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The accuracy of MUREAU residential market forecasts

Garry Dowse
Department of Finance, Banking and Property
Massey University
Palmerston North, New Zealand

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Abstract: Several years ago the Massey University Real Estate Analysis Unit (MUREAU) established the "Real Estate Outlook Survey" series, incorporating quarterly forecasts for various sectors of the New Zealand real estate market. The series attempt to bridge the gap between historic market information and forecasting future real estate market behaviour; to improve the range of information available to the property industry and the public so that people may be in a better position to report, make decisions, generate other analyses etc. at various points in time during the course of property ownership, lease, mortgage etc.

Forecasts are based on confidential questionnaires completed each quarter by panels of property "experts". The focus of this paper is the Auckland residential property market forecasts. It reviews the accuracy of quarterly property market forecasts by comparing the Auckland panelists' forecasts to market indicators. The review is intended to help readers gain an enhanced appreciation for the forecasts, and secondly and equally importantly to provide forecast participants with feedback to help improve judgmental accuracy of future predictions.

1. INTRODUCTION

MUREAU was established as a research unit at Massey University in the early 1990's. Its primary objective is to provide reliable property information to the property industry, land related professions and the public. It is considered to be in a unique position to provide the same, given the University is independent and not in competition with property industry groups. MUREAU research falls into two broad categories:

1. Freely available "public good" research.
2. Contracted private research.

Included in the freely available "public good" category is the Real Estate Market Outlook Survey series, incorporating quarterly forecasts covering the:

- New Zealand rural market.
- Auckland commercial market.
- Christchurch commercial market.
- Wellington commercial market.
- Auckland residential market.
- Christchurch residential market.
- Wellington residential market.

The series attempt to bridge the gap between historic market information and forecasting future real estate market behaviour; to improve the range of information available to the property industry and the public so that people may be in a better position to report, make decisions, generate other analyses etc. at various points in time during the course of property ownership, lease, mortgage etc.

The forecasts are based on confidential questionnaires completed each quarter by panels of property "experts". The use of panelist opinions is well established in economic forecasting and market research. For example, the New Zealand Institute of Economic Research (NZIER) Quarterly Survey of Business Opinion, The National Bank of New Zealand Limited (NBNZ) Monthly Survey of Business Outlook, and the WestpacTrust McDermott Miller Quarterly Survey of Consumer Confidence are all considered to be leading indicators of future economic activity in New Zealand.

In regard to New Zealand property markets, ASB Bank Limited produces a quarterly housing report incorporating a survey of consumer housing intentions and homebuyers' confidence. While Maltby and Partners Limited in association with the New Zealand Property Institute conducts surveys gathering information on property and construction industry sentiment.

MUREAU panelists are chosen on the basis of their property market expertise (i.e. involvement at the property "coal face"), to make sensible forecasts about future changes in property price levels, volumes of sales and market confidence amongst other things. With property there is normally a time lag between an impending event and occurrence of that event. The major advantage in using people at the property "coal face" is that they can observe emerging market trends before market evidence is available. For example, the impact of rising mortgage interest rates (higher debt servicing costs) on potential homebuyers often results in real estate agents observing a drop in buyer enquiry and sales volume months before official sales statistics are available.

It is all very well to publish property market forecasts, but how good are they? From time to time readers of MUREAU forecasts ask questions regarding their accuracy. Do the 'experts' panelists actually add value to the forecasts? Do any one individual group of respondents supply more reliable information? Could a group of 'non-experts' do as well by guessing? With such questions in mind this paper reviews the accuracy of the MUREAU quarterly property market forecasts, more particularly MUREAU's Auckland residential housing market forecasts. The study extends preliminary research undertaken by Hargreaves (1998) on the Auckland residential market, and parallels a study completed by Don (1998) on data collected from MUREAU's commercial property market forecasts.

Forecast accuracy is tested by comparing the Auckland panelists' forecasts to market indicators. Real Estate Institute of New Zealand sales data is used as a benchmark for price and sales volume comparisons. At the same time, the paper:

- Compares the panelists' general market confidence with consumer confidence to determine if there is any relationship or similar trends.
- Compares the panelists' forecasts with what they experienced.
- Tests whether the panelists' overall performance is superior to using the naï ve method of forecasting.
- Tests whether any one group of respondents is supplying more reliable information.
- Tests whether the aggregated respondents are supplying more reliable information than any one individual group.

2. LITERATURE REVIEW

The Concise Oxford Dictionary defines the word forecast as: *"conjectural estimate of something future; prediction".*

2.1 Why forecast?

The literature on forecasting is extensive. A common premise is that the need for forecasts are linked to society attempts to decrease their dependence on chance. Berenson and Levine (1996) note that since social and economic conditions change over time entities must find ways of making provisions for the effects of such changes. They advocate forecasting as an important aid. Makridakis et al (1998) contend that accurate forecasting information provides a superior base from which to plan and take appropriate actions aimed at enhancing the likelihood of a favourable outcome.

2.2 Forecasting Techniques

Forecasting situations vary widely in terms of time horizons, data patterns etc. Consequently, a wide range of forecasting methods have been developed to aid the discipline of forecasting. These range from naï ve methods, such as using the most recent observation as a forecast, through to highly complex approaches such as the modeling of econometric simultaneous equations. In general, forecasting methods can be divided into two categories: quantitative and qualitative (Berenson and Levine, 1996).

Quantitative forecasting methods can be applied when sufficient historical information is available, which can be quantified in the form of numerical data. The aim is to discover the structure of the available data and therefore provide a means for predicting future occurrences. The underlying methodology can be classified as either explanatory or time series.

- Explanatory methods involve discovering the explanatory variable(s) that relate to the variable to be predicted, and measuring and expressing the relationship(s) in the form of an equation. For example, the median house price for a region might be expressed as: price = f (employment, real wages, demographics, fiscal policies… error). In accord with explanatory forecasting a change to a factor on the right hand side of the equation will affect the dependent variable in a predictable way.
- Time series methods make no attempt to discover the explanatory variables that relate to the variable to be predicted. More simply the aim is to discover and measure the pattern in the historical data series, and extrapolate that pattern into the future. If the only concern were to forecast the future median house price without concern as to why a

certain price level will be reached, then a time series approach would be appropriate. Based on time series observation the median house price might be expressed as: $price_{t+1} = f$ ($price_t$, $price_{t-1}$, $price_{t-2}$, $price_{t-3}$… error). Here the median price of next month is dependent on the previous month and the month before that and so on; t is the present month, $t + 1$ is the next month, $t - 1$ is the last month, $t - 2$ is two months ago etc.

