is not well documented. Large-scale landlords have a very limited presence in the New Zealand market, with most investors in the New Zealand rental market being relatively small scale and only work part-time in the sector, with most landlords own 1-3 rental properties (NZPC, 2012). The NZ Property Investors

Federation estimates that 75% of investors own less than 2 properties (NZPIF, 2023). Infometrics estimated that 20% of the housing stock being owned by investors with 6 or more properties (Infometrics, 2021), and this is further reinforced by a 2022 sample survey of Auckland investors undertaken by the Ministry of Housing and Urban Development (Development, 2022).

The sample group is therefore weighted towards small to medium scale investors, as outlined in Table 3 below. This sample was obtained via a public advertisement, a request to the New Zealand Property Investors Federation, and snowball referrals. Of the 20 investors, 12 (10 small and 2 medium) were obtained via the APIA, and 6 (4 small and 2 medium) were obtained by snowball referrals. Both large investors were directly contacted by the researcher.

**Table 3: Investor Sample Composition**

<u>Portfolio Size</u>	<u>Number of Interviewees</u>
Large (more than 10 properties)	2
Medium (3 - 10 Properties)	4
Small (1 - 3 properties)	14
Total	20

The institutional interview respondent group was selected from those organisations that were identified as being influential on investor decisions, as outlined in the Qualitative Findings chapter and as shown in Table 4 below. All Institutional Interviewees were contacted directly by the researcher, based upon the reference to their institution by the Investors interviewed.

**Table 4: Institutional Sample Composition**

<u>Industry Sector</u>	<u>Number of Interviewees</u>
Market Intermediaries	3
Advisors	3
Banking and Finance	3
Industry Association	2
Media / Commentary	3
Regulatory and Policy	6
Total	20

The list of survey respondents (anonymised) for each sample is included in Appendices 1 and 2.

7.3.1.3 Interview questions

The interviews were structured around a set of questions designed to obtain evidence for the behavioural factors identified from the literature, as listed above. Survey questions and list of respondents are included in Appendices 1 and 2 respectively.

The rationale for the interview questions and triangulation is outlined in Tables 5 and 6 below:

**Table 5: Interview Questions Rationale (Heuristics)**

<u>Evidence Sought</u>	<u>Investor Questions</u>	<u>Institutional Questions</u>	<u>Rationale</u>
<ul style="list-style-type: none"> <li>• Use of analytic techniques or heuristics in decision making and relative importance (deviation from rationality / fundamentals)</li> <li>• Sources of information and justification for use (use of approximations and opinions rather than data)</li> </ul>	<ul style="list-style-type: none"> <li>• Which analytical methods and analytical tools are used in the evaluation of decisions to invest in housing assets?</li> <li>• To what extent are 'rules of thumb' used in analysis, what are these rules? To what extent do they supplement, support or override analysis?</li> <li>• Which sources of information and advice are used in decision making? How are these weighted?</li> </ul>	<ul style="list-style-type: none"> <li>• Which analytical methods and analytical tools are used by investors in the evaluation of decisions to invest in housing assets?</li> <li>• To what extent are 'rules of thumb' used by investors, what are these rules? To what extent do they supplement, support or override investor analysis?</li> <li>• Which sources of information and advice are used by investors in decision making? How are these weighted?</li> </ul>	<ul style="list-style-type: none"> <li>• Testing the contrast between the institutional perspective and investor perspective in order to validate findings or provide insights into perception gaps</li> <li>• The objective in the questioning is to identify where investors consciously or unconsciously use heuristics or analysis and recognise what is advice and what is information / data.</li> </ul>
<ul style="list-style-type: none"> <li>• Perceptions of complexity in decision making (use of unconscious heuristics)</li> </ul>	<ul style="list-style-type: none"> <li>• Which analytical methods and analytical tools are used in the evaluation of decisions to invest in housing assets?</li> <li>• To what extent are 'rules of thumb' used in analysis, what are these rules? To what extent do they</li> </ul>	<ul style="list-style-type: none"> <li>• Which analytical methods and analytical tools are used by investors in the evaluation of decisions to invest in housing assets?</li> <li>• To what extent are 'rules of thumb' used by investors, what are these rules? To what extent do they supplement, support</li> </ul>	<ul style="list-style-type: none"> <li>• The objective in the questioning is to identify where investors consciously or unconsciously use heuristics or analysis. (Respondents get to self-select for each category)</li> <li>•</li> </ul>

	supplement, support or override analysis?	or override investor analysis?	
<ul style="list-style-type: none"> <li>• Heuristics consciously being used in practice ('rules of thumb' in common use and level of influence)</li> </ul>	<ul style="list-style-type: none"> <li>• Which analytical methods and analytical tools are used in the evaluation of decisions to invest in housing assets?</li> <li>• To what extent are 'rules of thumb' used in analysis, what are these rules? To what extent do they supplement, support or override analysis?</li> </ul>	<ul style="list-style-type: none"> <li>• Which analytical methods and analytical tools are used by investors in the evaluation of decisions to invest in housing assets? To what extent are 'rules of thumb' used by investors, what are these rules? To what extent do they supplement, support or override investor analysis?</li> </ul>	<ul style="list-style-type: none"> <li>• The objective in the questioning is to identify where investors consciously or unconsciously use heuristics or analysis. (Respondents get to self-select for each category)</li> <li>• Institutions were not asked for the internal decision processes, this as it is an internal factor to the investors</li> </ul>

**Table 6: Interview Questions Rationale (Heuristics)**

<u>Evidence Sought</u>	<u>Investor Questions</u>	<u>Institutional Questions</u>	<u>Rationale</u>
<ul style="list-style-type: none"> <li>• Use of reference levels in determining investment decisions such as asset types, timing and pricing (reference/linking bias)</li> <li>• The key comparative factors that determine whether price is appropriate (anchoring bias)</li> <li>• The comparative basis used to assess performance (framing bias)</li> </ul>	<ul style="list-style-type: none"> <li>• How is performance benchmarked (own performance and comparative) and how is a reasonable return determined? What is the basis of comparison?</li> <li>• What are the expected benefits from investment? How are these expectations determined and what causes them to change?</li> <li>• To what extent is past performance and future projections considered?</li> </ul>	<ul style="list-style-type: none"> <li>• To what extent do past and anticipated future market performance influence investor expectations?</li> </ul>	<ul style="list-style-type: none"> <li>• Institutions were not asked for the internal decision processes, this as it is an internal factor to the investors</li> </ul>

<ul style="list-style-type: none"> <li>• The basis of determining reasonableness of return (hedonic framing of expectations)</li> </ul>			
<ul style="list-style-type: none"> <li>• The influence of other market participants, use of lead and lag indicators, influence of perceived market sentiment (herd instinct bias)</li> </ul>	<ul style="list-style-type: none"> <li>• To what extent is consideration given to the decisions of other market participants, use of lead and lag indicators, influence of perceived market sentiment. From where this this information obtained?</li> <li>• To what extent is past performance and future projections considered?</li> </ul>	<ul style="list-style-type: none"> <li>• To what extent are investors influenced by perceived market sentiment?</li> <li>• From where is this this information obtained?</li> </ul>	<ul style="list-style-type: none"> <li>• Testing the contrast between the institutional perspective and investor perspective may provide insights into perception gaps</li> <li>• Institutions were asked for their perspective on this, as the institutional environment potentially provides much of this information to investors</li> </ul>
<ul style="list-style-type: none"> <li>• The type of risks that are actively considered and monitored (loss aversion, disaster myopia)</li> </ul>	<ul style="list-style-type: none"> <li>• What are the type of risks that are considered when making a decision, and which are actively monitored?</li> </ul>	<ul style="list-style-type: none"> <li>• What are the type of risks that are considered by Investors, and which risks are actively monitored?</li> </ul>	<ul style="list-style-type: none"> <li>• Testing the contrast between the institutional perspective and investor perspective may provide insights into perception gaps</li> </ul>
<ul style="list-style-type: none"> <li>• The timeframes under active consideration, and relevance of factors within these timeframes (temporal distortion bias)</li> <li>• Factors that influence assessment of past performance</li> </ul>	<ul style="list-style-type: none"> <li>• Which timeframes considered, both forward and backward and what is the priority of these?</li> <li>• To what extent is past performance and future projections considered?</li> </ul>	<ul style="list-style-type: none"> <li>• To what extent do past and anticipated future market performance influence investor expectations?</li> </ul>	<ul style="list-style-type: none"> <li>• Institutions were asked for their perspective on this, as the institutional environment potentially provides much of this information to investors</li> </ul>

and influence on future decisions (choice framing, status quo bias, endowment effects)			
<ul style="list-style-type: none"> <li>• The stated preference in terms of motivations for investment decisions</li> </ul>	<ul style="list-style-type: none"> <li>• What are the expected benefits from investment? How are these expectations determined and what causes them to change?</li> </ul>		<ul style="list-style-type: none"> <li>• Institutions were not asked this as it is an internal factor to the investors, difficult to observe externally</li> </ul>
<ul style="list-style-type: none"> <li>• The extent of endogenous or exogenous influence and locus of control on motivations and decision process</li> <li>• Those institutions (and policy and practice levers) can influence investor decisions?</li> <li>• Those investor behaviours that are subject to constraints by institutional influence?</li> </ul>	<ul style="list-style-type: none"> <li>• Which institutions, policies and practices have the most influence on investment decisions, and to what extent does this information influence expectations?</li> </ul>	<ul style="list-style-type: none"> <li>• How does your institution influence the decision making of investors in terms of information sources, analysis, or rules of thumb, or expectations?</li> <li>• Which other institutions, policies and practices have the most influence on investor decisions?</li> </ul>	<ul style="list-style-type: none"> <li>• This question was used to inform the selection of Institutional respondents. Institutions were asked for their perspective on this, as the institutional environment potentially provides much of this information to investors</li> </ul>
<ul style="list-style-type: none"> <li>• Those institutions that provide information that influence expectations, and how and to what extent does this information influence expectations?</li> </ul>	<ul style="list-style-type: none"> <li>• Which institutions, policies and practices have the most influence on investment decisions, and to what extent does this information influence expectations?</li> </ul>	<ul style="list-style-type: none"> <li>• How does your institution influence the decision making of investors in terms of information sources, analysis, or rules of thumb, or expectations?</li> <li>• Which other institutions, policies and practices have</li> </ul>	<ul style="list-style-type: none"> <li>• Note, this is used to inform the selection of Institutional respondents.</li> <li>• Institutions were asked for their perspective on this, as the institutional environment potentially</li> </ul>

		the most influence on investor decisions?	provides much of this information to investors
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7.3.1.4 *Data gathering, analysis and coding*

Semi-structured interviews allow respondents the latitude to articulate fully their responses but require more attention from the interviewer since such an interview has a more conversational quality to it. Wherever possible, the interview should be recorded to enable a conversational style and to minimise information loss (Campbell et al., 2013). All but two of the interviews were recorded and transcribed, enabling better accuracy. The shortest was 25 minute and the longest was 1 hour 15 minutes.

A set of questions was provided to the respondents along with a brief overview of the research and a statement covering ethical matters such as confidentiality and storage of responses. These questions were developed to avoid ambiguity in the data being coded and any unconscious bias on behalf of the respondents, for example the ordering of questions began with the general and become more specific, to avoid the specific question being “discounted in the minds of respondents because they think they have already covered it” (Bryman, 2008, p. 205), for example the questions about analysis and tools preceded questions about ‘rules of thumb’; and the sources of information and comparable investments (what is given consideration) and importance of factors (weighting) were asked as two separate questions, to enable this information to be recorded separately.

Qualitative data analysis is the classification and interpretation of material in order to make statements about implicit and explicit dimensions and structures of meaning-making in the material and what is represented in it (Roulston, 2014). The responses were interpreted and coded in a deductive manner according to the a-priori behavioural concepts outlined in section 7.3.1.2, being the heuristics and biases identified from the literature. Although themes were distilled following this process of coding for the purposed of presenting the data within this report, this was not thematic coding.

All transcripts were independently transcribed and stored electronically in a secure folder to ensure confidentiality of respondents. The identities of the respondents were not available to the transcriber.

Coding was undertaken within the NVivo software, with the nodes developed from the literature and as summaries in the Tables 3 and 4 above.

### 7.3.2 Quantitative Methods

As outlined within the research strategy sections, the appropriate research strategy for Empirical Tests 2 and 3 is quantitative. The method adopted is a spreadsheet model of the UCEM, using secondary datasets for Test 2 (testing for market equilibrium) and a mix of secondary datasets for Test 3 which modifies the model to test the stated preference of investors.

#### *7.3.2.1 Applicability of the UCEM within housing markets.*

The UCEM proposes that for a rational market participant in a durable good market, the user cost of ownership should equate to the cost of renting that good (Hicks, 1939). The UCEM methodology is well supported within the literature for determining equilibrium pricing (and deviation thereof) for durable goods between ownership and renting tenure.

The application of the UCEM to housing markets has been adopted in the context of the Australian and New Zealand housing market by Hill and Syed (2016) and Nguyen et al. (2021), and adopted by the RBNZ for the purposes of assessing house price sustainability (Brunton, 2021) and taxation impacts (Hargreaves, 2008).

The literature is supportive of the assertion that housing markets can depart from the assumptions of EMH such as freely available information (Clapham, 2011) and heterogeneity (Gibb, 2009). This raises the question of whether a model such as UCEM should expect to find equilibrium within an inefficient market. In this regard, the UCEM is a normative model that compares aggregate observed preference (house price and rental prices) against what would normatively be expected were the market operating efficiently. In this way, the UCEM provides an indication of the impact of any inefficiencies that exist within the market (such as poor pricing information or bounded rationality) as a deviation from the normative model (equilibrium pricing of the tenures). The model holds that when either tenure becomes sufficiently overpriced, prices will adjust back towards equilibrium (Nathalie et al., 2006). The UCEM should be expected therefore to correctly identify a deviation from a normative equilibrium in a market which known to be inefficient. However, a fundamental premise of the model is that this deviation would be reduced (or perhaps reversed) over time, and the extent and duration of this deviation will reflect the impact of market imperfections (compared to the EMH ideal) on efficient pricing.

This is to say that the EMH assumptions do not hold in the case of many property markets, but the UCEM as an estimate of the normative equilibrium pricing of tenures does hold because it predicts that inefficient market may not be in equilibrium (under or over pricing

of a tenure) but that over time prices will adjust because of this mis-pricing, thereby reducing the deviation from equilibrium. This is explained by the RBNZ in selecting the UCEM: “from the perspective of households, sustainable house prices should reflect the net benefits of home ownership, particularly when compared with the alternative of renting. This means the options of home ownership and renting should be balanced over time, and the net benefits of both options should not deviate significantly” (Brunton, 2021, p. 4).

The existence of heuristics and biases as a form of bounded rationality (and a breach of the EMH assumption of full rationality) within housing markets is supported within the literature overseas (Gibb, 2009) and in NZ (Shi & Kabir, 2018) (de Bruin & Flint-Hartle, 2003). The impact of these factors (if they exist within the market) on pricing will be implicit in the observed preference pricing data. The UCEM should rightly identify a departure from rational pricing when assessing this observed preference data (by identifying a deviation from equilibrium).

This raises the question as to whether these heuristics and biases are evidence of bounded rationality or are a rational response to poor information and pricing signals within an inefficient market. In this regard, the defining matter is whether this tendency to generalise is unavoidable given the inefficiencies in the market (and therefore rational) or represents bounded rationality such as heuristics that are adopted in response to undue complexity (Pingle, 1992) or being not good at taking into account all possible risks when making their decisions (Shi & Kabir, 2018). This factor is considered within the Discussion chapter in relation to the testing of the heuristics and biases identified in the qualitative phase of the research and Empirical Test 3.

The findings within this research have been considered within these questions of the extent to which bounded rationality as a departure from EMH can be compared to a normative model such as UCEM, and this is addressed in the Discussion and Conclusion Chapters.

Chapter 11 identifies potential areas that could be further researched in terms of this connection between expectations of rational behaviour within an inefficient housing market.

#### *7.3.2.2 UCEM Model calculations*

The UCEM has been used previously in the context of the Australian and New Zealand housing market by Hill and Syed (2016) and Nguyen et al. (2021). According to those studies market equilibrium is attained when the following equation holds:

$$R_t = u_t P_t$$

Where  $R_t$  denotes the period  $t$  rental price;  $P_t$  is the purchase price;  $u_t P_t$  is user cost and  $u_t$  the per dollar user cost. In a housing context, the per dollar user cost can be calculated as follows:

$$u_t = r_t + \omega_t + \delta_t + \gamma_t - g_t$$

where  $r$  denotes an appropriate interest rate,  $w$  is running and average transaction costs,  $\delta$  the depreciation rate for housing,  $\gamma$  the risk premium of owning as opposed to renting, and  $g$  the expected capital gain.

Of the variables within the model, the literature discussion focussed largely on the estimate of the expected capital gain ( $g$ ) and the matching of the quality of the house prices with the rental stock.

The value for  $g$  is not directly observable (however, this research seeks the stated preference of investors in relation to this variable). There are various methodologies adopted in the literature including the use of indices, but the convergence in the New Zealand context is to assume that the expected real capital gain is extrapolated from the past performance of the housing market (Hill & Syed, 2016) (Nguyen et al., 2022a), based upon overseas studies, for example (Himmelberg et al., 2005) and (Flavin & Yamashita, 2002).

The duration of past market performance that should be used to create an estimate for the nominal value component of  $g$  focusses on the issue of volatility. Using a timeframe of at least 10 years was seen to substantially reduce the volatility of expected capital gain and results in the user-cost equilibrium approach being more likely to be practically applicable in the housing context (Nguyen et al., 2022b). That study also noted that other authors (Verbrugge (2008), Diewert (2009), Girouard et al. (2006)) had found that high volatility in the user cost can occur when the expected capital gain is extrapolated from short market performance horizons. The impact of different durations of past market performance was modelled a part of Empirical Test 2, to determine whether a shorter timeframe creates volatility with the datasets used.

In relation to the matching of house quality between the house price data and rental data, the concern is that the dwellings included in price indexes do not match the dwellings in rent indexes, so that the resulting comparison is akin to 'apples to oranges' despite the user cost equilibrium condition implicitly assuming that that  $P_t$  and  $R_t$  refer to houses of equal quality (Hill & Syed, 2016). The quality (amenity, age, condition) of rental properties in New Zealand is lower than owner occupied houses (CHRANZ, 2007) (Johnson et al., 2018).

To account for this difference in quality, an allowance of 18% (reduction from raw house price data) was adopted in studies in Australia (Hill & Syed, 2016) and New Zealand (Nguyen et al., 2022a). This value has been adopted, recognising that there is no comparable value within the NZ context, but this allowance is consistent with a comparative study which found a demonstrably lower standard of accommodation for rental properties compared to owner-occupied houses in NZ (Jones & White, 2023).

All variables adopted for Empirical Test 2 were all sensitivity tested, consistent with the methodology of other studies, such as those quoted above. This enabled an assessment to be made as to which variables are impactful on the result of the model and warrant more detailed consideration.

### 7.3.2.3 Quantitative modelling variables

The following datasets, values and methodologies were applied to the variables within the UCEM, with literature upon which this adoption is based, are outlined in Table 7 below:

**Table 7: UCEM Variables (Datasets and Rationale)**

<u>Variable</u>	<u>Source of Dataset</u>	<u>Rationale</u>
$R_t$ (rental price)	MBIE tenancy bond data	Monthly raw data used
$P_t$ (house prices)	REINZ Median house price	Monthly raw data used
$r_t$ (interest rate)	RBNZ mortgage interest rate new customer average rate and term deposit rate	Monthly raw data used
$\omega_t$ (running and transaction costs)	Assumption	2%, as adopted by Hill and Syed (2016) and reference to (Harding et al., 2007)
$\delta_t$ (depreciation rate for housing)	Assumption	2.5% based upon (Harding et al., 2007)
$\gamma_t$ (risk premium of owning)	Assumption	1%, based upon (Flavin & Yamashita, 2002) and (Himmelberg et al., 2005)
$g_t$ (expected capital gain)	Calculated using REINZ Median house price and CPI data (RBNZ)	10 Year real CAGR (using monthly CPI data), based upon (Verbrugge, 2008) and (Bracke, 2013), tested for duration and volatility
Loan to Value ratio	RBNZ mortgage LVR data	Calculated average ratio based upon new lending
Consumer Price Index	RBNZ CPI data	Monthly raw data used
Quality adjustment	Assumption	18%, based upon Hill and Syed (2016) and Nguyen (2022)

The variables for  $\omega_t$  (running and transaction costs),  $\delta_t$  (depreciation rate for housing), and  $\gamma_t$  (risk premium of owning) and Loan to Value Ratio were held constant for the duration of the

model as was the application in the studies from which they were derived. No conflicting literature was identified that would suggest a significant variation in the value of these variables had occurred over the duration of the model, and sensitivity testing identified that variations in these inputs were not significant to the result of the model.

The variable for  $g_t$  (expected capital gain) was calculated on a real basis, based upon (Verbrugge, 2008) and (Bracke, 2013), using CPI data from the Reserve bank of New Zealand. Tables containing these calculations and raw data are included in Appendix 3.

For Empirical Test 3, the investor stated preference variable in relation to expected capital gain ( $g_t$ ) and  $\gamma_t$  (risk premium of owning) were incorporated into the primary model, with other variables held constant.

The testing of investor stated preference within Part 2 of the quantitative analysis uses unsophisticated approaches to projections and ratios, to emulate the type of analysis that could be reasonably undertaken by Investors in lieu of (or to robustly test) heuristics and biases. In particular, the affordability calculations represent the simplest of the calculations regularly published in NZ, as covered in the literature review.

These affordability measures were calculated on a spreadsheet model using two measurements, the House Price to Income ratio and the Rental to Income ratio, as per the methodology adopted by Demographica International (Demographica, 2023), using the following datasets in Table 8:

**Table 8: Affordability Metrics Variables (Datasets and Rationale)**

<u>Variable</u>	<u>Source of Dataset</u>	<u>Rationale</u>
Rental	MBIE tenancy bond data	Monthly raw data used
House Prices	REINZ median house price data	Raw data used
Income	MBIE household income data	Monthly raw data annualised

#### 7.4 Datasets Summary

The evidence required to undertake the research has been assessed as a mix of qualitative and quantitative data, as outlined below. A review of datasets has been undertaken as part of the literature review and has identified the secondary datasets that provide quantitative evidence of relevance to Research Approach 3. No qualitative datasets were identified that address Research Approaches 4 and 5, and this evidence was created as a primary dataset. This is summarised below in Table 9:

**Table 9: Summary of Datasets**

<u>Research Approach</u>	<u>Evidence (Secondary)</u>	<u>Evidence (Primary)</u>
<p>1. LITERATURE</p> <p>Review and synthesise, by literature review, existing theory and studies on the motivations and behaviours of housing investors, that may contribute to over pricing of houses, price escalation and declining affordability.</p>	Literature review	Nil
<p>2. CONCEPTS</p> <p>Select theoretical concepts for qualitative testing within a framework that establish a link between investor motivations and behaviours, and the pricing of housing assets.</p>	Literature review	Nil
<p>3. QUANTITATIVE FINDINGS</p> <p>Undertake an aggregation of secondary datasets and statistically analyse housing transaction activity, incomes and rentals in Auckland to identify evidence of under or over-pricing of assets and a decline in housing affordability.</p>	<p>House price data (REINZ)</p> <p>Household incomes (MBIE)</p> <p>Rentals (MBIE)</p> <p>Interest rates (RBNZ)</p> <p>CPI (RBNZ)</p> <p>LVR (RBNZ)</p>	Stated preference of investors and institutional observers, for testing within the UCEM
<p>4. QUALITATIVE FINDINGS (1)</p> <p>Survey, via structured interviews, a sample of investors to test for evidence of the motivational and behavioural theoretical concepts selected from the literature; that contribute to house price escalation and declining affordability.</p>	Nil	Stated preference of investors
<p>5. QUALITATIVE FINDINGS (2)</p> <p>Survey, via structured interviews, a sample of policy and practice stakeholders to test for observed motivations and behaviours of investors that contribute to house pricing, and the policy context thereof.</p>	Nil	Observations of investor stated preference from an institutional perspective

## 7.5 Research Methodology Limitations

The limitations in relation to this research are outlined below:

### 7.5.1.1 Quantitative methods

As noted above, the input values for  $\omega_t$  (running and transaction costs),  $\delta_t$  (depreciation rate for housing), and  $\gamma_t$  (risk premium of owning) were derived from similar studies and adopted for the purposes of this research and held constant for the duration of the model. This approach is consistent with those studies, and the impact of these variables on the result of the model was sensitivity tested. The conclusion from this sensitivity testing is that the impact of any deviation from the values adopted is not material to the findings of the qualitative aspects of this research.

A static loan to value ratio throughout the model was adopted due to a lack of consistent data from the Reserve Bank of New Zealand in relation to this variable. Sensitivity testing showed that the model is not sensitive to this variable and that the value adopted is not material to the qualitative findings.

The raw data for house prices, rental, interest rates, incomes and CPI are based on government sources and have been taken as the most reliable data sources for these variables.

The quality adjustment allowance (reflecting any quality difference between rental properties and non- rental properties) is not available in the New Zealand context but following the studies of Hill and Syed (2016) and Nguyen (2022), and allowance of 18% was adopted. This allowance for a reduction in quality for rental properties is consistent with a study undertaken in New Zealand by the Building Research Association which found that rental properties of a lower quality than owner-occupied properties (Jones & White, 2023). This BRANZ research supports the inclusion of a quality allowance that reduces the quality of rental properties in NZ. The extend of this quality adjustment was sensitivity tested and not considered to be material to the outcome of the model.

It is acknowledged that the variables within the model for  $\omega_t$  (running and transaction costs);  $\delta_t$  (depreciation rate for housing);  $\gamma_t$  (risk premium of owning), and Loan-to-value ratio were held constant for the duration of the model, and that assessment of any required variations to these variables would likely result in a more accurate assessment of the deviation from equilibrium. Although these variables were sensitivity tested and were not material to the primary finding, including multi-factor sensitivity testing, there could be impacts that are not

accounted for by sensitivity analysis. The use of UCEM for Empirical Test 2 was undertaken to assess whether there is evidence for under-or over valuation within the market over this period and holding these factors constant allowed for the impact of the house prices and rentals on equilibrium (and a base for comparison to Empirical test 3) to be established. Although this is a limitation to the method, the findings from the model are considered to be valid for the purposes of this research.

It is acknowledged that Empirical Test 3 reflects the stated preference of Investors, and Empirical Test 2 reflects the observed preference of the market in aggregate (both Investors and owner-occupier transactions). This distinction is intentional, to determine the departure from the normative model by the Investor segment (the Investor segment this the subject of this research) and the potential impact on aggregate prices of Investor decision (such as upward or downward pricing bias compared to the normative model. The intent of Empirical Test 2 was to assess the existence and extent of any deviation from equilibrium over the period of the model, rather than to determine the cause of variations at shorter intervals within the model.

The quantitative testing of Investor stated preference calculations that do not use UCEM, such as the ratio analysis, affordability measures and projections are acknowledged as being unsophisticated. This is intentional, to represent the type of analysis that could be readily undertaken by an investor as an alternate to the stated preference heuristics.

#### *7.5.1.2 Qualitative methods*

There are three key aspects of the qualitative data that could present bias in this research:

##### **Sample size, composition and selection**

Comparable studies that would provide precedent for the sample size applicable to this research were not identified during the literature review phase, but the principle of generalisability of the sample was considered. This is important given the likely small sample size relative the population, to consider the concept of the sample being representative and a form of quota sampling that ensures that the sample includes relative proportions of respondents in particular categories (Bryman, 2008). In this regard, sought to ensure that the investors were indicative of the population in terms of the scale and experience, therefore the sample was weighted towards the small to medium end of the scale as the literature suggested would be indicative of the population (NZPC, 2012), (Infometrics, 2021) (Development, 2022).

The relatively small sample was mitigated in the research design by the use of triangulation and by consideration of saturation in responses. As noted above, the sample size for the investor segment was determined by the point at which saturation was achieved.

The sample of investors was not randomised, but nor were specific individuals sought. There is the potential bias in this selection process, in that the individuals may represent investors who are prepared to discuss their investment activities due to a perception of confidence in their abilities. Similarly, those investors that were sourced through the APIA may not be indicative of the general population due to their decision to join that organisation. It is the view of the researcher that these biases are more likely to result in the sample being more sophisticated than less sophisticated compared to the general population, thereby overstating the level of analysis undertaken in the wider population.

The size of the Institutional respondents was limited to the same number of interviews undertaken with Investors, to retain an even weighting. The makeup and number of the Institutions was determined after completing the Investor interviews, and the institutions that were identified therein.

The institutional interviewees were all senior members of their industry, and their observations of investor behaviour are indirect but broad based and this may represent a bias.

As noted in the qualitative findings, those findings that were supported by both groups were taken as the most reliable, consistent with a triangulation approach, and this provides confidence in the findings, despite the small sample size.

### **Collection Bias**

All recorded interviews were transcribed independently (two were not transcribed at the request of the interviewee) and there was no bias in the selection of interviews that were used in the analysis (no interviews were removed from the sample).

### **Interpretation bias**

All interviews and coding were undertaken by the same individual, avoiding any differences between individuals conducting the research. The questionnaire was designed to avoid jargon and ambiguity in the questions. However, in coding there were a limited number of instances wherein researcher discretion needed to be applied to adequately code the response. An example of this occurred when questioning about the use of rules of thumb (heuristics) and a respondent prefaced the response with 'everyone knows that' [house

prices double every ten years]. Such a response could be interpreted as a herd bias, however this was coded as a heuristic (how it is used in analysis) rather than the source of the heuristic (general knowledge).

It is acknowledged that there remains the potential for interpretation bias in the conducting of the interviews, and that there is element of subjectivity in the analysis and coding of the interviews.

#### *7.5.1.3 Conceptual framework*

As discussed in section 7.3.2.1 it is acknowledged that the classification of bounded rationality stated preference may be regarded as rational within an inefficient market. The conceptual framework of this research is a novel application of the individual theories and is without precedent. This is addressed in the Discussion and Conclusion chapters and has been identified as an area worthy of further research.

It is acknowledged that the existence and impact of these biases and heuristics may only apply in an upward market. In a declining (price reduction) market of one where market sentiment is negative, other bounded rationality may apply such as asymmetric framing and loss aversion. In this regard, the methodology is replicable to other markets and timeframes but the findings may not.

This research was undertaken during a period of sustained and unprecedented price increases, and therefore the finding in relation to pro-cyclicality. This implies that the existence of these heuristics and biases and the impact of them on individual and aggregate pricing may not be generalisable to dissimilar markets.

This research selected investors as a segment of the market, to reduce the impact of non-financial factors (emotions, sentiments and household dynamics in decision making) in the decision-making process of owner-occupiers that were identified in the literature. This raises the question of generalisability of the findings to owner occupiers which is conceded as undetermined but out of scope. The impact of investor decision making on the market in aggregate is covered in the Discussion and Conclusion chapters.

## 7.6 Ethics

This research was undertaken in an ethical manner, in accordance with the universal ethical principles of Autonomy; Avoidance of Harm; Beneficence; Justice; and Relationships.

All respondents to interviews were given full disclosure of the rationale and purpose of the survey and how their views will be held, interpreted and reported to ensure informed and unpressured consent to their involvement in the research.

In seeking the views of respondents' preferences; financial circumstances; actions; attitudes and beliefs in relation to other persons and institutions, it was important to adhere to a strict code of confidentiality in the storage, analysis and presentation of findings. This ensured that no reputational, financial or emotional harm occurs as a result of this information being provided as part of this research. Where requested, quotations were approved by interviewees prior to attribution within this research (one instance).

This research was undertaken in consideration of Massey University's commitment to the principles of the Treaty of Waitangi. The issue of home affordability in Auckland has been identified in the literature to be of interest to the local Iwi (NZPC, 2012); (Mills et al., 2015); (Johnson et al., 2018) and it is anticipated that there will be positive engagement with representative groups on the findings of this research, once published.

This research was undertaken in compliance with the code of conduct, and with the prior approval of the Massey University Ethics Committee.

## 8 QUALITATIVE INTERVIEW FINDINGS

### 8.1 Introduction

The qualitative phase was undertaken in two phases, the investor group and the institutional group. The findings from the interviews from each group are presented sequentially, followed by a comparison of the findings from each group, as consistent with a triangulation approach to the qualitative research.

For each group, the findings are presented in the order of the interview questions, as outlined in Appendices 1 and 2, followed by a thematic summary of the key findings for that group, as well as divergent and minority findings and researcher observations.

The key findings following a triangulation comparison for the qualitative phase (Empirical Test 1) are summarised at the end of the chapter, identifying the key heuristics and biases that will be tested in part 2 of the qualitative phase (Empirical Test 3).

### 8.2 Investor Interview Findings

These interviews were undertaken as a triangulated group semi-structured elite interview, based around ten overlapping questions, which sought evidence of the investors' perspectives on five aspects of investing. The findings in relation to each of these aspects is as follows.

#### 8.2.1 Use of Analytical methods; Information Sources; and Advice

The predominant analytical method and data source observed in the interviews was by far the consideration of recent sales evidence. This was mentioned by all respondents and for the majority of these, it was the predominant factor both in terms of a data source and type of analysis. The predominance of sales data corresponds with findings from the interviews in relation to the timeframes under consideration by Investors in that there is a much higher emphasis on past market performance.

Although the use of empirical data (sales information) was universal among respondents, the level of analysis was generally unsophisticated. Few investors advised that they undertook detailed analysis of the market overall, such as trend analysis or comparative analysis. Most commonly the analysis cited was in the nature of establishing the desirability of a prospective investment, or the comparison between competing investments. The focus of this analysis was (with only one exception) short-term and localised in nature.

The analysis that was undertaken to inform decisions was generally focused on the initial conditions such as achieving a particular investment hurdle (such as a one-off or initial return on investment), and the securing of funding. This analysis was undertaken using static spreadsheet models which calculate initial yields, residual income, debt to equity ratios or profitability on immediate upgrade works. Indicative responses include:

“I calculate the initial cashflow to make sure it can wash its face once I rent it out. A simple spread sheet is enough. For major reno works I will get a builder in but otherwise I just estimate the cost of redecoration]” ((M.M.), 2019).

“I suppose most of what I’ve done I’ve done my own things on a spreadsheet really. I’ve got various valuations and that kind of thing done, and then we were doing buildings or a subdivision or building another house and all that kind of thing” ((T.F.), 2019).

“Basically build up the estimates of what the various things were going to be, and basically went from there and just ran all the stuff in the spreadsheets to see what return we’d get” ((J.B.), 2019).

“Basically, we just collected all the data up. If we were going to do something to a property or build up or putting another house on, we might have got estimates from the various house building supply companies and that kind of thing and then go from there. Then put all those into a spreadsheet and added them all up, see how it looked” ((K.W.), 2019).

The largest two investors did, however, undertake analysis beyond individual asset decisions, looking at portfolio considerations such as the mix of returns, debt, insurance and cashflow management and economies of scale in procurement, or for interactions with financiers or tax purposes:

“We have got the big spreadsheet we run, which has got all the properties and what we bought them for and any valuations we’ve had over the years, and any CVs and what our current estimate of the properties are, and what the gross return is and the net return and all that sort of thing” ((T.F.), 2019).

80% of respondents undertook this analysis themselves, based upon sales evidence acquired from public records, intermediaries or subscription. A minority of respondents (3 investors) went further than their own subjective analysis and undertook or sought objective analysis of these sales (statistical, trends or hedonic). Most respondents relied upon subjective

assessments using simple rules (such as Sale price to Rating valuation ratio) or looked to third-party aggregate metrics such as sales volumes, average prices, or days to sell. Those respondents who considered to more objective analysis obtained this from third-party providers such as Corelogic, PropertyGuru, REINZ, Valuation firms or economic commentators.

The source of this information (and analysis thereof, as discussed below) was strongly weighted towards the real estate agency sector. Sales data was obtained from local agents, their publications, REINZ, and subscription services (in the minority, two investors).

In addition to the provision of empirical sales data, real estate agents dominated the responses from investors in the areas of the provision of information and advice in two further ways: as a source of advice (interpretation of trends), and asset sourcing and selection.

All investors noted that an understanding of the market was important, in particular the location in which they were operating. Many emphasised the need to keep up to date with transactions and keep in contact with the 'most effective' real estate agents (as per the quote below) and with fellow investors. This sentiment on the influence of other investors was also reflected in the role of investor groups (discussed below).

“You get to know what other investors are doing in the area, who to watch at the auctions, see what they do, go to their open homes when they are back on the market” ((J.S.), 2019).

There appears to be an inherent conflict of interest in the provision of advice in purchase decisions from a market intermediary that is commission remunerated by the vendor. This could be interpreted as less than rational, though perhaps could be seen as a rational assessment that the benefits outweigh the risk of the conflict of interest. It is of interest that this behaviour is occurring alongside the finding of very low perceptions of downside risk in house prices. To illustrate this point:

“Agents, well the good ones anyway, know the market and you need to keep in touch to get the goss. Bargains rarely go on the open market” ((D.M.), 2019).

Investors also noted the need to remain abreast of 'general market knowledge' for example commonly used techniques, trends, changes in legislation, and learning from the successes and failures of peers. This was sought from a variety of secondary sources such as newspapers, industry publications, government notices, and the financial sector such as

banks, insurance companies and publications from commentators such as NZIER. Only 10% of Investors paid for subscriptions services such as Property Guru.

In terms of information and advice, most investors were firmly focused on the immediate housing market (both temporally and geographically immediate) and the transactions, agents, and trends within it. There was an outlier observation with one (more experienced) investor who maintained a watching brief on systemic risks within the wider economic and political environment including immigration policy and international trends:

“I suppose average days to sale is something that I keep a close eye on, in the locality that I’m working in. Obviously, globally indicators, things like what’s happening with the US and China, Brexit, etc. But ultimately, they don’t really affect how I operate on a day-to day-basis. But equally, those things are more just for common knowledge than to direct the way within the business, because there has been nothing big enough for me to warrant a change of tack, is what I’m saying” ((D.C.), 2019).

The influence of investor groups and subscription seminars was observed in approximately half of the interviews. Three such entities were mentioned but the most prominent were the Auckland Property Investors Association (part of a wider national network of associations that is subscription based); and the Property Investors Chat Group (non-subscription Facebook group).

These groups were used by the less experience investors for advice and education, and by the more experienced investors for more general information such as trends and to keep abreast of legislative change:

“The APIA events, publications and Facebook page are great to share ideas and get advice from those who know what they are doing” ((G.T.), 2019).

“Absolutely, it’s [APIA] had an overbearing influence on the way I have operated and the information I’ve been privy to, consumed and acted on. It’s like the same old story: you can go to the pub with your mates and if no-one’s doing property, then it’s pointless to talk about it, because you’re crystal balling” ((D.C.), 2019).

“Typically I would take my advice or pay attention to those that have their fingers in the pie right now as opposed to the people that would like to think they do but they actually don’t – without sounding horrible” ((M.W.), 2020).

In terms of traditional methods of objective analysis of an investment, few investors saw the benefit in obtaining a registered valuation to ensure the price was objectively correct though two investors cited the use of automated value estimation services. Valuations were cited as obtained usually as a prerequisite for bank lending rather than an objective assessment of price validity. Indicative responses in relation to the role of valuers include:

“I only get a valuation if the bank requires it. I know the local market pretty well, I keep track of local sales, and talk to the decent local agents regularly so I know whether the price is right” ((T.M.), 2020).

“I analyse the sales of previous properties, ie the market at the moment. I wouldn't be getting valuations because the valuations are generally so far off the mark, because things are selling for 100K above RVs or even higher than that, 150K. A lot of the valuers can't get it right, where the market is telling you what people are prepared to pay” ((J.B.), 2019).

A minority (two investors) noted that valuers were also a source of market information and actively sought market discussions with valuers for general knowledge, as well as after receiving a valuation report.

The more experienced investors were more confident of their market understanding, and expressed less reliance on advice or analysis:

“My biggest tool is, I guess, myself in some respects, but what I do is market stats. So recent sales. Now that it's a full-time thing, I'm looking to flip places regularly. I'd go through most open homes under the \$900,000 mark in the areas I'm working in or if not go through, drive past it and just get a feel for them, essentially, gauging the market and then when we have stats for those sales, I can use, the knowledge that I've built up to make an informed decision about what I think things are worth” ((D.C.), 2019).

A similar response was made by an experience investor (now in a more passive phase of investment but very active during the timeframe under consideration):

“I suppose in those days we were a bit greener in terms of all the cycles and knowing where they're going and what the various trends were. We were probably relying more on other people as well. I have to say things like those, particularly the Property Investors' meetings, the monthly meetings, I found that very informative” ((T.F.), 2019).

In summary, the prevalence and importance of subjective information and advice from peers and market intermediaries as well as the short-term focus on historical performance is a key finding in this aspect of the interviews. This finding is evidence of behavioural factors such as anchoring bias and herd bias.

#### 8.2.2 Consideration of past and future performance

The interview questions in relation to this factor included an open and a closed component, seeking initially the sources and importance of ex-post and ex-ante performance that influence investors' market perceptions (open ended) and then a weighting of the importance of these (closed ended).

Consistent with the findings of reliance on transactional data and analysis there was a predominant perception on the behalf of investors that a considerable level of investment decision making was based upon past performance of the market. Most investors cited past performance of the market overall combined with their experience of that performance through their investment actions:

“In the long run, houses in Auckland always go up. If I'd started sooner I'd be twice as wealthy. When you look at where house prices were a decade ago, you can see why it's so popular. I could never make this kind of money in my day job. The future isn't certain, but its pretty clear where things are heading” ((C.S.), 2020).

“You and I probably both know what's happened on a national scale for the last 50-odd years. While there are no guarantees, the best indication of future activity is past activity” ((D.C.), 2019).

“I don't really look much further than 24 months ahead, because I think you've got the ability to do so much within 24 months that to ponder much further into the future is falling on the 'what if' sort of category” ((P.M.), 2019).

“Basically, I'm one of those guys that, you know how you can worry about what might happen or what is actually happening... For the buy and holds, I'm not so much worried about the time of the market or timing the market, cos I think it's the time in the market that will see you right. And the same old story: if you're not selling up, what's happening in the market actually doesn't matter” ((K.W.), 2019).

“Obviously most think the recent past will extrapolate into the future, that is what creates herd behaviour and FOMO and eventually asset bubble and pop - except for doomsayers, who will never buy a house anyway. I know it is impossible to predict the future, so pointless to worry about it” ((A.C.), 2020).

In commenting on use of predictive indicators of the market, 85% of comments were themed towards a belief that future projections were of limited relevance or that reliable measures were not available. There were four notable comments in contrast to this strong theme (these will be covered subsequently).

“We haven’t done any hard work in terms of numbers and projecting out where we think all that’s going, but I think the numbers would be quite different that you buy on and also the returns and the capital gains and the increase in rents has probably slowed down considerably from when we first started” ((T.F.), 2019).

“If they’re buy and holds, they’re buy and holds. Unless I needed to sell for a reason I don’t know about just yet, the plan would be to hold them. So what happens in the future is actually irrelevant to a point” ((D.C.), 2019).

