

## **HIGHER CAPITAL VALUES: ARE THEY WORTH THE PRICE? †**

**OLGA FILIPPOVA**

**The University of Auckland Business School**

### **ABSTRACT**

*The bigger the capital value (CV) of your house the bigger the rates bill. In New Zealand CVs are set every three years and provide a basis for levying rates at the local government level. At the time of general revaluation, some property owners appeal their CV. Intuitively such ‘objections to value’ would aim to lower housing taxes. However, two-thirds of objectors in Auckland City proclaim their houses are under-valued. This behaviour can partly be explained by the fact that CVs are readily available and are widely used as a ‘market price indicator’. Property sellers sometimes use the current CV in marketing efforts for their properties and CV becomes a reference point in buyers’ decision making. Due to such abnormal market activity, a recent evaluation was commissioned by Land Information New Zealand to investigate whether or not CVs and objections are being used as intended. For instance, anecdotal evidence suggests that sometimes CVs are being manipulated to influence objectors’ house prices when real estate agents advise sellers to object if they feel their property’s value has been set too low. The aim of this study is to understand if successful CV appeals affect prices of objectors who sell their properties. A detailed examination of the 2008 objections data uncovered that objectors’ houses tend to have a higher than average CV and a further spatial analysis identified “hot spots” - clusters with high proportion of objections. To test price impacts, I use residential sales transactions for Auckland City between Q3 2008 and Q3 2010 and identify properties whose owners objected in 2008. Contrary to the anecdotal evidence, the empirical results indicate that neither type of CV manipulation –reduction or increase – is found to have a statistically significant effect on sales prices.*

Keywords: Capital value, property tax, house price, New Zealand, hot spot analysis, hedonic price model

### **Introduction**

One of the first things to consider when selling your house is setting a list price that will most effectively bring acceptable offers. The list price will be a factor of pricing considerations and market conditions. Just as buyers will be comparing list prices, a seller would have to reflect other sellers’ price expectations when setting their own list price. This process would generally be well understood in the US, for example. In New Zealand, however, only a fraction of houses are advertised with price indication (Table 1). It is common for sellers, real estate agents and prospective buyers to make reference to the rating (taxable) value of the property, commonly known as capital value (CV). CVs are generated for every property and can be accessed by the public online. Reliance on CVs as a proxy for market value has been evidenced anecdotally with real estate agents advising sellers to contest their property’s value if it has been set too low (Garratt 2010).

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In this study, I am interested in the objections to the capital value (value of land plus buildings and other improvements) of residential properties. Using residential sales transactions and data on revaluation objections I assess if transaction prices are impacted when homeowners object to the capital values of their property and then subsequently put the property on the market to sell. It is not surprising, that in the absence of listing prices, buyers and sellers perceive CVs as a valid proxy of market value. Although CV is indicative of market value at the date of general revaluation, their primary purpose is for apportioning property taxes. Increasingly, CVs are being used as a value guide in other areas such as government compensation for earthquake damaged buildings and for insurance and loan purposes (Scally-Irvine et al. 2013). There exists a considerable body of research that demonstrates decisional biases by consumers when they are influenced by reference points – anchors – provided by sellers. In the real estate domain, this was first evidenced by Northcraft and Neale (1987) who found the value of a house to be strongly influenced by the presence of an uninformative list price. Several more experimental studies followed (Cypher & Hansz 2003; Kristensen & Garling 2000; Levy & Fretheim-Bentham 2010; Levy et al. 2013; Scott & Lizieri 2012) illustrating the robust influence of anchoring. This study will add to this body of literature using market-based property transactions.