Qualitative forecasting methods are relevant when quantitative historical data is not available, but sufficient human judgment and accumulated knowledge exists. In the main qualitative methods are used for medium and long term forecasting situations to provide hints rather than specific numerical forecasts.

The benefit of using a qualitative regime is that human judgment incorporates inside knowledge and information about the future. Quantitative forecasting methods are generally argued to be cheaper and more accurate than qualitative methods. However, qualitative forecasts remain indispensable, particularly where the costs of forecasting errors might be costly. Common to all quantitative forecasting is the assumption of continuity i.e. some aspect of the past will continue into the future. In reality though, unexpected changes can and do occur. Human judgment presents the only option to predicting changes from existing relationships and/or established patterns. Further, when changes are detected or if we know they are imminent, human judgment is the only viable alternative for predicting their extent or implications.

MUREAU's quarterly property market forecasts use qualitative forecasting methods. Qualitative approaches often require input from specially trained people or "experts". This holds true for the forecasting methodology adopted by MUREAU in producing their real estate market outlook series.

A common theme in econometric housing market literature is the complexity of markets (Savage, 1996):

- Housing is both a consumption good (for owner occupation) and an investment good (for income stream returns). Therefore, market activity/prices are influenced by a mix of consumption factors (e.g. demographic changes) and investment factors (e.g. rate of return on housing relative to other asset classes).
- Housing is a heterogeneous good. Every property has a unique set of characteristics (i.e. size, quality, location etc.). This implies that changes in the market value of certain properties may vary from median or average price movements, and at times there may be significant differences between construction costs and resale value.
- House prices are known to exhibit strong cyclical patterns and volatility.

An understanding of housing markets requires consideration of the following (Peters and Savage, 1996):

- Supply factors – includes changes in the availability of land and skilled construction labour. As supply of these factors declines (increases), there is upward (downward) pressure on house prices. There is evidence that construction activity is relatively slow to respond to changes in housing market conditions. New construction is slow to put downward pressure on prices during high demand periods. Therefore, higher prices can lead to overbuilding, which ultimately could result in excessive price falls.

- Institutional factors – include changes in the regulations affecting lending institutions, changes in the behaviour of those institutions (e.g. lending criteria), and changes in fiscal (e.g. home owner subsidies) and monetary policies (e.g. interest rates).
- Location factors – there is evidence that differences in the behaviour of house prices can persist between regions and between price tiers (e.g. the lower and upper ends of markets) within regions.
- Financial factors – includes changes in tax rates, inflation, share prices and interest rates.
- Demographic factors – changes in the growth rate and composition of the population. Amongst these the growth of the house buying "age-cohorts" and immigration are important.
- Industrial factors – changes in industrial activity can be exaggerated in regions or locations that rely on a small range of industries for employment.
- Speculative price bubbles – for periods of time prices may be inconsistent with the fundamental forces of supply and demand (i.e. current price movement may simply reflect past price movements).

Research on the behaviour of market participants indicates house buyers and sellers often have price expectations (current and future) that are inconsistent with the way markets actually work. Case and Shiller (1988) survey of house buyers in four United States cities found that the "popular model" employed by most participants varied significantly from the true "economic model" of housing markets. The results of their survey showed:

- None of the respondents noted fundamental factors related to current or future supply or demand trends as determining prices.
- There was a strong speculative motive behind house prices in some regions.
- There appeared to be a view that in boom cities prices could not fall. Most respondents anticipated little or no risk in buying a house.
- There was evidence of "shortage illusion" i.e. the belief that price changes will not tend to restore equilibrium. Respondents in boom cities tended to believe that house price increase would continue indefinitely.
- Housing markets are strongly influenced by recent local experience; with price expectations almost entirely based on past price movements.

Given the foregoing, MUREAU assert that there are only limited numbers of people who are suitably qualified (i.e. have the knowledge and experience) to comment on given sections of the property market.

Of the range of qualitative forecasting models, MUREAU's approach is most closely aligned to the "Delphi method". The "Delphi method" uses questionnaires to elicit responses from panels of experts and produce predictions of what future events will be or when they will occur. More particularly, MUREAU's approach mirrors the NZIER Quarterly Survey of Business Opinion model, whereby survey panelists are asked to indicate either up, down, or the same in response to a series of questions and the collected data is then analysed using the "net method" (see Section 3.2 Survey Methodology).

2.3 The Accuracy of Forecasts

Hargreaves (1998) notes that the literature on economic forecasts gives forecasters mixed reviews. For example, Cho (1996) suggests that individual forecasters may have a tendency

to take extreme positions because the payoffs for getting the forecast right are professional awards and positive media attention. Cronshore (1996) concludes that although surveys of United States inflation forecasts had a bad reputation in the early 1980's the forecasts have since improved. Baghestani and Nelson (1995) note that while the media tend to report forecasts that miss the mark, the consensus of professional forecasts is superior to the naï ve forecast; accuracy improves with shorter time horizons and although no single forecaster was consistently accurate, the average group forecast error was relatively low.

In reference to forecasting methods, Makridakis et al (1998) notes that empirical studies lead to the conclusion that simple forecasting methods do at least as well as statistically complex methods, even when a few series are involved and judgmental adjustments can be made by expert forecasters. They conclude that the weight of evidence suggests that judgmental forecasts are not necessarily any more accurate than statistical ones, particularly when forecasts are made on a frequent basis and/or when data can be quantified.

Sources of Forecasting Errors

Featherstone and James (1994) note three basic sources of errors that can potentially affect the accuracy of economic forecasts:

- Assumptions regarding exogenous events or circumstances.
- Quality of the base data.
- Specification of the economic models or forecasting techniques used.