“With the trades, we’re trying to turn them over so quickly that you are selling straight back into the same market or thereabouts. World events could happen that could change everything in five minutes, but we just don’t know when they’re gonna happen, so I just don’t think they’re worth sort of stagnating for” ((J.B.), 2019).

“I think about the future in terms of which areas are getting better, where roads are being built. I decide what to buy based on sales, so yeh 90% of it is about what’s been happening” ((J.S.), 2019).

Expanding on this final quote is the observation that four exceptions were noted. These were in respect of factors exogeneous to the market itself that could impact upon housing demand or supply (the aggregate level or distribution) such as infrastructure investment or population changes:

“There isn’t a lot that which would perhaps be future based, but I would be looking at what's happening with the demographics and migration changes and plans for roads etc. And you also see things like big projects and announcements. But if I had to weight them, 90 percent past 10 percent you know things that may or may not happen in the future” ((B.J.), 2019).

“I analyse sales data, but the future isn’t really there to be analysed... I keep an idea of what the Council is up to but otherwise I focus on sales in the past few months or so” ((T.M.), 2020).

The interviews support a finding that investors place a strong weighting on past performance (85% in aggregate across the interviews) when making investment decisions though this may be tempered by certain and specific knowledge of factors which could impact upon supply or demand.

### 8.2.3 Use of Analytical Heuristics

It was apparent that there is an unconscious aspect to the use of heuristics in some of the investors interviewed. Some investors considered that their experience, knowledge or intuition was form of analysis rather than a heuristic. There are therefore two types of heuristic represented in the data: conscious (stated) and unconscious (implied).

The stated heuristics cover themes of asset selection, risk management and investment strategies.

In determining the appropriate selection of assets, heuristics were used to determine the location, categorical type, and financial suitability of the property. Many of these appear to be simplifications of the evaluation procedure to narrow down potential investments to those that are likely to suit the investor’s expectations of risk and return. Examples include:

“Yeah, we had a few like that [rules of thumb], because we concentrated in what was the Waitakere City area. We wanted to be in one area where my wife could manage them all. It was handy so she could manage the houses, so we wanted them to be relatively close” ((T.F.), 2019).

“I don’t think you can really know more than five or six suburbs at any one time. Because you just spread yourself too thin. So if you really really wanna be confident in your own ability, you can only retain so much information well. Yeah, the discussions I’ve had with other people doing what I’m doing - we’re all in agreeance that you’ve basically gotta pick the area you’re working in and then just get to know it as best as you possibly could” ((D.C.), 2019).

“Ultimately, I think that one of my favourite sayings is, it’s never a bad time to buy a good deal. So that probably gives you an idea of my mindset” ((M.M.), 2019).

“Its all about the location. Any house can work in the right location - if you can get hold of it” ((D.M.), 2019).

“So I basically work on the threshold of I want over \$100 a week return for every \$100,000 that I put in” ((G.T.), 2019).

“Part of the rules of thumb were more around the returns that you were trying to target. At that stage it was 10 percent, but I suppose it would be a whole lot less than that as well, and we were able to achieve that, otherwise we weren’t really particularly looking at a property” ((I.P.), 2019).

“Some of it is the return. I think a lot of people kid themselves with what they get, but if you can get a net return of 70 percent of the rent coming in, you’re doing pretty bloody well” ((T.F.), 2019).

“I have a rule that all my expenses and interests including the interest payments for the mortgage would be 75 percent of the rental income right. So that look like a rough thumbnail rule that I could sort of work out if I was going around to looking at properties, so I could sort of work that on the fly rather than having you know masses of spreadsheets” ((B.J.), 2019).

“I’ve generally bought smaller properties that people [who lease these types of houses] are probably never going to own their own houses, so I look at those sorts of houses as well, because they tend to be renters for life” ((J.S.), 2019).

“If I’m looking to buy I might get 10 comparables that are nearby and I’ll put into a spreadsheet of sale prices what their CV was and then do an average and the median and all that. So then I’ll know in that area nearby that last 10 houses have sold at say 90 percent of their CV and then I’ll work out what 90 percent [of the subject property’s CV] is and I’ll get an idea [of value]” ((M.M.), 2019).

Heuristic statements were observed in relation to investment strategy that went further than return benchmarks into short-term profitability:

“But I’m always as an additional rule of thumb looking for those properties that have a bit of an angle that could increase the return” ((P.M.), 2019).

“The rule of thumb from an investment sense is just always keeping my eyes wide open for those opportunities or possibilities with each property that I look at. On the face of it, and it’s happened to me on a number of times” ((D.M.), 2019).

Heuristics were also identified in relation to the process of identification of potential assets and the use of market intermediaries:

“At the beginning I was buying properties close to home. I knew the market I knew the type of people wanting to live there but then I started experimenting buying out of town and I would buy from property sourcing companies and every time I've done that it's been a disaster” ((B.J.), 2019).

“I probably buy off real estate agents that aren't very good and I probably sell with good real estate agents. I pick out the real estate agents that aren't that great because normally the houses are under-priced or houses have been overvalued” ((R.D.), 2019).

A third of respondents noted that there are externally imposed heuristics in particular from financial institutions. This was raised both in discussion on heuristics and in relation to the influence of institutions. For those investors who were dependent upon finance as an initial condition of purchase these can represent a selection criterion:

“There are some rules imposed by others. So the obvious one is bankers who have the magic ratios and things like that. Lenders have their own thing where the rents had to be about 125 percent of the mortgage payment. Which is inversely around about 75 to 80 percent [debt servicing cover]” ((B.J.), 2019).

The unconscious heuristics stated by investors were raised within discussions on matters such as analysis and performance measurement. When discussing analysis techniques five investors stated that they considered 'gut feel', 'intuition', 'my technique' and 'knowing the market' to be a form of analysis and that these factors guided decision making more than formal or objective analysis or advice.

“People don't see the potential of the property. That's probably one of my main things; I can see what I can do to that property to make improvements. You make a garage into another bedroom, and knocking walls out and doing bits and pieces. That's probably my best attribute is foresight and what a place could look like” ((G.M.), 2019).

“I'm always going back to my buying rules. I'm buying with an angle as a bit of a security buffer so that say you buy this two-bedroom and you convert it to a three-bedroom, you put a little bit of money in but it increases the value and the yield and then you're protected if the arse of the market drops out” ((D.C.), 2019).

The use of heuristics, both stated and implied equate to a 60% incidence across the interviews by comparison to objective analytics at 40%. The more experienced investors

identified fewer stated heuristics than less experienced investors. The more experienced investors did however have a higher instance of reported the use of intuitive analytical techniques that were more akin to heuristics.

#### 8.2.4 Motivations and Expectations in relation to Investment (Risk and Return)

##### *Return Observations*

Responses from investors in relation to the perceived benefits from investing formed into two key themes: the first is in relation to the income and capital returns in a more traditional investment sense and the second theme relates to perceptions of control and flexibility.

The focus on returns was strongly weighted in terms of expectations of capital gain though the more experienced investors considered that property investing had a 'growth' phase followed by a 'cashflow' phase.

Although cashflow and income returns were raised by all but two investors (who were both generally short term holder or 'flippers' of property), for those smaller investors this was oriented towards ensuring cashflow neutrality and achieving acceptable ratios to enable funding. The predominant theme across all interviews was an expectation of capital gain implicit in the investment decision.

"I suppose we always look to try and get the cash flow, because we always thought the capital gains would look after itself. If we stopped now and we said, 'All right, we'll just sell everything up and see where we are', then the amount of capital that we will have gained out of it, and that's what we were thinking" ((T.M.), 2020).

"The reality was that at that stage we were looking to try and get at least a 10 percent return on what we expended. It didn't need to be that when we bought the properties; it was once we actually had finished whatever our plans were with them" ((D.M.), 2019).

"Our theory was that if we got enough cash flow, the capital gains would probably look after themselves, then you could keep repeating and keep repeating, as far as you wanted" ((R.D.), 2019).

In terms of stated perceptions of control many investors saw housing as an active investment in which that they could be rewarded for their efforts so that they were not simply 'price takers' in the market. These rewards were passive capital gains or active development gains.

“If you can buy them [houses] at a low rate and you’re willing to wait and you can make some improvements and that, if it takes a couple of years to get a movement, I’m not bothered about that either” ((G.T.), 2019).

“I’m going to get stuck into some of these properties and add value, because that’s the goal. That’s what I want to do. I can see what I want these places to look like, without overcapitalising, then sell them and then buy something else, and just do that sort of stuff” ((K.W.), 2019).

“I’ve walked into something and walked out thinking there was no future for me there and then after a bit of thought, I’ve gone back and made an offer and I guess made a successful process of that finding an angle mentality” ((D.C.), 2019).

“I’ll look at the areas; I’ll look at the street; I’ll look at the houses around. I’ll never buy the best house in the street; I’ll always buy something that I can add value to” ((G.T.), 2019).

Many investors saw housing investment as a key to flexibility in lifestyle both in terms of earning a living without a ‘dollars for hours’ approach, but also a perception that housing can (perhaps not initially but in the longer term once debt is reduced) be a passive income.

“There’s the big names in the world like Warren Buffett who would say, ‘you need to figure out how to get paid while you’re sleeping,’ and in reality, it’s not a passive income per se, because there is still work involved in managing a rental portfolio, but it’s the easiest money you’ll ever earn if you do it right” ((D.M.), 2019).

“Because the income that we can generate from it will give us an income where we don’t have to work, and we can be comfortable, and we can still invest. If I hadn’t done any of this and I’d saved, what would we have at the same point? Really, we didn’t have enough, we couldn’t save enough, so we had to use the money that we have to actually grow and keep growing it and keep growing it” ((G.T.), 2019).

“For me, property is my key in the door to freedom and I feel like sometimes or in reality, you just cannot work your way to wealth unless you are in that upper echelon of income earners, which the majority of us are not” ((D.M.), 2019).

“We’ve [travelled] for over a year, because we invested in real estate and we made some money, and we had income coming in from these properties. We couldn’t do it on my wage or our wages alone, so it’s subsidised our income, big

time. But am I going to be earning a million a year? No, but I don't want to be, I'm content" ((G.T.), 2019).

"I think the expectations are that I can have more time and be able to do all the things that I want to do. Since I've been investing I've been able to do that, but being able to buy something and leave it. I went overseas for eight years and you come back and that's been growing while you've been away" ((B.J.), 2019).

"I was 10 years in the public sector so I know all about working hard and getting paid no more for your efforts than the guy that's turned up for eating his lunch. What you do in property or outside of your day job is where you're either gonna create or not create your freedom. Yeah, I feel like that" ((D.C.), 2019).

Although half of the Investors compared the benefits of investment in housing to the alternative of a 'day job' there were very few observations in terms of the comparison between returns on property compared to other investment options (such as shares or interest). The comparative rates of return that were stated were by comparison to their own past returns on housing, perceptions of peers' returns and to the margin over the cost of funding. These return expectations were endogenous to the housing market. The expectation of income returns (when undertaking analysis to purchase) was compared by all but two investors to costs of owning the property (ie servicing the debt on the property) rather than opportunity cost of the funds if invested elsewhere in another form of investment. This 'required rental return' was closely linked the loan to value ratio and interest rates applicable to the investment and other costs such as maintenance, insurance and rates.

"So it would be about expectations about what other people are getting. But also in terms of my own my own criteria would be has to be you know 6 percent or above [the 5 % average return] and that I guess there's a feeling that the property price should have doubled in 10 years that's like an average" ((B.J.), 2019).

"It's sort of where interest rates were at that stage; we were above that. You were looking to getting 10 then, and interest rates, I think, at that stage we were probably about 8.5 percent or something, so that worked fairly well" ((T.F.), 2019).

Based upon responses to these and related questions investors saw the income return being linked to costs of ownership (rather than a return on capital) is the expectation of an element

of capital gain. There was no observed references to the required rental being linked to the rental market itself such as the supply, demand or affordability of rental prices.

Both active and passive capital gain expectations were noted. While approximately half of the investors actively sought capital gain either through improvements or asset choice or location there were also those who saw the capital gain as an expectation that did not require active management. Capital gain was seen as a given, and that provided that the property can cover expenses, it was an inevitability of holding property.

There was very little consideration by investors was of comparable investment opportunities / rates of returns (two observations). Investors appear from this research not to actively consider alternate investment returns when deciding on what is an appropriate rate of return. As noted above, the stated basis of return comparison was endogenous to the property market ('what should I get compared to my earlier investment or what others are achieving?') rather than exogenous bringing in consideration of other asset types ('how is property doing compared to shares or fixed interest?'). One notable exception was an investor who was initially attracted by the perception of better performance of housing as an investment:

"I remember when we first started looking at [investing], we actually had an insurance salespeople types coming around with life insurance or other investments and funds. We looked at that and thought 'I'm sure we can do better than this ourselves', so that's how we actually got into it" ((T.F.), 2019).

In interviews with five of the investors their motivations for investing extended beyond the financial in deciding upon the types or assets to purchase and their expectations of returns and viewed housing from the perspective of the occupier. Most investors identified the link between hedonic factors and rental returns such as the way that better bathrooms, nicer décor, and more bedrooms would increase rentals and prices. However, this minority of investors noted an emotional (how they 'feel' about houses as home owners or would like others to feel about the property) as well as an altruistic aspect to their investment approach:

"I'd be lying if I said I don't have an emotional attachment to some of the rentals, especially the first couple in the portfolio – like your milestones. Your first rental, once you sell it, you're never gonna get that back, but you've just gotta, like you say, go off the financials and make the best financial decision for your situation as opposed to just staying as is because it's comfortable" ((D.C.), 2019).

“We’ve bought a place where it was an emotional buy, or we’re trying to buy for what we like. Well, it’s not [important] what we like. We probably did that early on; we bought properties that we could live in, where really we’re buying stuff that renters can live in, and want to live in” ((B.J.), 2019).

“I guess I’ve got a social conscience as well. It’s not all about returns; it’s all about having a balance. I will put a new kitchen in, I will put bathrooms in. I’m not one of these landlords that make people live in these horrible, damp, shitty conditions” ((G.T.), 2019).

“I wouldn’t own an investment property that I wouldn’t live in myself. It would reflect badly on me, or I would even in the worst case feel ashamed to have my tenants occupying a house in poor condition” ((M.W.), 2020).

“I buy houses that I can imagine living in myself. When we [my partner and I] undertake a renovation, we bring our design skills to bear and get the places looking real good” ((P.M.), 2019).

#### *Risk Observations*

An overarching observation was that by comparison to comments from investors in relation to return (expectations, analysis and strategy), risk observations were comparatively low (10% observations in relation to risk, 90% observations in relation to returns).

The risks stated were of two types. The first type were those risk that are in the manner of day-to-day risks of existing investments that needed to be managed in an ongoing way but did not affect the decision to invest (non-systemic risks). The second type were those risks which are material to the investment decision itself whether to invest / divest or the asset type to select that are derived from the market (systemic risks). In the first category were issues such as the quality of property management, tenant covenant, and issues of enforcement, for example:

“I’d rather get the right tenants than put someone in that basically will stop paying, because really they could never afford to pay the rent in the first place. That’s probably the biggest thing moving forward, is that people are renegeing on rents more than they ever have, because the rents are high” ((G.T.), 2019).

“I suppose [risks] have changed over time. The old P [methamphetamine] seemed to be a bloody big thing a couple of years ago, and of course that’s dropped right

away considerably. The legislative changes are pretty significant of late” ((T.F.), 2019).

Those systemic risks that were likely to affect investment decisions were strongly clustered around two themes of debt (cost and availability) and legislative change. Examples of observations in relation to debt:

“The interest rates, you know that they’re unrealistic at 3.49 or below that. It’s not going to be like that, so I factor in about 5.5 percent. That’s what I look at as an interest rate and they’ll be back up there in the next ten years. But it doesn’t worry us the same as it would someone that was strapped, someone that when the interest rates go up to 5-6 percent, which they will, and people have leveraged right till the end, and they will go under” ((G.T.), 2019).

“Changes to lending policy and interest rates were of concern in the early days but, again, because we had high equity, changes to the LVR didn’t particularly worry us” ((T.F.), 2019). Similarly, from the same investor:

“You’d have to say that it’s looking pretty - the interest rates just keep being lower and sticking lower for longer, and lower for longer in the thinking and we’re forecasting it” ((T.F.), 2019).

“We’re reducing our debt as well over that time going on fixed rates for our rental property stock and rents are going up. Although that’s where things are looking to be going, it doesn’t look that risky for us, but we always keep an eye on it” ((B.J.), 2019).

The legislative risks identified could be both operational and strategic, depending on the nature of the assets owned. Around 70% of investors noted the risk of legislative compliance as it affects either the costs of ownership (e.g. ‘healthy homes’ upgrades such as insulation or heating), or ongoing property management risk (e.g. strengthening of tenant rights).

Comments from investors in relation to the risk of legislation would appear to be more based upon matters arising more recently, showing a temporal aspect to the perception of this risk, though this could be due to the increase in legislative change in the two terms of the current government. Examples of comments from investors include:

“There has been significant changes to a the compliance requirements for properties over the last year. I think because we’ve been at it for so long, it’s not quite so bad, but even for us it’s almost daunting with the amount of actual

change which has gone on, and the risks associated with that, and the additional costs that are creeping in” ((T.M.), 2020).

“But there must be a lot of people in the situation that they don’t have the money, that if they need to do a roof, and it’s not only the roof now. You’ve got to pay \$1,500-\$2,000 for the scaffolding. Then you’ve got all these other compliance costs that you have to do through the council, etc for lots of little bits and pieces, so it pushes the costs up” ((G.T.), 2019).

“There’s lots of things that have been added on from when we started and, as I say, the costs of rates, insurance and you’ve still got to maintain your properties. Because in the early days you used to be able to value walls and a lot of depreciation and stuff. In the early days that money that I used to get back each year, I used to put straight back into maintenance” ((K.W.), 2019).

Most notably there were no observations of the active monitoring of the systemic risk of a market reduction in prices such as market cycle indicators (such as affordability indices) or contributory factors such as significant correction in market sentiment, interest rates, demand, or supply. There was, however, observed awareness of market cycles but not in a risk context.

A researcher observation is that there is an implicit (though not explicitly stated) wider risk consideration being that investors observed that a housing portfolio provides a level of risk mitigation or diversification in respect of income from ‘day jobs’.

#### 8.2.5 Institutional Influences

Explicit responses in relation to the nature and influence of institutions clustered around three institutional groups: the banking sector, government (including local government), and sources of market information (market intermediaries, market commentators and investor groups / peers). These institutions are consistent with the nature of risks that were stated by investors.

“What I am hearing there is the way that these various institutions, the trade fraternity councils, insurance companies, banks, things like that; basically just takes some of the return out and takes the kind of compliance pressure on you, to the point where it just doesn’t seem to make sense for the effort you put in” ((G.T.), 2019).

“Government policies are a big thing. The capital gains tax, but at the end of the day, if you have to pay it, you have to pay it. Things like that, I’d probably walk away. There’s times where I’ve thought, ‘If this comes in, would we sell everything up?’” ((C.S.), 2020).

“Certainly [the Property Investor Groups] are pretty good, their various meetings and things. They have a heck of a lot of meetings, and not just meetings but various things, talks and that. I think there’s one tomorrow as well, they have legal people that are talking. I think that’s the one tomorrow afternoon about the trends of the government and where all that kind of thing is going. There has been significant changes to a lot of those various things, in terms of the requirements for properties over the last year” ((T.F.), 2019).

“I suppose the Reserve Bank and all the interest rates, and the government changes and that kind of thing. Obviously the Property Investors is a group in their own right” ((P.M.), 2019).

In addition to those institutions explicitly noted by investors as influential in decisions it is apparent from observations in relation to investor responses to sources of information and advice that the real estate agency industry and the providers of market commentary (media and subscription services) are of significant influence in decision making. Noteworthy is that only three (two of which were more experienced investors) explicitly noted these as influencing decisions.

“I think that the media and real estate agents basically have a choke hold on the vast majority of the population in terms of the way they can influence them for or against what’s happening in the market” ((D.C.), 2019).

“We kind of got guided a bit, like Bob Jones was someone that I aspired to, with a lot of the stuff he did in the eighties and onwards and then Rich Dad, Poor Dad. I read a lot of that stuff and that kind of inspired me that I could actually have a good lifestyle, even though I wasn’t a university graduate or a scholar or someone hugely intelligent” ((M.W.), 2020).

Perhaps this reflects a perception that positive messaging does not seem to explicitly influence behaviour as much as negative (risk) messaging, because the latter proposes a change of approach from the status quo rather than reinforcing the status quo.

A minority of investors also noted the influence of other professions, or family and friends.

“We also had our accountant held us and the lawyer in terms of our set-up and the way you can set up companies and trusts and originally the loss attributing qualifying companies, that kind of thing. We also used a mortgage broker for advice” ((R.D.), 2019).

Overall, across the explicit and implicit observations of the influence of institutions, the key findings are that these institutions can influence the behaviours of investors both in terms of perceptions of risk and return.

#### 8.2.6 Key Themes from Investor Interviews

The following themes have been distilled from the investor Interviews. These themes are representative of the majority of observations as well as the point of saturation in which the themes became consistent, and few additional observations were recorded. These are outlined below:

1. **Reliance on heuristics over objective, robust analysis.** The observed data indicate that investors rely on a combination of analysis and heuristics in making investment decisions. A combination of both is to be expected, though of key relevance to this research is the finding that heuristics represent 60% of the observations. Another key finding of interest to this research is the use of implicit heuristics over explicit heuristics. This implies that there is a subjective perception on behalf of investors that their analysis is more objective and robust than would be independently assessed. This analytical mix implies an oversimplification of the complexity of the market, and an undervaluing of the benefits of objective analysis.
2. **Reliance on subjective rather than objective evidence.** The observations indicate that investors are influenced by the opinions and analysis of market intermediaries, media influencers and other investors. This reliance combined with the findings in relation to heuristics and past performance of the market may have the effect of reinforcing current and past behaviours.
3. **Strong reliance on ex-post housing market performance.** The self-assessed weighting by investors clearly indicates the reliance in decision making on past market performance and endogenous factors. This finding is reinforced by the use by all investors of market transactional data and analysis, heuristics based on peer and personal experience, and absence of market downside started risks. Across all investors was a lack of consideration of the perceived opportunity cost of funds invested or an awareness of comparable returns from other asset classes.

4. **Motivations and expectations dominated by capital gains.** A triangulation of findings in terms of stated expectations, analytical tools and heuristics, and institutional influences indicates that the predominant driver of investment return is capital growth over both the short-term and long-term investment timeframes. An expectation of capital growth is not in itself unexpected, however lack of an observed objective basis to quantify this expectation is apparent from the findings.
5. **(Researcher observation) Experienced investors are more objective and balanced than those who are less experienced.** There are observable differences between the more experienced investors and the less experienced investors across many of the survey factors. The more experienced investors exhibited more balance and objectivity and a wider perspective in terms of both return and risk.

#### 8.2.7 Divergent Observations and Minority Findings

In addition to the consistent and saturated key themes above there were also a minor number of divergent observations that were insufficient to reach a thematic conclusion, but nonetheless are of relevance to the research. These are as follows:

1. The connection between the hedonic assessment of housing from the tenant perspective being influenced by the investor's hedonic perspective as an occupier of houses. There was evidence of selection of investment housing being influenced by investor preference as an occupier of houses.
2. The provision of housing to tenants in part being motivated altruistically, to provide a product as a social good, rather than simply as an investment vehicle. This manifested both in the selection and presentation of houses and in the management philosophy.

#### 8.3 Institutional Interview Findings

Many of the responses from the institutional interviews are in the manner of observations on investor preference rather than stated preference. The latter was obtained from investor interviews directly.

Respondents had a range of perspectives on investor behaviour, from direct contact (for example real estate agents) through to policy makers with limited direct contact. In this regard, four respondents note that they could not comment on the analytical techniques, heuristics or information sources used by investors due to the lack of direct experience.

### 8.3.1 Use of Analytical methods, Information Sources and Advice

Findings in relation to this aspect of investor decision making was differentiated between two groups of investors, with this distinction being unprompted. For 90% of institutional respondents, this distinction was between experienced (or large-scale) investors, and inexperienced (or small-scale) investors. A further distinction was made by those institutional respondents with a greater degree of direct contact with investors (40% of respondents) as between investors who 'hold' properties, and those who 'trade' properties (purchased with the intention of re-selling in the short term).

#### *Analytical methods*

In terms of analytical tools and methods, the institutional respondents indicated that for the majority of investors (in particular the less experienced ones) the analytical tools will be largely informal, comprising the application of experience and intuition to various sources of data, information, and advice. Institutional respondents considered the more experienced investors to be more sophisticated in their analysis, though not necessarily more formal (relying on their own experience).

"I think overall the New Zealand market is pretty unsophisticated. I think that will change and once you start buying blocks, a whole bunch of units, and building them and once you venture into commercial, I think that's when you get a little more serious about your analysis" ((G.B.), 2020).

"They don't [undertake detailed analysis]. They just get out the numbers, this is what the mortgage costs and this is what I'm getting, as long as there's a tiny surplus, that'll do" ((O.N), 2019).

"I don't think there's a lot of hard analytics is my view in the way that people deal with the housing market in New Zealand. I think it's a cultural preference to buy housing, I think it's aspirational, I think people feel like when they can count their wealth in terms of their houses, I think most people feel like they can understand what it is to be a landlord and to make money that way" ((A.W.), 2020).

"In terms of analytical tools, they [larger investors] would be using the typical ones that you would expect from the likes of other institutional investors; DCFs, Valuations, Feasibility Studies, those sorts of things. Whereas I think the smaller end of the scale such as Ma and Pa, they are more guided by comparative sales" ((A.P.), 2019).

“It depends on the type of investor that we’re dealing with. Mum and Dad probably run more with their gut feel as opposed to serious investors with maybe a portfolio of a dozen or more properties that are a bit more sophisticated on decision making. They’re the ones running the spreadsheets and DCF etc, to help make in their decision” ((D.A.), 2019).

“I don’t know to what degree those algorithms [automated valuations] do have influence. We hear them quoted to us occasionally. I think they’ve had an influence on the industry and that we don’t get asked for appraisals as often and I think that may have something to do with it” ((G.B.), 2020).

“Anecdotally I would say very few tools are used apart from how much am I able to borrow, how much are similar properties selling, yes there’s always the question, how much could this rent for” ((T.K.), 2020).

“That’s [gut feel decisions] probably more your Mums and Dads, as I say there’ll be the very serious investors that have got multiple properties in their portfolio. Probably have more sophisticated tools, I’m not saying they necessarily end up making better decisions, but they’re tools that they’ve felt have worked for them in the past and so they’ll stick by them. That might be a simplified DCF or a spreadsheet that’s calculating the likely rent increase over a period of time, cost etc, whether they need a new kitchen or add on a sleepout, or what can they do to maintain or enhance the rental return” ((D.A.), 2019).

Half of the respondents noted the use of spreadsheets, and 60% noted the use of online tools such as Onerooft and automated valuation tools. The use of formal registered valuations was only present in the responses from the banking and market analytics sectors’ respondents:

“I don’t recall an investor worrying about paying for a valuation, which would cost you, depending on the value of the property, maybe \$700-800. I don’t remember the last time an investor did that. They would do that only if the bank required it. That’s one source but they don’t seem to go down that path” ((G.B.), 2020).

The limited use of registered valuations is consistent with investor interviews, with this form of information / advice largely restricted to the purposes of securing funding.

#### *Information Sources and Advice*

The evidence gathered for this aspect was diverse and reflected a range of views across the institutional environment. There was an apparent emphasis from the respondents toward

the impact of their own institution, perhaps reflecting the weighting of their experience of investors within this context.

Despite this institutional emphasis, the distinction between experienced vs inexperienced investors was evident from the majority of respondents.

“For those that have got some experience and have an accountant and lawyer on staff, will know the trick about how to structure things to lower their liabilities and that will be their motivation, I imagine” ((C.P.), 2020).

“I think as you get more sophisticated you become more savvy so you’ve done your initial work as the Mum and Dad investor and then you build up your portfolio, so suddenly it’s looking and knowing the local market etc. You’re able to go there and do your own research” ((G.M.), 2019).

“The Mum and Dad investors, they’ve probably just got their ear to the ground about what’s happening with prices and they’re visiting open homes and purchasing rentals and getting a sense of what the market demand is. So, that would be for Mum and Dad walking the beat and institutional low scale professional investors, I’d imagine they’re looking at CBREs and some of those quarterly/monthly updates on the state of the market” ((C.P.), 2020).

“The seasoned investors take it quite seriously, they watch the market almost daily. See what house prices are doing. They’re the guys that will ring up and say hey what did this house sell for, or they’re constantly going through open homes just to view the property, see what it sells for and keep an eye on the market. They’re watching trends in the suburbs and what’s happening” ((R.H.), 2019).

“I guess when they’re doing their research they’re using sites like Trademe and One Roof and Homes, where you can get free data. Some of them will be prepared to spend money, most of them don’t. Some of them might be going to get an AVF, like an e-value type report. Whether they’re prepared to pay the \$50 or \$60 for those reports, they probably should be but I think a lot of them just back their own knowledge that they don’t need to do that. That they’re getting a lot of intel just by going to open homes, seeing what properties are transacting and what levels they’re transacting at, and of course a lot of these investors have pet real estate agents that are feeding them information, giving them an early heads-up on listings that are coming up next week” ((D.A.), 2019).

“First time [holding] investors will run the numbers themselves but get a rental appraisal, and based on that appraisal, they will work out what the property is worth to them” ((R.H.), 2019).

“I reckon there’s a range of level of sophistication but from my experience I reckon the property investors are real trainspotters for knowledge. They’ll go onto the websites and they’ll get as much free information as they can but they’re not paying for it. They just absorb all the commentators’ thoughts, all the free property information knowledge that they can glean probably before they end up making a decision” ((D.A.), 2019).

“If you are fully active in the market, you’ll know what properties go for. Someone newer to the market may be more guided by marketing materials, RVs or valuers” ((N.S.), 2019).

Themes in relation to information and advice were identified as follows:

1. Less experienced investors sought a wider range of information sources and advice.
2. Experienced investors sought data (such as sales evidence and listing information) as well as qualitative data (open homes and auction observations) for their own analysis and were more likely to develop a trusted advisory relationship with real estate agents.

The institutional respondents that had regular contact with investors noted a distinction between traders (short term hold, or ‘flipping’) and holders of properties:

“For [traders], 90% of the decision is based on what the trusted agent tells them that the retail price will be” ((R.H.), 2019).

“If you talk about analysis, [traders] are the category that probably would spend more time on working things out, and they’re going to spend more money on the property. So they will have a rule of thumb of how much they’re going to spend on a property, whether it’s \$50k/60k/100,000, what they expect in return for that, so the price they pay becomes important” ((G.B.), 2020).

Responses in relation to traders identified that in general terms their focus was on short term matters and accuracy in advice surrounding upgrade costs and the end sale price. Further findings in relation to traders are found below in relation to risks and funding.

### 8.3.2 Use of Analytical Heuristics

Observation of analytical heuristics was considerably lower than observed from investor interviews. This may reflect the 'internalised' nature of heuristics when used by investors therefore making them difficult to observe.

Heuristics identified were of three types: generalised 'rules of thumb' that relate to the market itself (most commonly cited); specific heuristics observed in use by investors; and those heuristics that are derived from third parties (in particular funders).

There were two predominant generalised rules of thumb, the first being the rate at which property priced doubled (11 instances), and the second being the general trajectory of housing prices over time (15 instances). Examples include:

"I guess the best rule of thumb is that property values double every 8 years, and they're not too far wrong on average that it does occur and probably 10 years ago, it didn't occur if you weren't in the main centres" ((D.A.), 2019).

With property, at least, its what New Zealanders invest in, its generational, its what you invest in. Stocks and bonds are less common, but property has always been a good investment in NZ. 'As safe as houses' is part of the kiwi mentality" ((R.H.), 2019).

"There is a general rule, believe it or not, where houses eventually always rise. They understand there's flat periods, but they don't want to believe it" ((O.N), 2019).

"My perception would be that investors are backward looking, house prices have gone up, so they're going to continue going up would be a generally accepted rule of thumb for investors" ((C.B.), 2020).

"I think there is the view that the past is a perfect predictor of the future, and property has outperformed everything else for 30-50 years so why would I invest in anything else? I'm not saying this to correct, I'm saying this seems to be investors' mindset" ((P.L.), 2020).

"There's consistent lines out there that property doubles every ten years... it's a terrible rule of thumb... it may have happened in some areas over time, but there's always, always an explanation for it" ((N.G.), 2020).

Heuristics applied at the investor level were most commonly the ratio / return on investment nature, and in terms of 'investment strategy', for example:

"General rule of thumb, depending on the work that's needed, they are looking for 50% more than the cost to do-up must be profit. Everyone seems to be a trader these days, you know. They watch those shows. I've seen people get burnt because they don't follow the principles" ((T.K.), 2020).

"Sayings like worst house/best street, though I haven't heard that kind of thing for a while because it's hard to find a pocket right now that's bad in terms of getting some [capital] gain" ((G.B.), 2020).

"One of the rules is, get a place that looks sunny, has got a decent backyard, suitable for kids, should be 3 bedrooms if possible but no less than 2. What are the neighbours like? How close is shopping? How close is transport? That sort of thing" ((O.N), 2019).

"You do hear people talk ratios to GVs, because we furnish people with a list of properties that have sold in the area, you can very quickly look at what they've sold for and how much above rateable value. It's a pretty crude tool but it will give you a pretty good feel of that area, that street and how those properties are tracking above rateable value" ((G.B.), 2020).

"They [experienced traders] do have a formula that they use [costs and returns], and they're always ultra conservative in terms of the costs being allowed quite high" ((R.H.), 2019).

The third type of heuristic observed was the application of banking processes to investors by virtue of the funding approval process. Observations on the influence of banks on investors is discussed separately but it is noteworthy that in addition to banks applying constraints to investors they also use heuristics that are adopted by investors seeking loan approvals. The heuristics of this type that were observed from institutional interviews include: serviceability ratios including rental returns, loan-to-value ratios, and the requirement to undertake a registered valuation. Observations include:

"They would do that [obtain a valuation] only if the bank required it. That's one source but they don't seem to go down that path" ((G.B.), 2020).

"You can have the same property, two different clients, one may need a valuation [to secure funding approval] and one may not" ((N.S.), 2019).

“Some [investors] will get a valuation done. They need it for the bank anyway if they’re going to get a mortgage” ((O.N), 2019).

### 8.3.3 Consideration of past and future performance, and market sentiment

The institutional respondents in all cases reflected the stated preference of investors in relation to investors’ reliance on past performance and upon market sentiment in forecasting returns. However, the institutional respondents placed considerably more emphasis on these aspects than investors did directly.

“Given the fact that we’ve seen year after year of increasing property values, and at the very worst, then plateauing for a wee while, that’s what’s giving people their motivation to get out there and invest” ((G.M.), 2019).

“I think they probably think they’re looking forward but I think it’s being influenced by the past and probably quite recent past. I think they’re seeing all around house prices going up and up and up and up, and I think that’s what the less sophisticated investors are probably doing” ((A.W.), 2020).

I guess there are people that have maybe been riding the wave of capital gain and they’ve made the decision in terms of adding value to a property and all of a sudden they think, I did alright, I can do it again, probably a lot of bravado too” ((D.A.), 2019).

“Investors are critically interested in market sentiment. They are constantly monitoring the market, ringing up wanting to know about recent transactions” ((R.H.), 2019).

“They’re very focussed on what’s happened in the past and that naturally flows through to what they anticipate will happen in the future i.e. prices will continue to increase at a level they have been historically” ((G.M.), 2019).

“Yeah, I think absolutely it’s guided by mostly the past. 70-80% guided by that. That leading into people going “it’s happened in the past, it’s likely to happen in the future” ((N.G.), 2020).

The institutional respondents (perhaps reflecting their positions as both experts and observers or commentators of the market) often went further than investors in taking their responses to an explanatory level:

“We certainly observe that property investors tend to be much more cyclical in their behaviour than the market participants, so the peak and flow tends to be

investors piling in. And then when the market turns, they're the first to be selling. They would tend to suggest they are fairly sensitive to market sentiment" ((C.B.), 2020).

"It tends to be in waves or in herds if you like, people all rush through the door at the same time to get into the paradise, and then rush to the door to get out" ((O.N), 2019).

"Investor sentiment is usually/hugely determined by market sentiment because it's not only backward looking but capital gain is really, as far as I'm concerned, the product of herd behaviour, so I think they would all be watching what the herd's doing, via the media often. Herd behaviour is very large, so social media, media, talking round the BBQ and all that sort of thing. Which by the way even back in 2015 Wellingtonians were not talking about housing round the BBQ, whereas Aucklanders have been doing so for a decade" ((C.P.), 2020).

"People will think about when they bought their house, say \$250k. Now you have to spend more like \$800-900k for the same house. People assume therefore if you go forward 5 or 10 years, they project forward assuming there's a linear relationship, I think that's what they think, it's just going to do that and I think most people believe that that's what's going to happen" ((A.W.), 2020).

"I'd say people are hugely influenced by past performance because the system's so complicated that almost no one understands it, including RBNZ or Treasury and so people just go off this experience and what other people say, which is off their own experience" ((C.P.), 2020).

"Investors or the public in general have very short selective memories, so they look at the residential market in relation to the fact that it always seems to be increasing, and a rule of thumb which is ridiculous as it sounds, is that property doubles every 10 years in value" ((G.M.), 2019).

In relation to the influence and sources of market sentiment, the institutional respondents overall expressed a stronger belief in the importance of market sentiment to investor decision making, and to the role of media and peers than did investors.

"They heard their mate bought a property 2 years ago in Auckland and they've made \$200k without getting out of bed and think, I want a piece of that action and I'll do that here in Palmerston North and see what happens" ((D.A.), 2019).

“My perception would be media plays quite a big role in terms of overall sentiment around the market. Which is really amplifying the messages that are coming from the likes of the Real Estate Institute and others who are putting out data” ((C.B.), 2020).

“They’re always hoping for capital gain because there’s always a story in the media somewhere that some areas make money and they follow that. It’s a dream. Underlying long term investments is the hope that the rent will help pay off the mortgage, and that they ended up with an unencumbered property” ((O.N), 2019).

“The media unfortunately or perhaps wrongly still does play a part in the decision making of these guys. The experienced investors should know that the media is necessarily accurate in reporting, in that its behind in terms of stats, and also should know that the media can sensationalise stories. I’m on the ground, I know that market and I see the media stories, and they’re sometimes quite different, painting it in a different light. Unfortunately though, most investors still read that garbage and are influenced somewhat by it. Its strange, but they are” ((R.H.), 2019).

Approximately half of the responses were caveated as being differentiated by the level of experience of the investor:

“Whereas probably the least sophisticated ones, your Mums and Dads who are thinking, crikey everyone else is making money from the property market, we better do one too. They’ll probably be more inclined as to follow the crowd” ((D.A.), 2019).

“Where are they getting the information from? I guess given the small scale of most investors I think the mainstream media type sources tends to be the main drivers. What’s the front page of the Herald or Dom saying? House price increased 20% in the last year, must be a great time to pile in” ((C.B.), 2020).

“I would suggest that the more wisened investors are not looking for the boom suburbs, they’re actually looking for the ones that have all been very flat and trying to find out why that is, and if that’s about to go. So, they probably rate themselves on being able to pick the suburb that is about to boom, rather than just following the crowd and go for one that’s already shown an increase in the

last 6 months. I think they rate themselves as being quite sophisticated and being able to pick the winning horse” ((D.A.), 2019).

“I think if it’s at the Mum and Dad level, I think it’s from other investors or their peers. People see other investors making good returns etc or hear about it via the media and I think that’s one of probably the principal area they get a lot of their information” ((G.M.), 2019).

#### 8.3.4 Motivations and Expectations in relation to Investment (Risk and Return)

##### **Returns**

The most frequent observation (observed in all but one respondent) was that investors are primarily investing with the motivation for (and expectation of) capital gain.

“We know from investor behaviour, almost no one invests to make money off yield, certainly not in the suburban stand alone or townhouse residential property. They’re investing for capital gain and that’s quite evident because of the yield that you get from property” ((D.N.), 2020).

“With holders [as distinct from traders], there’s no emotion in it, its purely looking at numbers. Its purely looking at rental yield, its purely looking at long term capital gains in this area” ((R.H.), 2019).

“I think, especially with the success of the property market, it doesn’t take you too long to talk to someone who has done well, and you end up saying to someone “do you own properties?”, and they do, and “how’s it gone?”, and you get these great stories about how much it’s increased in the last couple of years” ((N.G.), 2020).

“Seasoned investors are not necessarily attracted to a ‘decent’ area. They are attracted to an area that’s got growth or going to have growth. So they will have narrowed down specific suburbs that they will want to invest in” ((R.H.), 2019).

“In terms of capital gain [expectations] for the seasoned investor it’s a long term game. A balancing act between yield and growth. The inexperienced investor is looking at moreso capital gain in terms of short term, and by that I mean 5 years down the track” ((T.K.), 2020).

“I think it’s accepted that the rental return is next to nothing, and it’s all about capital gain, and that’s what’s driving it” ((O.N), 2019).

In relation to income returns the responses were varied but a clear theme was evident in relation to the secondary role of income returns as being either to secure funding or to cover holding costs while the capital gain was obtained.

“I think most landlords in New Zealand are renting out because they are waiting for capital gain. I don’t think they’re mostly waiting for the rent. I think the rents just help them manage the mortgage until they can sell it at a higher rate. I think that’s been the case for quite a long time in New Zealand” ((A.W.), 2020).

“There certainly is a focus on particularly those buyers that are having to stretch themselves to enable them to add a property to their portfolio, because then rent is very, very important to them. They need to get that rental return. Whereas those that are just using their own money, are not relying on that funding, they’re probably making more a decision where they’re thinking, I think this part of town is about to take off” ((D.A.), 2019).

“So long as the cashflow covers the debt servicing then the capital gain will take care of itself pretty much” ((C.B.), 2020).

“The rent is pouring the oil on the wheels while they wait for the capital gain, that’s all. The rent’s the oil for the gear to turn around until they wait for that capital gain at the end. That’s just the way it works” ((O.N), 2019).

When discussing investor motivations and expectations of returns, again many of the respondents expanded to include their explanatory viewpoint:

“I think capital gain is always expected because New Zealand has a history of capital gain and I don’t think there’s anyone alive who can remember it going down” ((G.B.), 2020).

“I think at the moment what’s influencing a lot of purchasers, whether they are buying for investment or other reasons, is the very low interest rates and what seems like high price inflation. I think that’s what really influences people and people just think it’s safe as houses” ((A.W.), 2020).

“All kiwis seem to have this fascination with property. I think it’s because historically we’ve had such high home ownership. We all want to have the kiwi dream, the ¼ acre section and that’s a distant dream for most of us these days but we’ve been brought up with that. Our parents have instilled that in us in terms of when you grow up and get a job you’ll be able to buy your own house and you’ll

be able to renovate and make some money. The old saying “safe as houses”, its your best investment” ((D.A.), 2019).