**Table 1 Houses advertised for sale with price indication in Auckland City**

Sale Method	Number of listings	Percent
Auction	370	49
Tender	10	1
Negotiation	196	26
Asking price	184	22
<b>Total</b>	<b>760</b>	<b>100</b>

Source: TradeMe Property; data collected on 18 September, 2013

## Background

In New Zealand, capital values are used for rating purposes and taxation is administered at the local government level (territorial authorities). All properties must be revalued at least once every three years (Ratings Valuations Act 1998). Property owners receive valuation notices of their revised values approximately one month after the general revaluation. Any mass valuation is prone to a significant level of error (Rating Valuations Rules 2008, p.25), therefore local councils allow owners to lodge an objection to any information on the notice of general revaluation, from incorrect property details to the actual assessed value, during a limited timeframe. Rationality suggests that a low valuation has low probability of being contested by homeowners (Firoozi et al. 2006). Motivated owners are more likely to correct high valuations through objection. In fact, the US academic literature and media focuses almost exclusively on appeals to high assessments. This expectation however does not persist in New Zealand, where objections to low assessed values significantly outnumber high value objections (Table 2). Since property taxes are proportionate to CVs, this pattern of objections to low valuations is counter intuitive. Therefore, given the New Zealand market's reliance on the CVs, I presume that some property owners that challenge low assessments and then subsequently sell their properties may have had ulterior motives. Specifically they may have objected to their CV in an attempt to influence their home's sales price.

**Table 2 Capital value movement request after the 2011 General Revaluation in Auckland City**

CV movement	Apartments	Single Dwellings	Flats	Total
Increase CV	425 (48%)	1,944 (70%)	283 (78%)	2,652 (66%)
Lower CV	457 (52%)	832 (30%)	79 (22%)	1,368 (34%)

Since listing price information is scarce, potential buyers have several options to form their opinion about property's market value: registered valuation report, recent comparable sales and rating values. The first two require financial investment and some 'know how' (e.g. which professional to instruct or, if they act alone, an ability to source residential transaction data and effectively analyse it). Tversky and Kahneman (1974) demonstrated that people rely on a limited number of heuristics or 'rules of thumb' to perform complex tasks. And even in the presence of rich information required to evaluate a piece of residential property, non-real estate professionals provided significantly biased value estimates that were anchored on 'uninformative' listing price (low, moderately low, moderately high and high prices) (Northcraft & Neale 1987). Therefore, since the general public is familiar with CV and have ready access to rating value information for every property, it is plausible that buyers would gravitate towards CVs as a price anchor.

Official sources (e.g. Auckland Council website) tend to warn users that CVs are not intended for marketing purposes. Furthermore, the real estate agent's code of conduct requires agents to provide their client (seller) a written appraisal that reflects current market conditions and is supported by comparable information on sales (Real Estate Agent Act Rules 2012). Perhaps as a result CVs do not often feature in listing information, with less than 10% of residential listings mentioning CV's (Table 3). However, anecdotal evidence points to vast proliferation of CVs in the home buying process (Helm 2013): frequent benchmarking of recent sales prices against CV's in the media (Eriksen 2013a, 2013b; Matthews 2013; Morris 2013); agents promoting increasing rating values to maximise selling price (Garratt 2010); and a major mass appraisal contractor recommending urgent rating value review to 'add value' before sale (Quotable Value Limited 2013).

**Table 3 Use of CV in print advertisement**

Publication	Reference to CV	Total listings
Property Press: South Auckland, September 2009	26	675
Property Press: South Auckland, August 2013	8	111

Given a high rate of tax payers who appeal low assessments I test Tversky and Kahneman's (1974) anchoring-and-adjustment theory. If potential buyers use the CV information of a property that has had its capital value increased as a result of the owner objecting to the local council, the bargaining will theoretically begin at a higher reference point than it would have otherwise. The buyers are likely to make insufficient adjustments and will stop adjusting once a satisfactory estimate is reached. Therefore, the study's hypothesis is that sellers who adjust their CVs are able to significantly influence transaction price.