With reference to qualitative forecasts judgmental bias is often a problem. According to Makridakis et al (1998) common judgmental biases include:

- Anchoring – being unduly influenced by initial information.
- Attribution of success and failure – believing success is attributable to one's skills and failure to bad luck or someone else's error.
- Availability – relying upon specific events easily recalled from memory.
- Conservatism – failing to change (or changing slowly) one's mind to new information.
- Conventional wisdom – information over-load and being unable to discriminate between useful and irrelevant information.
- Illusory correlation – believing that patterns or relationships exist when they do not.
- Inconsistency – being unable to apply the same decision criteria in similar circumstances.
- Optimism – preferences for future outcomes influencing overoptimistic predictions.
- Recentness – the memory of recent events dominating less recent events.
- Regression effects – rather than a genuine trend, continual increases (or decreases) might be due to chance.
- Search for supportive evidence – gathering data that supports certain conclusions.
- Selective perception – seeing problems in terms of one's own background and experience.

The consensus of literature on judgmental biases points in the same direction: judgmental biases do not imply ineptness on the part of the forecaster(s), rather they result from the way the mind operates in its attempts to reconcile conflicting information and objectives.

2.4 The New Zealand Experience

The NZIER has a practice of analysing the performance of their business opinion surveys and allied economic forecasts. This has resulted in a range of observations:

- In relation to the business opinion survey there is a slight negative bent in respondents' opinions regarding profits, service sectors are generally more optimistic than industrial sectors, the mean of responses generally equates with the net balance figure.
- No forecaster can accurately predict every variable forecast. For specific variables some forecasters may be more accurate than others, but few will consistently outperform others across either time or variable.

It is interesting to note that architects (included in the NZIER business opinion survey) to some extent predicted the commercial property market crash of the late 1980's. Following the 1987 New Zealand stock market crash architects responses to the Institute's business opinion survey indicated a massive downturn in their work. From a position of abundant design work in hand architectural practices were hit with cancelled work orders and staff layoffs, all at a time when the "crane index" was at an all time high.

The NBNZ publishes monthly survey data on business people's expectations of 12-months ahead CPI inflation. It reports the average response after removing responses that exceed three standard deviations from the mean. An analysis of the survey series by Razzak (1997) found that:

- The survey's predictive power was better than that of "random walk" and "ARIMA" time series models.
- When inflation is low and stable the survey's predictive power deteriorates.

Hargreaves (1998) in his paper *"Property Market Forecasting – How Good is it?"* assessed the accuracy of MUREAU's Auckland residential property market forecasts over the first year. In the first part of his paper simple linear regression was used to compare what the panelists forecast with what they actually experienced. Using net percentage experienced as the dependent variable and net percentage forecast as the independent variable the results for sale price, volume of sales, and combined price and volume showed that forecasts explained between 53 percent and 69 percent of the variation in what was subsequently experienced. Theil's *U*-Statistic was also computed to show that the overall performance of the panelists was superior to using the naï ve method of forecasting. The second part of the paper presented an analysis of the performance of the market forecasts by using Real Institute of New Zealand sales volume data and the median house price statistic as benchmarks for volume and price comparisons respectively.

Hargreaves concluded that:

- The panelists performed well by correctly predicting the direction of market price movements around 75% of the time.
- The panelists appeared to be better at predicting movements in sales volume as opposed to movements in sale price.

Don (1998) completed a similar study on MUREAU's Auckland, Wellington and Christchurch commercial property market forecasts, using data spanning a 15-month period.

He utilized national building consent data and the NBNZ Regional Economic Activity Index as benchmarks for market confidence and Quotable Value New Zealand (QVNZ) sales data as benchmarks for sales volume and price comparisons. He found that:

- The forecasts provided an accurate measure of general commercial property market confidence. They had a high positive correlation (R = 0.75) with the NBNZ Regional Economic Activity Index.
- Sales volume changes were more difficult to predict than price changes.
- No single group of respondents emerged as being more accurate than others.
- In most instances the overall net response proved to be more accurate than the individual group responses, indicating that the survey forecasts should continue to be published on an overall net response basis.
- Volume forecasting improved by lagging the sales data by one quarter; the effect on price was minimal as expected given the time series spanned a low inflationary period.
- Significant differences were found in the respondents' replies to the survey.

Both Hargreaves and Don noted that while the results were encouraging, the results were limited by the fact that they were based on short times series data (one year and 15-months respectively); and, accordingly further analysis using longer time series data would be desirable in due course.

This paper embraces Hargreaves and Don's recommendations; it reviews MUREAU's Auckland residential forecasts using data spanning a five-year period.

3. AUCKLAND RESIDENTIAL MARKET FORECASTS

MUREAU's first Auckland residential property market survey was done in June 1996. The survey provides a regional perspective. It takes a "broad brush" approach to forecasting market changes in the four Territorial Authorities (TAs) that make up the Auckland urban region: Auckland City, Manukau City, North Shore City, and Waitakere City. It does not capture information on suburbs or sub districts within the TAs, and as such it acknowledges that individual properties or subsections of a market may not move in tandem with overall market changes.

Of general interest, the combined TAs with a total population of just over 1 million form New Zealand's largest urban centre. Based on QVNZ figures (see Tables 3.1 and 3.2 below) Auckland City has the largest and the least affordable residential market, Waitakere the smallest and most affordable.

Table 3.1: Number of Residential Property Assessments June 2001

Territorial Authority	Houses	Flats	Sections
Auckland City	88,671	35,300	4,121
Manukau City	52,986	19,750	3,707
North Shore City	48,748	13,064	2,992
Waitakere City	45,849	4,279	3,099

Source: Quotable Value New Zealand

Table 3.2: Average Residential Sale Prices June 2001

Territorial Authority	Houses	Flats	Sections
Auckland City	334,170	213,774	185,321
North Shore City	294,149	225,605	138,263
Manukau City	241,268	196,627	121,397
Waitakere City	210,310	162,674	104,050

Source: Quotable Value New Zealand

3.1 Expert Panels

MUREAU panelists are all chosen on the basis of their property market expertise. By definition the number of "experts" in a given property market will be relatively small (Hargreaves, 1998). The number of "experts" for the Auckland region totals approximately 50; respondents for each Territorial Authority (TA) are about 30.

There are seven groups of respondents, all involved in the property market to varying degrees. Table 3.3 shows the profession of each group and the proportion they represent of the whole per TA.

Table 3.3: Respondent Groups in the Survey.