“I think people think that a house is the safest form of investment in New Zealand relative to financial assets, some of that I think there are people who are influenced by what happened in the 1980s in terms of the share market” ((A.W.), 2020).

“I think people always feel that property is easier to understand than today’s share market and so it’s bricks and mortar rather than shares in a company that they don’t know much about, and that they haven’t got the energy go ready about it to help make their decision. I think that people always have these expectations of capital growth over time. Where else are you going to get a return like you’re currently getting on the property market. If you’ve got cash you may as well have it under your mattress instead of the bank” ((D.A.), 2019).

“Interest rates have a huge effect certainly. If they do the numbers with 3% mortgages and do the numbers with 8% mortgages you get two different figures, because the rent doesn’t go up and down at the same time” ((O.N), 2019).

The experienced / inexperienced distinction was also evident in this aspect of the interviews:

“The Inexperienced investors have been drawn into the market by what they’ve seen in terms of capital growth” ((T.K.), 2020).

“Those longer term investors look at it from a yield perspective, because it’s a business. It’s a balancing scale, for example a property may have an excellent yield but lower capital growth expectations. It might be in an area of state housing, say, with lower capital growth, so they balance those two out” ((R.H.), 2019).

### **Risks**

Observations from the institutional respondents in relation to risks that are considered by investors can be grouped into two types: systemic and non-systemic. Non-systemic risks relate to the asset itself and systemic refers to the investment environment. This distinction is simply for the purposes of grouping responses, as these are not discrete groups. They are not discrete because there may well be a causal relationship between the two such as regulatory systemic risk being linked to additional compliance matters for certain asset based decisions (non-systemic risk).

Non-systemic risks were strongly observed as being of two types. The first is the risk of tenant default; and the second is the risk of additional asset-related costs, consistent with investor stated preference.

“Vacancy, and the tenants smashing the place up and leaving it, and the hassle of getting it to the Tenancy Tribunal” ((O.N), 2019).

“I think they’re probably most interested in whether or not the tenant is damaging the property and whether or not they’re getting their rent. Those are probably the two risks they’re monitoring most” ((A.W.), 2020).

“My perception would be, at a micro level, the tenant risks are quite front of mind, getting risk of property damage, risk of unpaid rent, those sorts of risks. And then at a macro level probably risks in terms of tenant protection, healthy homes type stuff, possible tax changes and interest rate risks, I’d expect to be pretty front of mind for investors. I guess my perception is probably that there is less cognisance and monitoring of broader macro risks. The risk that property prices decline significantly, trends that result in materially lower rents or rental stagnation type risks” ((C.B.), 2020).

“What can influence people are the materials that the house is made from. If it’s a 70’s house it’s almost certain to have asbestos somewhere. If I was to say, what in depth study does a potential investor put into considering risks, probably the most goes in to how much needs doing to this property, whether that’s to bring it up to regulation so that’s more prevalent now, but also is it leaking or is it going to leak? Has it got Dux Quest plumbing etc” ((G.B.), 2020).

“What’s it made of? What sort of repairs, what sort of tenant will go in there and that sort of thing” ((O.N), 2019).

“I think it’s just purely around what’s the quality of the tenants and also what CapEx do I have to put into the property. Whether that’s for repair damage or whether it’s just to make it more leasable or to meet government compliance” ((G.M.), 2019).

“I think it’s probably mostly property risk. Building, construction... I’d say that’s probably often the main concern. Whether it’s meth or whatever” ((N.G.), 2020).

Systemic risks were observed by all respondents, with the three most frequently observed being:

1. market fluctuations / house price decline
2. interest rate fluctuations / increases
3. increased regulation.

The first two risks were observed by respondents as being not being actively considered by investors (with only two exceptions). The third risk was considered by respondents to be an actively considered risk by investors, consistent with investor stated preference:

“I don’t think people would see much risk in the market going down, I think especially now that we’ve seen the sheer prospect of house prices going down by any sort of significant margin, will cause all aspect of the wider government system to completely break down and do whatever it takes to prop up prices. That’s what people have seen and so people would think the government would rather go bankrupt than allow house prices to go down” ((C.P.), 2020).

“I think that people would have been thinking about the risks of interest rate fluctuations and the market dipping, probably in the 90s and maybe some bits of the 2000s, I think now people just assume house prices will continue to escalate and there is no possibility that they will drop” ((A.W.), 2020).

“I doubt people are concerned about interest rates increasing because they’ve just been on a one-way track for the last 10 years and if interest rates were to be raised in any significant way now, it would put so many people under duress and increase the risk of the house crash, that interest rates won’t be rising in any significant way” ((C.P.), 2020).

“Interest rates have consistently been going down and rent and values are consistently going up. There isn’t any observational cycle in their time frame, so I think people are quite myopic in their decisions, from an investment perspective” ((A.W.), 2020).

“Risks considered by investors is something I’ve never thought about because I don’t think I’ve ever heard it actually voiced. I’d guess from that, that they’re not buying if they thought there was a risk. In terms of the bigger picture risks of interest rate increases and house price drops, there’s a lack of experience of that ever happening” ((G.B.), 2020).

“Investors consider obviously we hear a lot of talk about government regulation of the home standards. Investors will think ‘I’m competing with thousands of

others to try and get my house insulated by the due date of health home standard or whatever' and it will discourage some investors. I think government regulations will be one of the major risks that they are nervous about" ((P.L.), 2020).

Two further risk observations were made in relation to the experience level of the investor and the temporal proximity of the risk.

"Risk comes down to experience. The more experienced ones are more risk averse. The newer ones believe it or not take bigger risks but not because they are aware that they are doing it. They are sometime naive about what they are doing. They sometimes don't know that they are taking on a risk. The seasoned ones are very risk averse as I said earlier" ((T.K.), 2020).

"The newer guys, they're excited they don't know the risks, they're jumping into it. They're going to make some money out of this. And those guys I've seen them get so burnt" ((R.H.), 2019).

"People manage for the last risk and they manage for something they know about and it's very narrow. We see it in the Covid pandemic, where its hard to get very minor behavioural changes, so I think humans are cognitively not great at using information, that's even present information, to feed in. I think we just bank the past" ((A.W.), 2020).

"So I think people feel like it's a safer way to save, they feel like it's tangible, they can see it, it's not going to disappear anytime soon. Course, then we had the Christchurch earthquakes. People are very myopic, they think of the last risk, they don't think about the next risk" ((A.W.), 2020).

"I still think people think property goes up. I think people just assume houses go up. The thought of negative equity it doesn't really cross people's minds, or they think it won't happen again" ((J.G.), 2020).

"If you're sitting back as a grassroots investor, you're just looking at the fact that you've seen an ever increasing market and you either don't remember or certainly don't focus on the times when the market has gone through some degree of correction because it's been so long ago" ((G.M.), 2019).

### 8.3.5 Institutional Influences

The institutional interviews differed from the Investor interviews in this facet. Respondents were asked to comment on the influence of their own institution, and on other institutions. This enables further triangulation and comparison between the investor and the institutional views and allow for a comparison between the perspective of the institutional environment overall as to the degree of influence of various institutions, and the investor perspective.

#### 8.3.5.1 *Your institution's influence (respondent's perception of their Institution / sector)*

##### **Real Estate Agency Sector**

Overall, the respondents concurred with investor interviews that this sector is a key influencer and provides to investors both market data and general advice or analytics on the market. The more experienced investors also acknowledged the role of agents in providing asset specific advice such as direct contact on suitable stock and pricing. However, real estate agents considered that their role went further to being more of a trusted advisor:

“I provide sales data, but the main influence that agents have is advice from a trusted agent, somewhat they know and have worked with in the past” ((T.K.), 2020).

“I’ve got investors that I give sales stats and data to and say don’t worry its all nonsense, this is what its going to get [price] and they will blindly sign and listen. Investors know that agents are performance based, they need to get results. It’s a repetitive process, not a one-off. Track record of agents counts. Advice is gold” ((R.H.), 2019).

“We have buyers that say “look, let me know if you get, whatever, but as soon as we get a listing and we’ve signed that contract with the vendor, our responsibility switches to that vendor. We have to get the highest price we can and there’s only one way to ensure that you’ve got the highest price, you have to have the buyers compete” ((G.B.), 2020).

“The real estate salesperson said ‘In a year’s time you won’t even worry about it’, inferring that it would be worth more. No, you can’t say that” ((G.B.), 2020).

As noted within in the second two quotes above and in the investor findings, the potential conflict of interest within the role of real estate agents (acting for vendors yet providing advice to purchasers) was acknowledged by two agents interviewed as well as from another institutional respondent.

“An experienced agent is the best one to tell you what a property is worth, not valuers, or the bank, as long as they are totally honest about it. That’s where trust comes in” ((R.H.), 2019).

“That [the 2006 REA Act] made it very, very clear, that you’re working since you have a contract, your client is the seller of the property. As such you have a role to get the maximum price you can for that property” ((G.B.), 2020).

“So, buyers can misread a property that the agent may know there is little interest in and suddenly they pay a premium price to beat their opposition. It’s not for the agent to correct them, as they work for the vendor” ((P.R.), 2020).

“As you’re probably aware the regime of disclosure, we’re really well and truly into that now and it’s just not worth anybody’s while not disclosing information about a property. While we have fiduciary duties to the vendor, we have what’s known as duty of care under the law to the purchaser” ((G.B.), 2020).

This potential conflict of interest, while acknowledged by the institution, was not directly observed in investor interviews.

### ***Government / Macroprudential Sector***

Across all interviews the government sector respondents reflected strongly the investor investor interviews in relation to the impact of regulations in terms of tenancy laws and asset compliance on investors, and the ability to influence investors via this policy mechanism.

“The government can influence or unsettle investors or reset expectations, but if you’re a residential property investor we expect you to be doing these things in terms of tenants. That’s the main thing, how you reset expectations and through the residential tenancies act, that’s been the main lever” ((A.W.), 2020).

“We’re hearing that they’re worried about legislative uncertainty. And it also feels like we’re seeing the risk around which tenants they select as being more of a risk than in the past. This became more prevalent around the time of the methamphetamine awareness. We get a lot of feedback around the security of tenure changes. This will put an upon on landlords to have to engage with tenants around behaviours. Landlords are now being more judicious in the selection of tenants” ((C.M.), 2021).

The influence of macroprudential rules such as loan-to-value ratios, responsible lending and wholesale interest rates was similarly consistent between investor interviews and sector interviews:

“There’s a couple of direct things we do which influences investors. Number one is we obviously set interest rates and that’s a pretty fundamental driver of the market. And then the other is the control valuation rules, capital settings for banks, so all these things will have some impact on market dynamics” ((C.B.), 2020).

“From the association surveys we do, government intervention used to be around 10% [of risks being considered] about ten years ago and now its up to 50%, so that’s become an enormous thing. At the moment I think interest rates because there’s been talk of them going up” ((A.K.), 2022).

Government sector respondents presented the most varied and considered perspectives on the influence of government policy on investors, wider than other institutions or investors had presented. In this regard there would appear to be a wider potential range of government influences than perceived by investors and many institutions based on observations within this research. Examples include:

“I think taxation is one of [the key government levers] but I don’t think, in my view, if you touch taxation without thinking about some of the other things, I think you get a big push back. It’s kind of like RMA reform. If you do RMA reform without thinking about the whole eco system, there’s no point, you’re going to get a lot of political push back and you haven’t necessarily fixed it” ((A.W.), 2020)

“I’ve got no doubt the property market’s going to continue to increase while the government is stimulating the economy and I think most people that have access to money, if they’ve got access to \$500k to buy a house, they probably have that same intelligence to think, well it’s going to keep on going” ((D.A.), 2019).

The government institutions (as with the market analytics sector interviews) considered the level of impact of their publications on investors as being greater than investor observations. As previously noted only the more experienced investors regularly considered governmental publications on the property sector or on the wider economy.

“People are continually looking to the Reserve Bank to get an idea of what might be around the corner for the economy, and if they’re not listening to them directly

they're hearing what the commentators are saying and when they've joined the dots in terms of what this means for interest rates in the future or LVRs" ((D.A.), 2019).

"We publish forecasts and give commentary on what we're seeing around the housing market, outlook for interest rates, all these things are obviously out there. There's some influence on how investors perceive the market."((C.B.), 2020).

Overall, the government institutional responses reflected the observed investor perceptions of that sector's influence (regulation of tenancies and asset quality; and macroprudential), but also went further, providing an insight into a potential perception gap between investors and regulators in terms of actual and potential points of influence.

### ***Banking Sector***

Responses from the banking sector focussed on two themes of influence. Firstly was the role of providing a supply of funding to facilitate property purchases including the processes by which funding is approved:

"There are metrics that we require in order to process an application, which will vary from individual. And as a result of that it will affect the ability of someone to purchase a property" ((N.S.), 2019).

"It's [approval metrics] a mix of personal circumstance and the asset. Not all investors are equally able to borrow" ((P.L.), 2020).

"Depending on how much or what the quantum of value is, triggers a whole lot of internal processes in the bank in relation to how you determine that security value. So up to certain amounts we will lend on an e-Valuer, a government valuation, and then as we ramp up the risk profile and the LVR gets higher, then we'll require a registered valuation report" ((G.M.), 2019).

The second major theme was the influence of publications on topics such as the property market, interest rates, or economic outlook:

"I think you have your economic commentary, so again economists within banks are almost asked their opinion on a daily basis in the news. I think interest rates. We influence the decision making and again, we're not directly responsible for where the interest rates sit but having low interest rates certainly would stimulate someone thinking about investing" ((G.M.), 2019).

In this regard, banks have been observed as applying heuristics to some investors, but they are also observed as applying a level of third party scrutiny to individual investments that is absent elsewhere in the system. Both bankers interviewed noted that the increased emphasis on 'responsible lending' from both the Reserve bank of NZ and the government was seeing this scrutiny increase over the past decade:

"The banks are really focused on [responsible lending] and whether you're just going in for a personal loan now or whether it's a mortgage, you'll be quite surprised how much focus is on that and they have to be because the new policies are forcing us, and the regulator's requirements, whether it be the Reserve Bank or APRA" ((G.M.), 2019).

"Through the due diligence process of the bank's lending application we may ask matters such as have you had a builder's report, or we may require them to make an allowance for remedial works. Through the process we may ask for further information that may then make them not want to proceed" ((N.S.), 2019).

A further observation made by the bankers (and also by other interviewees) was that the impact of bankers via the funding mechanism (and approval processes) was likely to apply less to the larger investors and the experienced traders who were more likely to be self-funding. The impact of bankers was more likely to be experienced by smaller scale or newer investors. A related observation was that the banks consider the borrower's overall position rather than the individual transaction. This is to say that an investor with a large portfolio may well be able to exceed the loan-to-value policies of the bank on a particular purchase, due to the aggregate security and serviceability:

"I believe that the banks are favouring people with assets and I think pretty much that's understood and we see it with the pain that home buyers, particularly 1st home buyers, are having to be put through" ((G.B.), 2020).

"You can have the same property, two different clients, one may need a valuation [to secure funding approval] and one may not" ((P.L.), 2020).

This may have the effect of banks favouring experienced investors over new entrants in terms of availability of funding.

### ***Market Commentary and Market Analytics Sector***

This sector encompasses non-subscription sources of opinion and advice, including mainstream media, social media, investor groups, and organisations providing market statistics and analysis.

Responses from the market commentary sector focussed on the breadth of the channels available to investors and how investors will self-select commentators and media channels, thereby diluting the influence overall.

“Things like The Block and so forth have had a big influence initially and TV articles, horror stories, you know, the Herald put out another shock horror story. That has an influence” ((O.N), 2019).

“I think there’s a big difference between the experienced and the inexperienced investor. People have busy lives; they will just read a few headlines or they’ll see a few things, and so I think we definitely have some of that mixed interaction where sometimes you hear people say things and you know what they read, whereas other times you know that they’re pretty clued up and they understand a bit more of the actual drivers of the property market” ((N.G.), 2020).

“I think that people don’t want to know bad news, because people are fundamentally positive” ((J.G.), 2020).

“They probably keep your eye on the social media chat group etc which share some of these war stories, where they’ve had a particularly successful property development or investment decision that they’ve made. We talk about the victories though, we don’t talk about the ones that don’t go so well” ((D.A.), 2019).

The organisations that were more analytical in their publications focussed their responses on the value of their products and in particular how they would enhance the objectivity of investor analysis compared to those sources that they considered less objective:

“Its [the media] not a great source, but the general media is where most get their information from. The economists, the bank economists are better. To be honest its [the media] not a great source of information, it seems to be ill informed, looks for sensationalism. But I think a lot of people are really influenced by the general media and they probably shouldn’t really” ((A.K.), 2022).

“I guess because we’re independent and without any vested interest in talking the market up or down, people see us as I guess a trusted voice” ((D.A.), 2019).

“We publish forecasts and give commentary on what we’re seeing around the housing market, outlook for interest rates, all these things are obviously out there. There’s some influence on how investors perceive the market” ((C.B.), 2020).

“[Our company] is absolutely about educating the market, and that’s through a number of different sources. We present to clients, we present to the big banks, so their frontline staff understand what’s going on in the market so they have better conversations” ((N.G.), 2020).

“They’re now more frequently getting access to those [online] tools themselves to be able to understand not just the value but the potential risk of a property and all those different things as well. There’ll be the free tools as well; the websites such as homes.co.nz, OneRoof, Trade Me. I think those are standard tools to assess a property, and the insights pages that they offer” ((N.G.), 2020).

“I’d say there would be the likes of ourselves providing that, and media providing that information as to what’s going on. I think mainstream media, but also the economists, independent economists as well. Most of them would be pretty aware of that sort of commentary” ((P.R.), 2020).

“I think the role of the professional organization that’s providing advice is growing. That’s a bigger part these days than it has been in the past” ((N.G.), 2020).

#### *8.3.5.2 Influence of other institutions (respondent’s perception of other Institutions’ influence)*

The responses to this question revealed a consistent list of institutions across the respondents, perhaps reflecting their roles as experienced market professionals. No additional institutions were identified from investor interviews. In terms of frequency, the institutions most commonly cited by institutional respondents were:

1. Reserve Bank and the banking sector
2. Market commentators
3. Peers, including social media
4. Government

Within the institutional responses were reinforcing perspectives from other sectors which supported the self-observed institutional influences. The two most commonly cited were in relation to the influence of the regulatory role of the government, and the banking sector.

The most frequent cross-sector reinforcement was the influence of regulation in the decision making of investors:

“I also think it’s quite important the government regulations in relation to heating, insulation etc. just all those additional costs can sometimes be the tipping point for investors” ((G.M.), 2019).

“I would imagine it’s maintaining cashflow so rent paid on time and furnish the property and then after that, the risks are probably regulatory change especially over the last government with a plethora of changes and regulations to try and claw back some of the economic rent that has been transferred to landlords from renters and future home owners” ((C.P.), 2020).

The influence of the banking sector (through the supply of funding, and allocative decisions) was reiterated from the real estate agency sector and the government sector:

“Investors [rather than traders] are definitely going to the bank, so policy and reserve bank LVR policy plays a massive part. If you haven’t got the money, you can’t buy. Traders not as affected by funding, as most are not going to the bank. The first time ones [traders] that are getting burnt might be going to the bank, but most if not all experienced property traders self fund or go to second tier lenders” ((R.H.), 2019).

“Banks overall have massively changed their lending behaviour because we’re seeing a huge surge in mortgaged investors and in first time buyers. This hasn’t happened by accident, this is in direct response to LVRs being removed” ((D.N.), 2020).

This respondent also reiterated the banking sector observations in relation to the impact of bank processes in ‘responsible lending’ and third party scrutiny of decisions:

“This increased emphasis on responsible lending can weed out the weaker players” ((D.N.), 2020).

In addition to these cross-sector reinforcing observations, there were two notable inconsistencies. The first is in relation to the influence of real estate agents. The real estate agent sector noted considerable influence by agents (and this was reflected in investor interviews also), but this influence was much less frequently observed from other institutional respondents. One respondent went further to discredit the influence of real estate agents:

“I think people take real estate agents with a pinch of salt, everyone knows what they are, right” ((J.G.), 2020).

The second inconsistency observed was in relation to the influence of market commentators. The market commentary sector self-observed as being of limited influence, following rather than leading opinion. The predominant view of other institutions was that this sector could potentially amplifying investor perceptions and behaviours. Examples include:

“The media is as influencer whether that be through the news media or current affair shows, or whether it’s those reality shows looking at people investing and making an absolute fortune or on the flip side, people investing and having to outlay a lot more CapEx to repair properties as a result of poor tenant quality etc” ((G.M.), 2019).

“They’ll [investors] be listening to all of these commentators and picking the eyes out of what they’re saying and you’ll have a conversation with them when you might be inspecting a property with them and you’ll hear them say something and you’ll think, I heard [a commentator] say exactly the same words. So, they’re just parroting what they’ve heard. They’ve soaked up information that they read, hear or chat about on social media and it becomes unwritten law in their mind” ((D.A.), 2019).

“The first time guys are definitely influenced by the media, but even sometimes even the seasoned guys” ((R.H.), 2019).

“What you read in the paper, the cases from the tenancy tribunal etc. Time and time again we’re bombarded with horrendous cases or renters basically not paying rent, destroying the house, it’s going to cost me \$20k, \$100k to reline it etc” ((A.K.), 2022).

“I think there’s an emotional attachment to ‘my’ property, ‘my’ retirement, makes it really hard to have any kind of decent discussion with property investors and I think some of the commentators make it harder, not easier. So I think there’s a role there for those opinion leaders to actually think about it” ((A.W.), 2020).

#### 8.3.6 Observations on Investor types

Responses from the Institutional interviews resulted in a further self-selected category of observation, being the segmentation of the market by two aspects: scale of investment experience; and investment approach (‘hold’ versus ‘trade’).

The segmentation in terms of the investor's scale of investment experience was the most frequently and broadly observed. It was observed as having relevance to the following aspects of investor motivations and behaviours:

*Return Expectations and Use of Analytical Techniques*

"In terms of capital gain [expectations] for the seasoned investor it's a long term game. A balancing act between yield and growth. The inexperienced investor is looking more at capital gain in terms of short term, and by that I mean 5 years down the track" ((R.H.), 2019).

"I think there's probably a difference here between the professional property investors who do think about returns and what's going to be a growth market and what's not, where migration and other models are going to feed in. I think that's probably different from Mum and Dad investors who are probably quite opportunistic and aren't really thinking about what the purpose of the investment is, but rather "oh well, it's a good way to save, I'm just going to buy one" ((A.W.), 2020).

"There's a different level of knowledge and expertise for your more commercial residential investor or developer who owns a whole portfolio, than your Ma and Pa who has invested in their second" ((N.S.), 2019).

"Inexperienced investors have been drawn into the market by what they've seen in terms of capital growth" ((P.R.), 2020).

*Consideration of Past and Future Performance, Market Sentiment (and Sources)*

"The seasoned investors take it quite seriously, they watch the market almost daily. See what house prices are doing. They're the guys that will ring up and say hey what did this house sell for, or they're constantly going through open homes just to view the property, see what it sells for an keep an eye on the market. They're watching trends in the suburbs and what's happening" ((R.H.), 2019).

"Those first time investors they're not really listening to an agent. They're basing the decision on their gut" ((A.K.), 2022).

*Role of Funders and Funding Approval Scrutiny*

"Traders not as affected by funding, as most are not going to the bank. The first time ones [traders] that are getting burnt might be going to the bank, but most if

not all experienced property traders self fund or go to second tier lenders” ((R.H.), 2019).

#### *Risk Perception and Management*

“Risk comes down to experience. The more experience ones are more risk averse. The newer ones believe it or not take bigger risks but not because they are aware that they are doing it. They are sometime naive about what they are doing. They sometimes don’t know that they are taking on a risk. The seasoned ones are very risk averse” ((R.H.), 2019).

“The other factor is the cheapness of money and these people [newer investors] have never known high interest rates, never known double digit interest rates let alone the very high interest rates that some of us have seen many, many years ago, back in the 80s” ((G.B.), 2020).

Segmentation in terms of the investor’s approach to investment (‘hold’ versus ‘trade’) was less frequently observed but was of relevance to aspects of investor motivations and behaviours such as the importance of current market information and the short term horizon of risks. This is consistent with investor observations.

#### 8.3.7 Key Themes from Institutional Interviews

The following themes were identified from observations within the institutional interviews as being strongly supported by the majority of responses and respondents. Minority and divergent findings are noted separately.

1. **Investors have a predominant emphasis on capital gain as a motivator for investment.**

This theme was predominant and consistent across all institutional interviews in response to questions in relation to the types of analysis undertaken; use of heuristics and return expectations. There were observations in relation to the emphasis on capital gain, but there were no conflicting observations.

2. **Investors are strongly influenced by past market performance and have an expectation of capital gain based upon this past performance.**

This theme is consistently observed across three areas of questioning. Firstly, the sources of information and type of analysis that is undertaken by investors. This is to say that data and analysis are largely historical based and dominated by the theme of capital gain. There were a minority of observations in relation to other forms of analysis (analysis of rental returns or future projections based upon economic fundamentals), and no contradicting observations. Secondly, the importance of market sentiment in return expectations, and the influence

of peers and the media in relation to past performance of the market and individuals in determining this sentiment (being largely being observed in terms of capital gains rather than wider consideration of returns and risks). Thirdly, the observation in the area of heuristics. The most frequently observed heuristic was in terms of market house price trajectory, for example “house prices always increase”; “houses double in value every X years”.

3. **The consideration of risk is largely operational rather than macro, and temporally proximate.** The majority of institutional respondents identified a recognition of risks at the asset level (tenant risks such as damage and vacancy, and asset risks such as maintenance costs). There were observations acknowledging wider macro risks (such as price and interest fluctuations), reflecting the knowledge of the any institutional respondents, however these were most frequently observed as not being actively considered by investors. This observation of a lack of macro risk considerations was stated by many as being due to the lack of recent occurrence of these risks in particular interest rate increase and house price decreases. Reinforcing this is the observation by many respondents that macro regulatory risks were not of active concern to investors due to the frequency and proximity of such occurrences.
4. **Distinction in behaviours and motivations between experienced and inexperienced investors.** This theme was not only a predominant observation across the institutional respondents but was also pervasive across many of the behavioural factors being researched. This distinction was self-selected by the respondent, inferring that this distinction was important to understanding rather than simply categorical.

#### 8.3.8 Divergent observations and minority findings

The following divergent and minority findings were noteworthy. The first is in relation to the role of emotions.

“Most investors, they just do basic analysis; how much is the rent likely to be, how much is the mortgage going to cost me, what sort of repairs have to be done, and the rest is emotion” ((O.N), 2019).

There’s an emotional aspect for a trader. It’s not just about the yield they will get. It’s like a pet or a child. They get a bit crazy on it. It’s a creative process, and some almost consider it art. So there is a bit more of an emotional aspect to it” ((R.H.), 2019).

A minority observation (2 instances) which also was a minority observation among Investors was the issue of altruism:

“These guys see themselves as offering a service, doing something good in the community by providing rental properties. Some said they felt like they were getting attacked [by govt policy] for doing a good deed. So govt policy can have a massive impact on investors. Traders too, but less so” ((R.H.), 2019).

“They’re mostly doing this for their financial future, for retirement really, so they’re taking a long term view on it, supplying people with a home which I think is a good thing, its an extraordinarily important thing that they are providing and there is a need for it so they shouldn’t be demonised for it” ((A.K.), 2022).

#### 8.4 Qualitative Findings Comparative Analysis and Summary

The research methodology anticipated a cross-checking of evidence between investors (their stated preference) and the institutions which they consider are of influence in their investment activities.

This provides four types of observational findings:

1. Findings that are consistently supported by both groups
2. Findings consistent within Investor group, but inconsistent within Institutions
3. Findings consistent within Institutional group, but inconsistent within Investor group
4. Inconsistent or mutually incompatible findings between the two groups

The observations and findings across the groups can be grouped according to this framework as follows:

##### ***Findings that are consistently supported by both groups***

1. Investors place strong emphasis on past market performance when predicting future performance (particularly in terms of capital gain)
2. Market sentiment has a considerable influence on investors
3. The predominant motivation in housing investment is capital gain
4. The consideration of non-systemic risks (tenant default and asset related costs) rather than systemic risks is predominant
5. The risk of more stringent housing regulations is of active consideration
6. Macro risks of economic cycles or house price decline are not actively considered
7. Considerable emphasis is placed on sales analysis (technical analysis) rather than fundamental analysis

8. A temporal skew towards risks in the immediate past (previous few years)
9. Objective advice (such as valuations) advice is rarely sought, except as required by a bank, with a predominance of subjective advice and evidence
10. The return and risk considerations of 'holders' versus 'traders' are distinct
11. An absence of return comparison to other asset classes
12. Investors apply heuristics in investment decision making, in particular:
  - a. House price trajectory is upward
  - b. The imposition of bank processes, when seeking funding
  - c. Housing is a safe investment, and easily understood

***Findings consistent within investor group, but inconsistent within institutions***

1. The influence of real estate agents was noted as being more prevalent by investors than institutions, though it should be noted that as parties to the interactions this could be considered a valid self-assessment.
2. The role of investor groups, social media and peers as sources of information and advice.
3. The role of peers and media in establishing market sentiment.
4. Use of heuristics such as ratios and typologies for asset selection
5. Motivation in investing is to establish a portfolio and a passive income stream
6. The influence of occupant perspectives on asset selection, including altruism (empathy for the occupiers of property)

***Findings consistent within Institutional group, but inconsistent within Investor group***

1. Institutions generally considered the influence of market commentary and market analytics to be of more influence than investors did. This needs to also be considered within the context of inconsistency within the institutional groups as noted.
2. The distinction between experienced and inexperienced investors is considerable in terms of motivations, behaviours, and influences. This is reflected in investor findings, but not as strongly as the institutional group. This may reflect the stated versus observational perspectives of the groups.

***Inconsistent or mutually incompatible findings between the two groups***

1. The predominant *source(s)* of market sentiment were inconsistent across the groups, despite the *influence* of market sentiment being consistently observed as important across the groups.

Those findings which are consistent and triangulated across both groups are taken as the strongest findings of this research, and therefore to be given the most weight in consideration.

Those findings that were the stated preference of investors but were not consistently supported by the institutional group remain valid observations. This is because they relate to matters of investor motivations and behaviours that are difficult to observe directly by the institutional group. These findings should not therefore have their validity discounted.

Noteworthy is the role of real estate agents, which is stated by investors and the real estate agents interviewed as being a considerable influence. As both groups are directly observing this consistency, it has been accepted as a theme but is of limited impact on this research.

The first finding (use of market analytics) within the institutional group that was not supported by the investor group is difficult to validate as it relates to an external observation of private investor behaviour, and this was not supported by investor interviews. The second finding in relation to the distinction in behaviours (in particular, analytical sophistication) between experience and inexperienced investors was an observation of the researcher based upon the responses of the sample of investors interviewed but is also consistent with the observation of the majority of institutional respondents and is therefore regarded as reliable.

Findings in relation to the predominant source of market sentiment was difficult to establish conclusively, and no conclusive finding is made.

## 8.5 Conclusions of Qualitative Phase

A strong level of consistency within and between the interview groups was observed in terms of the following themes.

**Capital gain.** Investors saw capital gain as the primary motivation in investment. This capital gain was seen as a near-certainty, based upon medium term recent house price escalation, without consideration of fundamental determinants of house price growth or wider macro risks or cycles.

**Simplicity in Analysis.** Investors considered housing investment to be largely passive over the medium to long term, with returns inevitable. They saw little need for objective advice or analysis, preferring to base decision on transactional data, heuristics and experience, and market sentiment.

**Growth.** A predominant theme was the expansion of the portfolio, using capital gain and debt to increase the scale of investment and receive a passive income stream or accumulate wealth.

**Risk.** Investment in housing was seen to be very low risk with both income and capital returns considered an inevitability. Systemic risk such as market downturns or interest rate increases were not actively considered, and the consideration of risks largely confined to a non-systemic or operational level.

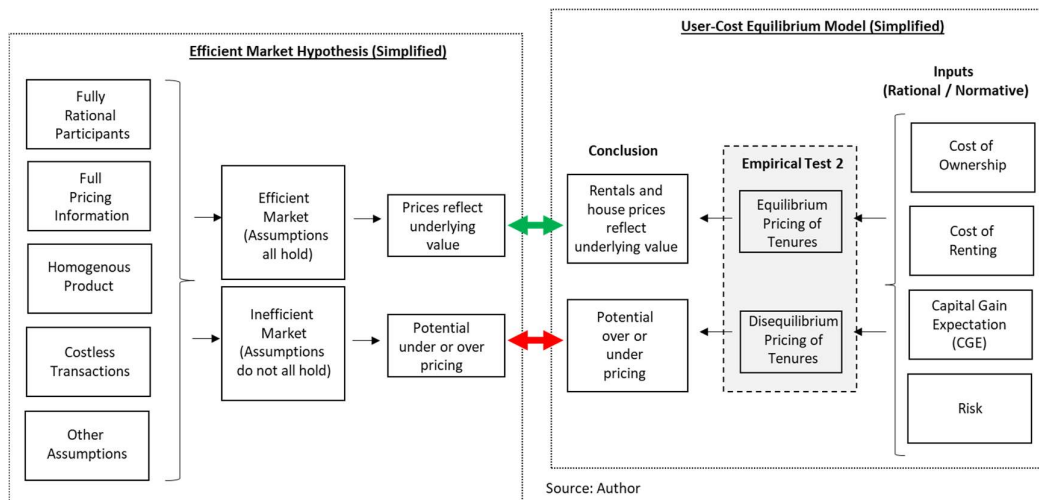
These observations may represent a sub-rational heuristic or bias when compared to a more objective view. This is tested in part two of the quantitative phase.

## 9 QUANTITATIVE RESEARCH FINDINGS

### 9.1 Introduction

The quantitative phase of this research undertakes two empirical tests. Part 1 of the quantitative findings outlines the findings in relation to *Empirical Test 2* within the conceptual model, as shown shaded in Diagram 7 below. The objective of this test is to determine whether there is evidence of equilibrium pricing in accordance with the UCEM within the Auckland housing market and therefore whether prices or houses and rents reflect underlying value in a normative and rational sense. In this regard, Empirical Test 2 will seek to determine whether there is evidence to support either the green or red connective arrows in the conceptual framework, shown in Diagram 7 below.

**Diagram 7: Conceptual Framework (Empirical Test 2)**



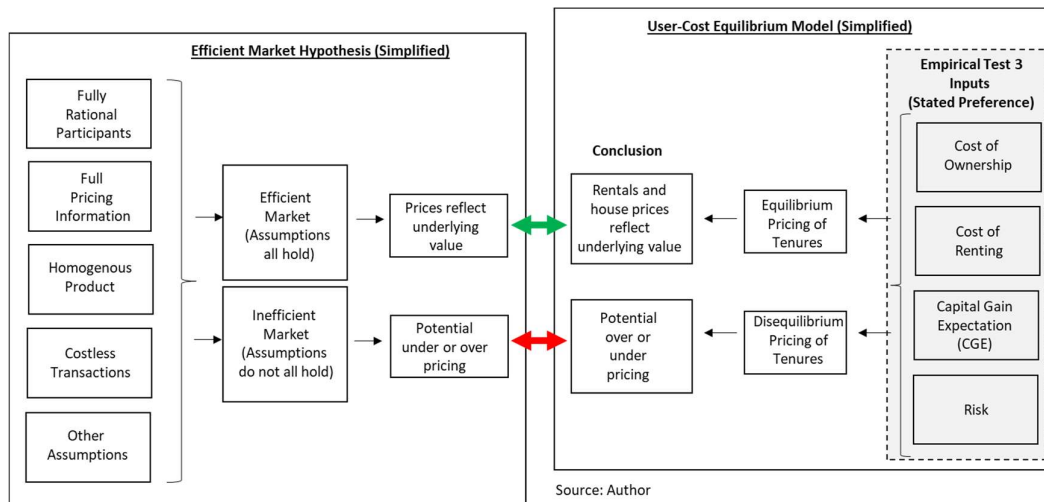
Part 2 of the quantitative phase of this research is to test the stated preference observations within the qualitative findings phase outlined in Chapter 8 via quantitative techniques to determine whether:

- the UCEM can explain how the stated preferences of investors (and the institutional observed preference) can manifest within pricing decisions, and
- quantitative techniques can provide evidence to validate (or otherwise) the implicit assumption of bounded rationality when heuristics and biases are present in decision making.

These two tests are undertaken as *Empirical Test 3*, shown shaded on the conceptual framework within Diagram 6 below. In Empirical Test 3 the UCEM that was adopted as the preferred model within Empirical Test 2 is used to test the observations from the qualitative

phase. This looks to quantify the impact of stated preference observations on pricing compared to the UCEM rational / normative model.

**Diagram 6: Conceptual Framework (Empirical Test 3)**



## 9.2 PART 1: What the UCEM Implies about Pricing in the Auckland Housing Market (Empirical Test 2)

Part 1 of the quantitative phase looks to determine whether the observed preference of the market in aggregate (observations of actual house prices and rentals) is in equilibrium according to the rational and normative UCEM. The UCEM calculates estimates for the respective costs of ownership and renting and holds that for a market to be in equilibrium and market participants to be acting in a fully rational manner, these should be equivalent over time. This is predicated upon a rational inclination (and ability) of market participants to move between tenures and minimise the cost incurred, relative to the utility offered by each tenure. Where the respective costs of owning and renting diverge, this is seen as a deviation from an equilibrium state, suggesting mispricing and a departure from full rationality in pricing.

The UCEM states that a market that is in equilibrium will be indicated by equivalence in the prices (rents and cost of ownership as reflected in house prices) for each tenure. Where these are not equivalent, the implication of the model is that the market is over-valuing one tenure over the other, compared to what would be considered rational and normative.

### 9.2.1.1 Data, Variables and Duration of the Model

This modelling uses the most complete and consistent datasets available for rentals and house prices, to provide a longitudinal and consistent view of the market.

### ***House Prices***

House Price data were obtained from REINZ, representing median house prices in the Auckland region. These median house prices are used in their raw form and require no sensitivity adjustment.

### ***House Quality***

To account for the difference in quality, an allowance of 18% (reduction from raw house price data) was adopted in studies in Australia (Hill & Syed, 2016) and New Zealand (Nguyen et al., 2022a). This value has been adopted, recognising that there is no comparable value within the NZ context, but this allowance is consistent with a comparative study which found a demonstrably lower standard of accommodation for rental properties compared to owner-occupied houses in NZ (Jones & White, 2023)

### ***Rentals***

Data have been obtained from MBIE based upon the tenancy bond lodgements. These data represent median weekly rentals for the Auckland area and is used in its annualised raw form.

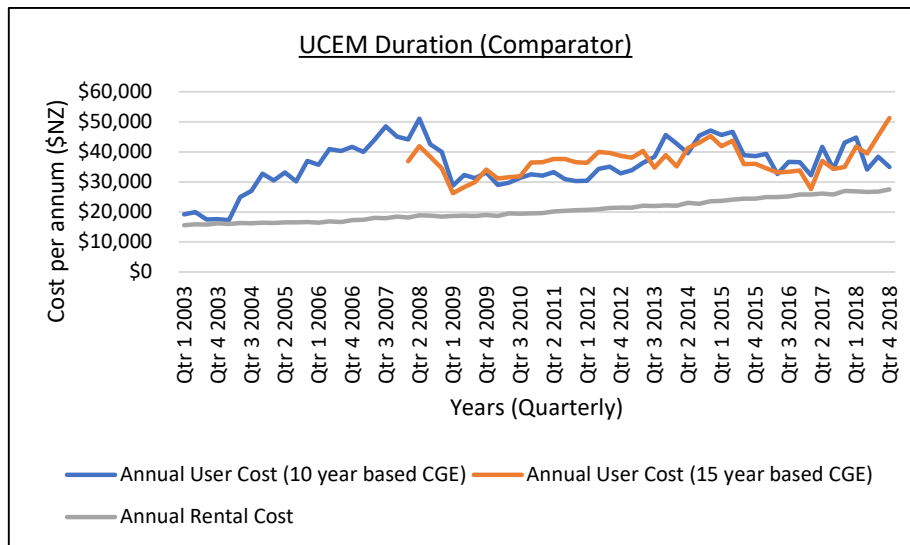
### ***Duration of Model***

There are two duration options for the model that can be undertaken within the available 25-year dataset from 1993 to 2018: the first being a 10 year model (with 15 years prior data to assess the CGE), and the second being a 15 year model (with 10 years prior data to assess the CGE). Extending the model into earlier timeframes cannot be undertaken with consistency of house price data as this would involve considerable manipulation of disparate datasets in an attempt to approximate consistency with the 1993 to 2018 dataset.

These two options represent a trade-off between the duration of the model and the duration of the preceding data on house prices as an input to the model in relation to CGE. The first option is a 10-year model (2008 to 2018), which uses up 15 years past house prices to assess the CGE (1993 to 2008). The second is a 15-year model (2003 to 2018), which uses up to 10 years of past house prices (1993 to 2003) to assess the CGE. As with model duration, the use of 5, 10 or 15 year durations for the calculation of CGE is supported in similar NZ based studies which adopted similar durations and extrapolation of CGE from the past performance of the housing market (Hill & Syed, 2016) (Nguyen et al., 2022a), based upon overseas studies, for example (Himmelberg et al., 2005) and (Flavin & Yamashita, 2002).

Using the preferred variables outlined below, comparison of the user-cost estimate from each of these is shown below:

**Graph 6: UCEM Model Duration Comparison**

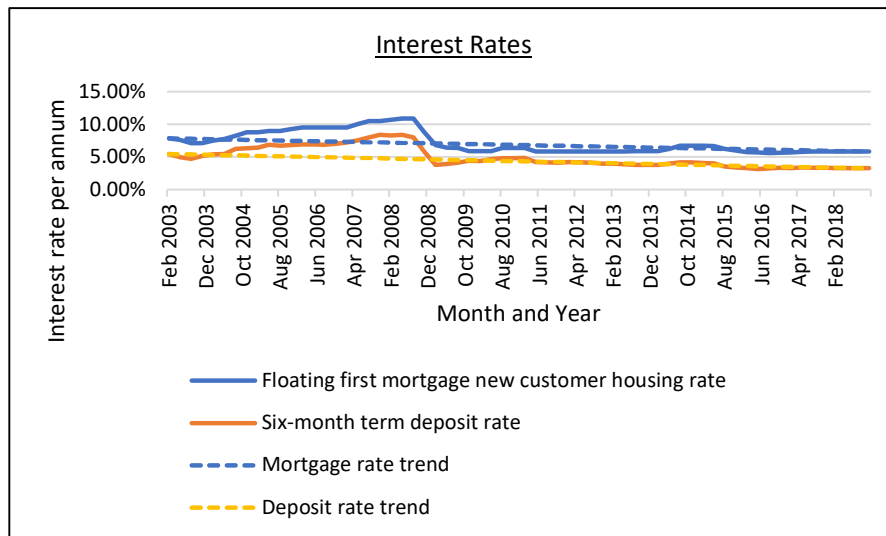


A 15 year duration from 2003 to 2018 has been adopted as the primary model, because it captures a longer duration of user-cost assumptions, and spans through the Global Financial Crisis (GFC) period (2008 - 2009). Both models appear largely consistent with respect to the common period of 2008 to 2018. It is noted that there is an apparent divergence of the User Cost calculations between the models in the final quarter of the model, but similar variations between quarters over the 10-year period are also evident within the results and this is not considered an inconsistency on that basis. This aspect of the quantitative modelling seeks to determine whether there was a deviation from equilibrium over the period under consideration but is not seeking to explain variations in this deviation where they do not appear to be material to the purpose of the test.