### Literature review

Houses make up the bulk of the wealth of most New Zealand homeowners (Briggs, 2012). Therefore selling a house is one of the most important financial transactions faced by a household during their lifetime. The seller of a house would want to sell the property for the price that is at least equal to its market value, unless that seller is constrained (for example relocation or financial distress) and is willing to accept a lower price to foster a faster sale (Springer, 1996). According to Springer, the listing price is the seller's primary mechanism for selling the property and is an important factor in determining the sale price. The listing price signals information to prospective buyers about the prices that sellers are willing to accept. Previous studies have demonstrated that the choice (e.g. high) as well as design of listing price can have a significant impact on the transaction price (Allen & Carter 2010; Allen & Dare 2004; Thomas, Simon & Kadiyali 2010). Although rational model assumes that a buyer would be able to obtain full information in order to make decisions, it had been repeatedly shown that potential homebuyers often rely on the listing price as a shortcut to estimate its value. Where assessed values are widely reported, public often use them as a market value proxy (Cypher & Hansz 2003). Available evidence for anchoring behaviour suggests that listing at higher prices would be beneficial for home sellers. Research on informational asymmetry in residential property markets also shows that sellers can use inflated asking prices to their advantage. When a house is advertised for sale, a buyer can observe house characteristics such as location, size, quality etc. Some information, however, remains unobserved by buyers, for example, capital value revisions.

A number of researchers have looked at the role of listing price on house transactions. Springer (1996) demonstrated that a motivated seller sets a listing price that is close, or even less, to the estimated value of the house and eventually realises a discount between 2.1% to 3.7% as a trade-off for a faster sale. Similarly, including phrases such as 'below market value' or 'below appraised value' in the listing information suggests that an owner is 'desperate' to sell. Allen and Carter (2010) show that properties suffer a 3 to 7% discount by using such phrases. The design of listing price is also shown to have a significant impact on transaction prices. The first researchers to consider the impact of the design were Allen and Dare (2004). In their study, houses with prices set just below some round number sell for significantly higher prices than houses listed at round prices. More recently, Thomas, Simon & Kadiyali (2010) confirmed that houses advertised with more precise list prices (fewer than three ending zeros) will sell at higher prices. Similarly, Beracha and Seiler (2013) establish round pricing to be inferior to precise pricing but a higher price premium is observed for 'just below' (thousands digit equals 9 or 4) pricing strategy.

The listing price is often viewed as a starting negotiating point - anchor. First introduced by Tversky and Kahneman (1974), their research has shown that if a value estimate is set in relation to the initial value, adjustments will be biased towards the initially presented value (anchoring). Numerous researchers conducted experiments evaluating anchoring from a valuation perspective. In a field experiment Northcraft and Neale (1987) asked two groups, amateurs (university students) and experts (real estate agents) to estimate the value of a "real world" house. Both groups received a packet of information with all the information necessary to evaluate residential property. The house's listing price was included but varied from low to high among the participants. Value estimates of both experts and amateurs were significantly biased by listing prices: the lower the listing price was, the lower were the assessments of the house. Later studies

confirmed that anchoring behaviour is widespread among experts, namely valuers, (Diaz & Hansz 1997, 2001; Diaz & Wolverton, 1998; Gallimore 1994, 1996; Hansz, 2004; Havard, 1999) as well as potential homebuyers (Cypher & Hansz 2003; Kristensen & Garling 2000; Levy & Frethey-Bentham 2010; Levy et al. 2013; Scott & Lizieri 2012). Strong evidence of anchoring-and-adjustment effect among first time homebuyers was observed by Levy et al. (2013). In their experiment, the researchers tested if the initial offer prices are skewed towards an influenced capital value. Anchoring effect, however, was found to be insignificant when professionals were making valuations in a familiar area (Cypher & Hansz 2003; Diaz 1997). Although most anchoring-related research is experimental, a recent study by Buccianeri and Minson (2013) tested anchoring empirically using a comprehensive dataset of over 14,000 residential transactions. Consistent with past research, overpricing was found to have a significant positive impact on the selling price. Research on anchoring indicates that listing price is an attractive and valid price indicator for consumers, even in a familiar setting, and a higher listing price is associated with a higher sale price.

In New Zealand, most houses are advertised without price indication. Capital value of every residential property, however, is freely available and can serve as an anchor for potential buyers. If some opportune sellers adjust capital values prior to sale, this would be unobservable to the buyers. If buyers anchor on the adjusted capital value, the transaction price would likely be higher than if the original CV was used. It's been shown that real estate agents are better informed about the value of houses and local market conditions and use this knowledge to obtain a higher selling price for their own houses than similar client owned houses (Levitt & Syverson 2008; Rutherford, Springer & Yavas 2005;). There is also evidence of asymmetric information in the residential property assessments area. Firoozi et al. (2006) found assessed values of property tax consultants' own homes were up to 6.2% lower than the typical homeowner.