	% of Panelists			
Profession	Auckland City	Manukau	North Shore	Waitakere
Bankers	19	13	11	19
Valuers	27	26	31	27
Real Estate Agents	19	30	23	11
Conveyancing Solicitors	15	9	15	23
Property Owners	4	4	4	8
Property Developers	8	9	8	4
Property Analysts	8	9	8	8

To gain the panelists confidence MUREAU signs an individual confidentiality agreement with every member. Under the agreement all survey panelists remain anonymous, and all information provided by the respondents remains confidential to MUREAU. Once collated and recorded the individual responses are destroyed, and the results of the survey are published on an aggregate basis only.

3.2 Survey Methodology

The surveys are carried out on a quarterly basis. The questionnaires are mailed out and the panelists are asked to respond by freepost envelope or facsimile. Methodology is similar to business and consumer confidence surveys. For each of the four TAs:

- The panelists are asked to express their opinions on the general outlook for the property market over the next six months.

- In addition they provide detailed information on sale price, sales volume and market confidence changes expected over the next three months, compared to the situation experienced over the past three months, for housing, unit/apartments, and sections.

A copy of the questionnaire is shown in Appendix 1. The surveys ask panelists to mark one of three options: upward movement, downward movement, or no change. Panelists are not asked to forecast the percentage change in prices, volumes etc., but simply the direction.

The captured survey data is analysed using the "net method" i.e. the total percentage of respondents forecasting upward movement minus the total percentage of respondents forecasting downward movement. An example of the "net method" is provided in Table 3.4.

Table 3.4: Panelist Responses

Response	Quarter 1	Quarter 2	Quarter 3
Up	30	10	10
Same	60	70	60
Down	10	10	30
N/A	0	10	0
Net response	Up	Same	Down

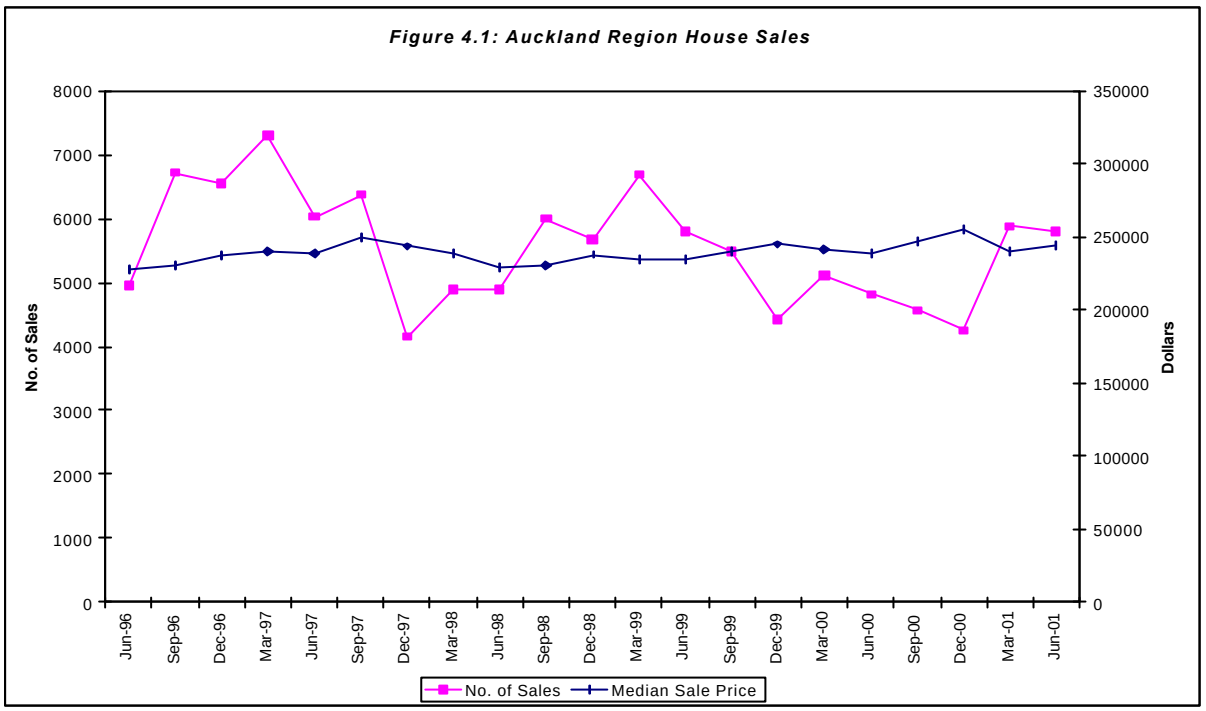
In Quarter 1: 30% of respondents expected the market to move up, 60% expected it to remain unchanged, and 10% expected it to move down. The result, net 20% for up (the percentage answering up minus the percentage answering down) implies a forecast improvement in the market. In Quarter 2, 10% expected the market to move up, 70% to remain unchanged, and 10% to move down. While, 10% were undecided or did not offer an opinion. The net percentage is zero (upward forecasts exactly balance downward forecasts) or a forecast of no change in the market. Quarter 3 is simply the reverse of Quarter 1 (net 20% for down); the market is forecast to deteriorate.

3.3 Survey Results

The results of the surveys are published on a quarterly basis. An example of the Auckland residential survey publication is attached at Appendix 2.

4. ANALYSIS OF FORECASTING PERFORMANCE

The forecasts cover the period 1 June 1996 to 31 August 2001, a total of 21 quarters. Figure 4.1 shows a plot of quarterly sales volume and median dwelling price data (from the quarter ended 31 August 1996) for the Auckland Metropolitan Region. Sales volume movements were quite volatile, displaying seasonality and cyclical behaviour, while the median dwelling price remained stable/shows modest growth.