**Interest Rates**

The model uses RBNZ data for new mortgage-backed loans as the interest rate for ‘cost of debt’ variable and the 6-month deposit rate for the ‘cost of equity’ variable, which are combined into the Interest Rate variable (Rt), after application of the LVR. The raw data for these interest rates are shown in Graph 7 below:

**Graph 7: Interest Rates (2003-2018). Source: RBNZ**

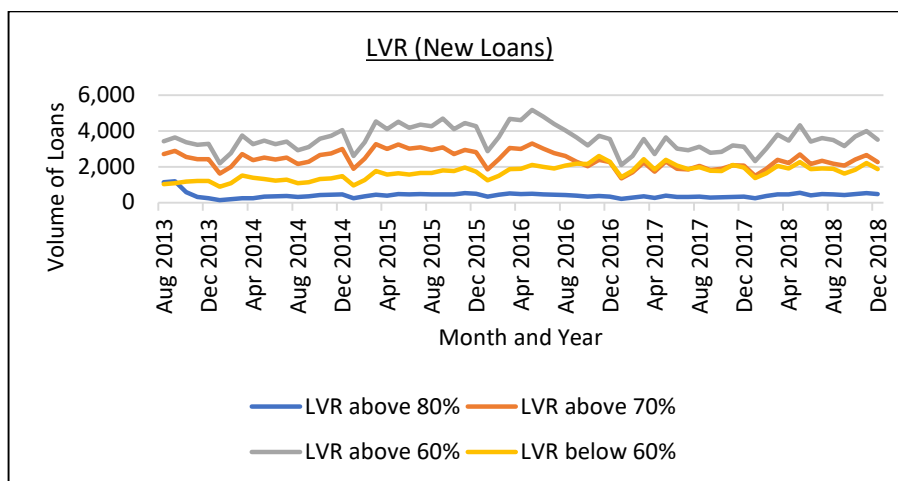


This shows that the spread between borrowing and lending is consistent over time (within a range of 159 and 67 basis points), with a downward trend, exacerbated by the GFC impact that is evident in 2008 and 2009.

**Loan to Value Ratio (LVR)**

RBNZ publishes the volume of new housing mortgage-backed loans categorised by LVR range groups as outlined in Graph 8 below. This data series begins in August 2013:

**Graph 8: Loan-to Value Ratio (2013-2018). Source: RBNZ data**



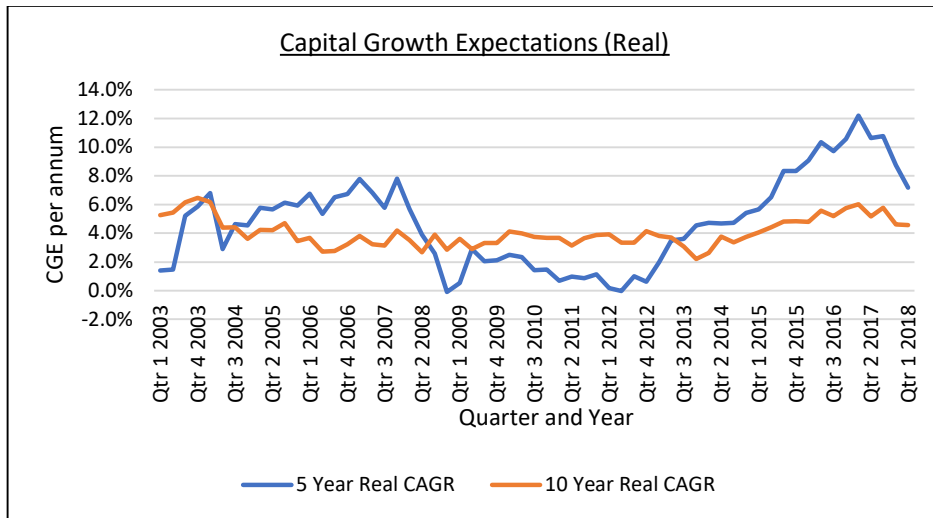
The volumes and distributions within the categories of LVR is largely consistent over the timeframe with no apparent trend, suggesting that an average over the time fame is an appropriate measure for modelling.

The primary model uses an LVR ratio of 54%, representing a weighted average of the LVR by volume over the period of this data that it is used as an input to the UCEM.

**Capital Gain Expectation (CGE)**

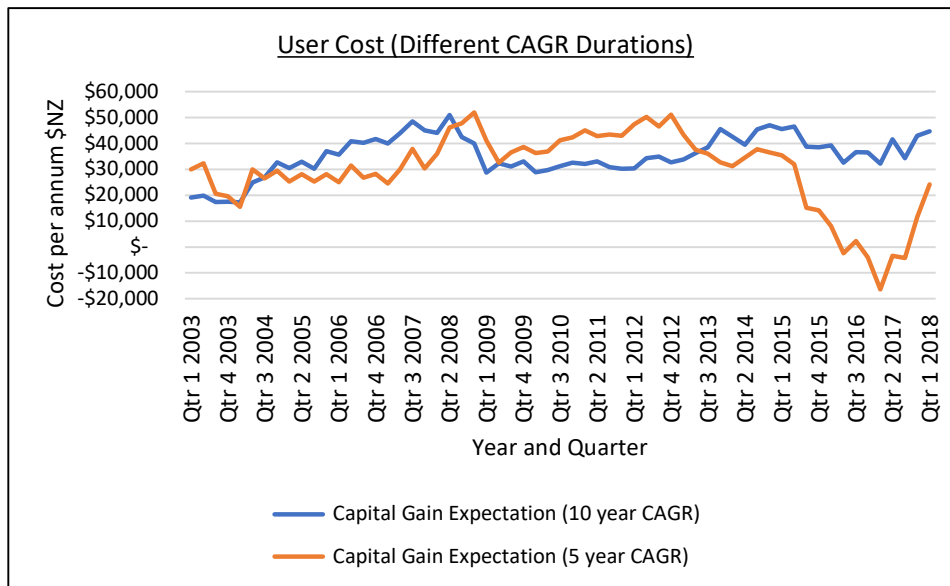
Within the adopted 15-year model duration, the preceding 5-year and 10-year periods were tested up to the first quarter of 2003. The CGE is calculated on a real basis, converting Nominal House Prices to real using CPI data from RBNZ. These prices are then formed into an index and a CAGR calculated for each duration, based upon the methodology adopted by Hill & Syed (Hill & Syed, 2016). This CAGR is used as the normative rational estimate for GCE. As shown in Graph 9 below, the 5-year CGE shows considerably more volatility than the 10-year CGE, which reflects the longer timeframe and therefore with more data points:

**Graph 9: Capital Growth Expectations Based on 5 and 10 Year Durations (2003-2018)**



When translated into the model, this volatility in the CGE is reflected in the volatility in the implied user-cost for each of the assumptions as shown in Graph 10 below:

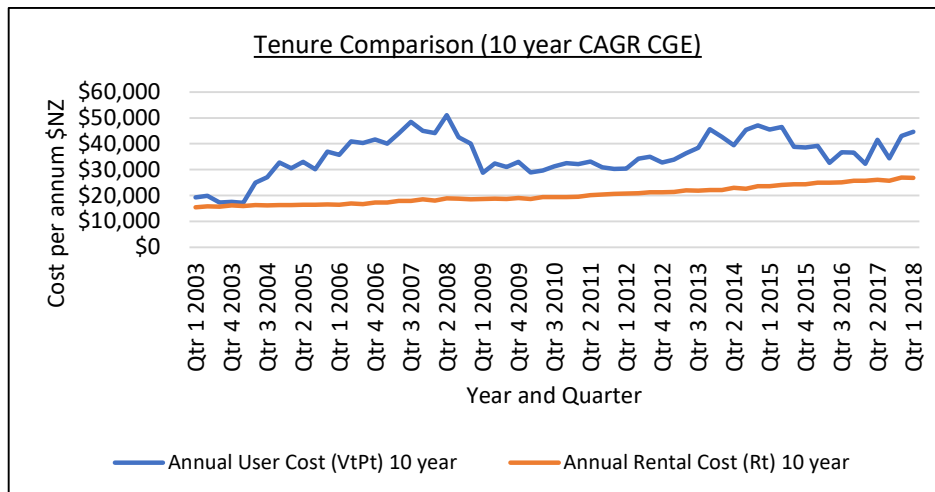
**Graph 10: User-cost Based on 5 and 10 Year CGE Durations (2003-2018)**



This analysis indicates a greater degree of volatility in the 5-year CGE User Cost, compared to the model which adopts the CGE based upon the 10-year CGE. This volatility in the user-cost estimates for each duration reflects the underlying volatility in relation to CGE estimates.

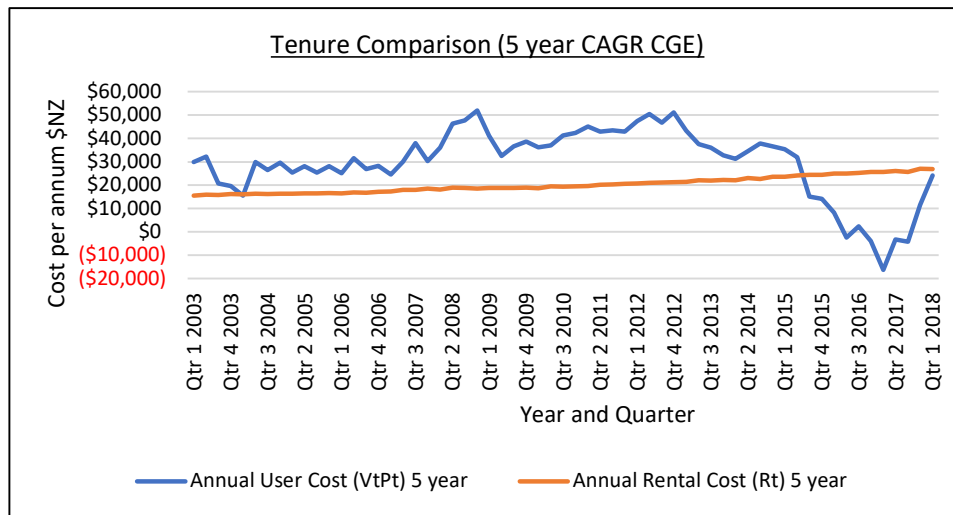
Comparing these respective user-costs to the annual rental cost indicates the extent of deviation from equilibrium (represented by the difference between the respective costs). For the 10-year CGE this is shown in Graph 11:

**Graph 11: Annual Rental Cost and User-cost Based on 10 Year CGE Duration (1993-2003)**



Similarly, using a CGE based upon a 5-year CGE the following values for user-cost and annual rental cost are shown on Graph 12 below:

Graph 12: Annual Rental Cost and User-cost Based on 5 Year CGE Duration (1998-2003)



The 5-year CGE model indicates that the market was out of equilibrium for the majority of the 15-year term of the model, and in this regard is consistent with the 10-year CGE model. For both models, the extent of the deviation from equilibrium was less in Quarter 1 2004 and Quarter 3 2018 at which point that the variation was within 3-5% of the values; and Quarters 1 and 4 of 2018, which were within a 9-10% variation.

According to both of these projections, there is a deviation from equilibrium in the housing market over the majority of the model duration from 2003 to 2018. Under both models, the period from Quarter 1 2003 to Quarter 3 2015 the User Cost of ownership exceeds that of renting, at which point the 5-year model CGE model diverges from the 10-year model, suggesting that the user-cost is lower than the annual rental cost.

The CGE based upon the 10-year preceding period has been adopted. Using a timeframe of at least 10 years was seen to substantially reduce the volatility of expected capital gain and results in the user-cost equilibrium approach being more likely to be practically applicable in the housing context (Nguyen et al., 2022b). That study also noted that other authors (Verbrugge (2008), Diewert (2009), Girouard et al. (2006)) had found that high volatility in the user cost can occur when the expected capital gain is extrapolated from short market performance horizons.

**Running and Transaction Costs**

A value of 2.0% was adopted, by reference to Hill and Syed (2016) and reference to (Harding et al., 2007).

### ***Depreciation Rate***

A value of 2.5% was adopted, as adopted by Hill and Syed (2016) and reference to (Harding et al., 2007).

### ***Risk Premium of Owning***

A value of 1.0% was adopted, based upon (Flavin & Yamashita, 2002) and (Himmelberg et al., 2005).

#### *9.2.1.2 Model Sensitivity to Input Variables*

The input variables for median house prices and median rentals have not been sensitivity tested, as they utilise raw data rather than assumptions.

Those inputs which require assumptions have been tested to check the sensitivity of the model to the range of values selected, keeping other variables constant at the preferred values. All scenarios have been tested against the corresponding impact on the annual user-cost only, as the annual rental cost variable is independent of these inputs.

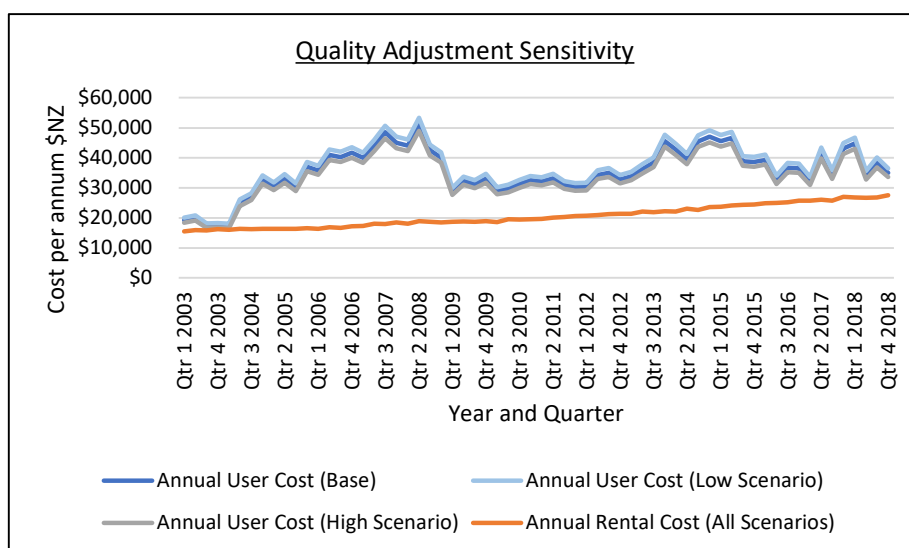
The range selected for sensitivity testing of each variable is based upon the validity and variation of the source data and similar studies in a New Zealand context (Hill & Syed, 2016); (Nguyen et al., 2022a).

In addition, a multi-factor sensitivity has been undertaken which tests the upper and lower bounds of all variables. The results of this sensitivity testing are as follows:

### ***House Quality***

The allowance for house price quality was sensitivity tested by applying a range of 5% +/- from the adopted value of 18% (therefore testing a quality adjustment value between 13% and 23%). The results of this are as shown in Graph 13:

**Graph 13: Quality Adjustment Variable Sensitivity**



This suggests that the model output is not materially affected by the range of values sensitivity tested and the assumption can be relied upon.

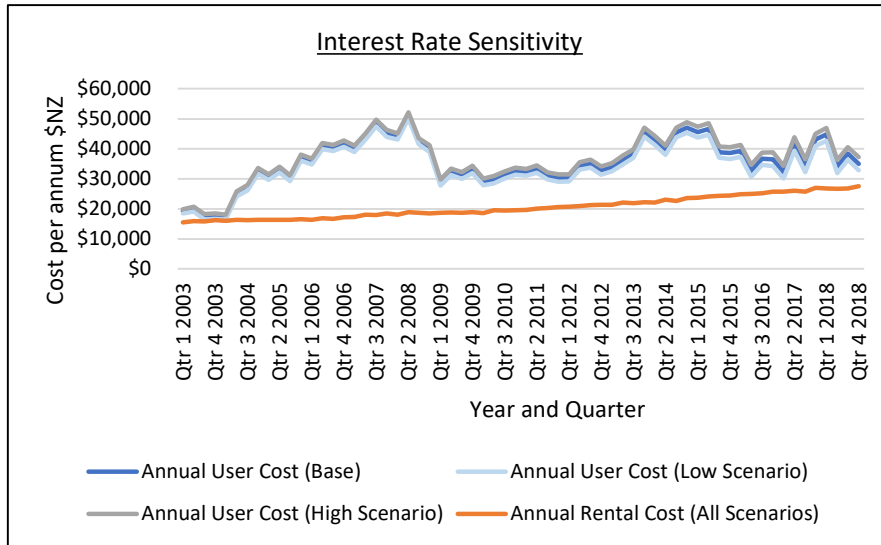
**Model Duration**

The key issue in determining the most appropriate duration of the model is the impact of the duration of CGE from available preceding data. This was evaluated in section 9.2.1.1 and the 10-year CGE model adopted.

**Interest Rates**

Although the interest rates are raw data from RBNZ, there is likely a variation in these rates that would apply to individual transactions within the industry standard range of discretion of 50 basis points. A sensitivity range of 50 basis points has been tested in relation to the mortgage loan rate variable. The deposit rate has not been sensitivity tested as it is less subject to negotiation between the parties. The impact on the preferred model is shown on Graph 14 as follows:

**Graph 14: Mortgage Loan Interest Rate Variable Sensitivity**

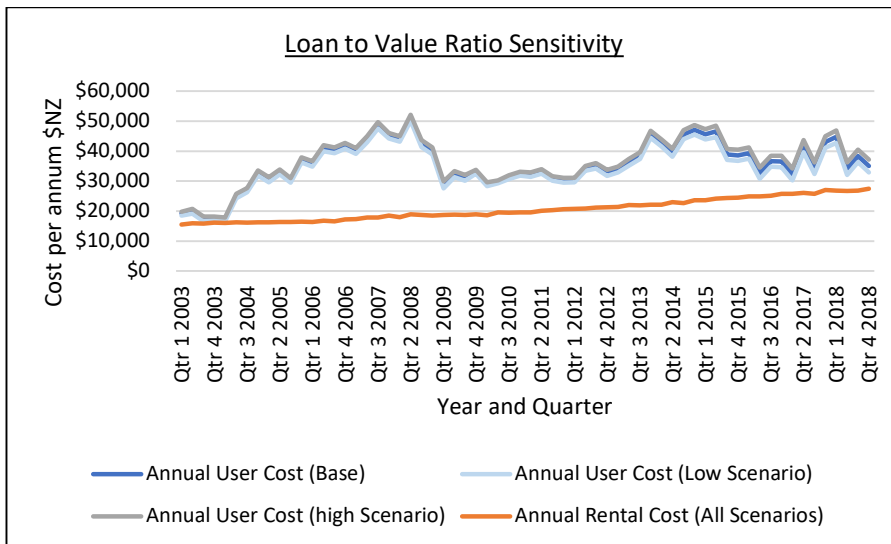


This indicates that the model is not materially sensitive to the impact of the interest rate applicable to new lending within the market in each period.

**Loan to Value Ratio**

Sensitivity analysis on this input factor was undertaken within a 10% range of the base model variable value of 54%, consistent with the range that is indicated from the RBNZ data. A sensitivity range between 44%, and a 64% was undertaken with the result shown on Graph 15 below:

**Graph 15: Loan-to Value Ratio Variable Sensitivity**

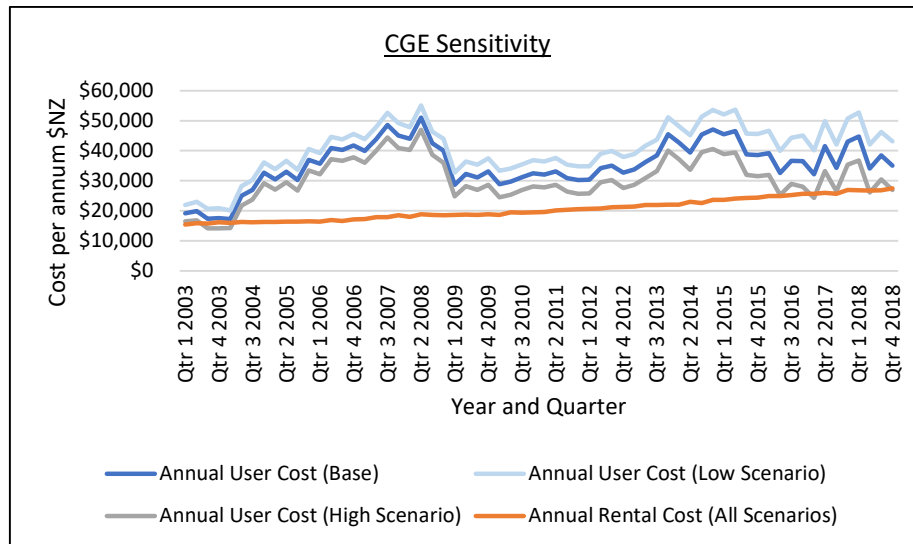


This suggests that the model is not materially affected by the range for this variable that is indicated by the RBNZ data during the period of the preferred model.

### Capital Gain Expectation

As outlined in section 9.2.1.1 when determining whether to adopt the 5-year or 10-year CGE estimate, the model is sensitive to volatility between periods in the value of this variable, and this is consistent with similar studies. For the purposes of sensitivity testing a 1.0% +/- absolute variation from the CGE estimate was modelled, which represents a 20% +/- relative variance. The results are as shown on Graph 16:

Graph 16: Capital Gain Expectation Variable Sensitivity

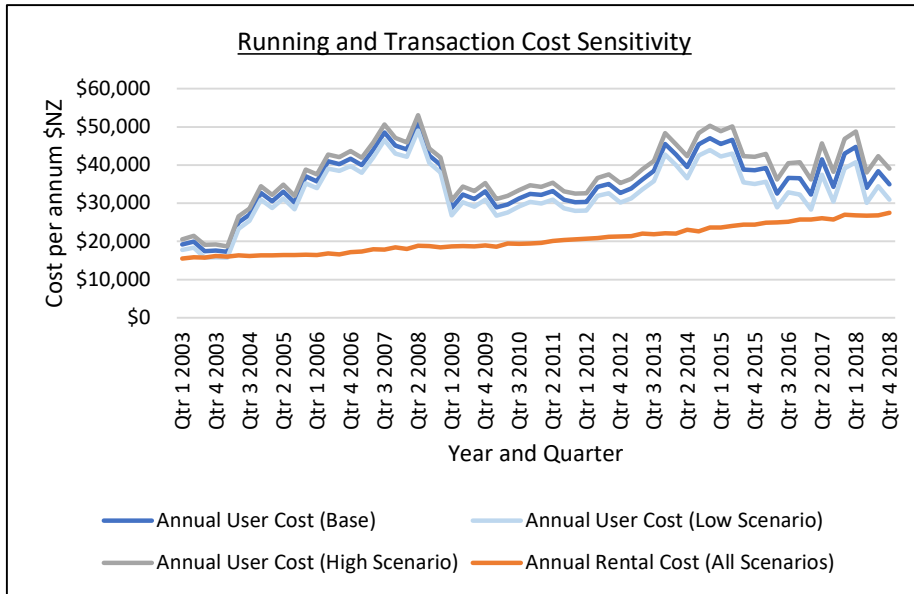


This indicates that although the model is sensitive to volatility as outlined in section 9.2.1.1, it is less sensitive to proportional variance from a base value.

### Running and Transaction Costs

A variance of 0.5% +/- from the base value of 2% was modelled (representing a +/- 25% relative variance). The results are as shown on Graph 17 below:

**Graph 17: Running and Transaction Costs Variable Sensitivity**

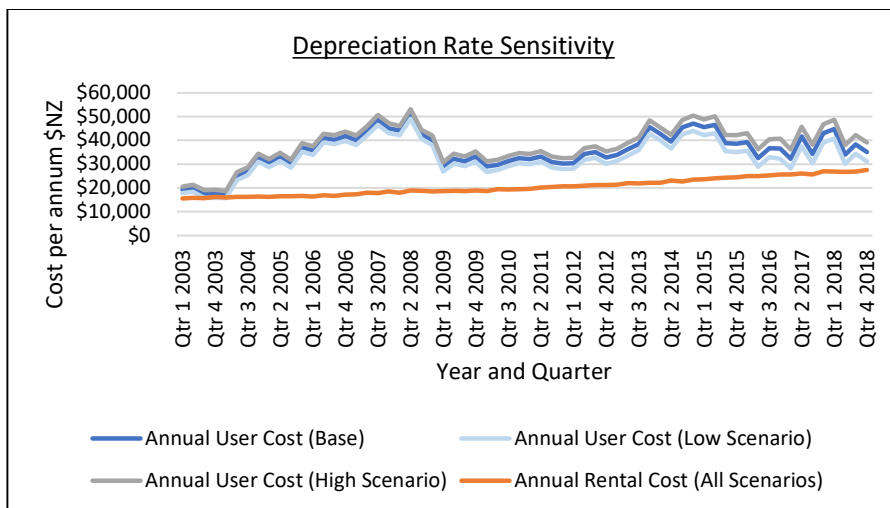


This indicates that the model is not materially sensitive to this level of variation in the variable.

**Depreciation Rate**

A variance of 0.5% +/- variation from the base variable of 2.5% was modelled (representing a +/- 20% relative variance). The results are as shown on Graph 18 below:

**Graph 18: Depreciation Rate Variable Sensitivity**

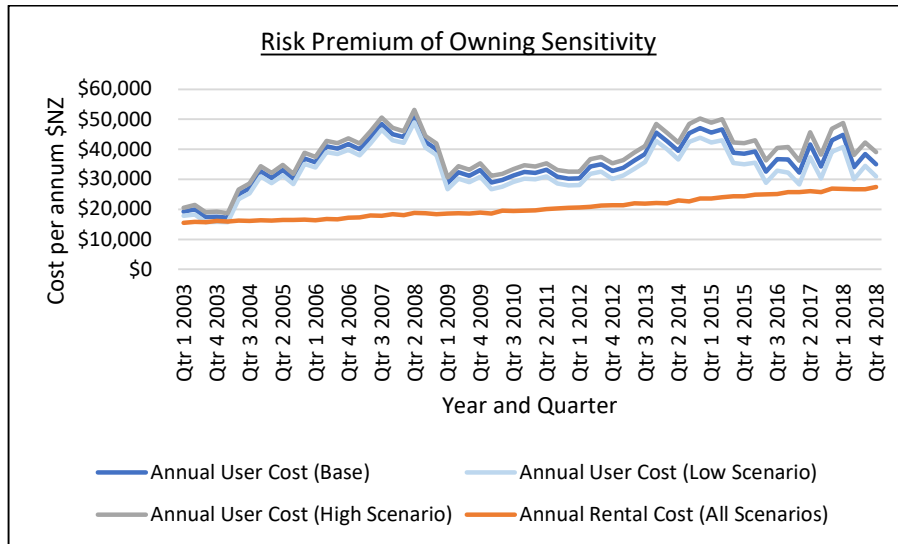


This indicates that the model is not materially sensitive to this level of variation in the variable.

### **Risk Premium of Owning**

A variance of 0.5% +/- variation from the adopted value of 1% was modelled (representing a +/- 50% relative variance). The results are as shown on Graph 19 below:

**Graph 19: Risk Premium of Owning Variable Sensitivity**



This indicates that the model is not materially sensitive to this level of variation in the variable.

### **Multi-Factor Sensitivity**

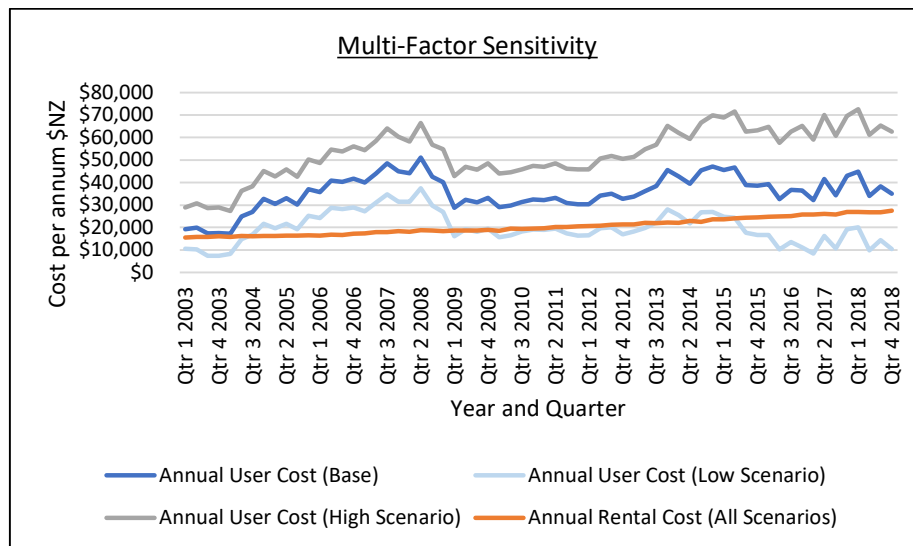
In addition to the sensitivity of the model to the value of individual variables, a combined scenario has been undertaken which includes the upper and lower bound for all variables combined, thereby providing an outer range of output values for the model. These have been undertaken using the variable ranges that were sensitivity tested above. Two scenarios were undertaken, one which accumulates the upside impacts (variable values that over-estimate the user-cost compared to the preferred model values) and one that accumulates the downside impacts (variable values that under-estimate the user-cost compared to the preferred model values). These adjustments are outlined in Table 10 below:

**Table 10: Impact of Input Variables on User-cost Output**

<u>Variable</u>	<u>Over-estimates the User-cost</u>	<u>Under-estimates the User-cost</u>
House Price Quality Adjustment	-5%	+5%
Debt Interest Rate	+50 BP	-50 BP
Loan to Value Ratio (LVR)	+10%	-10%
Capital Gain Expectation (CGE)	-1%	+1%
Running & Transaction Cost	+0.5%	-0.5%
Depreciation Rate	+0.5%	-0.5%
Risk Premium of Owning	+0.5%	-0.5%

Using these two scenarios of variables, a multi-factor sensitivity of the model produces the following range of output values for the user-cost, shown on Graph 20 below:

**Graph 20: Multi-factor Sensitivity**



This indicates that in a scenario where all variables are used toward an under-estimate of the user-cost that the model indicates a lower degree of disequilibrium, and that this disequilibrium is more evenly distributed between the over-pricing and under-pricing of houses.

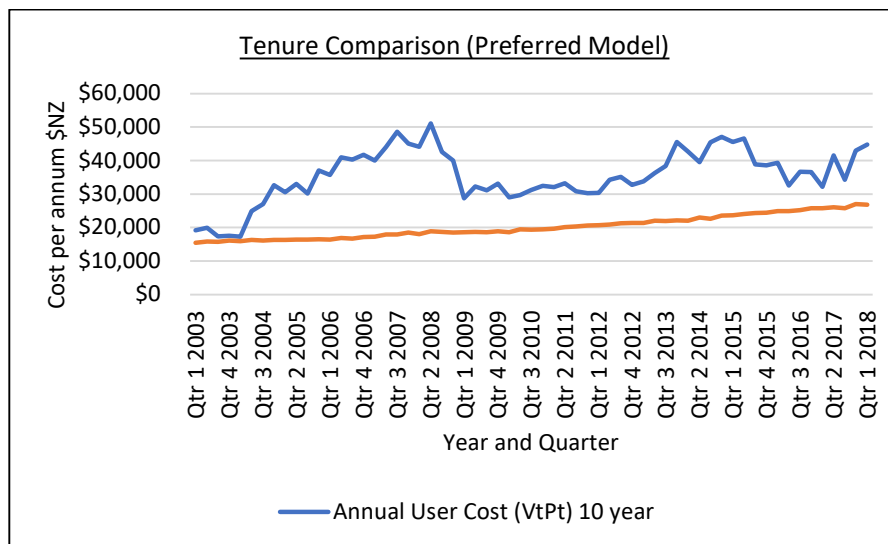
However, the range of the values between the upper and lower scenario bounds of the User Cost are predominantly above the Rental Cost over the 2003 to 2018 period, and the conclusion is made is that that this is a reasonable estimate of the market equilibrium condition over the timeframe. It is recognised by the researcher that individual market participants may have subjective assessments outside of the sensitivity range, for example

the risk factor relating to interest rates and market downturns can be seen as objectively more volatile than the stated preference of investors, as considered within Empirical Test 3.

***Deviation from Equilibrium (Preferred Model)***

Using the preferred variables as outlined above, the following values for user-cost and annual rental cost are established by the model. The difference between these annual costs represents a deviation from equilibrium, because equilibrium under the UCEM is indicated by cost equivalence. This is shown on Graph 21 below:

**Graph 21: UCEM Tenure Comparison 2003 – 2018 Preferred Model**



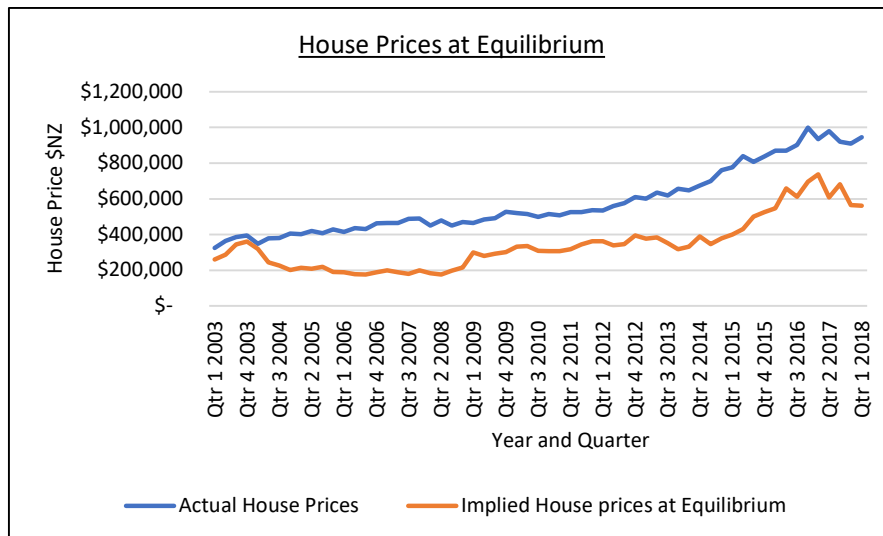
This shows that the user-cost of ownership exceeds the annual rental cost consistently across the period of the model, and therefore that the market is out of equilibrium according to the UCEM.

This analysis indicates that the user-cost of ownership exceeds that of rental tenure, implying that the market has a consistent deviation from equilibrium according to the UCEM model. According to the model, this implies that either the rental market is being consistently under-valued (rentals), or that the ownership market (house prices and the assumed cost of ownership associated with those prices) is over-valued, or a combination of both.

This deviation from equilibrium could therefore be attributed to either the market for housing ownership tenure (house prices) or the market for housing rental tenure (rentals) or a combination of both. The extent to which this deviation from equilibrium that is implied by this model can be attributed to each of these market prices is determined by holding other variables constant and determining the prices which would denote equilibrium. Graph 22

below indicated the implied house prices that would equalate the user-cost with rentals (thereby placing the market into equilibrium under the UCEM):

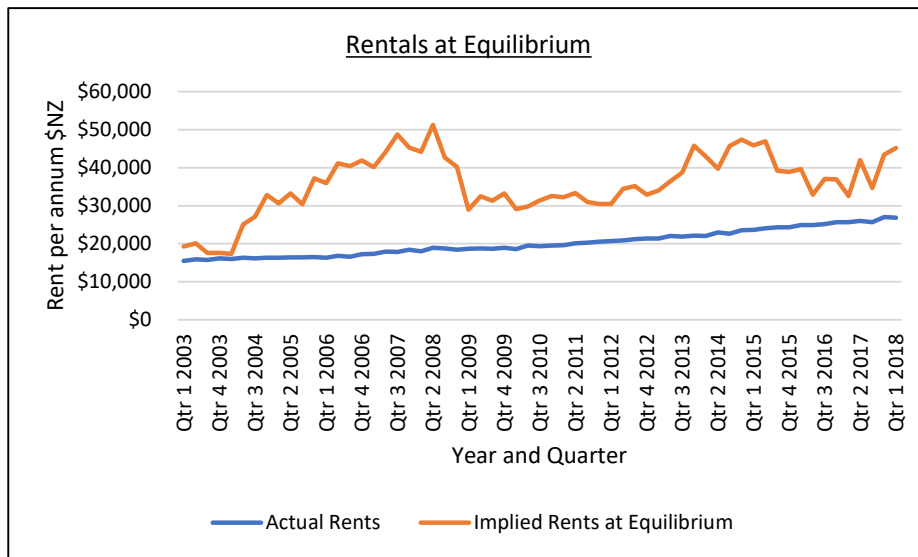
**Graph 22: Implied House Prices at Equilibrium - Preferred Model**



As to be expected given the disequilibrium, house prices are over-valued compared to what would be expected within the normative UCEM model, holding other variables constant. Of significance is the extent to which the over-valuation varies over time but is consistently over valued compared to what would be predicted by the model. This analysis is not to suggest that the implied prices are an accurate reflection of market value (for example in Quarter 1 2015 the difference is almost double circa \$400,000 vs \$800,000), but rather is to highlight the relative explanatory comparison of rentals versus house prices in terms of the disequilibrium.

The same analysis was undertaken to determine the rentals that the model implies in order to achieve equilibrium between the tenures, holding house prices (and other user-cost input variables) constant. This is shown on Graph 23 below:

**Graph 23: Implied Rentals at Equilibrium - Preferred Model**



As with the implied house prices in Graph 22 above, this reflects the model’s inference that actual rentals are under-valued compared to the user-cost of ownership and therefore that rentals would need to be higher than actual rentals in order to be at equilibrium (holding house prices and other user-cost inputs constant).

The extent of this implied under-valuation of rentals reflects the general trend of the deviation of actual to ‘equilibrium implied’ house prices, including the largest deviations occurring in the periods 2005-2008, and 2013-2015.

Although the general trend is similar, the relative difference between actual rents and equilibrium implied rents is considerably larger by comparison to the base (actual) figures. To illustrate this comparison, we can look at the points within the model when the greatest differences occur between actual and equilibrium implied prices (for both house prices and rentals), being Quarter 2 2008 and Quarter 2 2015, as shown in Table 11 below:

**Table 11: Proportional Deviation of Implied House Prices and Rentals**

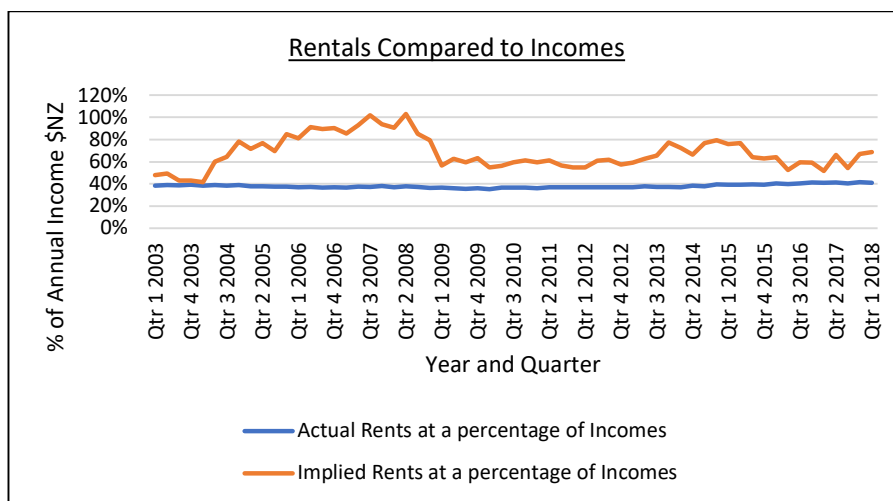
	<u>Quarter 2 2008</u>	<u>Quarter 2 2015</u>
Actual House Prices	\$480,000	\$840,000
Implied House prices at Equilibrium	\$176,651	\$430,360
Deviation	-\$303,349	-\$409,640
Deviation as a percentage of Actual	-63%	-49%
	<u>Quarter 2 2008</u>	<u>Quarter 2 2015</u>
Actual Rents	\$18,876	\$24,076
Implied Rents at Equilibrium	\$51,290	\$46,993
Deviation	\$32,414	\$22,917
Deviation as a percentage of Actual	172%	95%

This analysis shows that to attribute the disequilibrium within the model to rental pricing implies significantly greater relative under-pricing (172% in 2008 and 95% in 2015), compared to over pricing of house prices (63% and 49% respectively).

It can also be seen that from an affordability perspective ownership tenure would be more affordable than at actual house prices, but the rental price adjustment would be likely untenable and not a reasonable explanation of the disequilibrium.

Graph 24 below shows the actual and implied rentals as a percentage of annual mean household incomes in Auckland:

**Graph 24: Actual and Implied Rentals at Equilibrium and Household Incomes**



The consistency of the relationship between Actual rents as a proportion of income is evident visually. Actual rents deviate minimally from the average of 38% over the timeframe, with the greatest deviation being 3.2% in Quarter 1 2010.

The apparent strong correlation between incomes and rents may well imply causality from an affordability perspective, and at 40% of income is consistent with affordability measures within the literature. At this level, rentals are within the range of affordability. An increase to 60% or more as implied by the above graph would not be tenable according to accepted affordability measures.

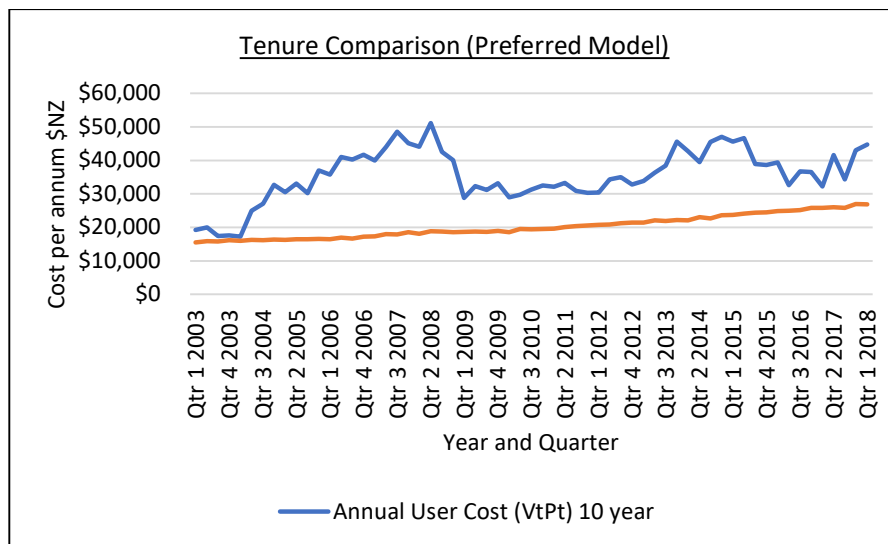
It is proposed that the consistent relationship between household incomes and actual rentals implies that an under-valuation of rentals is not a good explanation of the disequilibrium, nor would a partial attribution to under-valuation of rentals where this would be inconsistent with affordability measures. It is recognised that rentals are determined by a number of

factors including income and the matching of supply and demand (and corresponding vacancy / occupancy rates), though vacancy / occupancy rate data were not identified within the literature. However, the correlation and causality between rentals and incomes was confirmed by RBNZ “wage inflation and relative supply and demand of dwellings (measured by people per dwelling) are the two key drivers of rent inflation” (Bentley et al., 2023).