With the evidence on listing price strategies, anchoring and asymmetric information, this study tests whether sellers of houses that appealed their CV and successfully increased their capital values, are able to sell their houses at a significant premium. Past research on anchoring is mainly conducted in a contrived setting. To the contrary this research will use residential transactions to test anchoring effects in order to determine if the strategy of objecting to low valuations provides significant pay off to the sellers.

## Data and methodology

The 2008 general revaluation objection data of residential properties within the former Auckland City area was obtained from the Auckland Council's Valuation Services Department. There were 2,834 residential properties who's owner objected to the CV. The dataset included the address of the property, property category, initial general revaluation values, contended values and settled values. Table 4 presents the descriptive statistics for these variables.

**Table 4 Summary statistics for 2008 objections data**

Property category	Revaluation value		Contended value		Settled value	
	Mean	SE	Mean	SE	Mean	SE
Single dwelling	1,031,896	21,413	944,338	18,021	981,028	19,480
Apartment	445,851	27,117	362,885	23,647	409,470	25,455
Flat	352,265	8,032	312,419	8,199	329,029	7,744

As mentioned earlier, general revaluations take place at least every three years and the assessed value represents 100% of the market value on the date of revaluation. In Auckland City, the 2008 revaluation was on 1 July. In August, the homeowners receive the general revaluation notice with the updated value. During a 20-day window, if the homeowner believes the assessed value is too low or too high, the individual can object at no cost and propose a revised capital value. The owner's suggested valuation will be reviewed by a registered valuer with several possible outcomes. Objections that have been declined an amendment in value are coded as "NOCHGFIN", meaning no change shall be made to the original revaluation amount. Similarly, the objection to value can be coded as "WITHDRAWN" which signifies that the owner has decided to withdraw their objection and therefore the original revaluation sum remains. If an owner's objection to value is at least partially successful it is coded as "COMPLETE" which indicates that the registered valuer has approved a change in the final value. Table 5 presents the proportion of each outcome in the 2008 round of objections. Although only 2.4% of residential property owners in Auckland City objected, the majority were at least partially successful.

**Table 5 Objection outcome after the 2008 General Revaluation in Auckland City**

Objection outcome	Number of residential properties	Percent
COMPLETE	2,376	84
NO CHANGE/WITHDRAWN	458	16
Total	2,834	100

Notes: Properties include apartments, flats and single dwellings only

Since the main objective of this study was to test if the property owners who objected to the valuation were able to obtain a different sales price, data was collected and analysed to identify objection properties that were subsequently sold. As the objection data obtained is for the 2008 Auckland City revaluation cycle the timeframe chosen for this study is between Q3 2008 and Q3 2010 which would capture sales transaction prices that would have potentially benefited from owner's objections to value. The source of the residential sales transactions within Auckland City was PropertyIQ Limited. Descriptions of variables used in this study are defined in Table 6. The empirical analysis is limited to detached and semi-detached residential dwellings. The total number of transactions recorded in this time period is 8,030. Merging the objection data with the sales transactions, there were 203 'objecting' properties that were sold, of those 43 were unsuccessful objections. Table 7 compares summary statistics of properties with objections with the other sales within the dataset.