Source: Real Estate Institute of New Zealand

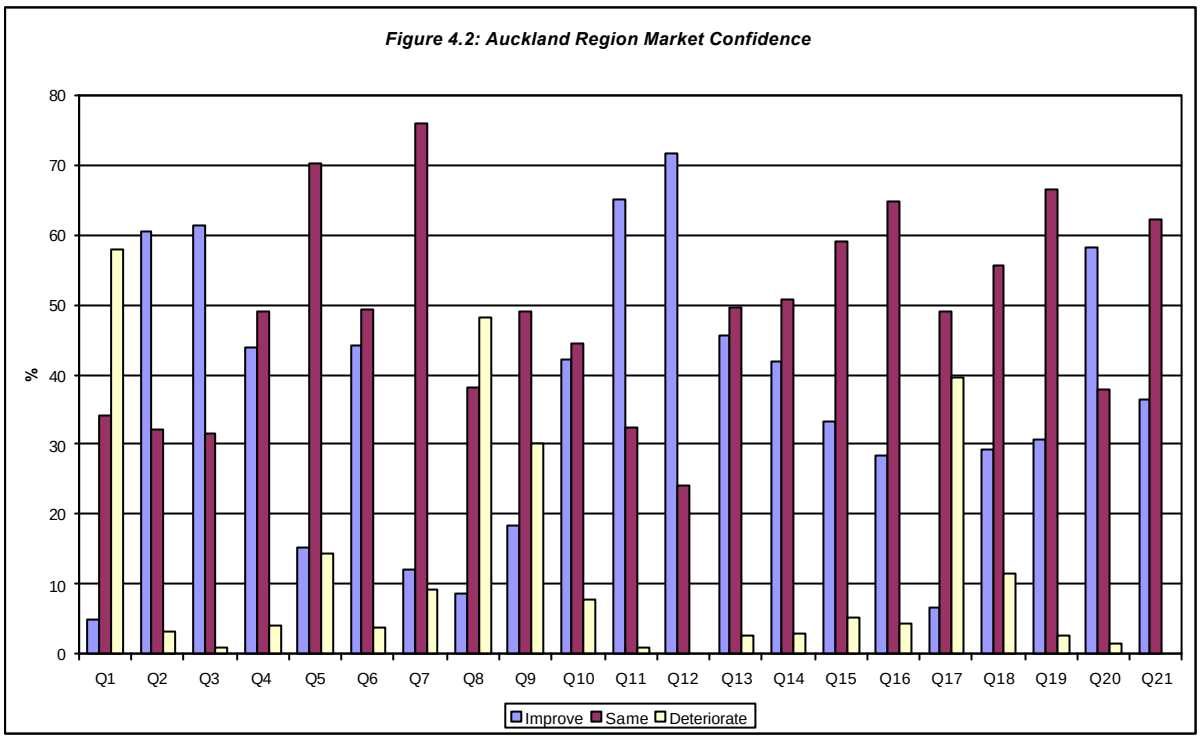
In particular, changes to immigration policy, mortgage interest rates and economic outlook appear to have had a significant impact on the market. In regard to sales activity, after peaking in mid 1997 there was a sharp drop through to early 1998 coinciding with a slowdown in immigration and weak consumer confidence; then a rise over the next twelve months, with a fall in interest rates and improved housing affordability. From mid 1999 to the end of 2000 uncertainty over Government policy, rising mortgage interest rates, the low New Zealand dollar, and rising fuel and retailing prices variously dampened investment. Latterly, sales activity has increased again, with a fall in interest rates and improved housing affordability. Some these factors as contributors to price stability, are the result of Government economic policies. Government, like many globally has recognised the importance of keeping inflation at low levels and economic policies recognise this. The Reserve Bank has a 0-3% inflation target zone.

4.1 Market Confidence

Question One of the survey relates to confidence in the real estate market. It asks, do you consider that the residential market will improve, remain the same or deteriorate during the next six months?

4.1.1 Market Confidence Responses

Confidence data for all four TAs is aggregated into Figure 4.2. The correlation between improvement and same is –0.54, and –0.76 between improvement and deterioration. This infers that the respondents believe the market has been in decline over the survey period.



Question One confidence data for each TA exhibit similar results. In each instance there is a general trend from improvement towards same.

4.1.2 Comparison with Consumer Confidence

Survey results are compared to WestpacTrust McDermott Miller Consumer Confidence Index survey data for Auckland, by constructing a MUREAU index adopting WestpacTrust McDermott Miller Consumer Confidence indexing methodology. The index base is 100; net percentage data (i.e. the total percentage of respondents forecasting upward movement minus the total percentage of respondents forecasting downward movement) for each quarter is then added or subtracted from the base depending upon whether it implies upward or downward movement. An index number over 100 indicates improvement (or there are more optimists than pessimists), while a number under 100 indicates deterioration (or that pessimists outnumber optimists).

WestpacTrust McDermott Miller Consumer Confidence surveys date pre 1990s. The survey questionnaire – index component questions are as follows:

1. Thinking about how you are getting along financially these days, would you say you and your family are better off or worse off financially, than you were this time last year?
2. Looking ahead to this time next year, do you expect you and your family to be better off financially or worse off or about the same as now?
3. Now thinking of the economic conditions in New Zealand as a whole. During the next 12 months, do you expect we'll be having mainly good economic times, or mainly bad economic times?
4. Looking ahead now, in the next five years do you think New Zealand as a whole will have mainly good economic times, or will we have mainly bad economic times?
5. Now thinking about major household purchases. Do you think now is a good time or a bad time to buy major household items?

WestpacTrust McDermott Miller Consumer Confidence survey results reflect many economic factors, some of which may or may not impact on property. The purpose in comparing consumer confidence with MUREAU confidence was to determine if there were similar trends.

Figure 4.3 shows a comparison of the indexes (with MUREAU data for the four TAs aggregated). The MUREAU respondents confidence is generally more extreme than consumer confidence. However, MUREAU confidence and consumer confidence moves in the same direction in 15 quarters or 75% of the time. This indicates a good correlation between MUREAU confidence and general consumer confidence.