9.2.1.3 Conclusions of Part 1

Following the testing of the input variable assumptions, the following model shown on Graph 21 below has been selected as the primary finding of this part of the quantitative analysis:

Graph 21: UCEM Tenure Comparison 2003 – 2018 Preferred Model



This analysis finds that according to the UCEM there is a persistent disequilibrium in the housing market over the period 2003 to 2018, with a predominant over-valuation of houses or under-valuation of rentals, or a combination thereof, compared to a market that is in equilibrium. Quarterly calculations of this preferred model are included as Appendix 3.

In looking to attribute this deviation from equilibrium to either the rental tenure market pricing (rentals) or the ownership tenure pricing (house prices), a comparison was made between *actual* house prices and rentals and the *implied* house prices and rentals (that the model implies at equilibrium).

The market pricing of actual rentals has been shown over the duration of the model to be less variable over time and a consistent proportion of household incomes that aligns with affordability measures. Attributing fully or partially the deviation from equilibrium to rentals would infer a significant variability in rentals that is inconsistent with the historical rental data over the period of the model. This would also infer variability in the ratio of rents to

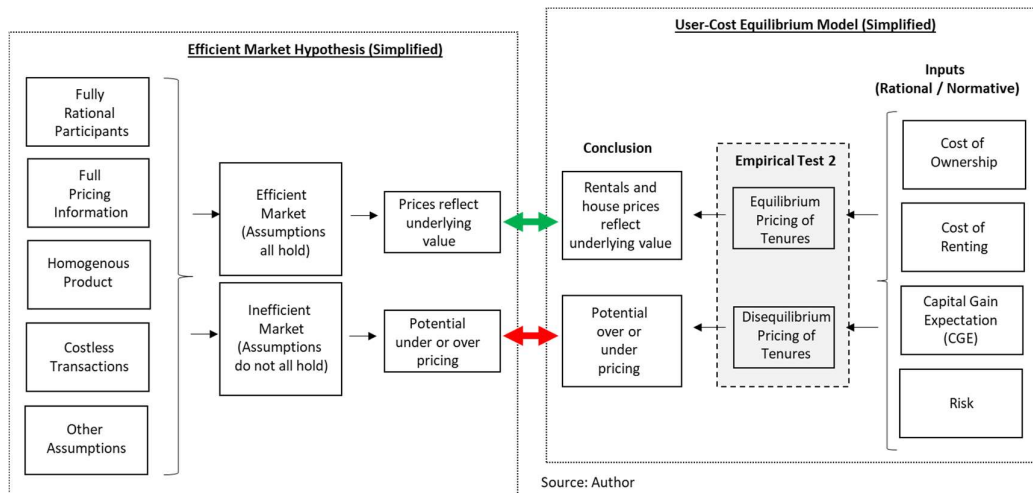
incomes that is well outside of the narrow range observed over the period of the model, and outside of ratios that are commonly accepted affordability measures. Therefore, the underpricing of rents is not a good explanation of the disequilibrium that is indicated by the preferred model.

Over-pricing of house prices is a better explanation of the disequilibrium, because the range of implied house prices (that would achieve equilibrium) is not inconsistent with historical house prices.

In explanatory terms this analysis also concludes that that the level of disequilibrium that is attributed to the ownership tenure is most sensitive to the assumption that is made for CGE and is considerably less sensitive to other input variables. The analysis also shows that an over-estimation of CGE is a useful explanation of the over-pricing of ownership tenure.

In conclusion, Part 1 of this quantitative analysis undertook Empirical Test 2, and the finding is that the UCEM indicates a persistent disequilibrium in the housing market (the red arrow on Diagram 7 below).

**Diagram 7: Conceptual Framework (Empirical Test 2)**



This infers that there is evidence of sub-rational decision-making in the market in aggregate compared to the normative and rational assumptions of the UCEM, and therefore that prices may not reflect fundamental value.

Part 1 further finds that the evidence does not support this sub-rational pricing being attributed to under-pricing of rents but does support attribution to over-pricing of houses; and that this over-pricing of houses can best be attributed and explained by an over-estimation of CGE compared to a normative model.

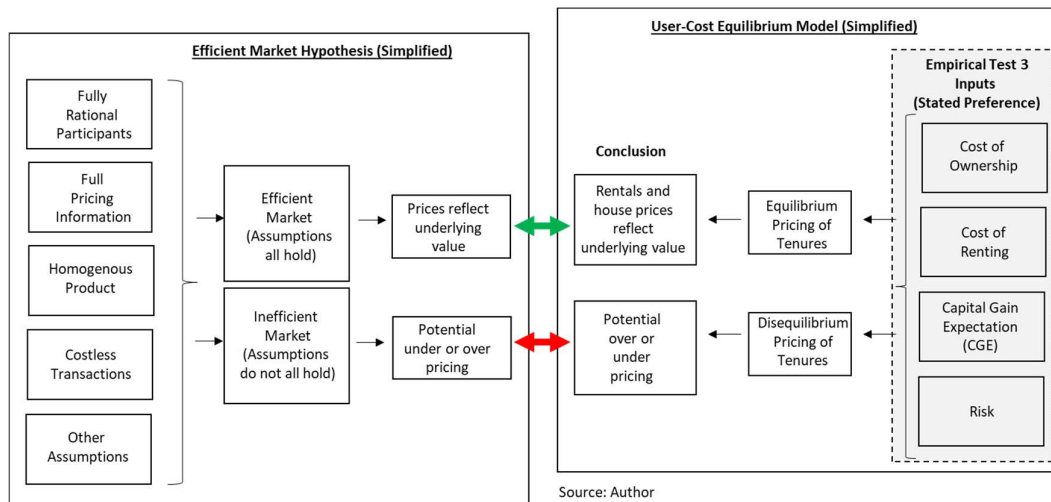
### 9.3 PART 2: Testing of Stated Preferences of Investors within the UCEM framework (Empirical Test 3)

Part 1 of the qualitative phase tested the observed preference of the Auckland housing market using rational and normative inputs. Part 2 of the quantitative phase uses the preferred model from Part 1 and test the stated preference observations within the qualitative phase to determine whether the UCEM can provide findings that are explanatory in terms of:

- how the stated preferences of investors (and the preferences of investors as observed from an institutional perspective) can manifest within pricing decisions (such as upside or downside bias compared to the normative rational approach), and
- provide evidence to validate (or otherwise) the assumption that rationality is likely to be bounded when heuristics and biases are present in decision making.

This second part of the quantitative findings represents the results of *Empirical Test 3*, shown shaded on Diagram 6 below.

**Diagram 6: Conceptual Framework (Empirical Test 3)**



The qualitative phase of this research identified the stated preferences of investors (as consistently observed within the institutional context) that can be tested within the UCEM framework. Having established a preferred model in Part 1, these stated preferences have been tested against the preferred model to determine whether they may be explanatory in terms of pricing impacts and therefore a departure from the rational model that was adopted in Part 1.

The following stated preferences may represent heuristics or biases that have pricing implications compared to the fully rational model, and can therefore be considered evidence of bounded rationality:

1. Past market performance (capital gain in particular) is a strong predictor of future performance
2. There is minimal to nil risk in housing investment, particularly in terms of market fluctuations (house prices)
3. The forward trajectory of interest rates is of minimal to nil consideration in pricing decisions
4. House prices double every 7 to 10 years
5. Rental return is a 'given', but has implications for bank decision-making processes, when seeking funding
6. Housing returns are stable, it is a safe investment and easily understood.

The use of heuristics represents a simplified form of analysis. This section quantifies those heuristics that were identified in the qualitative phase that were well supported in the interviews and that were strongly associated with pricing decisions of investors.

A heuristic may be problematic for efficient and rational pricing decisions where it materially affects the decision by comparison with more objective (evidence based) analysis of the same factor, and this is the intention of the analysis within Empirical Test 3. Where a heuristic can be shown to have an impact on pricing, this can be seen as evidence for bounded rationality.

These are considered in turn below.

#### *9.3.1.1 Past market performance (capital gain in particular) is a strong predictor of future performance*

A strong finding of investor interviews was a lack of sophistication in forward price expectations, with only one investor giving consideration to factors that would be considered 'fundamental' (the factors that determine pricing) rather than 'technical' (the prices themselves) as a basis for projecting future pricing.

This is to say that investors considered that prices could continue to increase without reference to any underlying fundamental factors on the supply side or on the demand side such as population growth or income growth. To test this, historic house price growth has been projected forward against two factors which are linked via affordability to house prices: rentals and incomes. This analysis is not intended to be complex nor able to predict prices,

but rather is to determine whether this heuristic is reasonable within a context of widespread publicity of declining affordability of both house ownership and rentals.

It is a matter of economic necessity that the supplier of any product would give due consideration to the ability of the customer to sustain price increases. To not consider this may represent a departure from rationality where there is good availability of affordability information (and frequent media coverage of the matter).

Two affordability measures have been selected as being used widely in the media: firstly the *house price to income ratio* and secondly the *rent to income ratio*. These measures have been used to make simple forward projections of these affordability measures using the CAGR from three historic time periods (5, 10, and 15 years prior to Quarter 4 2018) to determine whether this would be a reasonable basis to project forward past market performance. The resulting CAGR figures are outlined in Table 12 as follows:

**Table 12: Affordability Measure Inputs (Historic CAGR)**

<u>5 Year Period to Quarter 4 2018</u>	<u>CAGR</u>
House prices	9.7%
Annual Rentals	5.2%
Annualised Incomes	2.9%
<u>10 Year Period to Quarter 4 2018</u>	<u>CAGR</u>
House prices	7.8%
Annual Rentals	4.3%
Annualised Incomes	3.1%
<u>15 Year Period to Quarter 4 2018</u>	<u>CAGR</u>
House prices	7.5%
Annual Rentals	3.9%
Annualised Incomes	3.4%

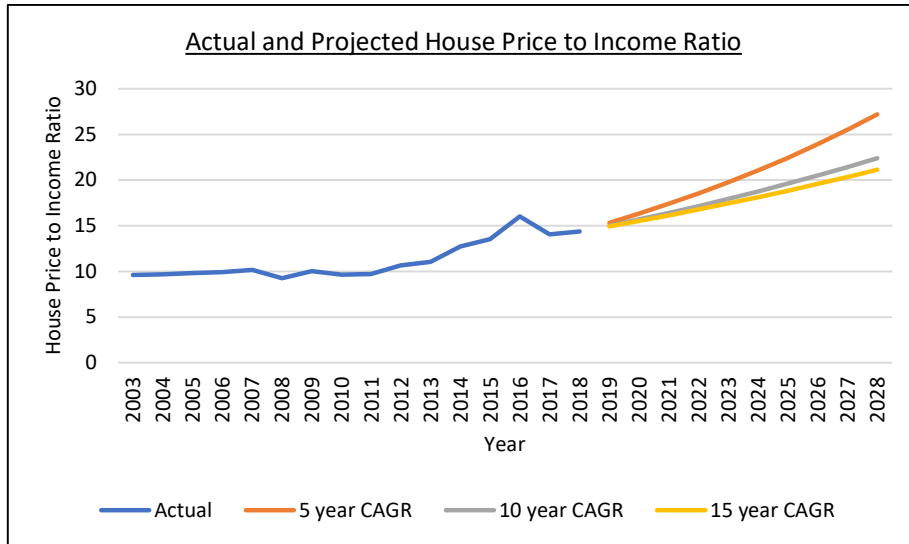
The following projections are based upon a simple continuation of the CAGR within Table 10 of these 3 affordability elements of incomes, house prices, and rents, using Quarter 4 2018 as the base. It represents the literal interpretation of the stated preference heuristic, that ‘the past is a good guide to the future’. This heuristic implies that more detailed analysis will not yield better information, despite requiring simple analysis that any investor could undertake to check the validity of the heuristic.

It can be seen from Table 12 that the longer the duration that is used to determine a future trend, the less pronounced the trend due to volatility in house price. Shorter periods, for

example periods 2006-2008 or 2016-2018 indicate a declining trend. Again, this emphasises that property markets can fluctuate over the short term and therefore using technical projections of past data can be unreliable for predictions.

In relation to the house price to income ratio, the following projections shown in Graph 25 can be made, placing these projections within the context of the previous 15 years of actual data:

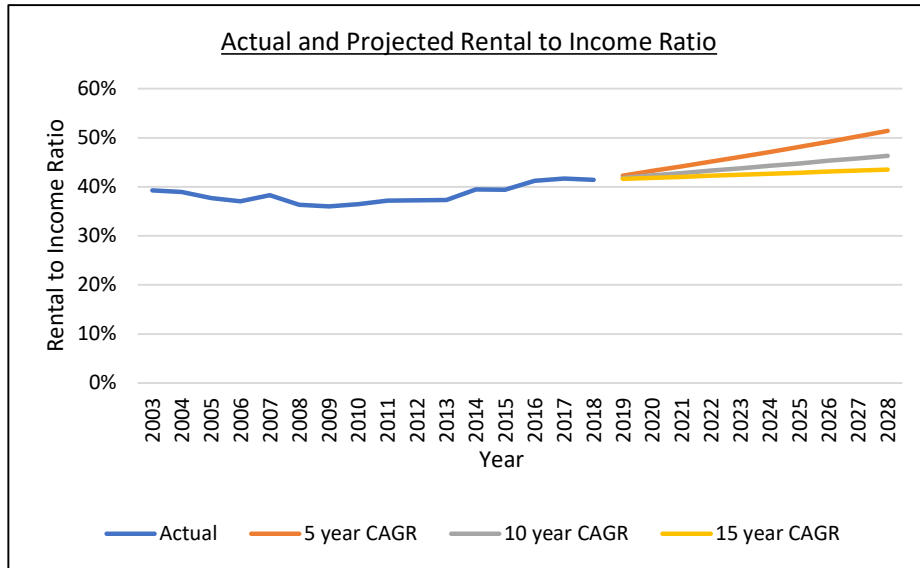
**Graph 25: Historic and Projected House Price to Income Ratio**



Graph 25 indicates a ratio that is considerably higher than the past, indicating that affordability will be significantly lower than in the past and therefore that the past market conditions may not apply in the future as they have in the past. It also indicates that projections based upon the shorter past performance are more pronounced, reflecting the short-term rise in house prices over that period.

Below are the projections for the second affordability measure, being rental to income ratio, and placing these projections in context of the previous 15-year actual data (Quarter 4 of each year):

Graph 26: Historic and Projected Rental to Income Ratio



As with the first affordability measure, this projection of past trends results in affordability that is considerably less favourable than the past. Consistent with the house price to income ratio, it also indicates that projections based upon the shorter durations of historic performance are more pronounced.

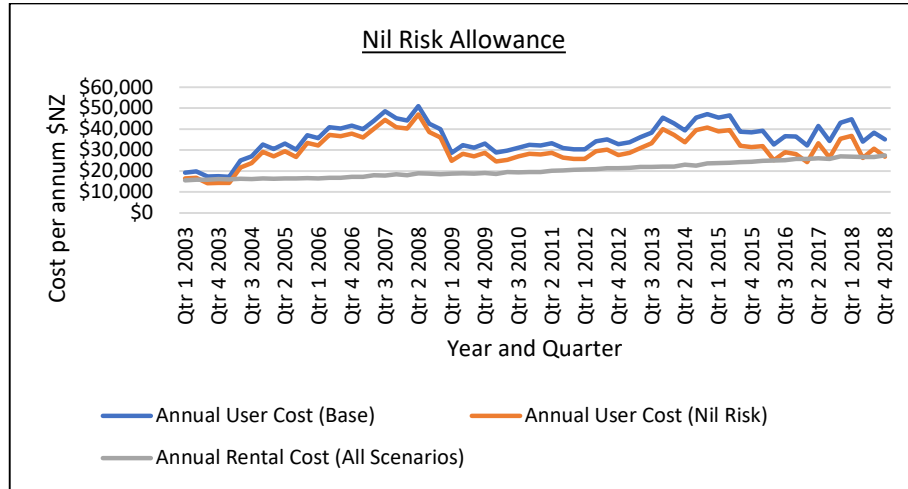
This analysis shows that a heuristic of assuming that the trajectory of past house prices (particularly the more recent past) will continue implies an assumption of declining affordability.

Given widespread media attention on the decline in affordability, it is suggested that an assumption of this continuing indefinitely may represent bounded rationality, particularly in terms of rental affordability. As housing investors, it would be reasonable to assume that rental affordability would be a factor of interest to investors.

9.3.1.2 *There is minimal to nil risk in housing investment, particularly in terms of market fluctuations, and this is reflected in pricing decisions*

To test this assumption within the model, the Risk Premium of Owning variable ( $Y_t$ ) was set to zero within the preferred model. This results in the following User-cost as shown in Graph 27:

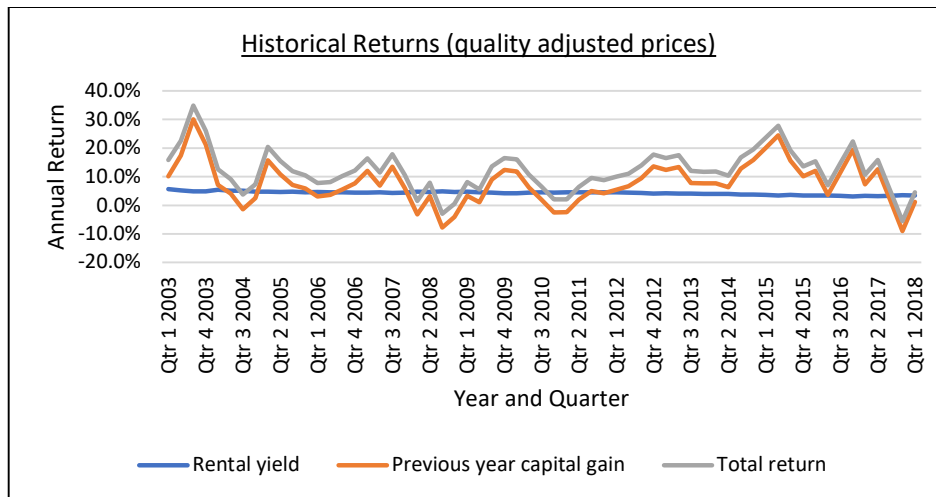
**Graph 27: Preferred UCEM Model Nil Risk Allowance**



This suggests that this stated preference brings the user-cost closer to the annual rental cost, and therefore is a partial explanation of the deviation from equilibrium.

This implies that a low or nil risk allowance by investors is supported by the overpricing that is indicated in the preferred model. However although this is explanatory, from an objective / normative perspective this would be considered less than rational considering the objective volatility in historic housing returns (as shown in Graph 28 below) and other stated preferences in terms of risks.

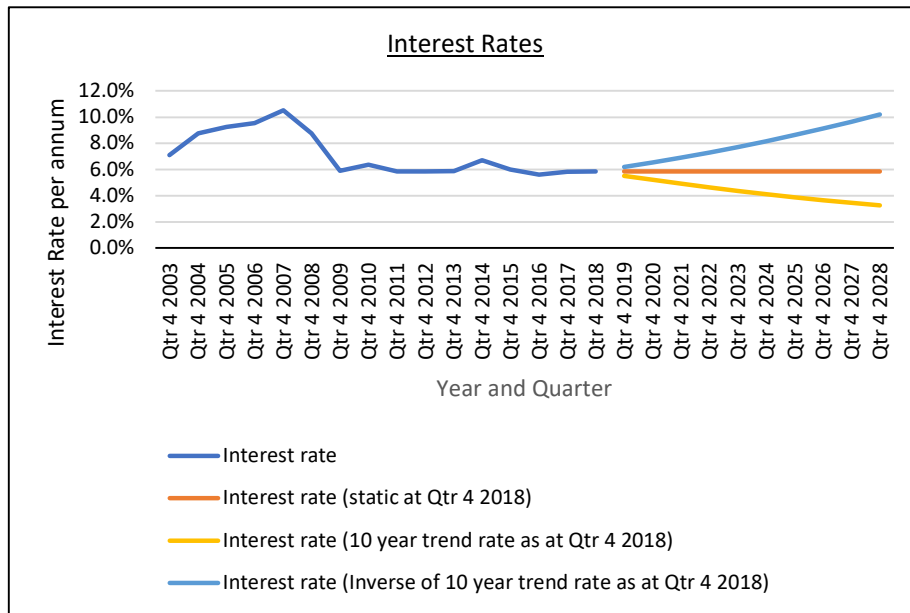
**Graph 28: Historical Auckland Residential Property Returns**



9.3.1.3 *The forward trajectory of interest rates is of minimal to nil consideration in pricing decisions*

Interest rates have fluctuated but have consistently declined over a 5, 10, and 15-year period up to the end of 2018. Using historic data, ten year projections can be made as follows, plus an inverse of the downward trend, reflecting the potential that the market cycle could have peaked and the trend reversed (thereby covering a range of potential scenarios). This is shown on Graph 29 Below:

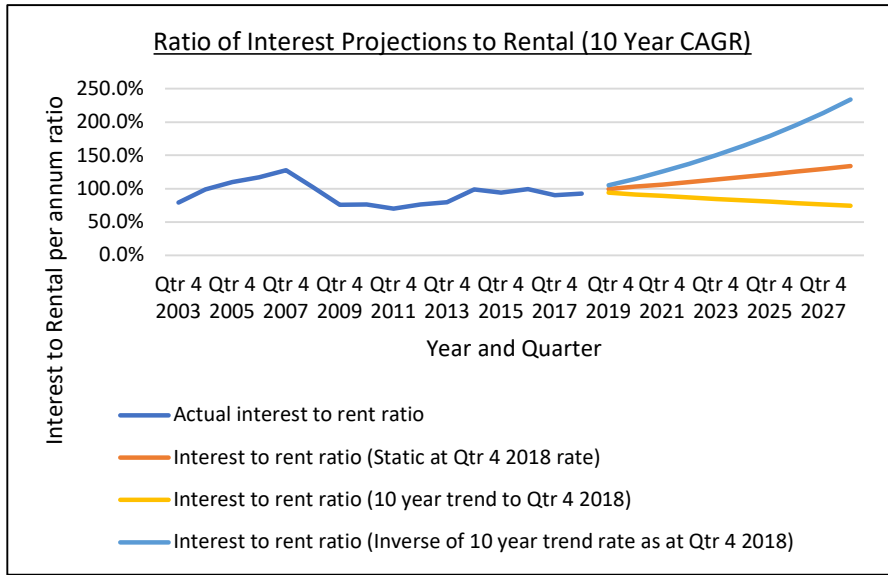
**Graph 29: Past and Projected Interested Rates Based on Historical CAGR**



Graph 29 indicates that a simple projection of past trends will be favourable. However, in the wider economic and historic context, interest rates are cyclic and linked to economic cycles. As assumption that interest rates will remain favourable and not impact the housing market may be an optimism bias.

As shown in Graph 30 below, even if interest rates remain low, when considered alongside other past trends (in particular house price growth in excess of rental growth), the impact of interest ratios will be noticeable particularly in terms of loan servicing. Simple projections show that the ratio of interest to rentals will become less favourable to investors, should interest rates remain static or increase (as assumption is made of an upside increase in rates at the average level of (decrease) over the 10-year period to Quarter 4 2018). These projections all use a 10-year CAGR of house prices and rentals as at Quarter 4 2018:

**Graph 30: Past and Projected Interest to Rent Ratio**

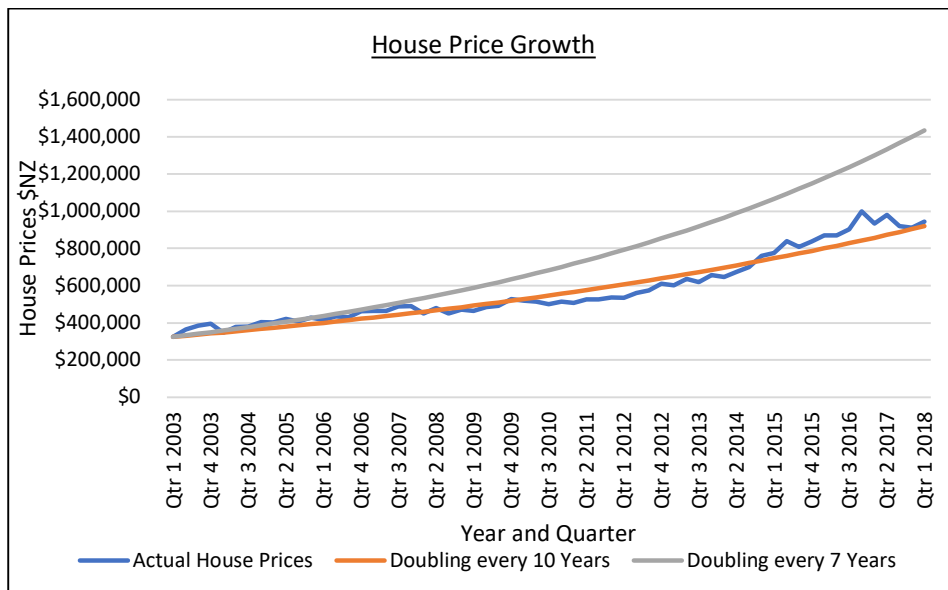


The disregard of this factor by investors is likely to produce an upside pricing bias, should interest rates not continue the downward trend or should they remain static or increase. A heuristic that disregards the impact of adverse interest rate changes based upon the recent trend is downwards will decrease the risk perception and reduce the user-cost under the model (thereby creating upside pricing bias).

9.3.1.4 House prices double every 7 to 10 years

Graph 31 below shows the house prices that would have been observed, were these heuristics an accurate reflection of objective analysis (using Quarter 1, 2003 as a base):

**Graph 31: Actual and Heuristically Projected House Prices**

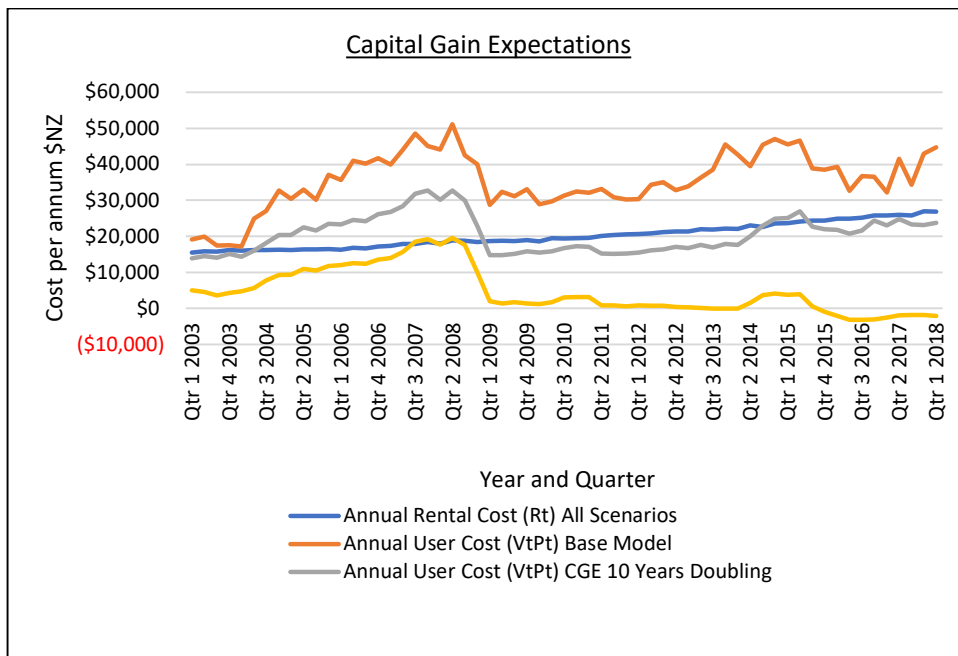


This shows that the '10-years doubling' heuristic is a reasonable approximation of the market over the timeframe in question. Aside from the expected volatility of the actual prices, this heuristic closely tracks the actual house prices for this timeframe. The '7-years doubling' heuristic, however, is not an accurate reflection of evidence from the market, leading to an upside pricing bias compared to the normative UCEM.

These heuristics can be taken as a range, in that they reflect the range of investor sentiment. In this regard, the range between the 7-year and 10-year projection is regarded by investors as the likely house price growth, however the actual prices are at the bottom of this range, again leading to an upside pricing bias compared to the normative UCEM.

When applied to the preferred UCEM model, the impact of this capital gain expectation heuristic is as shown on Graph 32:

**Graph 32: Heuristically Implied User-Cost**



It can be observed that the user-costs that are implied by the use of '7 years doubling' and the '10 years doubling' heuristic suggest to the investor that houses are under-valued, compared to the normative base model. Both of these heuristics lead to an upside pricing bias when compared to the normative model.

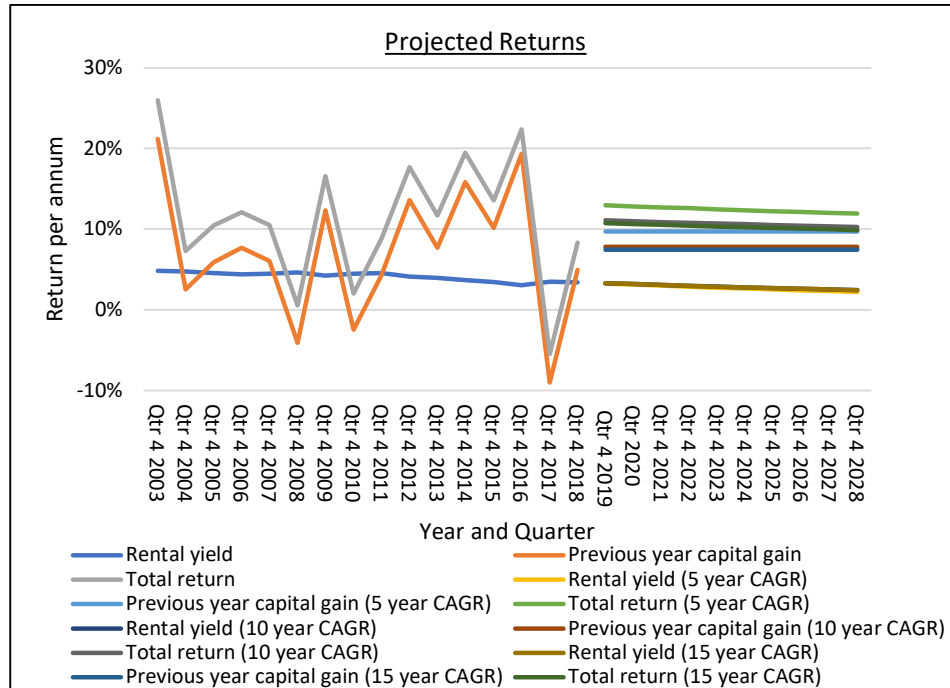
9.3.1.5 *Rental return is a 'given', but has implication for bank decision-making processes, when seeking funding*

As shown on Graph 28 above, actual returns for the past 15 years show that total returns fluctuate (due to capital return fluctuations) and that rental returns are declining due to

house price growth exceeding rental growth. It also shows an element of cyclicality in these return, particularly capital return.

An assumption of projecting forward past market trends in particular capital gain (in excess of the rate of rental growth) will result in rental yields continuing to decline as rents become a lower proportion of values. This is indicated by Graph 33 below, looking at a forward projection of 10 years:

**Graph 33: Projected Housing Returns**



With rental yields declining, serviceability of mortgage debt (assuming a static LVR) will therefore continue to decline, even with interest rates remaining level (as house prices increase).

An assumption of ongoing capital gains and a slow rate of increase in rents (both based upon past market performance) is not consistent with a heuristic that dismisses the importance of rental returns. As noted in 9.3.1.3 above, rental returns will continue to decline in relation to interest serviceability.

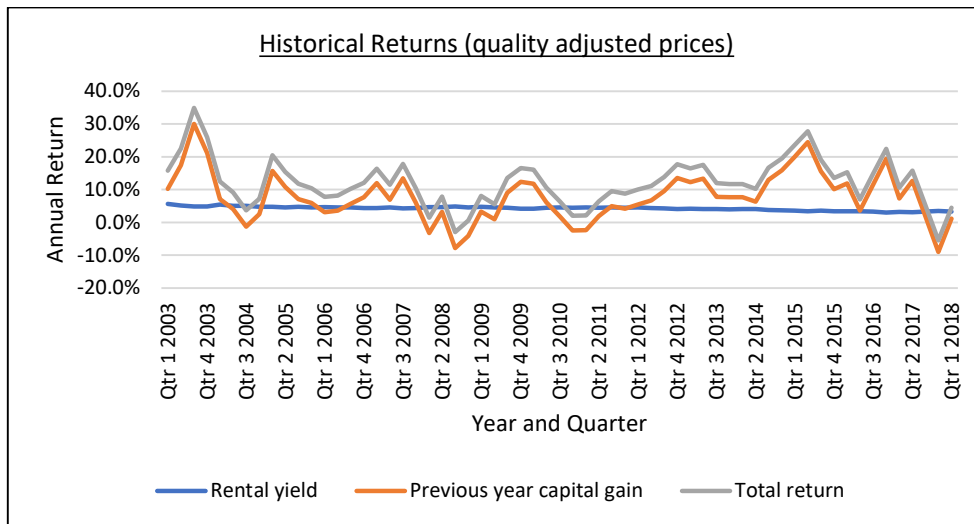
A heuristic which suggests that rental returns (and how these rental yields will be assessed by funders) will not place limits on funding of increased house prices is incorrect from an objective viewpoint. Compared to the normative UCEM model, this will have the effect of an upside pricing bias.

9.3.1.6 Housing returns are stable, it is a safe investment and easily understood

Looking at the historical returns shown on Graph 28 below over the 15-year period, income returns are within a consistent range, although declining due to house price escalation. There is, however, a considerable variability on capital returns over this period, including periods of negative returns, contributing to variability of total returns.

Over this period, capital returns represented 64% of the total return, at considerably higher volatility than rental returns:

Graph 28: Historical Auckland Residential Property Returns



This variability in returns suggests that housing returns are somewhat uncertain. Investment in housing has a considerable element of variability, particularly with regard to capital returns, and that losses could be made with an investment horizon a shorter period (say less than 5 years). Although the period of investment was not specifically surveyed, overall the investors looked to these shorter term horizons when determining return expectations.

Graph 28 indicates that a simple projection of past returns is not a good indicator of future performance (particularly over shorter timeframes) and that there is an element of cyclicality in the trend suggestive of fundamental factors contributing to investment returns. Objectively it can be seen that in 8 of the previous 15 years capital returns were nil or negative.

This heuristic is therefore not a good approximation for objective analysis and may in part explain the stated preference in 9.3.1.2 above that housing is of minimal risk in terms of returns, in particular CGE. This heuristic is likely to create an upside pricing bias (via CGE

expectations or risk understatement) compared to the normative UCEM and is explanatory in terms of the disequilibrium that is indicated by the preferred model.

#### *9.3.1.7 Conclusions from Part 2*

The stated preference heuristics that were identified in the qualitative interviews may produce pricing decisions that are inconsistent with objective analysis on matters of risk and return as are inherent within a rational model such as UCEM.

From an explanatory perspective, investor stated preference heuristics in relation to projected capital gain based upon past performance and a lower risk perception can partially explain the deviation from equilibrium within the model, via an upside pricing bias. This bias manifests into pricing via the risk allowance and CGE components within the user-cost calculation when compared to a normative, fully rational approach.

In considering the impact of the investor stated preferences, it was seen that they broadly support the inherent over-pricing in the preferred model. The exception is the heuristic that house prices double every ten years, which generally fits the data over the 15-year period to Quarter 4 2018.

It was found that the heuristics within the stated preference of investors all have the effect of over-estimating returns or under-estimating risks of housing investments compared to objective analysis. This may partially explain the disequilibrium in the market, via the upside bias in house pricing, though is unlikely to explain any bias in terms of any under-pricing of rentals.

The testing of investor stated preference heuristics and biases as part of Empirical test 3 were shown to produce upside pricing bias within the UCEM normative rational model, and therefore that these pricing decisions were likely to be sub-rational and a departure from what would be considered a fundamental (objective) value under the normative UCEM.

## 10 DISCUSSION – APPLICATION OF THEORY TO FINDINGS

### 10.1 Introduction

This chapter brings together the evidence that was obtained through the qualitative and quantitative phases of this research and considers this evidence within the context of the literature and the conceptual model outlined in Chapter 6 and the limitations noted in The Research Methodology chapter.

This chapter begins with a discussion structured around the conceptual framework (Research Question 1), how the empirical findings support this conceptual framework, and how the conceptual linkages can be shown. This is followed by a discussion of the quantitative and qualitative findings (Research Question 2), and how it relates to the literature.

This research paradigm of this thesis is deductive, identifying evidence within the Auckland housing market evidence that supports existing theoretical frameworks. The empirical tests establish the evidence for the existence of behavioural factors (Empirical Test 1), and any departure from normative pricing (Empirical Test 2). These tests identify evidence of departure from full rationality in house pricing within the Auckland housing market within the existing theoretical frameworks of the normative rational pricing and the behavioural concepts that may cause a departure from rational pricing.

This research goes further than providing further supportive evidence for existing theories from within the Auckland housing market. The conceptual model includes explanatory linkages between the normative and behavioural theories. This explanatory linkage between the normative fully rational view of *Homo Economicus* and the observations of the sub-rational everyday behaviours of *Homo Sapiens*, is at the heart of the debate within the literature as to how these prevailing theories can be reconciled.

Richard Thaler is a prominent author within this debate (coining the phrase *Homo Economicus*) and proposes that a reconciliation between the full rationality and bounded rationality approaches can be achieved by supplementing (rather than refuting) the traditional rational approaches, through the development of explanatory frameworks which describe the impact of sub-rational behaviours. In their words:

“On the theory side, the basic problem is that we are relying on one theory [traditional normative models] to accomplish two rather different goals, namely to characterize optimal

behavior and to predict actual behavior. We should not abandon the first type of theories as they are essential building blocks for any kind of economic analysis, but we must augment them with additional descriptive theories that are derived from data rather than axioms” (Thaler, 2016, p. 1577).

This research adds to this discourse on the *descriptive* ability of behavioural economic principles to explain departures from the normative models’ predictions. Empirical Tests 1 and 2 identify the evidence that supports existing literature. Empirical Test 3 seeks to describe the impact of the behavioural factors identified in Empirical Test 1 as a departure from the normative model. This test considers the stated preference of investors within the normative model, to test for the impact of these behavioural factors as a departure from that which is predicted by that normative model. In that regard, this research becomes inductive, inferring how this analysis may be descriptive of the empirical findings.

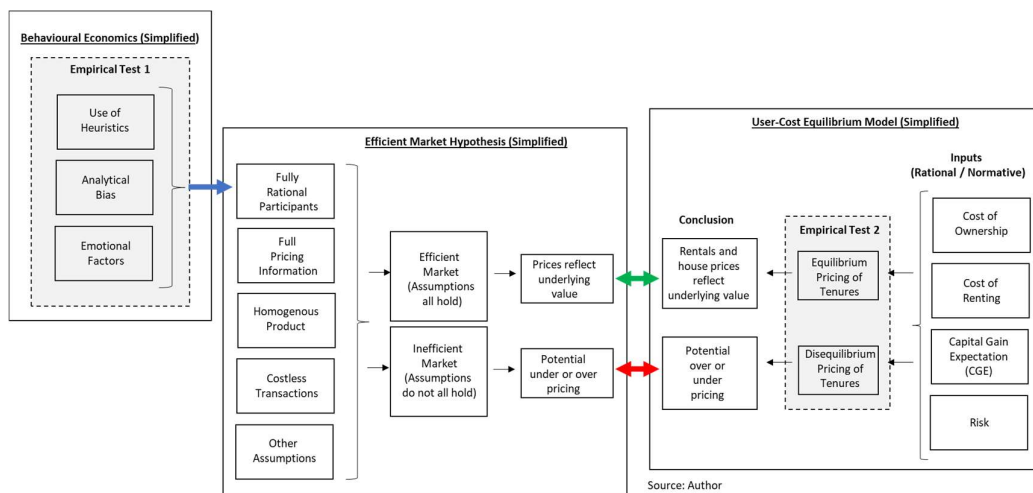
This chapter concludes with a discussion of the findings and observations within the research that do not directly address the research questions, but where it provides a descriptive perspective on related theory and potential areas for further research or the development of theoretical concepts relating to pricing within housing markets.

## 10.2 Research Question 1 - Conceptual Frameworks

The first research question asks *what conceptual frameworks can be used to demonstrate a linkage between investor activity and house price escalation, with a corresponding impact on declining house affordability?*

This research is based upon the conceptual framework outlined as Diagram 5 below:

**Diagram 5: Conceptual Framework (Empirical Tests 1 and 2)**



The conceptual framework addresses the first research question by establishing a linkage in the conceptual framework between the rational and normative assumptions within the Efficient Market Hypothesis (EMH) and the field of behavioural economics, which identifies limits to this rational view, or bounded rationality. This linkage is indicated by the blue arrow in Diagram 5 above (linkage 1).

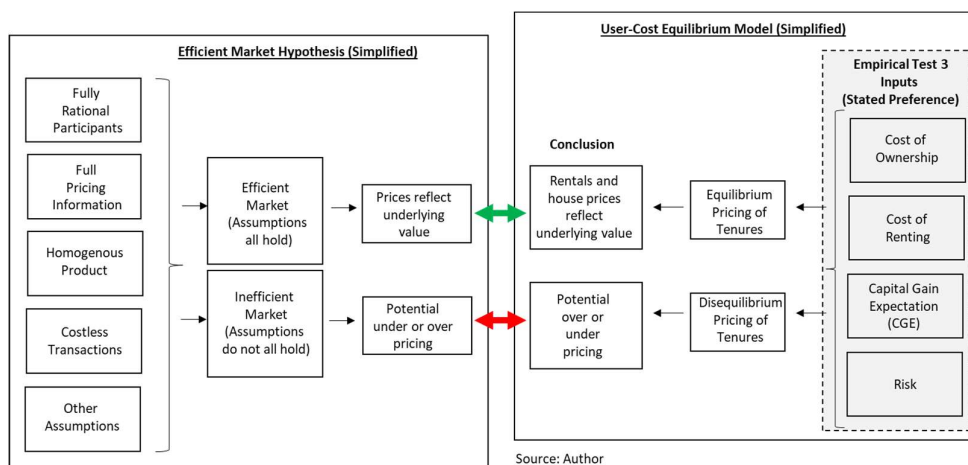
The second linkage in the conceptual framework to address Research Question 1 is between the rational and normative EMH description of markets (wherein products such as houses should be efficiently priced), and the UCEM which is also a rational and normative model for the pricing of durable goods. Linkage 2 (indicated by the red and green arrows) provides a basis for establishing whether there is evidence for non-rational pricing, such as over pricing (and escalation in pricing). This linkage is shown as the red and green arrows in Diagram 5 above.