**Table 6 Definition of variables used in the hedonic equation**

Variable name	Variable Description
$LN(SP)$	Natural log of net sale price
<i>Object_up, Object_down</i>	Dummy variable for whether the property's CV was adjusted up/down.
<i>BFA, BFA2</i>	Floor area (in square metres), floor area squared.
<i>Storeys_2, Storeys_3</i>	Dummy variable indicating the number of storeys. The default condition is a one-storey (level) house.
<i>D1910, D1920, D1930, ... D1980, D1990</i>	A series of dummy variables corresponding to the vintage (decade) in which the house was built. The default condition is built in the 2000s.
<i>Exterior_Poor, Exterior_Good</i>	Variable for whether the property's exterior walls were coded by the valuer as being in 'Poor/Fair', 'Average' or 'Good' condition. The default condition is 'Average'.
<i>Interior_Poor, Interior_Good</i>	Variable for whether the property's interior fixtures and finishes were coded by the valuer as being in 'Poor', 'Average' or 'Good' condition. The default is 'Average'.
<i>Water_view</i>	Variable for whether the property has appreciable water view. The default category is no appreciable water view.
<i>Steep_Contour</i>	Dummy variable for whether the property's land plot is steeply sloped or not. The default category is <u>not</u> steep, which includes properties coded in the dataset as featuring either a 'Level' contour or having an 'Easy to Moderate' fall or rise.
<i>Garage</i>	Dummy variable indicating if there is a free standing garage on the property
<i>au514401, au515410, etc</i>	A series of dummy variables indicating the area unit in which a property is located. The area unit containing the most observations serves as the default category.
<i>Q4_2008, Q1_2009, ... Q3_2010</i>	A series of dummy variables for each quarter of when the property was sold. The default condition is 3 <sup>rd</sup> quarter of 2008.

**Table 7 Summary statistics of the sales subsamples**

Variable	Transactions with successful objections		Transactions without objections		t-Stats/ <i>Chi-Sq</i>
	Mean	SE	Mean	SE	
<i>Sale price</i>	1,015,411	71,164	716,529	5,711	7.252
<i>Capital value</i>	1,061,000	73,715	691,841	5,290	9.581
<i>Floor area</i>	211.84	7.882	161.26	.798	8.873
<i>Vintage</i>	1960	2.541	1955	.352	2.185
<i>Exterior_Good</i>	.62	.039	.53	.006	4.55
<i>Interior_Good</i>	.19	.031	.04	.002	104.88
<i>Deck</i>	.65	0.038	0.48	0.006	18.44
<i>Contour_ Steep</i>	.13	.026	.07	.003	8.473
<i>Water_View</i>	.26	.035	.10	.003	45.622
<i>N</i>	160		7,870		

A hedonic pricing model is employed which is a common method for estimating marginal contribution of various house characteristics on its price (Sirmans, Macpherson & Zietz 2005). Including dummy variables indicating the type of CV adjustments in the model allows to observe if significant price effects are associated with these adjustments. Employing log-linear specification, the model takes the following form:

$$\ln(SP) = \beta_0 + \beta_1 object\_up + \beta_2 floor + \beta_3 floor2 + \beta_4 storeys\_2 + \beta_5 storeys\_3 + \beta_6 exterior\_cond + \beta_7 interior\_cond + \beta_8 water\_view + \beta_9 vintage + \beta_{10} steep\_contour + \beta_{11} garage + \beta_{12} sale\_qtr + \beta_{13} area\_unit + \varepsilon \quad (1)$$

The dependent variable (SP) is the net sales price of each house in the dataset. The *object\_up* is a dummy variable that indicate the successful objection outcome of the transactions whose owners lodged an appeal and are set to 1 if the change in value was up. The remaining variables are the physical characteristics of the residential property as well as quarterly time dummy variables. In addition, 103 area unit dummy variables serve as proxies for suburb and control for variation in neighbourhood-specific characteristics. It has been recognised that hedonic price models can potentially suffer from heteroscedasticity where the variances of the error term are unequal. Therefore, to correct for it, the heteroscedasticity-consistent standard errors are reported in this paper.

Table 7 shows that average capital values of sold properties with objections to be higher than properties of homeowners that did not object, which suggests that there are differences between the two types of sellers. To further understand the relationship between properties that are more likely to have their values appealed, analysis of the socio-economic composition of areas is performed. New Zealand deprivation index – NZDep2006 – is used as an indicator of social and material deprivation of small areas. NZDep2006 combines nine variables collected in the 2006 Census and is available in the form of an ordinal scale ranging from 1 to 10, where 1 represent the areas with the least deprived scores. Deprivation scores are calculated for the smallest statistical areas – meshblocks. In order to assign deprivation scale to the objection data, the residential properties were first geocoded in GIS. The X-Y coordinates of these properties were used to obtain their meshblock number.