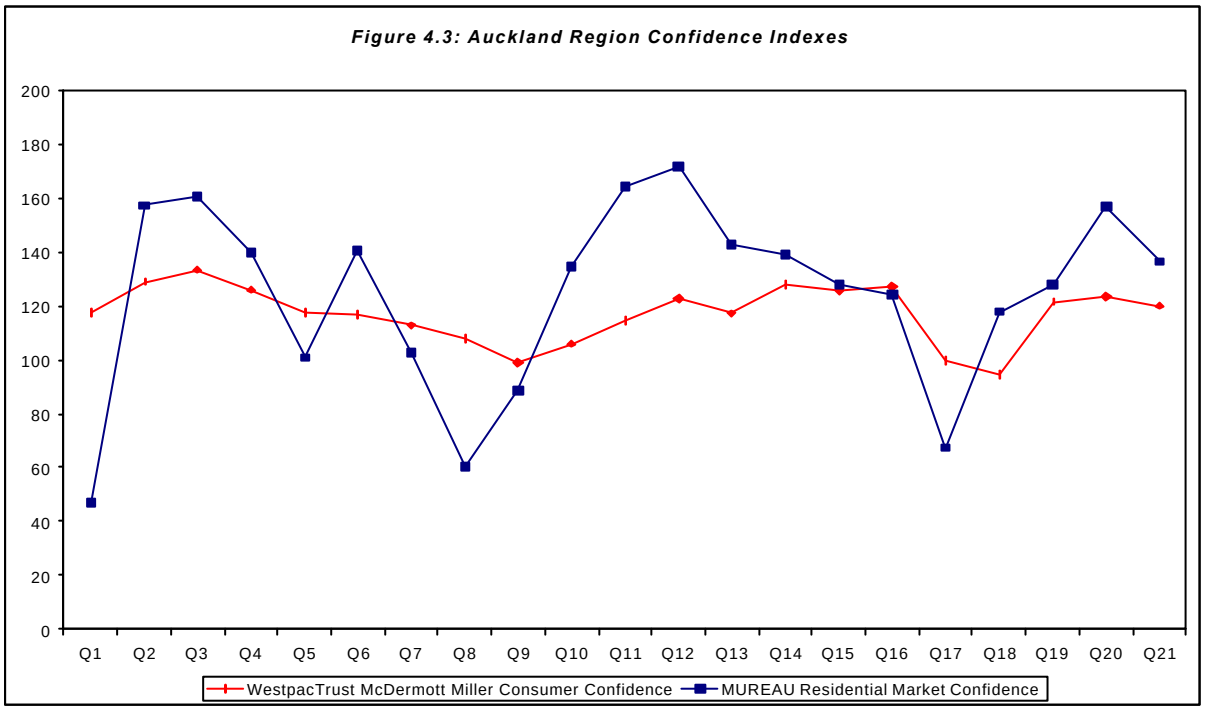


Table 4.1 shows the correlation coefficients (R) between the MUREAU Market Confidence and WestpacTrust McDermott Miller Consumer Confidence indexes.

Table 4.1: Correlation Coefficients for MUREAU and WestpacTrust Surveys

Territorial Authority	R
Auckland City	0.500
Manukau City	0.539
North Shore City	0.514
Waitakere City	0.595
Overall	0.545

This indicates that there is a positive linear relationship between the MUREAU Market Confidence and WestpacTrust McDermott Miller Consumer Confidence indexes.

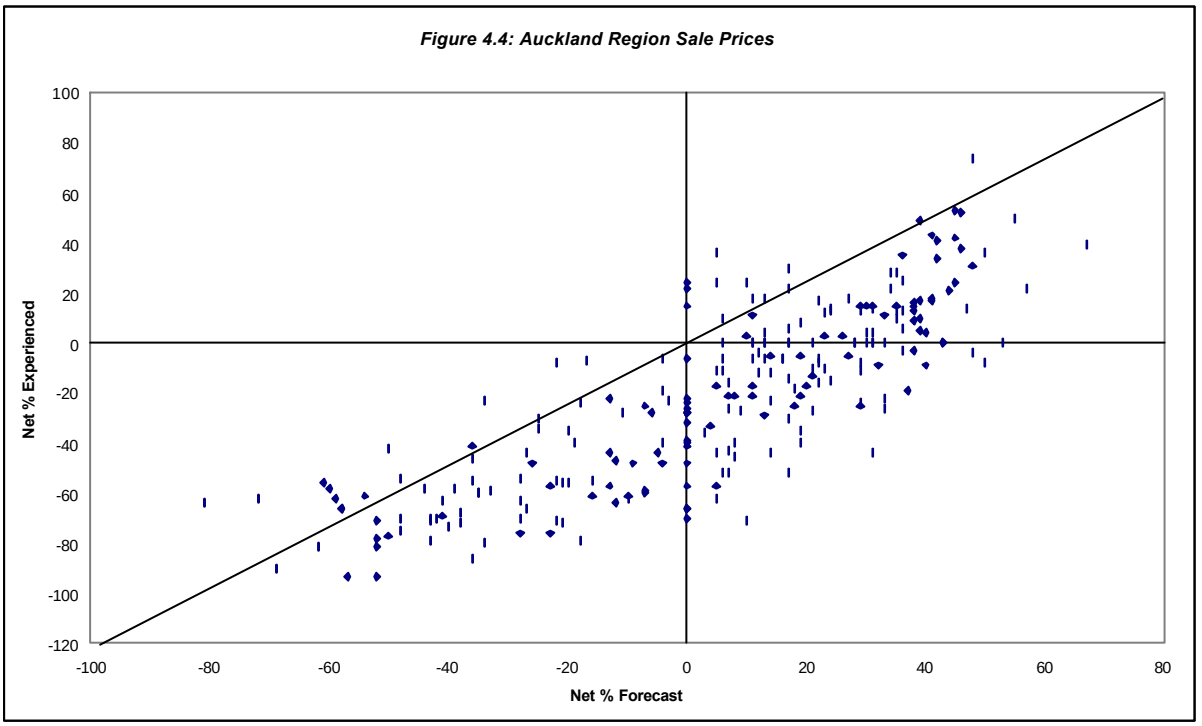
As noted earlier in the literature review section of this paper property markets are especially complex. The distinctive characteristics of property; the individual market characteristics, fixed capital commitment etc. may help to explain variations in movement/direction between MUREAU confidence and consumer confidence.

4.2 Comparing Forecast with Experienced

The second part of the MUREAU survey incorporates the capture of sale price and volume of sales information. It asks, basing your opinion on the work done in your own office, what has been your experience in the past three months and what changes do you expect during the next three months in relation to change in sale prices and volume of sales?

Housing sale price data from all four TAs in the Auckland Region is aggregated into the scatterplot shown in Figure 4.4. It shows a plot of what the panelists forecast versus what they ultimately experienced.