To address research question one both linkages must be demonstrated. The conceptual linkage between investor behaviour and over-pricing of housing is the assertion that bounded rationality in the behaviour of investors could lead to inefficient market pricing (specifically over-pricing), relative to a rational / normative value. The UCEM provides a model which can establish whether market pricing is potentially under-valued or over-valued relative to a rational / normative value.

Empirical Test 1 was qualitative in nature, seeking evidence of the stated preferences, motivations and behaviours of investors (including as observed from within the institutional environment) and Empirical Test 2 is quantitative, seeking evidence for disequilibrium in the housing market, as evidence of over or under pricing (departure from normative pricing).

Empirical Test 3 draws the linkage between investor stated preferences, motivations and behaviours (specifically bounded rationality) that were observed in Empirical Test 1 and uses the UCEM to test the impact of these on pricing decisions, as shown on Diagram 6 below.

**Diagram 6: Conceptual Framework (Empirical Test 3)**



Empirical Test 3 estimates the impact of the bounded rationality stated preference on house prices. It also uses the UCEM (which is a rational / normative model) to test whether the heuristics which were stated by investors do result in sub-rational pricing decisions (as opposed to a heuristic which is a good proxy for rational decision-making).

These tests provide the evidence base that will validate Linkage 1 and Linkage 2 within the conceptual framework, validating the conceptual model and answering the research questions by demonstrating the linkage between investor motivations and behaviours and over-pricing of houses.

*10.2.1.1 Conceptual Framework Linkage 1 (Efficient Market Hypothesis, Rationality, Behavioural Economics)*

Efficient market Hypothesis holds that when a market is operating efficiently, prices will reflect all available relevant information about the underlying value of the good or service, resulting in prices being neither over-priced nor under-priced relative to underlying value. Whether a market is operating efficiently and therefore prices are reflecting underlying value is gauged by whether certain assumptions hold.

There is an extensive body of literature when it comes to the potential for many EMH assumptions to not apply to housing markets, for example: “As many textbooks about the housing market underpin, the housing market can be characterised as an imperfect market. The lack of information, the complexity of the product, the long production time, the high investment costs and the site specificity are some important reasons for this statement” (Boelhouwer, 2011, p. 276).

The focus of this research in relation to EMH assumptions is the assumption of rationality of participants, though the other EMH assumptions such as full pricing information, the

homogeneity of housing assets, and the cost of transactions are also well supported in the literature. This distinction between the ‘rationality of participants’ and ‘market structural features’ was made by Clapham when explaining that housing markets do not meet EMH assumptions for two main reasons: firstly, the structural features of the market itself, such as infrequent and costly transactions, complexity, heterogeneity, and long lead times, and secondly, the assumptions of consumer behaviour: rationality, defined preferences, perfect information, budget constraints, and insatiability do not apply to housing (Clapham, 2011).

Although the focus of this research is on the rationality of participants, no evidence was observed that would contradict the literature and imply that these other EMH assumptions may hold within the Auckland housing market and potentially contribute to over-pricing that was identified by Empirical Test 2. There were, however, a number of supporting observations within the interviews in relation to pricing data being imperfect, examples of this being:

“I analyse the sales of previous properties, ie the market at the moment. I wouldn’t be getting valuations because the valuations are generally so far off the mark, because things are selling for 100K above RVs or even higher than that, 150K. A lot of the valuers can’t get it right, where the market is telling you what people are prepared to pay” ((J.B.), 2019).

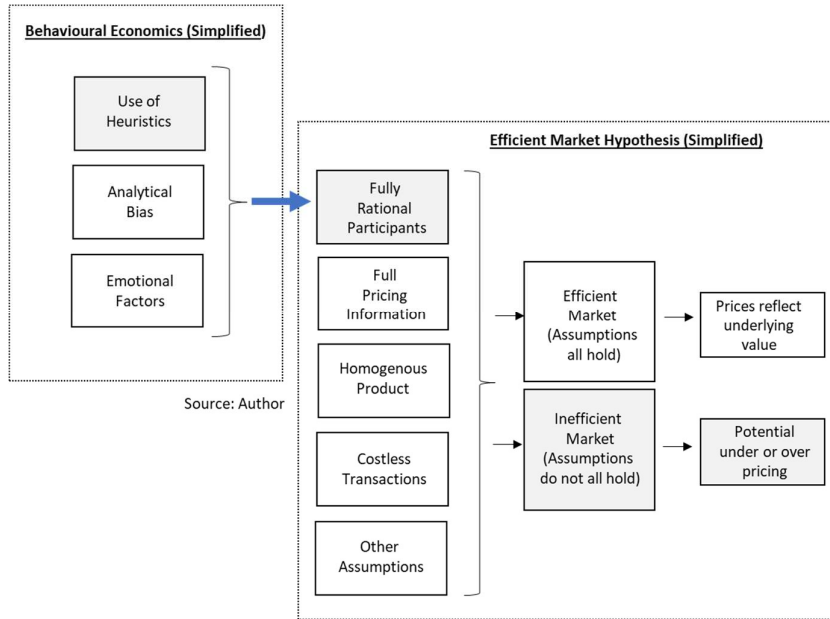
“I analyse sales data, but the future isn’t really there to be analysed... I keep an idea of what the Council is up to but otherwise I focus on sales in the past few months or so” ((T.M.), 2020).

These observations also support the ‘participant’ and ‘market structural features’ distinction made by Clapham above. It is the scarcity or quality of pricing information that contributes to the use of heuristics by investors, and the institutions within the market.

This link between the participants and the market structure that results in a participant adopting a bounded rationality behaviour was also made by Marsh and Gibb, who proposed that rationality within the complexity of housing is likely bounded and that behavioural approaches will provide better understanding of the decision making of households, in particular the concepts of loss aversion, anchoring, and adjustment bias (Marsh & Gibb, 2011).

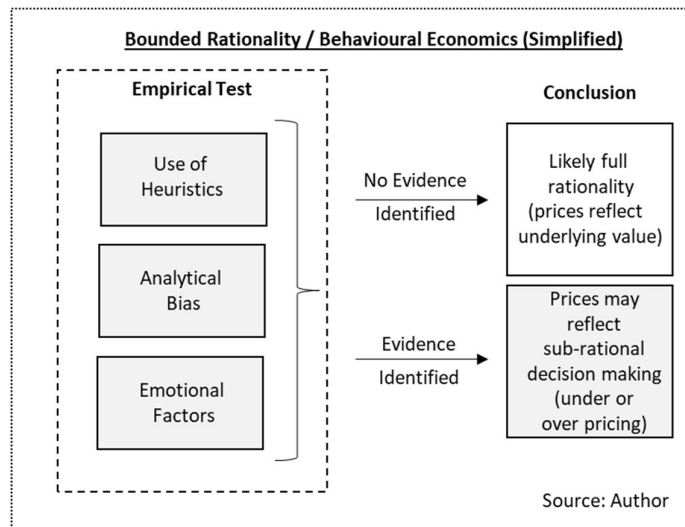
Shaded below in Diagram 8 is the linkage proposed in the conceptual model, wherein the rationality of participants is limited by the use of heuristics, and this could lead to under-pricing or over-pricing:

**Diagram 8: Linkage between Behavioural Economics and EMH**



This is to say that if there is evidence that rationality is bounded (as well as other impacts on efficient pricing such as poor pricing information), then there could be over-pricing or under-pricing in the market, as shown shaded in Diagram 9 below:

**Diagram 9: Behavioural Economics Linkage between Behavioural Factors and Pricing**



The testing for evidence of behavioural factors as shown in Diagram 9 was undertaken as Empirical Test 1. The stated preference of investors (both directly stated and via the observations from the institutional environment) was obtained to identify evidence of departure from the EMH assumption of full rationality. This was undertaken by the semi-structured interview survey.

The interviews identified there was evidence for behavioural factors such as biases and the use of heuristics within investor decision making, as well as a minority finding that there was evidence for emotional factors within investor decision making. Therefore there is evidence for the application of this conceptual model to apply the Auckland Housing market.

Given that EMH assumptions may not hold in housing markets, there remains a question as to whether the use of heuristics is evidence of bounded rationality, or a rational response to market inefficiencies such as poor pricing information. In this regard, the testing of the stated preference in Empirical test 3 showed that simple or more objective analysis could alleviate the upside pricing bias of these factors. This being the case it is contended herein that this is evidence of bounded rationality rather than a rational response and represents irrational exuberance in a rising market or an example of what was identified by Chaudhuri: “that in forming their price expectations, the traders are not taking all salient information into consideration, such as the fundamental value or the length of the time horizon, but are myopically basing their future forecasts on current prices alone” (Chaudhuri, 2021, p. 384).

This concept was reinforced in the NZ context that found evidence of irrational exuberance in rising markets, in which market participants were seen as not being good at taking account of all possible risks in making their decisions (Shi & Kabir, 2018). This departure from rationality in rising markets has support from the US, where a study concluded that it “provided some evidence that investors in housing markets do not know fundamentals. They tend to interpret events in terms of heresay, clichés and casual observations”, and “it is certainly plausible that expectations heavily influence the prices people are prepared to pay in these markets. Because these expectations do not appear to make much sense except as extrapolations of past price changes, we cannot expect prices to be rationally determined” (Case & Shiller, 1996, p. 17).

Evidence of these behavioural factors does not in itself assess the extent to which there is over-pricing or under-pricing. The existence of these factors implies only that the EMH assumption of rationality does not hold and therefore it cannot be inferred that pricing reflects underlying value.

The assessment of whether these biases and heuristics are likely to result in under-pricing or over-pricing requires consideration of what a more objective (rational) perspective would be on the pricing consideration that is affected by that bias or heuristic. This research looks at this from a normative perspective, ie what *should* a rational market participant consider in this situation, and how would this bias affect investor decision-making relative to this more

rational perspective. This was demonstrated by using the UCEM normative rational model to quantify the impact of these behavioural aspects, showing the impact that they have on pricing compared to the rational model.

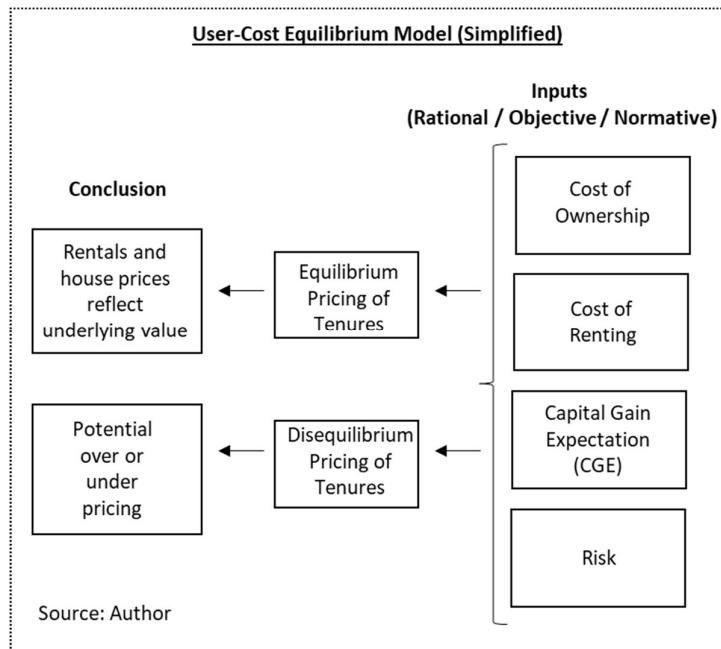
As will be discussed subsequently, the impact of the observed behavioural factors within Empirical Test 1 were shown in Empirical Test to 3 cause an upside pricing bias compared to the normative UCEM.

#### *10.2.1.2 Conceptual Framework Linkage 2 (UCEM as a Rational Pricing Model)*

The UCEM is a descriptive model and a normative view of how rational market participants should behave and therefore a basis upon which to assess the underlying value. On this assumption of rationality the model holds that markets will be in equilibrium, and therefore the price of ownership (house prices) will be in equilibrium with the price of rental tenure (rentals), or as explained by Nathalie “This approach to consumer behaviour is based upon rationality. If the cost of ownership rises too high compared to the cost of renting, demand will reduce for the purchase of houses placing downward pressure on house prices” (Nathalie et al., 2006, p. 16).

The UCEM holds that for rational market participants, the market will be in equilibrium (and prices for each tenure will be rational) when the annual user cost and annual rental cost are equivalent. The user cost of a house is the present value of buying it, living in it for one period and then selling it. In equilibrium this should equal the cost of renting the house for one period (Hill & Syed, 2016). Therefore, the rationality of pricing can be empirically tested using normative assumptions and market data in accordance with this part of the conceptual framework shown in Diagram 10 below:

**Diagram 10: UCEM Linkage between Behavioural Factors and Pricing**



This research looks for evidence of a linkage between investor behaviour and house price escalation, and the UCEM provides two perspectives. The first perspective is as a model to identify aggregate overpricing relative to underlying value (Empirical Test 2). The second perspective is a rational and normative framework with which to test the stated preference of investors (Empirical Test 3) to identify whether stated preferences result in a departure from what the normative approach would predict. In this regard the model can compare a normative approach with the heuristics and biases identified within the stated preference of investors, thereby quantifying the impact of any departures from rationality.

The UCEM is well supported in the literature, having been widely used to test for equilibrium in housing markets, using a range of approaches, assumptions and adjustments (Hill & Syed, 2016). It has also been applied in the New Zealand context over a similar timeframe, wherein it identified evidence of over pricing (Nguyen et al., 2022a). In terms of conceptual relevance to this research, it is reasonable to assume that this model is applicable to the Auckland housing market.

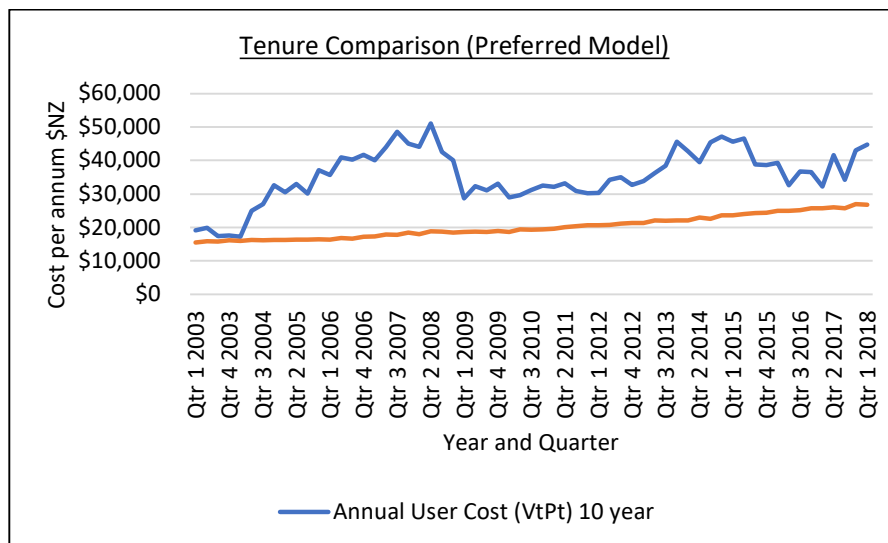
It has been noted that EMH assumptions do not hold in the case of many property markets, but the UCEM as an estimate of the normative equilibrium pricing of tenures does hold because it predicts that inefficient market may not be in equilibrium (under or over pricing of a tenure) but that over time prices will adjust because of this mis-pricing, thereby reducing the deviation from equilibrium. This is explained by the RBNZ in selecting the UCEM: “from

the perspective of households, sustainable house prices should reflect the net benefits of home ownership, particularly when compared with the alternative of renting. This means the options of home ownership and renting should be balanced over time, and the net benefits of both options should not deviate significantly” (Brunton, 2021, p. 4).

The existence of heuristics and biases as a form of bounded rationality (and a breach of the EMH assumption of full rationality) within housing markets is supported within the literature overseas (Gibb, 2009) and in NZ (Shi & Kabir, 2018) (de Bruin & Flint-Hartle, 2003). The impact of these factors (if they exist within the market) on pricing will be implicit in the observed preference pricing data. The UCEM should rightly identify a departure from rational pricing when assessing this observed preference data (by identifying a deviation from equilibrium).

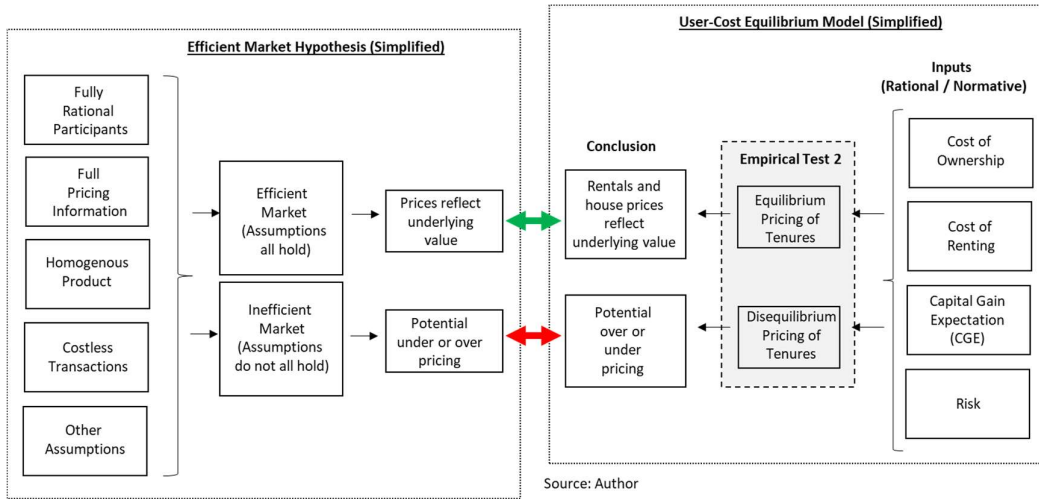
Empirical Test 2 demonstrated consistent aggregate over-pricing of houses over the period of the model, inferring that housing is over-priced compared to the rational pricing model of UCEM, as shown in Graph 21 below:

**Graph 21: UCEM Tenure Comparison 2003 – 2018 Preferred Model**



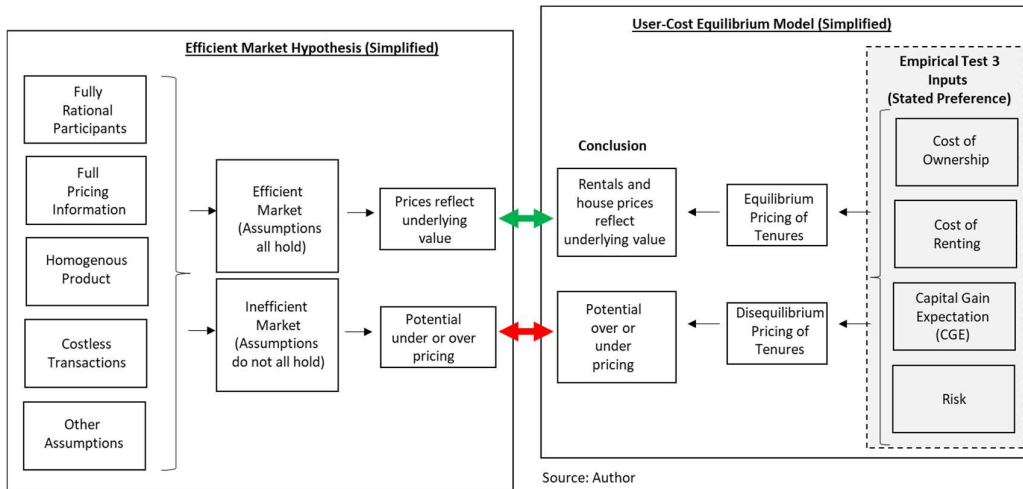
This persistent deviation between the cost of tenures represents a disequilibrium under the UCEM, and confirms the validity of Linkage 2 (red arrow) on the conceptual model as outlined in Diagram 7 below:

**Diagram 7: Conceptual Framework (Empirical Test 2)**



Empirical Test 3 took the investor stated preference (with evidence of factors implying bounded rationality) and quantified the impact of these factors on pricing, when compared to the normative UCEM, as shown on Diagram 6 below:

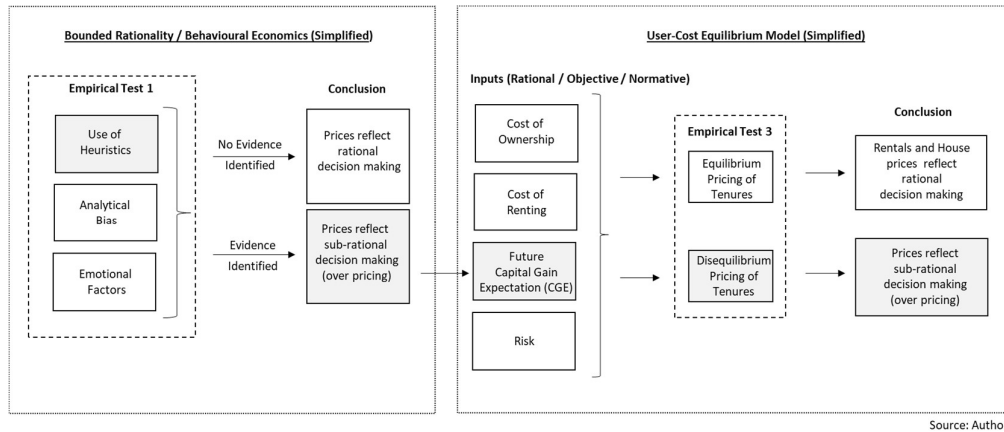
**Diagram 6: Conceptual Framework (Empirical Test 3)**



Empirical Test 3 (shown shaded on Diagram 6 above) provided evidence that stated preference biases and heuristics were likely to cause upside pricing bias and therefore a departure from what the normative pricing that is indicated by the UCEM. This is to say that the most consistently observed biases and heuristics that were identified in Empirical Test 1 when compared to a more normative assessment in Empirical Test 3 have the effect of upside-pricing bias, and therefore lead to over-pricing rather than a combination of over-pricing and under-pricing.

Empirical Test 3 demonstrated that the largest contributor to the over-pricing of ownership tenure was CGE, show shaded in Diagram 11 below:

**Diagram 11: Conceptual Linkage Between Behavioural Factors and Pricing**



This shows the conceptual linkage between the behavioural heuristics in relation to CGE, and the over-valuation of assets compared to underlying fundamental value (which in the UCEM is indicated by a disequilibrium in pricing between tenures). Empirical Test 3 found that an over-estimation of CGE was a likely explanation for the deviation from equilibrium, and that this would explain an upside pricing bias as indicated by Empirical Test 2.

This raises the question as to whether these heuristics and biases are evidence of bounded rationality or are a rational response to poor information and pricing signals within an inefficient market. In this regard, the defining matter is whether this tendency to generalise is unavoidable given the inefficiencies in the market (and therefore rational) or represents bounded rationality such as heuristics that are adopted in response to undue complexity (Pingle, 1992) or being “not good at taking into account all possible risks when making their decisions” (Shi & Kabir, 2018).

In summary, the UCEM was used within Empirical Test 2 and Empirical Test 3 to identify a difference between normative pricing decisions (observed preference of the market in aggregate) and the stated preference identified in Empirical Test 1. The linkages within the conceptual framework are demonstrated by the findings of this research.

#### 10.2.1.3 Linkage to house price escalation

The mechanisms by which investor pricing decisions can impact aggregate pricing are twofold. Firstly, in their involvement in the housing transactions, whether this results in a sale to the investor or not via their involvement in the competitive process. Secondly, in the use of sales data from (over-priced) transactions in subsequent sales. The idea that bounded

rationality can have an impact on house pricing within a competitive process is supported in the literature (Shi & Kabir, 2018).

Empirical Test 3 indicated that investor decision making that includes bounded rationality biases and heuristics were likely to result in an upside-pricing bias.

As noted previously housing markets breach many of the EMH assumptions that need to apply if we wish to presume that pricing reflects underlying value, most notable being poor information and heterogeneity of the asset. This paucity of information is further exacerbated by the lack of a centralised register or homogenous pricing mechanism. Prices are determined by past sales, many of which were completed within a competitive process.

Competitive processes can exacerbate the exuberance of individuals, especially in a rising market, as identified in a New Zealand study: "Theoretically, the winner in a common value auction is the one who overestimates the value of the underlying asset the most. The phenomenon that the winner overbids in an auction is called 'the winner curse' in auction literature". (Shi & Kabir, 2018, p. 63)

There is an element of pro-cyclicality inherent in this over-estimation of CGE. The motivation to invest for the purposes of capital gain is reinforced by heuristics and technical analysis of recent house price trajectory (sales data), which leads to an up-side pricing bias via irrational exuberance. House prices continue to rise based upon upside biased pricing, and this further reinforces the trend. This idea of irrational exuberance and pro-cyclicality was observed by the institutional respondents:

"It tends to be in waves or in herds if you like, people all rush through the door at the same time to get into the paradise, and then rush to the door to get out" ((O.N), 2019).

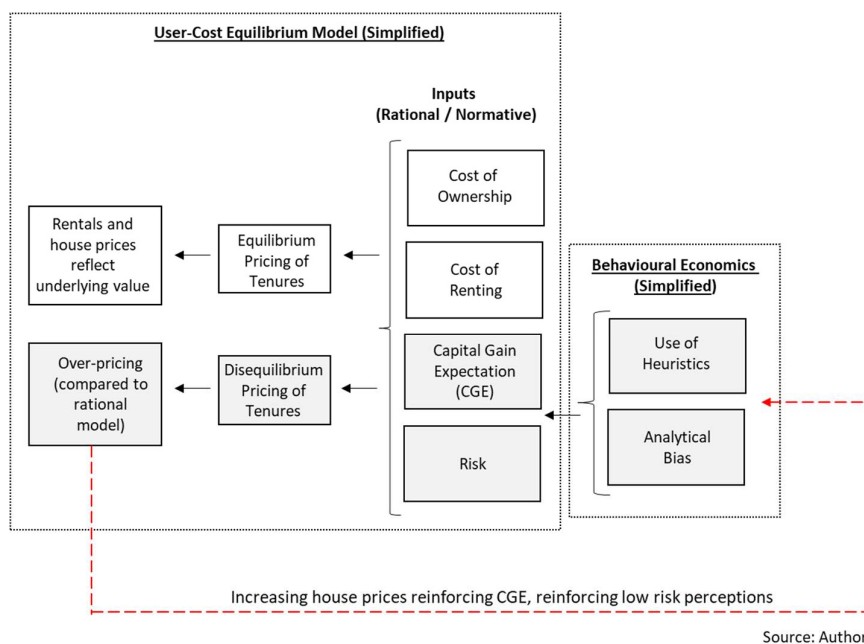
"Investor sentiment is usually/hugely determined by market sentiment because it's not only backward looking but capital gain is really, as far as I'm concerned, the product of herd behaviour, so I think they would all be watching what the herd's doing, via the media often." ((C.P.), 2020).

A considerable number of observations within the qualitative findings contribute to this pro-cyclicality. Investors were generally not 'future focussed' based on fundamental analysis but rather were expecting of a continuation of the recent past.

The reinforcement of the status quo is supported in the literature as a 'herd bias' as discussed earlier, but is also analogous to the behavioural concept of anchoring which occurs when an

estimate is biased towards a pre-established point in the absence of which the estimate would have a wider range of possibilities (Camerer et al., 2004). This anchoring effect has been shown experimentally in the context of housing, showing that estimates tend to anchor around a starting figure, biasing towards the anchored status quo and minimise the magnitude of difference between alternatives (Kahneman et al., 1982). Investors interviewed in this research were strongly supportive of the importance of the status quo in decision making, both in terms of recent market performance, and the prevailing market sentiment. This pro cyclicality can be shown diagrammatically within the conceptual framework as shown in Diagram 12 below:

**Diagram 12: Conceptual Process of Pro-Cyclicality**



It is not yet apparent whether this reinforcement of current trends will continue to be pro-cyclic in a declining market, as area that has been identified by the researcher as an area for further research. Studies have shown that behavioural factors such as anchoring and loss aversion may apply, limiting the extent to which the over-pricing will be corrected.

The idea that bounded rationality can be pro-cyclic and reinforce the status quo in an upward market yet limit downward corrections was noted by Smith, who proposed that the non-rational elements of housing market pricing can be broadly grouped into themes: “over-optimism and the risk of regret; momentum reasoning (e.g. the conviction that prices will continue to rise); inflation mistakes; and disposition effects (people dislike making losses more than they enjoy making gains)” (Smith, 2011, p. 246).

It has been previously noted that this research is focused on the investor segment, and the mechanisms above are the manner in which investor activity can influence non-investor pricing decisions. The generalisability of the research findings could be tested using the same research methodology within the owner occupier market to determine the existence and impact of behavioural factors in decision making.

### 10.3 Research Question 2: Empirical Findings

Research Question 2 asks what stated and observed preferences, motivations and behaviours can be empirically observed that show a linkage between investor activity and house price escalation, with a corresponding impact on house prices and declining affordability. This research question is addressed by three empirical tests, as outlined below.

#### *10.3.1.1 Empirical Test 1 - Qualitative Interviews*

Empirical test 1 sought evidence for behavioural factors that were identified within the literature, via structured interviews of investors and their institutional environment.

These findings will be discussed as two themes:

1. Capital gain expectation is the primary motivator and is largely assured based upon past returns and market sentiment
2. Housing investment is a straightforward, low-risk Investment

#### **Capital gain expectation is the primary motivator and is largely assured based upon past returns and market sentiment**

Investors saw capital gain as the primary motivation in investment. This capital gain was seen as a near-certainty, based upon medium term past house price escalation, without consideration of fundamental determinants of house price growth or wider macro risks or cycles.

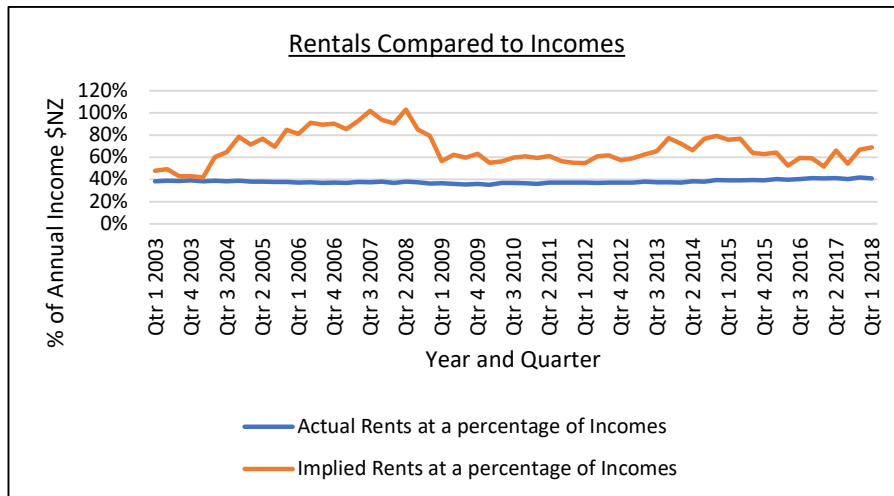
Similar studies within housing markets support these findings in terms of pricing being based upon extrapolating past returns rather than the more rational pricing considerations that is proposed by normative approaches, such as fundamentals. An example from the US found that homeowners over the 2000–2005 period (in which there was considerable house price growth) expected house prices to continue to rise at double-digit rates for the next decade (Case et al., 2012). This study supported the findings from a study three decades earlier, suggesting that “People seem to form their expectations from past price movements rather than having any knowledge of fundamentals” (Case & Shiller, 1988, p. 21).

This extrapolation of capital gain has been identified in the literature as being due to a combination of behavioural factors, including both biases (including framing, anchoring and herd biases); and the use of heuristics. These factors were identified as stated preference in Empirical Test 1. As was shown, the heuristic of ‘ten years doubling’ was a good proxy for house prices over the longer term, but for terms of 5 years or less, within which there is greater volatility in returns, it may overstate the gain.

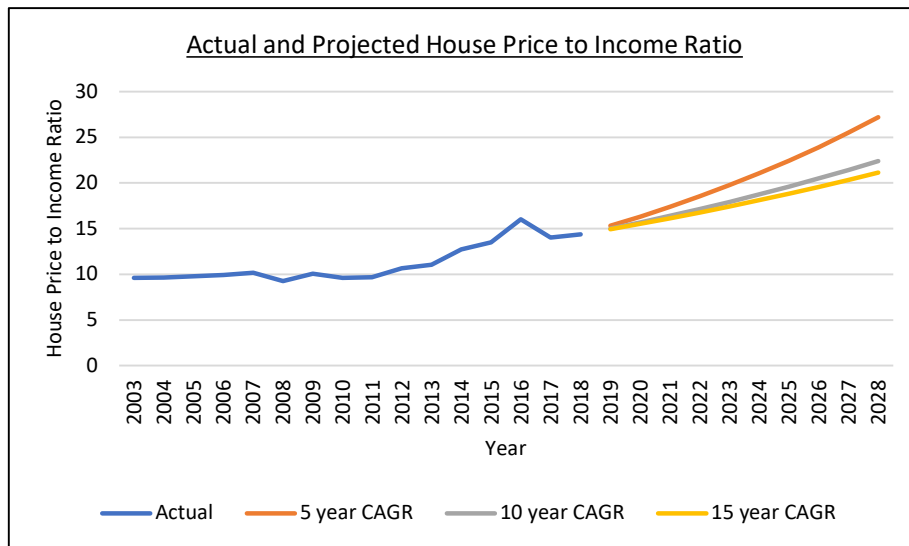
Investors considered that the best guide to future capital returns was past returns, in particular the near-term past. This was strongly based upon market sentiment rather than any fundamental analysis such as equilibrium between future supply and demand or affordability.

It is asserted that it is reasonable that rental affordability would be a consideration in pricing decisions by investors. As noted in the quantitative phase of this research (Graphs 24 and 25 below) rentals as a percentage of incomes has remained consistently at 40%. However, pricing decisions (using the UCEM) have inferred a rental consistently above this range which suggests that affordability for tenants is of a lesser concern than ongoing capital gain, which (even by simple ratio analysis) would seem less than sustainable to a rational investor:

**Graph 24: Actual and Implied Rentals at Equilibrium and Household Incomes**



Graph 25: Historic and Projected House Price to Income Ratio



This is to say that the assumption that house prices will continue on the past trajectory, when applying the most commonly used affordability ratios, is likely to result in an affordability problem for many households in relation to rental affordability (noting the House Price to Income ratio does not exhibit a long-run apparent equilibrium state). However, the use of such basic *fundamental* analysis was not part of the stated preference factors considered by investors, who chose rather to focus on house prices alone.

In this regard the term ‘fundamental value’ is used as synonymous with ‘rational pricing’ such as is modelled within the UCEM. This expectation of investors that capital gain will continue as it has in the past is not supported by the UCEM. The modelling in Empirical Tests 2 and 3 indicates that the persistent overpricing within the Auckland market is most readily attributed to an over-estimation of capital gain, particularly when the heuristics that were stated by the investors (and as supported by institutional interviews) were applied.

The literature includes many studies which indicate evidence of the reliance of investors on limited and subjective data that reinforces the status quo (often via the media) which can be seen as narrow framing and analogous to the findings of Alves and Mata (2019) who found that the metacognitive task of accounting for the constraints inherent in information samples, could be an indication of metacognitive myopia.” (Alves et al., 2023, p. 2)

This predominance of optimism bias likely reflects the upward phase of the property cycle and resultant market sentiment and media coverage during the period of this research and the relevant experience of the interviewees. The stated preference of the less experienced investors (and this was supported by the institutional interviews) was that market sentiment

was of primary importance and that capital gain was largely assured. The more experienced investors indicated more conservatism in their outlook and less concern with sentiment, reflecting a study by Camerer and Covallo in which investors saw housing investment as somewhat straightforward, and returns (especially capital gain) were largely assured especially with the less experienced investors. This has been shown to result in as a form of overconfidence, an internal bias of overstating their own abilities resulting in exuberant behaviour, overpricing (relative to risk) and excess entry into markets (Camerer & Lovo, 1999). Similarly, this difference between experienced and inexperienced investors was noted in a US study, which similarly found that housing market can become overvalued though the impact of transactions by less experienced or less financially sophisticated participants (Ackert et al., 2011).

The qualitative findings indicated that less experienced investors were less analytical and more likely to be influenced by the media and market sentiment than more experienced investors. In this regard it follows that they are more likely to exhibit biases such as herd bias and anchoring bias, being influenced by past market performance without reference to more fundamental factors. This impact of experience on seeking speculative gains irrespective of a deviation from fundamental values was noted by Chaudhuri: “At some level, the pattern of behaviour seems obvious, given what we know about human decision making. The possibility of speculative gains unleashes “animal spirits” among inexperienced traders” (Chaudhuri, 2021, p. 383).

There was strong evidence from both investors and institutions (in particular market commentary and media sectors) that the incidence of information that refutes positive market sentiment was low, and there was a corresponding low inclination of investors to consider these factors (and respond to by seeking further information or changing their evaluation).

“My perception would be media plays quite a big role in terms of overall sentiment around the market. Which is really amplifying the messages that are coming from the likes of the Real Estate Institute and others who are putting out data” ((C.B.), 2020).

“They’re always hoping for capital gain because there’s always a story in the media somewhere that some areas make money and they follow that. It’s a dream. Underlying long term investments is the hope that the rent will help pay

off the mortgage, and that they ended up with an unencumbered property” ((O.N), 2019).

The influence of the media and real estate agents was prevalent in Investor interviews, particularly with those less experienced. This herd bias, or ‘social validation effect’ was noted in a study by Wanzel which considered the impact of advisors on investor decision making. In that study the impact of peers, the media and trusted real estate agents was found to be a bias in terms of validating investor’s perceptions, seeking advice that is less independent and more interdependent with the investor’s current viewpoint. (Wanzel et al. (2017)).

The influence of the media and real estate agents, particularly by those less experienced, is supported by the findings of this research that the more experienced investors were less concerned with the messaging within the media and focussed their attention on understanding the sectors (such as suburbs) of the market that they were engaged in and following the findings by Levy et al, are less likely to exhibit framing bias, for example:

“I think there’s a big difference between the experienced and the inexperienced investor. People have busy lives; they will just read a few headlines or they’ll see a few things, and so I think we definitely have some of that mixed interaction where sometimes you hear people say things and you know what they read, whereas other times you know that they’re pretty clued up and they understand a bit more of the actual drivers of the property market” ((N.G.), 2020).

This reliance on market transactions and sentiment in decision making, given the likelihood of sub-rational decision-making being a contributor to transaction data and sentiment, raises the question of whether the market mechanism itself can be reasonably relied upon. This is to question whether it is reasonable for investors to assume that aggregate prices reflect the underlying fundamental value, or whether this is unreasonable and indicates bounded rationality. There was a strong reliance on market sentiment and recent market prices within investor interviews, and this was supported by the institutional interviews, though the latter were sceptical as to whether this was prudent behaviour.

There is support within the literature for this assertion that there could be bounded rationality in play whenever houses are over-valued relative to fundamental value. This was considered in relation to the years following the 2008 GFC correction, in a study by Whittle: “whether those investors are correct or incorrect, their beliefs reject fundamental assumptions of neoclassical economics (that every person is equally effective in assessing

prices). Behavioural biases affect the rise and expansion of bubbles, such as overconfidence from speculative perceptions of house price rises” (Whittle et al., 2014, p. 22).

Traditional normative rational models assume that deviations from rational pricing will not hold at the market level, but rather will be counteracted by the market overall, as posed by Mallard that at the aggregate level, the standard assumptions of rationality represent effectively the average behaviour and the market itself will serve to counteract the behavioural anomalies at the level of individuals” (Mallard, 2017).

Interview findings (and quantitative analysis) from this research suggest that the market may not counteract individual over-pricing decisions as traditional economic models suggest, and this is reinforced by literature that supports the existence of persistent aggregate over pricing of housing markets (bubbles).

Responses from investors suggest a reliance on a small number of transactions with limited consideration of more fundamental factors which should (from a normative perspective) be considered as important to pricing and fundamental value. The reliance on transaction data to estimate current values is common in the NZ housing market and is standard valuation practice. All investors that were interviewed saw transaction data as the primary indicator of value and (over time) of house price growth. This reliance on transactions can be seen as a herd bias, in that there is an implicit assumption that other participants are rational in the pricing decisions that they make thereby making transaction data a validation of fundamental value.

In summary, there is a strong and consistent theme within the interviews with investors that the primary focus of their pricing is upon past market performance, especially in relation to capital gain expectation, and this was reinforced by the institutional interviews. This focus on capital gains was a primary motivation to invest and in pricing decisions and was based upon biases and heuristics. These heuristics and biases identified in this research are supported by relevant studies and theory, including the mechanism by which these decisions at an individual level could affect the market overall and result in sustained over valuation compared to fundamental values in a rising market.

## **2. Housing investment is a straightforward, low-risk Investment**

Investors considered housing investment to be largely passive over the medium to long term, with returns inevitable. They saw little need for objective advice or analysis, preferring to base decisions on transactional data, heuristics and experience, and market sentiment.

These findings have support within the literature in terms of the use of heuristics and biases which act as a form of simplification of analysis, but also the concept of risk myopia. In the interviews this was tested from both perspectives, asking investors about the type of analysis that was undertaken, and asking separately about the treatment of risks. As noted in Chapter 8, two strongly supported themes across both groups of interviews were firstly the reliance on past market performance (technical rather than fundamental analysis) and market sentiment; and secondly the absence of consideration of the larger macro risks such as interest rate increases or market cycles, with the focus being largely on operational (non-systematic) risks.

This simplification of analysis and the use of heuristics in housing markets is supported within the literature over many studies across the world since the 1990s, including Pringle in 1992, Baxter in 1993, and through to Gibb in 2009 and Houston and Spencer in 2014. In the New Zealand context, it was also observed in studies by deBruin and Flint-Hartle in 2003, Shi in 2018, and Levy in 2016. This use of simple technical analysis based upon past house prices saw particular attention post the GFC correction, such as the studies by Ackert et al in 2011 and in the following year in studies by Case & Shiller and Scerbina et al.

In this regard the consideration of systemic risks such as market cycles and the impact of interest rate rises was also not a significant risk noted by investors, despite simple analysis revealing the significance of this upon returns, as shown in Chapter 9.

The disregard of these downside risks by investors is likely to produce an upside pricing bias, should interest rates increase and serviceability become problematic based upon forecast rental growth. It would also likely seriously affect serviceability of loans and therefore the viability of the property as an investment, should the property be leveraged.

This raises the question of whether it is reasonable or rational not to take this into consideration, or whether this constitutes a form of risk myopia. Institutional interviewees reinforced the low incidence of longer-term risk consideration identified within the Investor interviews:

“I doubt people are concerned about interest rates increasing because they’ve just been on a one-way track for the last 10 years and if interest rates were to be raised in any significant way now, it would put so many people under duress and increase the risk of the house crash, that interest rates won’t be rising in any significant way” ((C.P.), 2020).