Finally, I analyse the spatial clustering of objections. Getis – Ord  $G_i^*$  statistics is calculated for every small area to identify significant clusters with high and low proportion of objections at a meshblock-level (see Ord & Getis 1995). To test the hypothesis of clustering of high or low values within the specified distance of location  $i$ , the proportion of dwellings with objections was determined using the total number of occupied dwellings per meshblock collected in the 2006 Census.

$$G_i^*(d) = \frac{\sum_j w_{ij}(d)x_j}{\sum_j x_j} \quad (2)$$

$G_i^*$  is the local statistics for the  $i$ th meshblock at distance ( $d$ ) between centroid of meshblock  $i$  and centroid of neighbouring meshblock  $j$ ,  $w_{ij}$  is a binary spatial weights matrix with ones for all points  $j$  within distance  $d$  of point  $i$  and

zeros otherwise,  $x_j$  are the weighted values of neighbouring meshblocks. The higher statistics indicates existence of areas with more intense clustering, whereas a score near zero means no spatial clustering.

## Results

Table 8 shows the results of equation (1), the hedonic model of the selling price on physical housing attributes and the primary variables of interest indicating objection outcome. The model has high explanatory power with the  $R^2$  of .883. All the independent physical attributes variables have expected signs and most are statistically significant at least at the 5% level. Consistent with prior expectations, the coefficient of *floor area* variable is positive and highly significant and the *floor area\_2* variable is negative and significant, suggesting that the contribution of per square metre of floor area is rising at a decreasing rate. Similarly to the findings of Rehm et al. (2006), a non-linear relationship between period of construction and house prices was confirmed over this sample period. The coefficients of the sale quarter variables show that New Zealand housing market affected by the 2007-2009 recession appeared to turn a corner in the second half of 2009 when house prices began to rise again.

Turning to the variable of interest, the coefficient for the *object\_up* variable is found to be statistically insignificant. This implies that the strategy of increasing capital value before sale does not increase the final price yield. Contrary to the findings of researchers who demonstrated that overpricing is a favourable strategy for sellers, the present data could not confirm previously found results. One difficulty with interpreting this coefficient from the anchoring-and-adjustment theory perspective, is that I am not able to verify if sellers actively use capital value information in their marketing efforts. Although a rational homeowner is not likely to appeal an assessment that is lower than the true underlying market value, a homeowner who intends to sell their property, presumably, brings up the value of their property to the market level so that negotiation process can start at a higher point. Therefore, our results indicate that properties with increased capital values are sold at their market value and in fact, the seller's strategy was beneficial as otherwise the seller would not have been able to obtain a market price. In other words, appeals allow sellers correct the market value and are not used as a strategy to yield a price premium. As a robustness check, the effect of an *object\_down* dummy variable is tested. It has been demonstrated that motivated sellers tend to sell their properties for lower prices. We can assume that sellers who successfully contested a high valuation signal to the market their eagerness to sell and are willing to forego some amount of value. However, the coefficient of the *object\_down* variable is also statistically insignificant confirming earlier proposition of market value corrections.