Figure 4.4: Auckland Region Sale Prices



In the unlikely event that the forecasts perfectly matched experienced, then all the points on the graph would fall along an upward sloping 45-degree line through the origin. A more likely scenario is for the points to be randomly distributed on either side of a theoretical upward sloping 45-degree line (Hargreaves, 1998). In this case there appears to be a bias indicating that the forecasts were generally more optimistic than what was subsequently experienced.

A simple linear regression was also undertaken on the aggregated TA housing data. Net percentage experienced was inputted as the dependent variable and net percentage forecast the independent variable. The results of the regressions for sale prices and sales volume are shown in Table 4.2. The statistics show that forecast explains between 56 and 67 percent of the variation in what was subsequently experienced.

Table 4.2: Auckland Region Regression Outputs

Statistic	Sale Prices	Sales Volume
R	0.820	0.750
R Square	0.672	0.562
Adjusted R Square	0.671	0.561
No. of Observations	252	252
Standard Error	0.042	0.053
T	22.651	17.923
Sig. T	0.000	0.000

Unexpected events subsequent to the forecasts being made do impact on what was experienced. Changes in exchange rates and mortgage interest rates can fall into the unexpected event category.

The data was also analysed using Theil's *U*-statistic. This statistic provides a relative basis for comparing formal forecasting methods with naïve approaches (Makridakis et al, 1998). The ranges of the *U*-statistic can be interpreted as follows:

- $U = 1$: the naïve method is as good as the forecasting method being evaluated.
- $U < 1$: the forecasting method being evaluated is better than the naïve method.
- $U > 1$: the naïve method is better than the formal forecasting method.

The naïve method uses the most recent observation as a forecast. It assumes what happens in the next period will be the same as what has just occurred. The *U*-statistics for changes in house sale prices and sales volumes are shown in Tables 4.3 and 4.4 respectively.

Table 4.3: Theil's U-statistics for House Prices – Forecast with Experienced

Territorial Authority	Low Cost	Medium Cost	High Cost
Auckland City	1.037	1.134	1.556
Manukau City	0.983	1.122	1.008
North Shore City	0.737	0.994	0.967
Waitakere City	1.136	1.355	1.360

Table 4.4: Theil's U-statistics for House Sales Volume – Forecast with Experienced

Territorial Authority	Low Cost	Medium Cost	High Cost
Auckland City	0.902	1.253	1.449
Manukau City	0.871	0.655	0.769
North Shore City	0.824	1.173	1.280
Waitakere City	0.647	0.844	0.698

The panelists appear to be doing much better than the naïve method in forecasting changes in sales volumes (in particular in the more affordable TAs Manukau and Waitakere, and the low cost housing category in Auckland City and North Shore). The panelists are inferior in forecasting changes in prices. The latter finding is not necessarily surprising given empirical studies of business surveys have found that when inflation is low and stable the predictive power of surveys deteriorate (see Razzak, 1997). Not too much should be read into comparing forecast with experience. It must be remembered that panelist opinion is based on work done in their office, and it is possible that the panelist experience may not coincide with actual market outcomes. The next section compares forecasts with actual sales (price and volume) data.

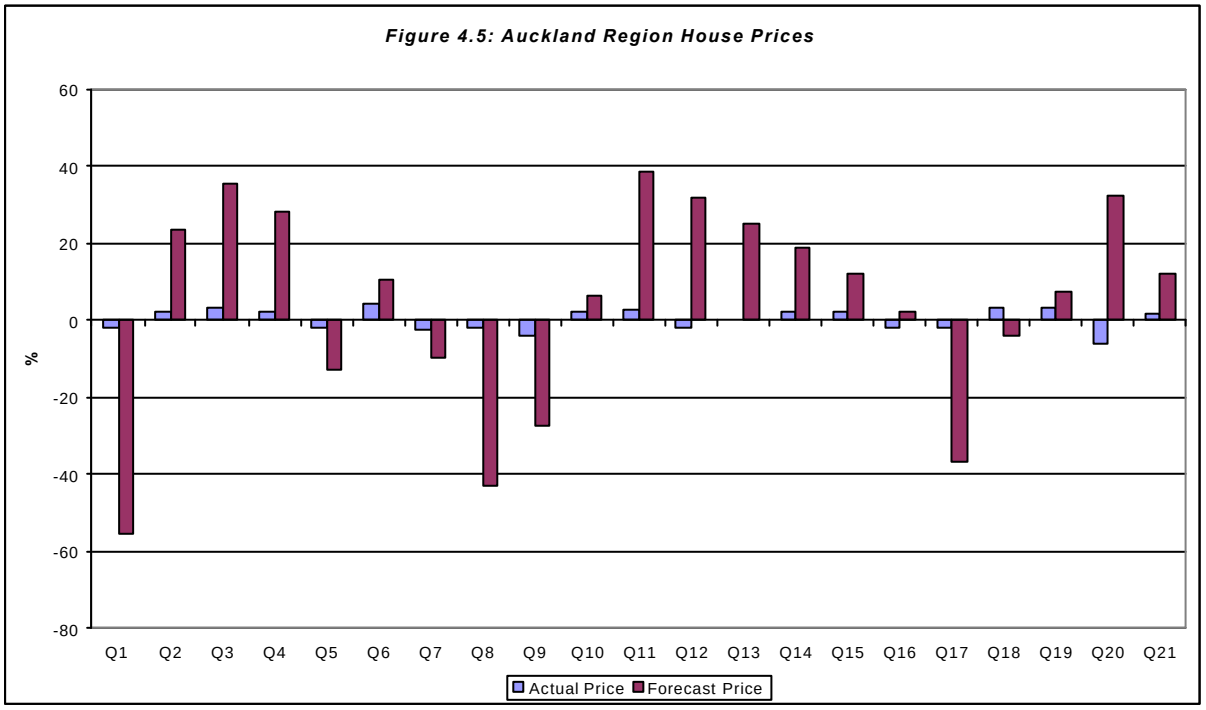
4.3 Comparing Forecast with Actual

With real estate, sourcing market data and measuring performance is not a simple task. Residential property has the best set of regularly published historical sales data, namely:

- Real Estate Institute of New Zealand (REINZ) Market Statistics - monthly series.
- Quotable Value New Zealand (QVNZ) Sales Statistics – quarterly and half-yearly series.