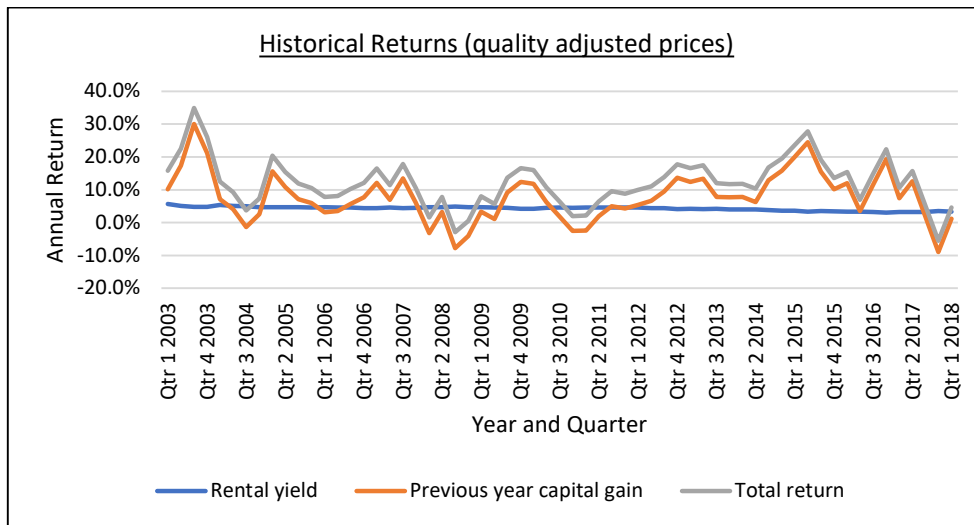
“Interest rates have consistently been going down and rent and values are consistently going up. There isn’t any observational cycle in their time frame, so I think people are quite myopic in their decisions, from an investment perspective” ((A.W.), 2020).

In this regard there is support in the qualitative findings that an element of risk myopia is present in the decision making of Investors, and this is likely to have an upside-pricing bias. However, a greater understanding of the approach to comparative risk will require further research, as is suggested subsequently.

Across both interview groups, there was a well evidenced theme of investor reliance on short to medium term capital gain in extrapolating return expectations, a finding that is consistent with the literature including the 2021 study by Chaudhuri that is cited above. In terms of the risk of not receiving the anticipated returns, a similar finding was made in Empirical Test 3, which quantified the stated preference of investors in relation to capital gain expectations.

This brings into question the rationality of investors in assuming that capital gain is a ‘given’, especially when simple analysis of historic returns using readily available information shows that capital gains are quite volatile and include periods of negative total returns, as shown on Graph 28 below:

**Graph 28: Historical Auckland Residential Property Returns**



In the qualitative phase of this research, the source and impact of information on investment sentiment (risk and return) was obtained. There was a strong bias towards reinforcement of the status quo (in particular that past returns will continue forward) in the information sources quoted by investors. This was reinforced by market commentators, who indicated

that there is an asymmetry in the information available and the apparent reluctance of behalf of investors to consider information that is more objective.

“The media in as influencer whether that be through the news media or current affair shows, or whether it’s those reality shows looking at people investing and making an absolute fortune or on the flip side, people investing and having to outlay a lot more CapEx to repair properties as a result of poor tenant quality etc” ((G.M.), 2019).

“They’ve [investors] soaked up information that they read, hear or chat about on social media and it becomes unwritten law in their mind” ((D.A.), 2019).

Investors strongly noted the low risk of housing investment and the near-certainly of capital gain. In interviews with investors, seeking an understanding of the motivation to invest and the comparison to alternate investments, there was a clear and widely supported view that housing was unlikely to result on a loss of initial investment, by comparison with say the sharemarket, indicating a loss aversion aspect to the decision, in addition to anticipated returns.

“With property, at least, its what New Zealanders invest in, its generational, its what you invest in. Stocks and bonds are less common, but property has always been a good investment in NZ. ‘As safe as houses’ is part of the kiwi mentality” ((R.H.), 2019).

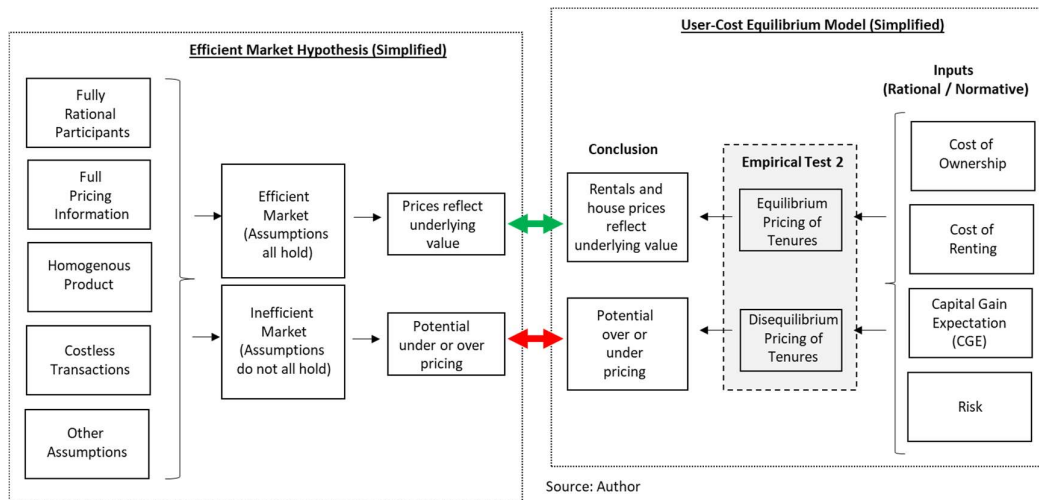
“There is a general rule, believe it or not, where houses eventually always rise. They understand there’s flat periods, but they don’t want to believe it” ((O.N), 2019).

In summary, in relation to both housing return and risk there were strong and consistent observations of behavioural factors which could potentially contribute to house price escalation via an upside bias in pricing or a downside bias in risk. Interviews also indicated a finding that reinforces the role of experience and the impact of the media, which is supported within the literature.

#### *10.3.1.2 Empirical Test 2 - Quantitative Analysis (Market Equilibrium)*

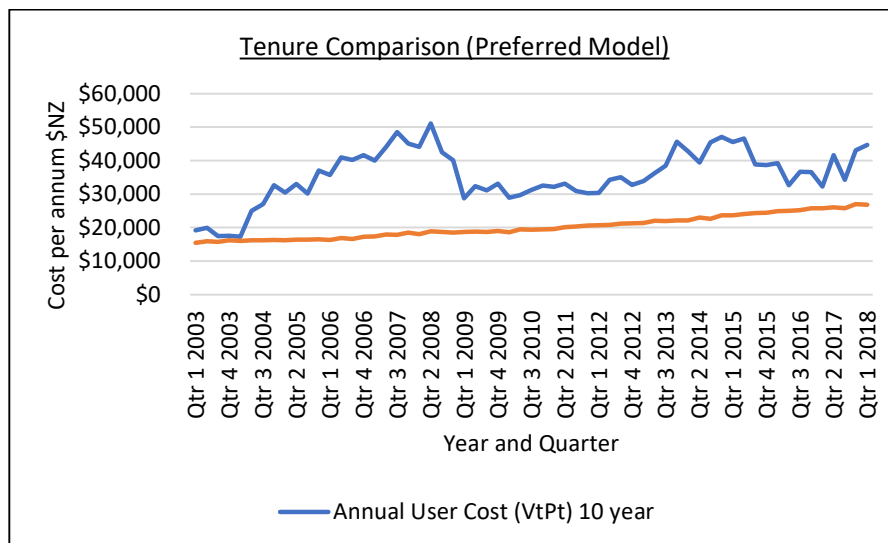
Part 1 of the quantitative analysis (Empirical Test 2) is shown shaded on the conceptual framework in Diagram 7 below:

**Diagram 7: Conceptual Framework (Empirical Test 2)**



In the UCEM preferred model, a persistent disequilibrium was indicated, indicating that the user-cost of ownership was consistently above the rental yield, as shown on Graph 21 below.

**Graph 21: UCEM Tenure Comparison 2003 – 2018 Preferred Model**



According to the principles of the UCEM, this suggests that house prices are over-valued, or rental are under-valued compared to a market that is in equilibrium.

This infers that from a normative perspective there is evidence of sub-rational decisions in the market in aggregate compared to the normative and rational assumptions of the UCEM, and therefore that house prices (or rentals) may not reflect fundamental value. In considering this result, other studies were considered to determine whether a consistent sub-rational pricing could be linked to individual pricing decisions and how a consistent over-valuation can go unnoticed by those in the market. Any mis-pricing should be of particular

interest to investors who by their nature are focussed on financial aspects of housing rather than broader hedonic aspects the literature shows are more likely to apply to owner-occupation decisions.

This issue was considered by Chaudhuri, by posing the question 'given that prices in most, albeit not all, markets eventually crash back down toward the fundamental value, why are traders not able to anticipate this crash?'. He proposed that once the price begins to deviate from the fundamental value, traders seem to believe that the fundamental value is no longer the primary concern but base their future forecasts on current prices. He proposed that in forming their price expectations, the traders are not taking all salient information into consideration, such as the fundamental value or the length of the time horizon, but are myopically basing their future forecasts on current prices alone (Chaudhuri, 2021). This assertion is supported by this research's interview findings wherein investors had very little regard for fundamental factors underlying house prices, but rather based their expectations of house price growth on recent past performance.

This view that the housing markets could be influenced by past over pricing in the aggregate rather than fundamental elements of value is further supported in a 2012 paper which considered the post-GFC correction and noted "Some features of the residential real estate market would ensure that bubbles are more prevalent there than they are in equities. In particular, real estate transaction costs are much higher than the costs of trading equities, and short sale constraints are binding, preventing rational investors from easily trading against an overvaluation" (Scherbina & Schlusche, 2012, p. 464). This paper also addresses the contribution to aggregate overpricing of bounded rationality by individual pricing of houses.

Evidence from financial markets indicates that a deviation from fundamental (full rationality) pricing can occur even in markets that are closer to the EMH ideal. In reviewing a number of empirical studies, Thaler concluded that the impact of rationality of individuals can result in aggregate over pricing in the market: "The conclusion I reach from research in behavioural finance is that even these most efficient of markets often lead to empirical results that are inconsistent with theories based on rational investors making choices in markets with tiny transaction costs. In other words, the results we obtain are not consistent with the hypothesis that investors behave "as if" they were rational" (Thaler, 2016, p. 1590). This being the case, it would follow that in housing markets within which many of the EMH assumptions do not hold, over-pricing at an aggregate level could occur.

It is therefore asserted that there is evidence of a persistent disequilibrium in the Auckland housing market and that this could be attributed to sub-rational decisions at the individual level (but it is accepted that this does not exclude affects due to other factors such as other breaches of EMH assumptions).

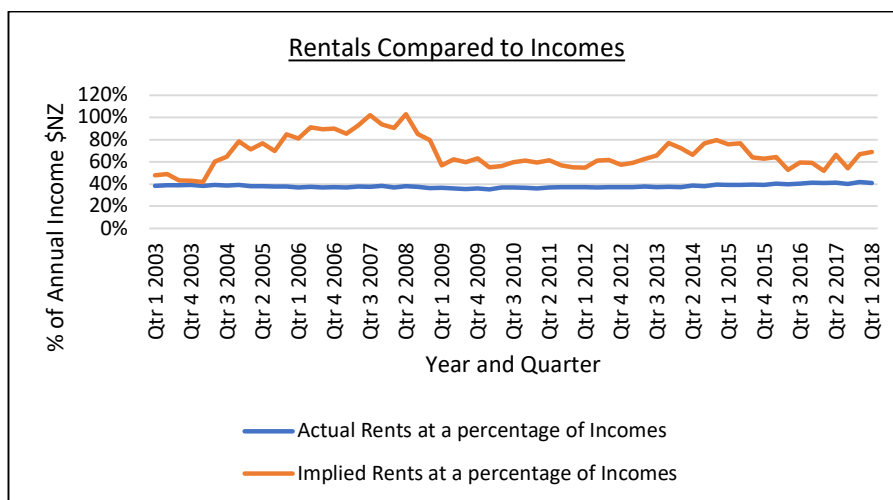
The matter to then be determined is whether this disequilibrium is best explained by houses being over-valued or rentals being under-valued. This was considered from an affordability perspective of each tenure, because affordability is a fundamental requirement of purchase.

An OECD study that considered fundamental determinants of house prices in 18 countries (including NZ) looked at the role of affordability in the pricing mechanism and concluded as follows: “One summary measure commonly used to assess housing market conditions is the price-to-income ratio, a gauge of whether or not housing is within reach of the average buyer. If this ratio rises above its long-term average, it could be an indication that prices were overvalued. In that case, prospective buyers would find purchasing a home difficult, which in turn should reduce demand and lead to downward pressure on house prices” (Girouard et al., 2006, p. 16).

It is asserted that this link between incomes and prices (when considering affordability as a fundamental determinant of prices) is of more relevance to the rental market because the price of this tenure (rental) is directly attributed to household incomes in that period, and therefore the ability to pay (or ‘within reach’ as per the OECD study) can be directly observed.

Graph 24 below from Empirical Test 2 shows the rental that is implied by the UCEM to put the market into equilibrium (holding other variables constant) compared to incomes:

**Graph 24: Actual and Implied Rentals at Equilibrium and Household Incomes**

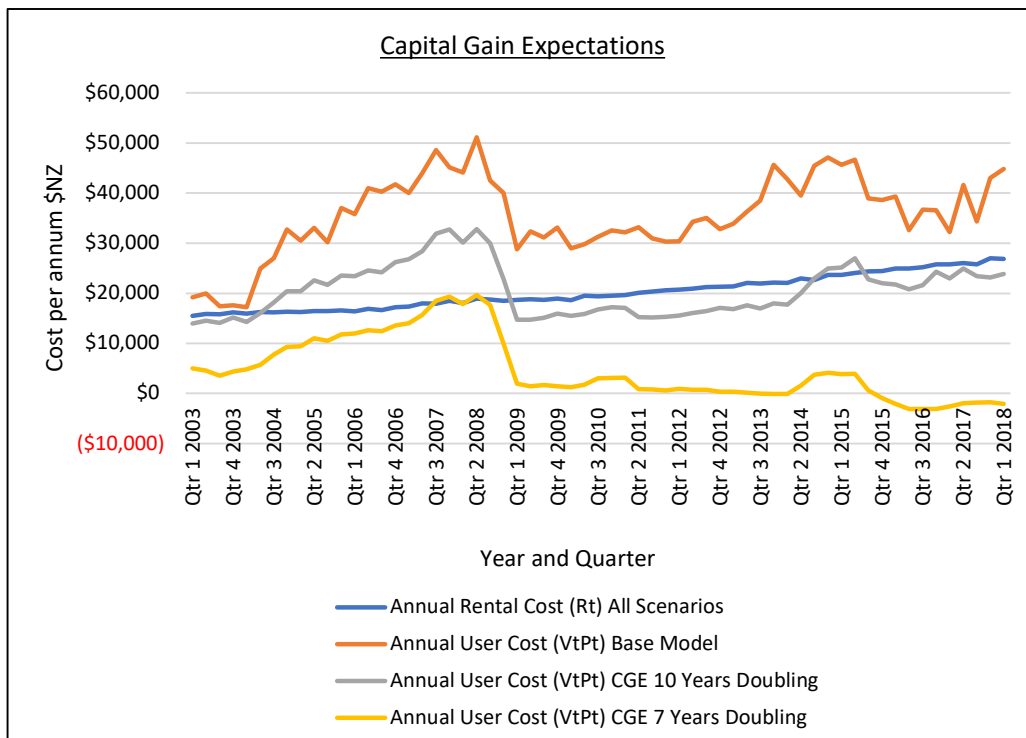


This linkage between rentals and incomes is widely used in New Zealand when measuring affordability. In a NZ study, this ratio was seen as between 30% and 50% of incomes: “In New Zealand, Stats NZ use a 30 per cent threshold as their key housing affordability metric, but also publish series for 25 per cent and 40 per cent thresholds.” (Bentley, 2021, p. 151). As shown in Graph 24 above actual rentals are consistent with this affordability perspective, being consistently close to 40% of incomes over the duration of the model. The implied rents are significantly higher (60% or more of incomes) and therefore I assert that under-valuation of rentals is an untenable explanation of the deviation from equilibrium, further supported by the findings of the RBNZ in terms of the linkage between incomes and rentals (Bentley et al., 2023). It is therefore asserted that it is the ownership tenure that is most likely out of equilibrium (via over-pricing) of the user-cost.

In terms of input contributions to the user-cost within the UCEM, sensitivity analysis showed that changes in CGE was the most impactful of the variables. This is to say that the disequilibrium is more readily explained by CGE than by other input variables to the user-cost (such as risk premium as per the study cited below).

The effect of CGE stated preference of investors was tested (Empirical Test 3) and similarly found that an over-estimation of CGE was explanatory in terms of the deviation in equilibrium between the tenures, as shown in Graph 32 below:

**Graph 32: Heuristically Implied User-Cost**



This contribution of CGE to house prices is consistent with an American study that compared the relative price of each tenure (much as the UCEM does), and looked at the contribution of the input variables to the disequilibrium between the tenures: “Using the accounting framework outlined by Campbell and Shiller(1988), Campbell et al. (2007) show that almost all of the decline in the rent-price ratio is attributable to either a steep decline in the risk premium paid to housing over and above a 10-year Treasury bond, or an increase in the expected rate of growth of house prices, or some combination of these two factors.” (Davis et al., 2008, p. 284)

This analysis concludes that the evidence does not support this sub-rational pricing being attributed to under-pricing of rents but does support attribution to over-pricing of houses, and that this over-pricing of houses can best be explained by an over-estimation of CGE compared to the normative model.

#### *10.3.1.3 Empirical Test 3 – Quantitative Analysis of Stated Preference*

In the second part of the quantitative analysis the stated preferences of investors that were identified in the qualitative interviews were tested against the UCEM normative model.

The testing of investor stated preference heuristics and biases were shown to produce upside pricing compared to the UCEM normative rational model, with the most explanatory of these in terms of the deviation from equilibrium being capital gain expectation.

For each of these tests the result was an upside-pricing bias, rather than a mix of upside and downside-pricing bias. None of the behavioural factors resulted in a consistent result with the normative model. This deviation from what is expected within the normative model further reinforces the assertion that these factors are evidence of bounded rationality. This finding is on the basis of being consistent with observed behaviours in other studies, but also in terms of the impact on pricing in this analysis.

Empirical Test 1 supports the findings of other studies that identified the existence of heuristics and biases (as discussed above), and Empirical Test 3 goes further and quantifies the impact of these factors. This approach is consistent with the views of Thaler, who proposed the importance of using empirical approaches to integrate the behavioural factors within the traditional full rationality models to predict outcomes rather than simply their existence: “This evidence-based discipline will still be theoretically grounded, but not in such a way that restricts our attention to only those factors that can be derived from our traditional normative traditions. Indeed, my sense is that we are at the beginning of a new

wave of theoretical developments made possible simply by turning our attention to the study of Humans rather than Econs” (Thaler, 2016, p. 1597).

#### 10.4 Other findings

In undertaking this research it appears that the interaction between the normative / rational perspectives within the EMH and UCEM and the bounded rationality perspective can be seen as more integrated than distinct or contradictory. This sentiment of Thaler noted above was noted by other authors: “At the core of behavioural economics is the conviction that increasing the realism of the psychological underpinnings of economic analysis will improve economics on its own terms...This conviction does not imply a wholesale rejection of the neoclassical approaches to economics based on utility maximisation, equilibrium, and efficiency” (Camerer et al., 2004, p. 3).

The UCEM and EMH are both rational constructs which conclude that where full rationality applies, pricing will reflect underlying value. EMH allows for an assumption of under-pricing or over-pricing where rationality is bounded but does not in itself quantify this. The UCEM however is a descriptive model and can be used to identify and quantify potential differences in prices that can be predicted under rational and sub-rational assumptions.

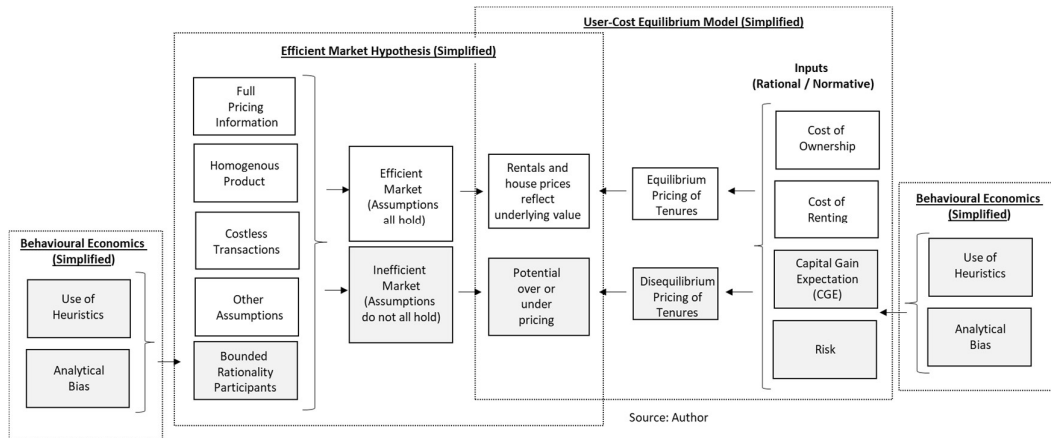
In undertaking Empirical Test 3 the behavioural factors identified in Empirical Test 1 were incorporated into the UCEM to identify the impact of bounded rationality on prices that would otherwise be predicted by the rational / normative model. This provided an assessment of the impact of the sub-rational behaviour (in the case of this research – an upside-pricing bias). This is to say that this research has demonstrated what was proposed by Marsh and Gibb, when they suggested that the complexity of the decision-making leads to the adoption of heuristics, and therefore the traditional rational expected utility models may not adequately explain behaviour (Marsh & Gibb, 2011).

This explanatory ability of the UCEM (when combined with behavioural economics principles) to demonstrate the impact of bounded rationality is perhaps an example of what was proposed by Gibb and Pryce: “Housing economics has made much use of behavioural ideas such as loss aversion and herd or frenzy effects to help explain market bubbles and disequilibria and ideas such as mental accounting, hyperbolic discounting and concepts developed in relation to biases and heuristics in decision-making also have considerable scope for helping us understand housing and mortgage choices” (Gibb & Pryce, 2012, p. 278).

This linkage between behavioural economics and the UCEM can be seen as an extension of the conceptual framework as follows, with the linkage of *sub-rational* linkages (shown

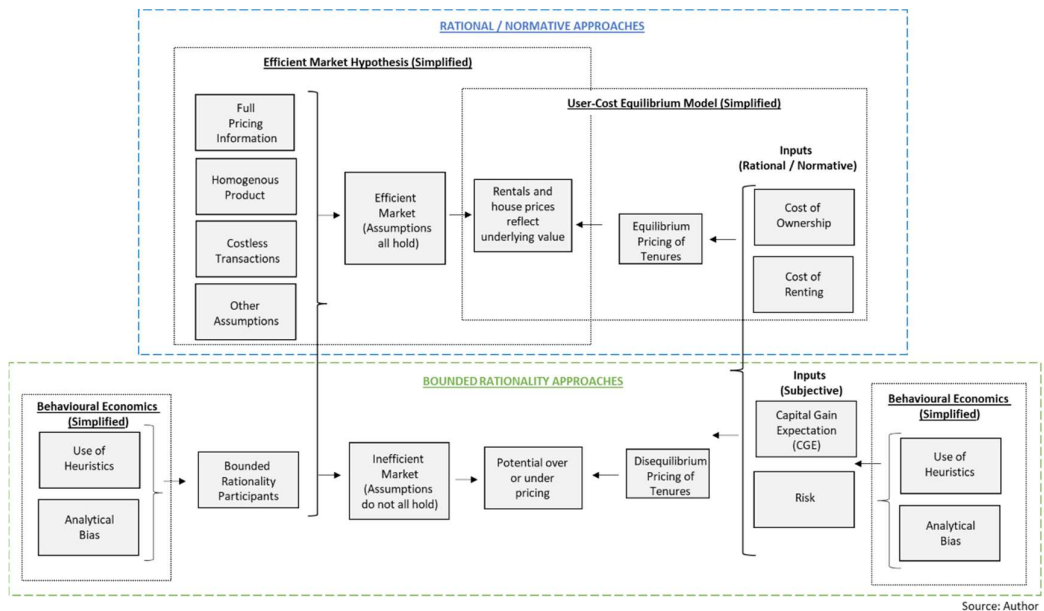
shaded on Diagram 13 below) and the *rational* linkages of EMH and UCEM which share a common assumption of pricing reflecting fundamental value under full rationality. The sub-rational (shaded) linkages indicate pricing not reflecting underlying value when rationality is not full:

**Diagram 13: Revised Conceptual Framework Indicating Linkages of Rationality**



This could be taken further, to separate the frameworks into a rational / normative perspective (within which there is an assumption of prices reflecting underlying value); and bounded rationality perspective wherein there is the potential for under-pricing or over-pricing, as shown by Diagram 14 below:

**Diagram 14: Revised Conceptual Framework Separated by Rationality**



## 11 PRACTICE, POLICY AND FURTHER RESEARCH OBSERVATIONS

This chapter addresses Research Question 3 which asks how practice and policy institutions impact on the motivations and behaviours of investors that contribute to house price escalation, and declining house affordability, and makes recommendations on policy areas of further research that were identified during this research.

During the qualitative phase of this research, 20 interviews were undertaken with individuals from those institutions that investors noted as being of influence in decision making. These interviews were undertaken as part of a triangulation approach to the survey method that sought an evidence base to address the second research questions.

Responses from the interviews with both the investor and institutional group interviews were predominantly in relation to the two institutions, the government and the banking sector. These observations and context within the literature are outlined below.

### 11.1 Policy Observations

#### *11.1.1.1 Government*

The impact that the government can have on Investor motivations and behaviours can be grouped into two themes, taxation (in particular the incentives created by taxation) and regulatory intervention in tenancy matters. The role of the Reserve Bank, although part of the state sector is discussed below within the context of the banking sector.

In relation to taxation, there has been considerable public discourse in the past five years in New Zealand in relation to whether housing investment is taxed appropriately to discourage undue speculation or demand pressure on the housing stock. Much of this appears to be the perceived competition between investors and owner occupiers (in particular first home buyers), as well as an appreciation that the role of government in regulating housing is multi-faceted. As noted by Gibb: Housing is both a consumption good and an asset. It plays an often central role in regional and macroeconomies. It is fundamental to urban phenomena. In all such contexts it is important to include an economic analysis of individual, organizational and market phenomena (Gibb, 2009, p. 28).

This perceived tension is supported in the literature. The NZ housing stock is transferable between the tenure sectors, and it is conceivable that the pricing decisions of the investor group may affect the owner occupier group and vice versa. As explained by Clapham “the market is divided into rental and ownership categories that are separate in their everyday functioning, though strongly linked because the prices in one will influence the prices in the

other and these relative prices will influence the size of the respective categories” (Clapham, 2018, p. 174).

The narrative that the government should be intervening to limit housing investment appears to draw on the perceived impact that financialisation and speculation of housing has on the owner-occupier (consumption) market. One institutional interviewee reflected this narrative in relation to property investors’ interests being in conflict with home ownership:

“The risks are probably regulatory change especially over the last government with a plethora of changes and regulations to try and claw back some of the economic rent that has been transferred to landlords from renters and future home owners” ((C.P.), 2020).

The concept of financialisation is that rather than being regarded primarily as a means of acquiring adequate and secure shelter, it is increasingly treated as a commodity and investment. This change in approach is supported by a policy environment by governments that facilitates and encourages the financialisation of housing. This is done by lessening regulation, creating tax regimes which encourage speculation and deemphasising social housing (Morris, 2018).

The literature supports the notion that governments can influence the behaviours and motivations of investors through the tax and regulatory regime. A report by the Productivity Commission noted that “Taxation affects the attractiveness of investing in housing and its affordability, although the impacts are difficult to quantify and depend on factors such as tax design and key features of housing markets” (NZPC, 2012, p. 14).

Investor interviews reflected the literature in that intervention in the regulatory and tax systems are a risk that is front of mind for many investors (but noting the temporal proximity point made previously), and would potentially influence investment decisions:

“Government policies are a big thing. The capital gains tax, but at the end of the day, if you have to pay it, you have to pay it. Things like that, I’d probably walk away. There’s times where I’ve thought, ‘If this comes in, would we sell everything up?’ ((C.S.), 2020).

“Basically it just takes some of the return out and takes the kind of compliance pressure on you, to the point where it just doesn’t seem to make sense for the effort you put in” ((G.T.), 2019).

The institutional interviewees, particularly those in the government sector reinforced these views that the government can influence the attractiveness of investment via taxation or additional compliance burden.

“I think taxation is one of [the key government levers] but I don’t think, in my view, if you touch taxation without thinking about some of the other things, I think you get a big push back. It’s kind of like RMA reform. If you do RMA reform without thinking about the whole eco system, there’s no point, you’re going to get a lot of political push back and you haven’t necessarily fixed it” ((A.W.), 2020).

“Investors consider obviously we hear a lot of talk about government regulation of the home standards. Investors will think ‘I’m competing with thousands of others to try and get my house insulated by the due date of health home standard or whatever’ and it will discourage some investors. I think government regulations will be one of the major risks that they are nervous about” ((D.N.), 2020).

“The government can influence or unsettle investors or reset expectations, but if you’re a residential property investor we expect you to be doing these things in terms of tenants. That’s the main thing, how you reset expectations and through the residential tenancies act, that’s been the main lever” ((A.W.), 2020).

“These guys see themselves as offering a service, doing something good in the community by providing rental properties. Some said they felt like they were getting attacked [by govt policy] for doing a good deed. So govt policy can have a massive impact on investors. Traders too, but less so” ((R.H.), 2019).

“I also think it’s quite important the government regulations in relation to heating, insulation etc. just all those additional costs can sometimes be the tipping point for investors” ((G.M.), 2019).

There is support within the literature for government interventions in the taxation and regulatory space being targeted at investment housing. Investors and the institutional interviewees noted there is potential for behavioural responses to policy levers, particularly those which impact on the returns (both income and capital).

#### *11.1.1.2 Banking Sector*

Housing in NZ is predominantly funded with debt, and this is in both the consumption and investment sectors (Spencer, 2015). The Reserve Bank has used the control that it has over

macroprudential rules to limit the funding of investment property on the basis that this will limit the expansion of this sector with a corresponding expansion of the owner-occupied sector. The impact of bank and macroprudential policy on the approval and availability of funding was also noted from the market commentator perspective:

“Banks overall have massively changed their lending behaviour because we’re seeing a huge surge in mortgaged investors and in first time buyers. This hasn’t happened by accident, this is in direct response to LVRs being removed” ((D.N.), 2020).

Investors’ responses to the influence of the banking sector predominantly related to interest rate risks and access to funding to enable investment. In this regard, some investors noted the imposition of bank requirements as an important hurdle to securing funding (and therefore ownership):

“I only get a valuation if the bank requires it. I know the local market pretty well, I keep track of local sales, and talk to the decent local agents regularly so I know whether the price is right” ((T.M.), 2020).

“There are some rules imposed by others. So the obvious one is bankers who have the magic ratios and things like that. Lenders have their own thing where the rents had to be about 125 percent of the mortgage payment. Which is inversely around about 75 to 80 percent [debt servicing cover]” ((B.J.), 2019).

The latter point was supported by the institutional sector:

“They [investors] don’t [undertake detailed analysis]. They just get out the numbers, this is what the mortgage costs and this is what I’m getting, as long as there’s a tiny surplus, that’ll do” ((O.N), 2019).

“So long as the cashflow covers the debt servicing then the capital gain will take care of itself pretty much” ((C.B.), 2020).

The influence of banks can be significant for investors, particularly in relation to access to funding and the process and scrutiny surrounding this. This influence is not the same for all investors, however. Some investors are less reliant on debt, particularly those that have been investing for a longer timeframe and have accumulated equity.

This, combined with the tendency for banks to consider the investor’s overall position rather than the individual transaction (discussed below), means that the influence of banks is higher for newer investors. From a more established investor perspective:

“But [interest rate risk] doesn’t worry us the same as it would someone that was strapped, someone that when the interest rates go up to 5-6 percent, which they will, and people have leveraged right till the end, and they will go under” ((G.T.), 2019).

“Changes to lending policy and interest rates were of concern in the early days but, again, because we had high equity, changes to the LVR didn’t particularly worry us” ((T.F.), 2019).

This difference in the treatment by banks of investors with significant equity and those without was confirmed by interviewees from within the banking sector:

“There are metrics that we require in order to process an application, which will vary from individual. And as a result of that it will affect the ability of someone to purchase a property” ((N.S.), 2019).

“It’s [approval metrics] a mix of personal circumstance and the asset. Not all investors are equally able to borrow” ((N.S.), 2019).

The basis used by banks in approving funding is very influential to those investors who require debt to invest. On one hand, this ‘banker scrutiny’ acts to encourage robust analysis and protect investors (and themselves) from adverse market conditions:

“Depending on how much or what the quantum of value is, triggers a whole lot of internal processes in the bank in relation to how you determine that security value. So up to certain amounts we will lend on an evaluator, a government valuation, and then as we ramp up the risk profile and the LVR gets higher, then we’ll require a registered valuation report” ((G.M.), 2019).

However, on the other hand, banks can tend to encourage pro-cyclical behaviour, relaxing this scrutiny in a buoyant market:

“I don’t recall an investor worrying about paying for a valuation, which would cost you, depending on the value of the property, maybe \$700-800. I don’t remember the last time an investor did that. They would do that only if the bank required it. That’s one source but they don’t seem to go down that path” ((G.B.), 2020).

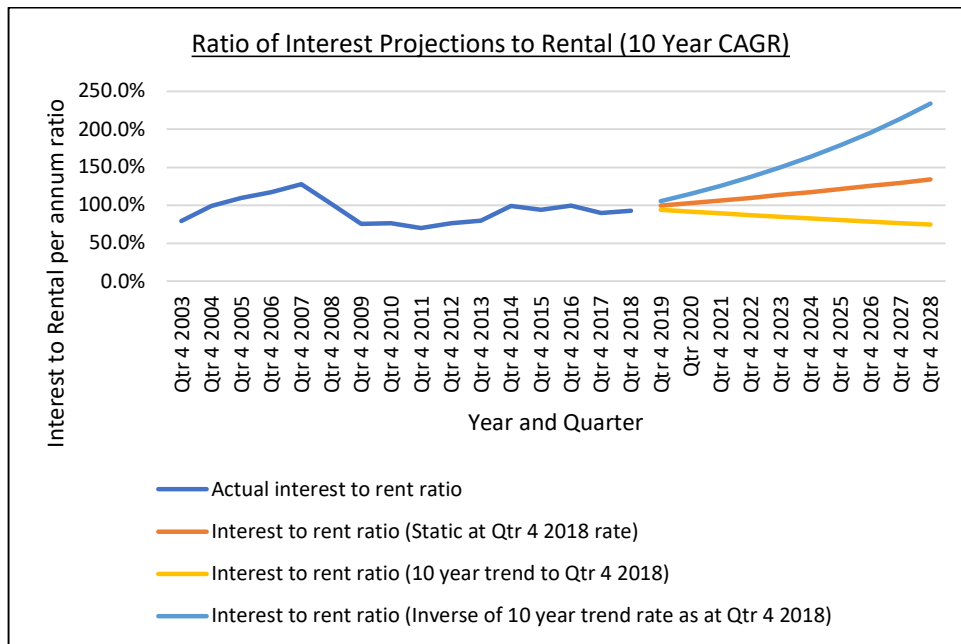
The impact of the banking on housing investment is strongly influenced by the Reserve Bank of NZ, through macroprudential policy and official cash rates. The influence of macroprudential rules, such as LVR, and wholesale interest rates was similarly consistent between investor interviews and sector interviews:

“There’s a couple of direct things we do which influences investors. Number one is we obviously set interest rates and that’s a pretty fundamental driver of the market. And then the other is the control valuation rules, capital settings for banks, so all these things will have some impact on market dynamics” ((C.B.), 2020).

“The banks are really focused on [responsible lending] and whether you’re just going in for a personal load now or whether it’s a mortgage, you’ll be quite surprised how much focus is on that and they have to be because the new policies are forcing us, and the regulator’s requirements, whether it be the Reserve Bank or APRA” ((G.M.), 2019).

The impact of interest rate increases affects investors via the institutional environment, in that lending institution expectations of serviceability will begin to place a limit of the availability of funding in the event of interest rate increases, as indicated by Graph30 below:

**Graph 30: Past and Projected Interest to Rent Ratio**



11.1.1.3 Summary

Overall, the availability of funding (including the approval criteria) is of considerable influence on smaller and newer investors who are likely to have lower levels of equity than larger investors. This could have the effect of reinforcing the status quo but could also be beneficial in that it places a limit on new entrants to the housing investment market and reducing the incidence of inexperienced investors.

This role of banker scrutiny should be considered alongside the strongly supported finding in the qualitative phase that there is considerable difference in the sophistication of experienced investors compared to less experienced investors:

“It depends on the type of investor that we’re dealing with. Mum and Dad probably run more with their gut feel as opposed to serious investors with maybe a portfolio of a dozen or more properties that are a bit more sophisticated on decision making. They’re the ones running the spreadsheets and DCF etc, to help make in their decision” ((D.A.), 2019).

“I think as you get more sophisticated you become more savvy so you’ve done your initial work as the Mum and Dad investor and then you build up your portfolio, so suddenly it’s looking and knowing the local market etc. You’re able to go there and do your own research” ((G.M.), 2019).

“The Mum and Dad investors, they’ve probably just got their ear to the ground about what’s happening with prices and they’re visiting open homes and purchasing rentals and getting a sense of what the market demand is. So, that would be for Mum and Dad walking the beat and institutional low scale professional investors, I’d imagine they’re looking at CBREs and some of those quarterly/monthly updates on the state of the market” ((C.P.), 2020).

“I would suggest that the more wisened investors are not looking for the boom suburbs, they’re actually looking for the ones that have all been very flat and trying to find out why that is, and if that’s about to go. So, they probably rate themselves on being able to pick the suburb that is about to boom, rather than just following the crowd and go for one that’s already shown an increase in the last 6 months. I think they rate themselves as being quite sophisticated and being able to pick the winning horse” ((D.A.), 2019).

“The Inexperienced investors have been drawn into the market by what they’ve seen in terms of capital growth” ((R.H.), 2019).

This sophistication of experienced investors was strongly supported within the institutional interviews as being associated with greater prudence, less reliance on debt and being less likely to be influenced by market sentiment. As one institutional interviewee noted:

“This increased emphasis on responsible lending can weed out the weaker players” ((D.N.), 2020).

From an institutional perspective, this research has observed that government policy can impact upon the returns and perceived risks of housing investment. This could have the effect of reducing the demand for investment properties, and/or placing limitations on house prices that will be paid by investors in achieving a reasonable return.

Reserve Bank of NZ policy and individual bank policy were also observed as being able to influence investor behaviour, particularly small or inexperienced investors, via approval processes and 'banker scrutiny' such as a requirement for objective valuations, and LVR requirements.

## 11.2 Policy Recommendations

The following Policy recommendations are presented as the view of the researcher as a secondary finding of this research:

1. Macro-prudential rules and responsible lending codes could give consideration to the effect of evaluating the overall position of the investor rather than the individual transaction, as this can have the effect of allowing houses to be purchased at inflated prices or unsustainable income returns.
2. The Banking sector could consider the role of objective valuation advice in a rising market rather than reliance on algorithm-based valuations of CVs, as this can be pro-cyclic and reduce the objectivity in price setting.
3. The Valuation sector and RBNZ could consider the establishment of an index or methodology for determining the fundamental value of housing (say using the methodologies adopted by the OECD), to reduce the reliance on technical sales data and the pro-cyclicality this can create, and better predict market cycles and potential pricing bubbles.
4. The Valuation sector could consider residential valuation methodologies that appear to be considered irrelevant in a rising market. This could perhaps via an emphasis on fundamental value and forward projections of underlying drivers of value, such as are adopted in commercial valuation methodologies.
5. Policy makers could consider policies which better inform the investment market of fundamental factors and systemic risks, particularly for inexperienced investors, perhaps via regulation of intermediaries and bankers.

### 11.3 Suggestions for Further Research

The following are further research recommendations of the researcher, based upon the stated limitations of this research, and the findings made:

1. A greater understanding of the risk profile of residential property investors, and the basis for the observed of a low perception of systemic risk.
2. The connection between heuristics and the known information asymmetries in the housing market, and how greater objectivity can be embedded into decision making (related to the policy recommendations above).
3. The methodology of this research could be expanded to a larger sample size and generalisability tested by application to the owner-occupier market, and to markets which are in decline.
4. Research into the perceptions of the definition and measurement of 'fundamental value' of housing across the investor, owner-occupier, and institutional influencers.

## 12 CONCLUSION

This research was undertaken to address the research aim of establishing whether evidence exists for a linkage between investor activity and house price escalation in Auckland, as a contributor to declining house affordability. In addressing this aim, evidence was sought that would address the following primary research questions:

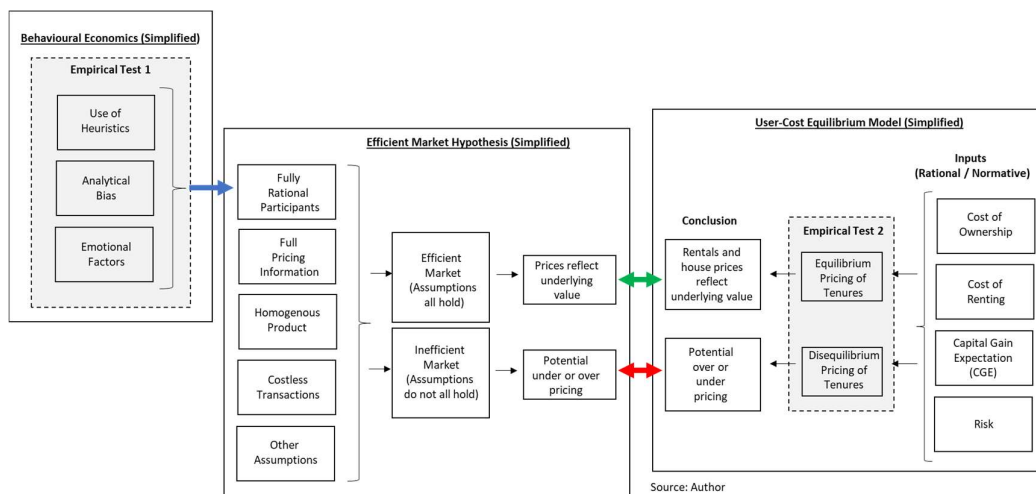
1. What conceptual frameworks can be used to demonstrate a linkage between investor activity and house price escalation, with a corresponding impact on house prices and declining affordability?
2. What stated and observed preferences, motivations and behaviours can be empirically observed that show a linkage between investor activity and house price escalation, with a corresponding impact on house prices and declining affordability?

Outlined below are the conclusions that have been drawn in relation to these research questions and thereby achieving the aim of this research.