**Table 8 Hedonic model results**

Variable	Increased CV		Decreased CV	
	Coeff.	t-stats	Coeff.	t-stats
Constant	12.496	649.02 ***	12.495	648.84 ***
Floor	0.004	33.14 ***	0.004	33.19 ***
Floor2	-7.42E-07	-2.70 ***	-7.43E-07	-2.71 ***
Storeys_2	-0.059	-11.12 ***	-0.059	-11.11 ***
Storeys_3	-0.136	-13.62 ***	-0.136	-13.62 ***
Exterior_Good	0.041	9.14 ***	0.041	9.10 ***
Exterior_Poor	-0.023	-1.99 **	-0.023	-1.98 **
Interior_Good	0.196	14.12 ***	0.197	14.16 ***
Interior_Poor	-0.057	-1.94 **	-0.056	-1.91 *
Deck	0.023	5.31 ***	0.023	5.33 ***
Steep_contour	-0.054	-6.77 ***	-0.054	-6.75 ***
Garage	0.083	17.95 ***	0.083	17.96 ***
Water_View	0.098	11.05 ***	0.099	11.13 ***
V1910	0.140	12.63 ***	0.140	12.63 ***
V1920	0.105	11.43 ***	0.105	11.41 ***
V1930	0.076	6.86 ***	0.076	6.86 ***
V1940	0.028	2.74 ***	0.027	2.73 ***
V1950	0.011	1.157	0.011	1.16
V1960	3.64E-05	0.00	-7.60E-05	-0.01
V1970	-0.085	-7.77 ***	-0.085	-7.76 ***
V1980	-0.081	-9.53 ***	-0.081	-9.51 ***
V1990	-0.080	-10.18 ***	-0.080	-10.17 ***
Q4_2008	-0.031	-3.45 ***	-0.031	-3.44 ***
Q1_2009	-0.010	-1.18	-0.010	-1.18
Q2_2009	0.016	1.93 **	0.016	1.93 **
Q3_2009	0.069	8.40 ***	0.070	8.41 ***
Q4_2009	0.085	10.12 ***	0.085	10.11 ***
Q1_2010	0.100	11.29 ***	0.100	11.29 ***
Q2_2010	0.086	9.80 ***	0.086	9.79 ***
Q3_2010	0.089	9.66 ***	0.089	9.64 ***
Object_UP	0.006	0.36		
Object_DOWN			-0.02	-0.61
R <sup>2</sup>		0.883	0.883	
F-stat		449.9	449.9	

Notes:  $\ln(SP)$  is the dependent variable; regressions include dummy variables for area units to control for location, their coefficients are not reported for brevity; N = 8,030.

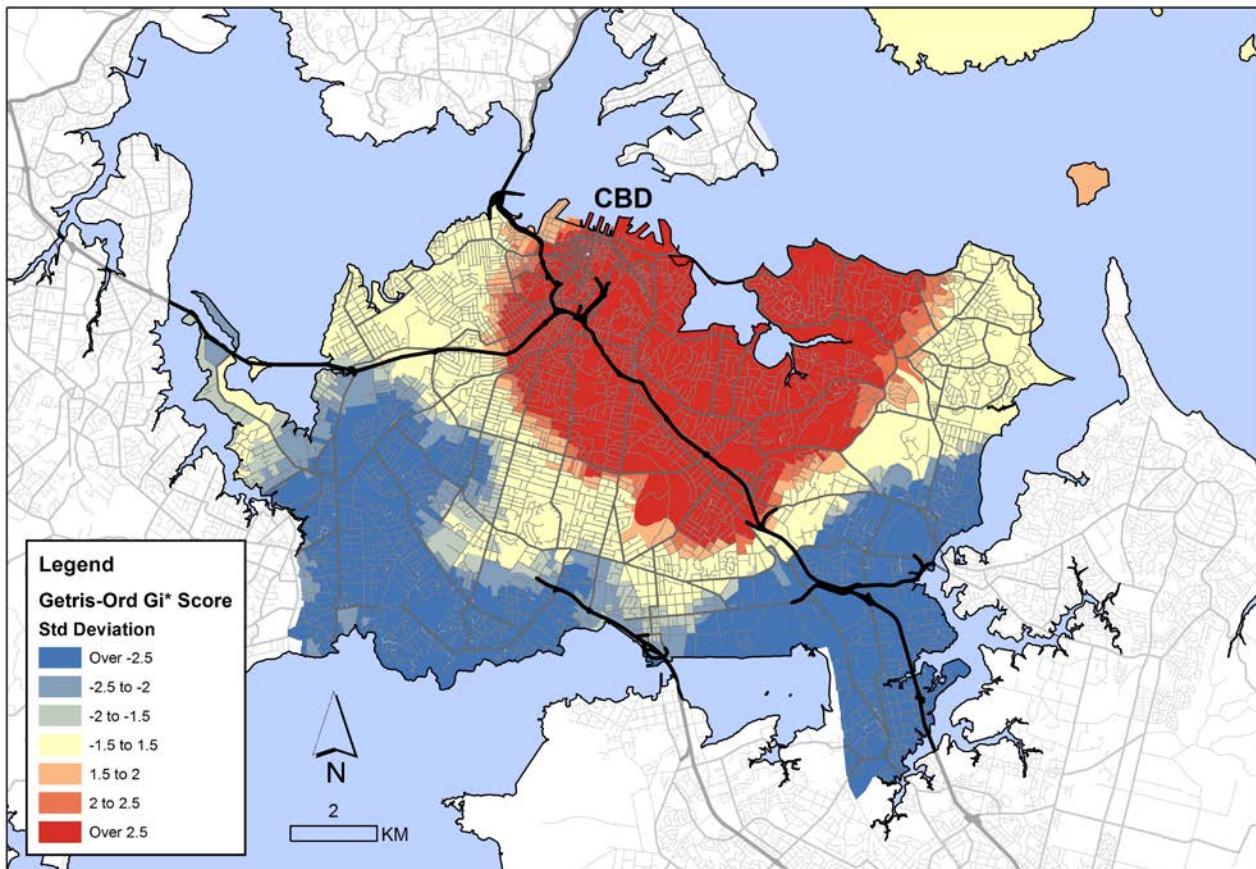
Significant at \*0.1, \*\*0.05, and \*\*\*0.001 levels

To further understand the nature of capital value appeals I conducted a descriptive analysis of socio-economic composition of areas with objections, as well as testing for significant spatial clustering of objections. Firstly, cross tabulations of the type of objections and deprivation index, reveal that majority of objections originate in more affluent areas. For example, over half of objections were from areas with deprivation index below five. This reveals the socio-economic pattern of objections and indicates that people residing in those areas tend to be better educated and generate greater income level. To test the geographical patterns of proportion of objections at a meshblock-level, scores of the Getis-Ord Gi\* were calculated for each meshblock and the results are mapped in Figure 1. Meshblocks in the northern part of Auckland City were more likely to have clusters of high proportion of objections – hot spots. Whereas the southern meshblocks tend to have statistically significant areas with lower proportion of objections – cold spots, with a band of neutral meshblocks separating the cold and hot spots. The higher incidence of objections in more affluent areas is correlated with higher property values found in the hot spots of the map. These results indicate that, firstly, homeowners contesting values are more informed about the procedure and have more complete information about the property market. Secondly, successful objections would generate larger benefits for owners of more expensive houses than for average ones.

**Table 9 Number of objections in Auckland City by deprivation index**

NZ Dep Index	No of objections	Percent	NZ Dep Index	No of objections	Percent
1	567	18	6	283	9
2	400	13	7	270	8
3	403	13	8	254	8
4	319	10	9	181	6
5	306	10	10	164	5

**Figure 1 Spatial clustering of objections (Gi\* scores) in Auckland City**



## Conclusion

Experimental studies on the anchoring-and-adjustment theory consistently demonstrate that potential home buyers tend to produce value estimates biased towards the initially presented value (anchor). This study provides empirical evidence on anchoring in the Auckland residential property market. Using the property revaluation data, properties that appealed a low assessment were identified. Then successful appeals that were subsequently sold were coded with the dataset of residential sales transactions. Contrary to cited anecdotal evidence, the results of this study suggest that properties with upward adjusted assessments did not sell for higher prices. It appears that adjusted CVs were not sufficiently high enough to serve as an anchor that would have resulted in a higher price. However, the results indicate that property appeals are useful and sale price could have been lower if the CV was not increased. This would indicate that capital values of properties with objection were under-valued and was eventually revised to reflect their market value.

It is also found that objections tend to originate from wealthier neighbourhoods which have higher education attainment and income levels. This finding suggests that there exist some degree of information asymmetry among households with different socio-economic status. Also, by successfully increasing capital values, sellers of higher valued properties can realise sufficiently greater gains than lower priced properties. Therefore, sellers in the areas with higher property values and socio-economic level are more motivated to object to their property assessment. The rate of objections is found to be spatially clustered. This is useful for local governments and provides areas where their mass appraisal model can be improved to reduce the rate of objections.

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**Email contact:** o.filippova@auckland.ac.nz