### 12.1 Research Question 1

The conceptual model is based upon three key theoretical frameworks which support partial linkages between pricing, market mechanisms and the actions of individuals and/or institutions as shown in Diagram 5 below:

**Diagram 5: Conceptual Framework (Empirical Tests 1 and 2)**



This conceptual framework addresses the first research question by establishing linkages across these three separate frameworks, from behaviours through to pricing. The first linkage (shown as the blue arrow) within the conceptual framework links EMH (a normative and rational model) and the field of Behavioural Economics, which describes limits to this

rational view. This linkage is widely accepted in the literature. It is this linkage that enables the EMH assumption of full rationality to be tested but does not in itself allow for the implications on pricing to be quantified.

The second linkage (indicated by the red and green arrows) links the rational and normative EMH (within which houses should be efficiently priced and reflect underlying value without under or over pricing) to the UCEM, which is also a rational and normative model for the pricing of durable goods. This linkage provides a basis for establishing whether there is evidence for sub-rational pricing, such as under-pricing or over-pricing, and escalation in pricing if over valuation is sustained.

This research question requires both linkages to be demonstrated. Linkage 1 is established through the qualitative testing (as outlined in Research Question 2 below), and linkage 2 is established by quantitative testing (also outlined below). These empirical tests confirmed that these linkages can be empirically observed.

The conceptual linkages that address this research question can be stated as: investor behaviour (heuristics and biases that are sub-rational within the theoretical constructs of EMH and behavioural economics) can result in the sustained over-pricing of houses (as quantified by the UCEM normative pricing model), thereby contributing to house price escalation and declining affordability (by standard measures using income data), when these prices become sales evidence and contribute to future pricing decisions.

The conceptual framework quantifies within the UCEM the pricing impact of heuristics and biases identified in the qualitative phase by comparing the normative (observed preference) model with the stated preference of investors, as outlined below under Research Question 2. This framework has quantified the impact (departure from the normative model) of the sub-rational behaviours most consistently observed. As outlined within Research Question 2 the most consistently observed behaviours (capital gain expectation and risk assessment) were quantified as having an upside-pricing bias, partially explaining within the UCEM the observed preference and reinforcing the linkage in this framework between investor behaviour (stated preference) and market pricing (observed preference).

The contribution to declining affordability was considered by the application of widely published measures of affordability to historical data. This concept of affordability was also considered as a factor in determining the rationality of the sustainability of current trends when projected forward using these affordability measures.

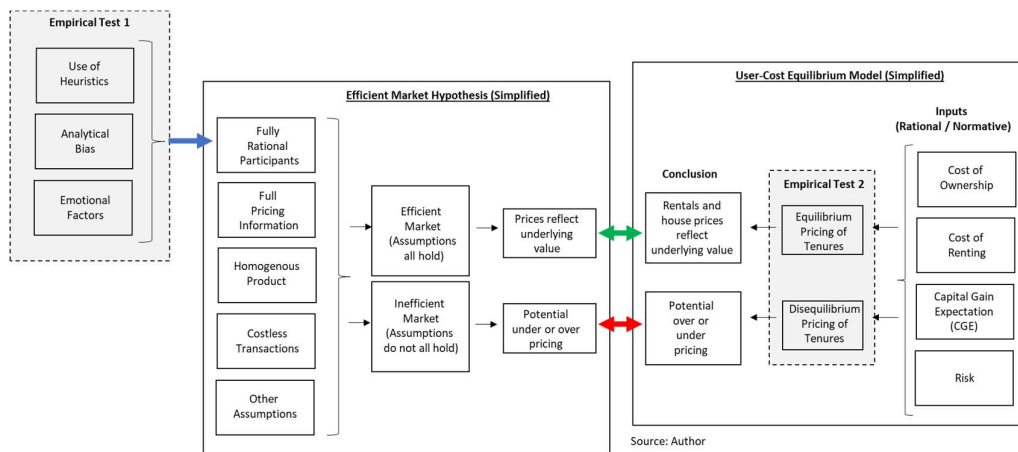
Research Question 1 is therefore addressed in response to the findings of this research as follows:

*The concepts of bounded rationality such as heuristics and biases can contribute to overpricing of houses in an upward market when compared to the rational / normative model, and when this overpricing is sustained, it can contribute to house price escalation via sales evidence and pro-cyclic expectations. Where this house price escalation exceeds income growth there is a contribution to declining affordability.*

## 12.2 Research Question 2

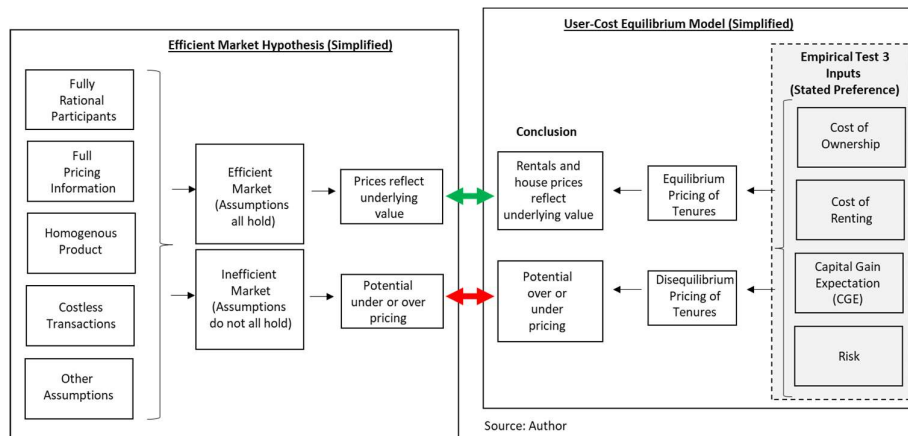
Research Question 2 looked at three empirical tests to test for evidence of the linkages within the conceptual framework as shown in Diagrams 5 and 6 below:

**Diagram 5 Conceptual Framework (Empirical Tests 1 and 2)**



In addition to these two tests within the conceptual framework a third test was undertaken that tested the stated preference (identified as heuristics and biases) of investors by comparison to the normative UCEM, to estimate the effect of these as a deviation from the normative model:

**Diagram 6 Conceptual Framework (Empirical Test 3)**



Empirical Test 1 was a qualitative survey of investors and the institutions with whom they engage in making investment decisions. It sought evidence for the use of the behavioural concepts that were identified within the literature and the conceptual model (heuristics, biases and motivations). Empirical Test 1 provided consistent evidence of sub-rational behaviours that were triangulated across two survey groups of three themes which are of relevance to the normative model (as validated by Empirical Tests 2 and 3):

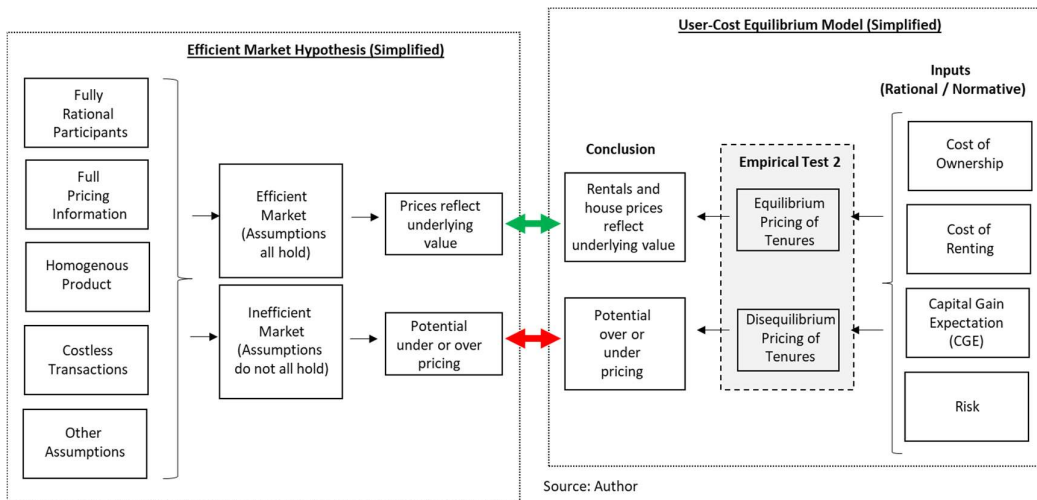
**Capital gain.** Investors saw capital gain as the primary motivation in investment. This capital gain was seen as a near-certainty, based upon medium term recent house price escalation, without consideration of fundamental determinants of house price growth or wider macro risks or cycles. This perspective represents both a heuristic and a bias.

**Simplicity in Analysis.** Investors considered housing investment to be largely passive over the medium to long term, with returns inevitable. They saw little need for objective advice or analysis, preferring to base decision on transactional data, heuristics and experience, and market sentiment.

**Risk.** Investment in housing was seen to be very low risk, with both income and capital returns considered an inevitability. Market downturns were not actively considered, and the consideration of risks was largely confined to an operational level. This perspective represents both a heuristic and a bias.

Empirical Test 2 found evidence of a persistent disequilibrium in the housing market (the red arrow on Diagram 7 below):

**Diagram 7: Conceptual Framework (Empirical Test 2)**



This infers that there is evidence of sub-rational decisions in the market in aggregate compared to the normative and rational assumptions of the UCEM. This implies that that house prices may not reflect fundamental value, with a persistent over-pricing over the period 2003 to 2018.

Empirical Test 3 found that the heuristics within the stated preference of investors all have the effect of over-estimating returns or under-estimating risks of housing investments compared to objective / normative analysis. This testing of investor stated preference was shown to produce upside pricing bias compared to the UCEM normative rational model. This implies therefore that these pricing decisions were likely to be sub-rational and not based on fundamental value as implied by the UCEM. This can explain the disequilibrium in the market, via the persistent upside bias in house pricing.

These empirical tests provide the evidence to address Research Question 2 as follows:

*Investor stated preferences have been observed which include heuristics and biases in decision making that can be empirically tested as resulting in upside-pricing bias in house prices when compared to the normative model of the UCEM, which can have a consequent effect on aggregate pricing. This model has indicated a persistent over-pricing of housing assets over the 2003 to 2018 period within which observed house prices and incomes have resulted in declining affordability by standard measures.*

### 12.3 Addressing the Research Aim

The aim of this research is to establish whether evidence exists for a linkage between investor activity and house price escalation in Auckland, as a contributor to declining house affordability.

Research Question 1 established the evidence within the literature for a conceptual framework that identified behavioural concepts such as the use of heuristics and biases that could lead to sustained overpricing compared to the normative models of EMH and the UCEM. Sustained price escalation, when greater than income growth will contribute to declining affordability by accepted measures.

Research Question 2 established (via qualitative and quantitative methods) that evidence exists for both the heuristics and biases (stated preference) and the overpricing (observed preference) required to support the conceptual linkages within Research Question 1.

It is asserted therefore that the research aim has been achieved, in this concluding statement:

*The literature supports a linkage between heuristics and biases and persistent overpricing by investors which can contribute via sales evidence and pro-cyclic behaviour to house price escalation and declining affordability. Evidence exists for the sustained over-pricing of housing in Auckland and the contribution to this over-pricing by heuristics and biases which have the effect on an upside-pricing bias by investors with a consequent effect on the market in aggregate.*

### 12.4 Contribution of this Research to the Literature

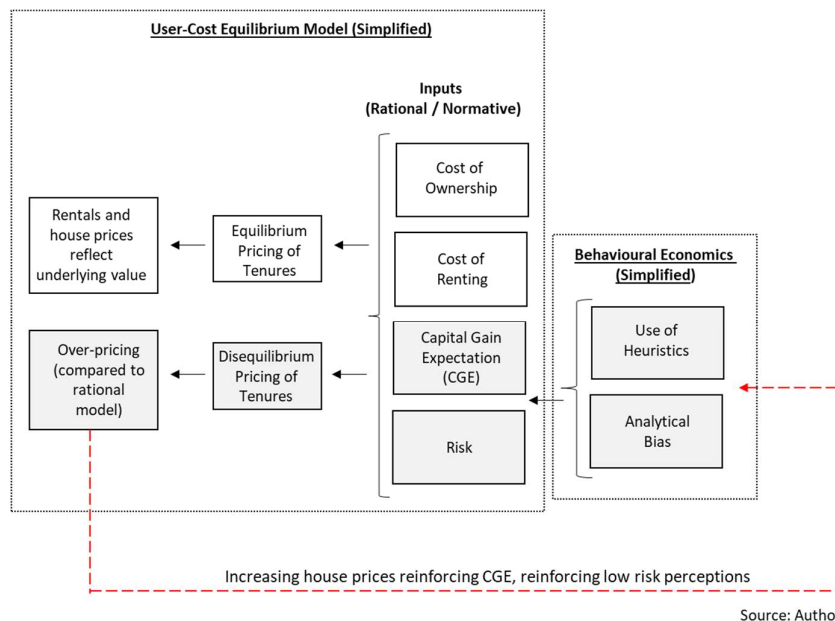
This research represents a unique application of the three well established conceptual frameworks of Efficient Market Hypothesis, Behavioural Economics and the User-cost Equilibrium Model. This unique application is the identification and testing the linkage between these within a novel conceptual framework that is able to be applied to different geographic locations or timeframes.

In addition, three further conceptual approaches have been proposed in relation to the interaction between the traditional rational and normative concepts of EMH and UCEM and the bounded rationality concepts within Behavioural Economics that were not identified within the literature but may be worthy of further consideration.

The first is the pro-cyclic effect of the behavioural concept of anchoring as it applies to CGE as an input to the normative UCEM was notable and the impact quantified. Investors were

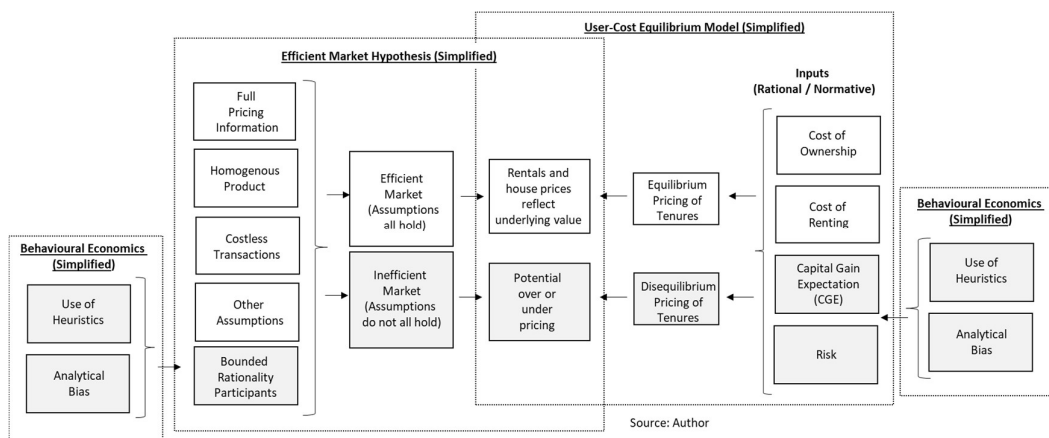
strongly supportive of the importance of the status quo in decision making, both in terms of recent market performance, and the prevailing market sentiment. This can be self-reinforcing and pro-cyclic in an upward market wherein investors appear to use this anchoring bias and herd bias to project the past forward, thereby reinforcing previous gains regardless of the UCEM indicating overpricing from a normative perspective. In terms of the UCEM (which can quantify this effect), it has been proposed that the link between the rational and sub-rational models can be demonstrated by Diagram 12:

**Diagram 12: Conceptual Process of Pro-Cyclicality**



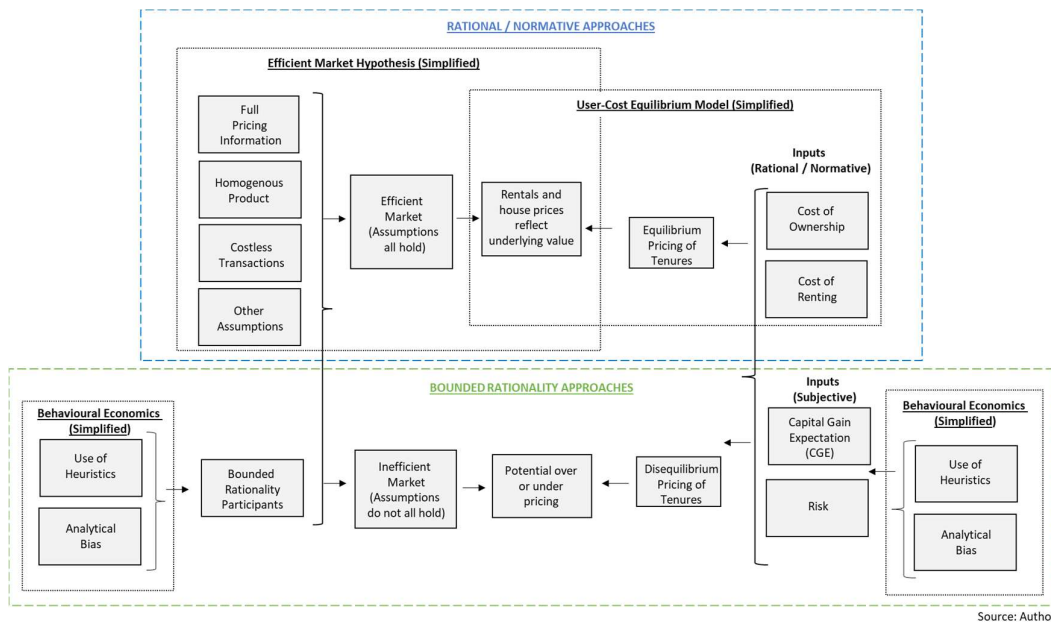
Extending this linkage between behavioural economics and the UCEM (as was tested in Empirical Test 3) can be seen as an extension of the conceptual framework to include the link to EMH as shown on Diagram 13 below (sub-rational aspects shown shaded):

**Diagram 13: Revised Conceptual Framework Indicating Linkages of Rationality**



It is suggested that this could be taken further by separating into separate but connected perspectives: The first being a rational normative perspective (within which there is an assumption of prices reflecting underlying value); and the second being a bounded rationality perspective wherein there is the potential for under-pricing or over-pricing, as shown by Diagram 14:

**Diagram 14: Revised Conceptual Framework Separated by Rationality**



## 12.5 Research Limitations

This research represents a unique application of the three well established conceptual frameworks of Efficient Market Hypothesis, Behavioural Economics and the User-cost Equilibrium Model.

The limitations to this research stem from two areas. The first is the relatively small sample size from the qualitative phase, and the second is due to the period of time in which the study was undertaken. It is asserted that the methodology is replicable and that the results may be generalisable to similar markets and timeframes. This research has identified the impact of behavioural factors in an upward rising market and how these can result in an enduring over-pricing to due pro-cyclicality. It remains to be seen as to whether behavioural factors will be evident during a downward phase of a housing market, and the impact that these will have on pricing. It may, for example, be found that 'irrational exuberance' may be less of a factor observed, compared to say 'loss aversion' in a downward market.

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## 14 APPENDIX 1: SEMI-STRUCTURED SURVEY (INVESTORS)

### QUESTIONS

1. Which analytical methods and analytical tools are used in the evaluation of decisions to invest in housing assets?
2. To what extent are 'rules of thumb' used in analysis, what are these rules? To what extent do they supplement, support or override analysis?
3. Which sources of information and advice are used in decision making? How are these weighted?
4. How is performance benchmarked (own performance and comparative) and how is a reasonable return determined? What is the basis of comparison?
5. To what extent is past performance and future projections considered?
6. To what extent is consideration given to the decisions of other market participants, use of lead and lag indicators, influence of perceived market sentiment. From where this information obtained?
7. The type of risks that are considered when making a decision, and which are actively monitored?
8. Which timeframes considered, both forward and backward and what is the priority of these?
9. What are the expected benefits from investment? How are these expectations determined and what causes them to change?
10. Which institutions, policies and practices have the most influence on investment decisions, and to what extent does this information influence expectations?

### LIST OF STRUCTURED INTERVIEW RESPONDENTS

Interviews were undertaken with the following number and type of respondents:

Large Investors (20+ properties)	2
Medium Investors (6-20 Properties)	4
Small Investors (1-5 properties)	<u>14</u>
TOTAL:	20

	<u>Investor</u>		<u>Scale</u>	<u>Experience</u>
1	Stephen W	SW	Large	High
2	Andrew	AC	Large	High
3	Garth T	GT	Medium	High
4	Brian J	BJ	Medium	High
5	Daniel C	DC	Medium	High
6	Tim F	TF	Medium	High
7	Johan B	JB	Small	Low
8	Kim W	KW	Small	High
9	Toby M	TM	Small	High
10	Lewis	LH	Small	Low
11	Peter M	PM	Small	Low
12	Vaughan W	VW	Small	High
13	Ian P	IP	Small	High
14	Malcolm W	MW	small	High
15	Richard D	RD	Small	Low
16	Michael M	MM	Small	Low
17	Chris S	CS	Small	Low
18	Ian J	IJ	Small	High
19	Jeff S	JS	Small	Low
20	David M	DM	Small	High

## 15 APPENDIX 2: SEIMI-STRUCTURED SURVEY (INSTITUTIONS)

### QUESTIONS

1. Which analytical methods and analytical tools are used by investors in the evaluation of decisions to invest in housing assets?
2. To what extent are 'rules of thumb' used by investors, what are these rules? To what extent do they supplement, support or override investor analysis?
3. Which sources of information and advice are used by investors in decision making? How are these weighted?
4. The type of risks that are considered by Investors, and which risks are actively monitored?
5. Which factors are used by investors in determining suitability of an asset?
6. How do investors determine a reasonable return expectation? What is the basis of comparison?
7. To what extent are investors influenced by perceived market sentiment. From where this this information obtained?
8. How does your institution influence the decision making of investors in terms of information sources, analysis, or rules of thumb, or expectations?
9. Which constraints do your organisation's policies and practices apply to investor activity?
10. What are the primary policy and practice levers within your organisation that can influence behaviour change in investors?
11. Which other institutions, policies and practices have the most influence on investor decisions, and how do these interact from an Investor perspective?

### LIST OF STRUCTURED INTERVIEW RESPONDENTS

Interviews were undertaken with the following number and type of respondents:

Market Intermediaries	3
Advisors	3
Banking and Finance	3
Industry Association	2
Media / Commentary	3
Regulatory and Policy	<u>6</u>
TOTAL:	20

	<u>Group</u>	<u>Industry</u>	<u>Name</u>	
1	Market Intermediaries	RE Agent	Tony K	TK
2	Market Intermediaries	RE Agent	Ronald H	RH
3	Market Intermediaries	RE Agent	Graham B	GB
4	Banking and Finance	Lending: ANZ	Graham M	GM
5	Banking and Finance	Lending: BNZ	Nicole S	NS
6	Banking and Finance	Mortgage Broker	Pete L	PL
7	Industry Association	Urban Development Institute	Ian P	AP
8	Industry Association	APIA	Andrew K	AK
9	Media / Commentary / Advisory	Website / Moderator	JP G	JG
10	Media / Commentary / Advisory	Commentator	Ollie N	ON
11	Media / Commentary / Advisory	Data and analytics	Dave N	DA
12	Media / Commentary / Advisory	Data and analytics	Nick G	NG
13	Media / Commentary / Advisory	TLA / Commentator	David N	DN
14	Media / Commentary / Advisory	Property Apprentice	Paul R	PR
15	Regulatory and Policy	Govt Policy DPMC	Arati W	AW
16	Regulatory and Policy	Regulator: Treasury	Chris P	CP
17	Regulatory and Policy	RBNZ	David H	DH
18	Regulatory and Policy	RBNZ	Chris B	CB
19	Regulatory and Policy	HUD	Claire M	CM
20	Regulatory and Policy	MBIE	Steve W	SW



Quarter 1, 2007 to Quarter 4, 2010

	Input	UCEM Variable	Qtr 1 2007	Qtr 2 2007	Qtr 3 2007	Qtr 4 2007	Qtr 1 2008	Qtr 2 2008	Qtr 3 2008	Qtr 4 2008	Qtr 1 2009	Qtr 2 2009	Qtr 3 2009	Qtr 4 2009	Qtr 1 2010	Qtr 2 2010	Qtr 3 2010	Qtr 4 2010
REINZ Median House Prices			\$465,000	\$465,000	\$488,000	\$490,000	\$450,000	\$480,000	\$450,000	\$470,000	\$465,000	\$485,000	\$491,000	\$528,000	\$520,000	\$515,000	\$500,000	\$515,000
Quality adjusted Median House Price at:	18%	Pt	\$394,068	\$394,068	\$413,559	\$415,254	\$381,356	\$406,780	\$381,356	\$398,305	\$394,068	\$411,017	\$416,102	\$447,458	\$440,678	\$436,441	\$423,729	\$436,441
RBNZ mortgage data			9.5%	10.0%	10.5%	10.5%	10.7%	10.9%	10.9%	8.8%	6.8%	6.4%	6.4%	5.9%	5.9%	5.9%	6.4%	6.4%
RBNZ 6 month term deposit rate			7.2%	7.5%	8.0%	8.4%	8.3%	8.4%	8.0%	5.8%	3.8%	3.9%	4.1%	4.4%	4.4%	4.6%	4.8%	4.8%
Debt equity ratio (level of debt):	54%		54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
Interest rate		Rt	8.5%	8.9%	9.4%	9.6%	9.6%	9.7%	9.5%	7.4%	5.4%	5.3%	5.3%	5.2%	5.2%	5.3%	5.6%	5.6%
Running cost and transaction cost	2.0%	Wt	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Depreciation rate	2.5%	Dt	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Risk Premium of Owning	1.0%	Yt	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Capital Gain expectation		Gt	3.8%	3.2%	3.1%	4.2%	3.5%	2.7%	3.9%	2.9%	3.6%	2.9%	3.3%	3.3%	4.1%	4.0%	3.7%	3.7%
User Cost per dollar		Vt	10.1%	11.2%	11.7%	10.9%	11.6%	12.6%	11.1%	10.1%	7.3%	7.9%	7.5%	7.4%	6.6%	6.8%	7.4%	7.4%
User cost		VtPt	\$39,995	\$43,998	\$48,552	\$45,101	\$44,078	\$51,088	\$42,508	\$40,049	\$28,751	\$32,337	\$31,139	\$33,114	\$28,954	\$29,735	\$31,266	\$32,499
Cost of renting annualised		Rt	\$17,316	\$17,940	\$17,888	\$18,460	\$18,044	\$18,876	\$18,720	\$18,460	\$18,668	\$18,772	\$18,668	\$18,928	\$18,616	\$19,500	\$19,396	\$19,500
User cost to own		Vt	10.1%	11.2%	11.7%	10.9%	11.6%	12.6%	11.1%	10.1%	7.3%	7.9%	7.5%	7.4%	6.6%	6.8%	7.4%	7.4%
Rental yield			4.4%	4.6%	4.3%	4.4%	4.7%	4.6%	4.9%	4.6%	4.7%	4.6%	4.5%	4.2%	4.2%	4.5%	4.6%	4.5%
Annual User Cost		VtPt	\$39,995	\$43,998	\$48,552	\$45,101	\$44,078	\$51,088	\$42,508	\$40,049	\$28,751	\$32,337	\$31,139	\$33,114	\$28,954	\$29,735	\$31,266	\$32,499
Annual Rental Cost		Rt	\$17,316	\$17,940	\$17,888	\$18,460	\$18,044	\$18,876	\$18,720	\$18,460	\$18,668	\$18,772	\$18,668	\$18,928	\$18,616	\$19,500	\$19,396	\$19,500
Difference			\$22,679	\$26,058	\$30,664	\$26,641	\$26,034	\$32,212	\$23,788	\$21,589	\$10,083	\$13,565	\$12,471	\$14,186	\$10,338	\$10,235	\$11,870	\$12,999
Houses are over-valued or under-valued?			Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over

Quarter 1, 2011 to Quarter 4, 2012

	Input	UCEM Variable	Qtr 1 2011	Qtr 2 2011	Qtr 3 2011	Qtr 4 2011	Qtr 1 2012	Qtr 2 2012	Qtr 3 2012	Qtr 4 2012	Qtr 1 2013	Qtr 2 2013	Qtr 3 2013	Qtr 4 2013	Qtr 1 2014	Qtr 2 2014	Qtr 3 2014	Qtr 4 2014
REINZ Median House Prices			\$507,500	\$525,000	\$525,000	\$537,000	\$535,000	\$560,000	\$575,000	\$610,000	\$601,000	\$635,000	\$620,000	\$657,000	\$647,500	\$675,000	\$700,000	\$761,000
Quality adjusted Median House Price at:	18%	Pt	\$430,085	\$444,915	\$444,915	\$455,085	\$453,390	\$474,576	\$487,288	\$516,949	\$509,322	\$538,136	\$525,424	\$556,780	\$548,729	\$572,034	\$593,220	\$644,915
RBNZ mortgage data			6.4%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	6.2%	6.7%	6.7%
RBNZ 6 month term deposit rate			4.8%	4.2%	4.2%	4.1%	4.2%	4.1%	4.1%	4.0%	3.9%	3.9%	3.8%	3.8%	3.8%	4.0%	4.2%	4.2%
Debt equity ratio (level of debt):	54%		54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
Interest rate		Rt	5.6%	5.1%	5.1%	5.0%	5.1%	5.1%	5.1%	5.0%	5.0%	4.9%	4.9%	4.9%	4.9%	5.2%	5.5%	5.6%
Running cost and transaction cost	2.0%	Wt	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Depreciation rate	2.5%	Dt	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Risk Premium of Owning	1.0%	Yt	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Capital Gain expectation		Gt	3.7%	3.1%	3.6%	3.9%	3.9%	3.3%	3.4%	4.1%	3.8%	3.7%	3.1%	2.2%	2.6%	3.8%	3.4%	3.7%
User Cost per dollar		Vt	7.5%	7.5%	6.9%	6.7%	6.7%	7.2%	7.2%	6.3%	6.6%	6.7%	7.3%	8.2%	7.8%	6.9%	7.7%	7.3%
User cost		VtPt	\$32,141	\$33,181	\$30,891	\$30,272	\$30,342	\$34,271	\$35,049	\$32,750	\$33,862	\$36,271	\$38,449	\$45,594	\$42,727	\$39,474	\$45,448	\$47,101
Cost of renting annualised		Rt	\$19,604	\$20,124	\$20,332	\$20,592	\$20,696	\$20,852	\$21,216	\$21,320	\$21,372	\$22,048	\$21,944	\$22,152	\$22,100	\$22,984	\$22,620	\$23,608
User cost to own		Vt	7.5%	7.5%	6.9%	6.7%	6.7%	7.2%	7.2%	6.3%	6.6%	6.7%	7.3%	8.2%	7.8%	6.9%	7.7%	7.3%
Rental yield			4.6%	4.5%	4.6%	4.5%	4.6%	4.4%	4.4%	4.1%	4.2%	4.1%	4.2%	4.0%	4.0%	4.0%	3.8%	3.7%
Annual User Cost		VtPt	\$32,141	\$33,181	\$30,891	\$30,272	\$30,342	\$34,271	\$35,049	\$32,750	\$33,862	\$36,271	\$38,449	\$45,594	\$42,727	\$39,474	\$45,448	\$47,101
Annual Rental Cost		Rt	\$19,604	\$20,124	\$20,332	\$20,592	\$20,696	\$20,852	\$21,216	\$21,320	\$21,372	\$22,048	\$21,944	\$22,152	\$22,100	\$22,984	\$22,620	\$23,608
Difference			\$12,537	\$13,057	\$10,559	\$9,680	\$9,646	\$13,419	\$13,833	\$11,430	\$12,490	\$14,223	\$16,505	\$23,442	\$20,627	\$16,490	\$22,828	\$23,493
Houses are over-valued or under-valued?			Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over

Quarter 1, 2015 to Quarter 4 2018

	Input	UCEM Variable	Qtr 1 2015	Qtr 2 2015	Qtr 3 2015	Qtr 4 2015	Qtr 1 2016	Qtr 2 2016	Qtr 3 2016	Qtr 4 2016	Qtr 1 2017	Qtr 2 2017	Qtr 3 2017	Qtr 4 2017	Qtr 1 2018	Qtr 2 2018	Qtr 3 2018	Qtr 4 2018
REINZ Median House Prices			\$777,000	\$840,000	\$809,000	\$838,000	\$870,000	\$870,000	\$902,000	\$1,000,000	\$934,000	\$980,000	\$920,000	\$910,000	\$945,000	\$940,000	\$925,000	\$955,000
Quality adjusted Median House Price at:	18%	Pt	\$658,475	\$711,864	\$685,593	\$710,169	\$737,288	\$737,288	\$764,407	\$847,458	\$791,525	\$830,508	\$779,661	\$771,186	\$800,847	\$796,610	\$783,898	\$809,322
RBNZ mortgage data			6.7%	6.7%	6.2%	6.0%	5.8%	5.6%	5.6%	5.6%	5.7%	5.8%	5.8%	5.8%	5.8%	5.9%	5.9%	5.9%
RBNZ 6 month term deposit rate			4.1%	4.0%	3.6%	3.4%	3.3%	3.1%	3.2%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%
Debt equity ratio (level of debt):	54%		54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
Interest rate		Rt	5.5%	5.5%	5.0%	4.8%	4.6%	4.5%	4.5%	4.5%	4.6%	4.7%	4.7%	4.7%	4.6%	4.7%	4.7%	4.7%
Running cost and transaction cost	2.0%	Wt	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Depreciation rate	2.5%	Dt	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Risk Premium of Owning	1.0%	Yt	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Capital Gain expectation		Gt	4.1%	4.4%	4.8%	4.8%	4.8%	5.6%	5.2%	5.7%	6.0%	5.2%	5.8%	4.6%	4.6%	5.9%	5.3%	5.8%
User Cost per dollar		Vt	6.9%	6.5%	5.7%	5.4%	5.3%	4.4%	4.8%	4.3%	4.1%	5.0%	4.4%	5.6%	5.6%	4.3%	4.9%	4.3%
User cost		VtPt	\$45,579	\$46,610	\$38,865	\$38,593	\$39,289	\$32,588	\$36,688	\$36,542	\$32,232	\$41,577	\$34,302	\$43,021	\$44,763	\$34,092	\$38,401	\$35,025
Cost of renting annualised		Rt	\$23,660	\$24,076	\$24,336	\$24,388	\$24,908	\$24,960	\$25,168	\$25,740	\$25,740	\$26,052	\$25,740	\$26,988	\$26,832	\$26,728	\$26,780	\$27,508
User cost to own		Vt	6.9%	6.5%	5.7%	5.4%	5.3%	4.4%	4.8%	4.3%	4.1%	5.0%	4.4%	5.6%	5.6%	4.3%	4.9%	4.3%
Rental yield			3.6%	3.4%	3.5%	3.4%	3.4%	3.4%	3.3%	3.0%	3.3%	3.1%	3.3%	3.5%	3.4%	3.4%	3.4%	3.4%
Annual User Cost		VtPt	\$45,579	\$46,610	\$38,865	\$38,593	\$39,289	\$32,588	\$36,688	\$36,542	\$32,232	\$41,577	\$34,302	\$43,021	\$44,763	\$34,092	\$38,401	\$35,025
Annual Rental Cost		Rt	\$23,660	\$24,076	\$24,336	\$24,388	\$24,908	\$24,960	\$25,168	\$25,740	\$25,740	\$26,052	\$25,740	\$26,988	\$26,832	\$26,728	\$26,780	\$27,508
Difference			\$21,919	\$22,534	\$14,529	\$14,205	\$14,381	\$7,628	\$11,520	\$10,802	\$6,492	\$15,525	\$8,562	\$16,033	\$17,931	\$7,364	\$11,621	\$7,517
Houses are over-valued or under-valued?			Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over	Over

## 18 APPENDIX 4 : REAL CAGR CALCULATIONS

Real CAGR Calculations																										
Year	1992	1993	1993	1993	1993	1994	1994	1994	1994	1995	1995	1995	1995	1996	1996	1996	1996	1997	1997	1997	1997	1998	1998	1998	1998	
Quarter	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	
House Prices	\$160,500	\$157,000	\$165,000	\$170,000	\$178,000	\$185,000	\$200,000	\$218,500	\$220,000	\$220,000	\$238,000	\$245,000	\$260,000	\$269,000	\$254,000	\$260,000	\$275,000	\$275,000	\$260,500	\$277,500	\$275,000	\$258,000	\$265,000	\$256,000		
CPI start of quarter		610	611	614	618	619	619	621	628	636	643	650	651	654	658	663	666	671	669	670	673	677	678	681	685	
CPI end of quarter	610	611	614	618	619	619	621	628	636	643	650	651	654	658	663	666	671	669	670	673	677	678	681	685	679	
Quarter CPI		0.16%	0.49%	0.65%	0.16%	0.00%	0.32%	1.13%	1.27%	1.10%	1.09%	0.15%	0.46%	0.61%	0.76%	0.45%	0.75%	-0.30%	0.15%	0.45%	0.59%	0.15%	0.44%	0.59%	-0.88%	
Nominal HPI quarter to quarter		0.9782	1.0510	1.0303	1.0471	1.0393	1.0811	1.0925	1.0069	1.0000	1.0000	1.0818	1.0294	1.0612	1.0346	0.9442	1.0236	1.0577	1.0000	0.9473	1.0653	0.9910	0.9382	1.0271	0.9660	
Nominal chained HPI quarter to quarter	1	0.9782	1.0280	1.0592	1.1090	1.1526	1.2461	1.3614	1.3707	1.3707	1.3707	1.4829	1.5265	1.6199	1.6760	1.5826	1.6199	1.7134	1.7134	1.6231	1.7290	1.7134	1.6075	1.6511	1.5950	
Real HPI quarter to quarter		0.9766	1.0458	1.0236	1.0454	1.0393	1.0776	1.0803	0.9942	0.9891	0.9892	1.0802	1.0247	1.0548	1.0268	0.9400	1.0160	1.0609	0.9985	0.9431	1.0590	0.9895	0.9340	1.0211	0.9746	
Real chained HPI quarter to quarter	1	0.9766	1.0213	1.0455	1.0929	1.1359	1.2240	1.3224	1.3147	1.3004	1.2864	1.3895	1.4238	1.5018	1.5420	1.4495	1.4727	1.5623	1.5600	1.4711	1.5579	1.5416	1.4399	1.4703	1.4329	
			2003	2003	2003	2003	2004	2004	2004	2004	2005	2005	2005	2005	2006	2006	2006	2006	2007	2007	2007	2007	2008	2008	2008	2008
			Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
5 Year Real CAGR			1.4%	1.5%	5.2%	5.9%	6.8%	2.9%	4.6%	4.6%	5.8%	5.7%	6.1%	5.9%	6.7%	5.3%	6.5%	6.7%	7.8%	6.8%	5.8%	7.8%	5.7%	3.9%	2.6%	-0.1%
10 Year Real CAGR			5.3%	5.4%	6.2%	6.5%	6.2%	4.4%	4.4%	3.6%	4.2%	4.2%	4.7%	3.5%	3.7%	2.7%	2.8%	3.2%	3.8%	3.2%	3.1%	4.2%	3.5%	2.7%	3.9%	2.9%
15 Year Real CAGR (Begins Qtr 1, 2008)																						5.4%	4.9%	5.0%	4.2%	

Real CAGR Calculations																													
Year	1999	1999	1999	1999	2000	2000	2000	2000	2001	2001	2001	2001	2002	2002	2002	2002	2003	2003	2003	2003	2004	2004	2004	2004	2005	2005	2005	2005	
Quarter	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	
House Prices	\$270,000	\$269,000	\$270,000	\$270,000	\$275,250	\$270,000	\$275,000	\$282,000	\$278,000	\$272,000	\$280,000	\$295,000	\$310,000	\$296,000	\$326,000	\$325,000	\$364,000	\$385,000	\$395,000	\$348,000	\$379,000	\$380,000	\$405,000	\$402,500	\$420,000	\$407,000	\$429,000		
CPI start of quarter	679	677	679	681	683	687	692	702	710	708	715	719	723	727	734	738	742	745	748	754	757	763	767	774	778	784	793		
CPI end of quarter	677	679	681	683	687	692	702	710	708	715	719	723	727	734	738	742	745	748	754	757	763	767	774	778	784	793	799		
Quarter CPI	-0.29%	0.30%	0.29%	0.29%	0.59%	0.73%	1.45%	1.14%	-0.28%	0.99%	0.56%	0.56%	0.55%	0.96%	0.54%	0.54%	0.40%	0.00%	0.40%	0.80%	0.40%	0.79%	0.52%	0.91%	0.52%	0.77%	1.15%	0.76%	
Nominal HPI quarter to quarter	1.0547	0.9963	1.0037	1.0000	1.0000	1.0194	0.9809	1.0185	1.0255	0.9858	0.9784	1.0294	1.0536	1.0508	0.9548	1.1014	0.9969	1.1200	1.0577	1.0260	0.8810	1.0891	1.0026	1.0658	0.9938	1.0435	0.9690	1.0541	
Nominal chained HPI quarter to quarter	1.6822	1.6760	1.6822	1.6822	1.6822	1.7150	1.6822	1.7134	1.7570	1.7321	1.6947	1.7445	1.8380	1.9315	1.8442	2.0312	2.0249	2.2679	2.3988	2.4611	2.1682	2.3614	2.3676	2.5234	2.5078	2.6168	2.5358	2.6729	
Real HPI quarter to quarter	1.0578	0.9934	1.0008	0.9971	0.9942	1.0121	0.9670	1.0070	1.0284	0.9762	0.9730	1.0237	1.0478	1.0408	0.9497	1.0954	0.9929	1.1200	1.0535	1.0178	0.8775	1.0805	0.9974	1.0562	0.9887	1.0355	0.9580	1.0461	
Real chained HPI quarter to quarter	1.5158	1.5057	1.5069	1.5024	1.4937	1.5117	1.4618	1.4721	1.5138	1.4777	1.4378	1.4719	1.5422	1.6052	1.5244	1.6698	1.6580	1.8569	1.9562	1.9910	1.7472	1.8879	1.8830	1.9887	1.9663	2.0360	1.9506	2.0406	
		2009	2009	2009	2009	2010	2010	2010	2010	2011	2011	2011	2011	2012	2012	2012	2012	2013	2013	2013	2013	2014	2014	2014	2014	2015	2015	2015	2015
		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
5 Year Real CAGR		0.5%	2.9%	2.1%	2.1%	2.5%	2.3%	1.4%	1.5%	0.7%	1.0%	0.9%	1.1%	0.2%	0.0%	1.0%	0.6%	2.0%	3.5%	3.6%	4.6%	4.7%	4.7%	5.4%	5.7%	6.5%	8.3%	8.3%	
10 Year Real CAGR		3.6%	2.9%	3.3%	3.3%	4.1%	4.0%	3.7%	3.7%	3.7%	3.1%	3.6%	3.9%	3.9%	3.3%	3.4%	4.1%	3.8%	3.7%	3.1%	2.2%	2.6%	3.8%	3.4%	3.7%	4.1%	4.4%	4.8%	4.8%
15 Year Real CAGR (Begins Qtr 1, 2008)		4.3%	3.9%	3.6%	3.1%	3.6%	3.6%	3.6%	2.8%	2.7%	2.1%	2.1%	2.5%	2.6%	2.1%	2.4%	3.0%	3.0%	3.0%	3.8%	3.4%	4.0%	3.5%	3.8%	4.0%	4.6%	4.8%	5.3%	5.2%