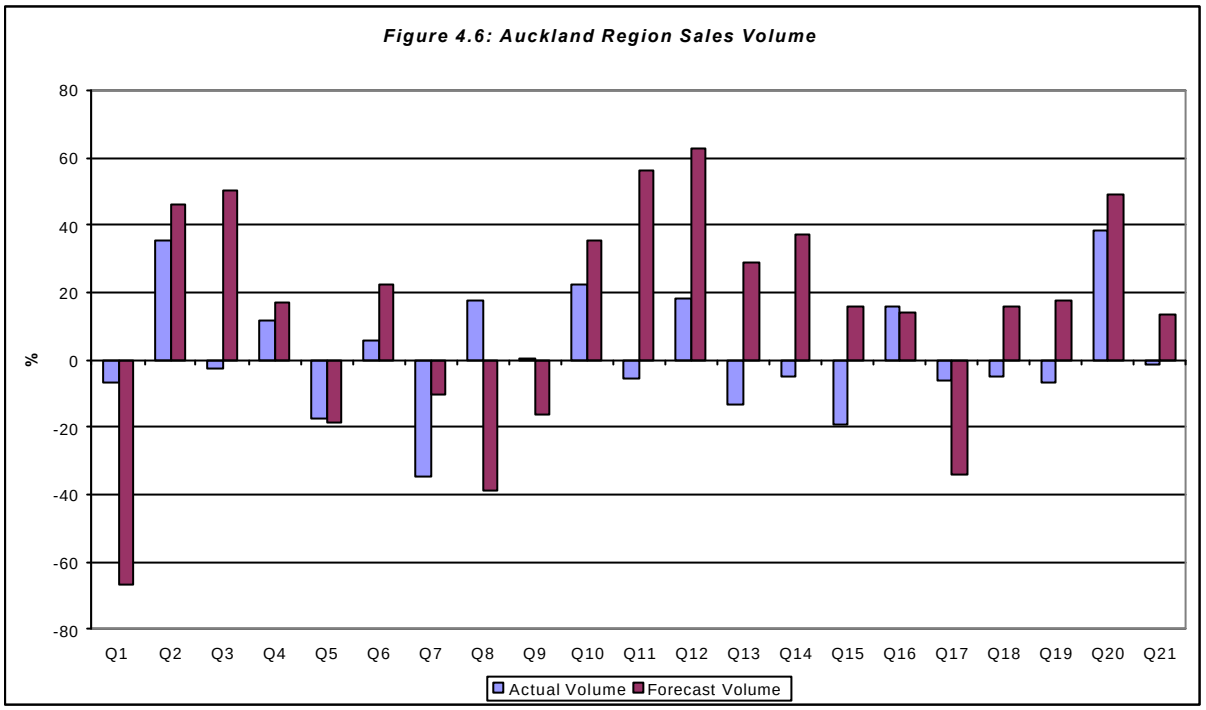
In this section of the paper, REINZ statistics are used to compare sale price and volume forecasts with actual changes in prices and sales volumes. QVNZ data has been rejected because of time lag problems associated with their sales data; also with the enactment of the Rating Valuations Act 1998 there is no longer a mandatory obligation for Territorial Authorities to forward sales data onto QVNZ. With the large volume of sales in Auckland, the REINZ median dwelling price statistic is considered a reliable benchmark for price comparison. The figures are released monthly by REINZ via a survey of member agencies' sales during that specific month

Figures 4.5 and 4.6 show comparisons of actual percentage change with net percentage of panelists. Once again data from the four TAs is aggregated. Readers should remember that panelists are not asked to forecast the percentage change in prices or volumes, rather they are simply asked to forecast the direction of change.



In Figure 4.5: Auckland Region House Prices, the panelists forecast the direction of the market changes correctly in 16 of the 21 quarters, or 76% of the time. This indicates a good correlation between the actual percent market price change and the net percent forecast. It can be concluded that if the panelists forecast a particular price direction movement then it is extremely likely that the market will move in this direction.

Figure 4.6 shows percentage changes in the quarterly volume of house sales in relation to forecasts. The panelists have correctly forecast the direction of volume changes in 11 of the 21 quarters, or 52% of the time.



The results of the analysis on changes in house sale prices and sales volumes for each TA are recorded in Table 4.5. The percentages represent the number of times the forecasts match actual sales data over the 21 quarters. The results indicate that price changes are more difficult to predict in North Shore and Waitakere.

Table 4.5: Territorial Authority Sales – Forecast with Actual

	Correct Forecasts	
Territorial Authority	Sale Prices (%)	Sales Volume (%)
Auckland City	71	62
Manukau City	62	52
North Shore City	50	57
Waitakere City	57	62

It is not simple to work out why the panelists were wrong in some quarters. Changes to the political environment, immigration policy, mortgage interest rates and economic outlook may have impacted at various stages. Obviously, any system of forecasting is unlikely to turn out correct all the time. As noted earlier, unexpected events can/do influence actual outcomes. One of the strengths of quarterly forecasts, such as the MUREAU forecasts, is the ability of panelists to quickly adjust their forecasts to incorporate new information.

4.4 Respondent Groups: Comparing Forecast with Actual

The results of the analysis comparing the respondent groups with actual changes in house sale prices and sales volumes are recorded in Table 4.6. Data from the four TAs is aggregated; once again, the percentages represent the number of times the forecasts match actual sales data.

Table 4.6: Respondent Group Comparison with Region Sales – Forecast with Actual

	Correct Forecasts	
Group	Sale Prices (%)	Sales Volume (%)
Bankers	57	62
Valuers	71	57
Real Estate Agents	81	38
Conveyancing Solicitors	71	52
Property Owners	38	33
Property Developers	53	26
Property Analysts	24	35

Bankers (62%) are the most accurate group at forecasting volume changes, followed by Valuers (57%) then Solicitors (52%). This is not too surprising, given these groups are widely involved in the sale process (loan application, valuation, conveyancing) and can observe emerging market trends before official statistics are available. What is surprising is the poor performance of Real Estate Agents (correct only 38% of the time).

Real Estate Agents do redeem themselves when forecasting changes in price. They are the most accurate group (81%), followed by Valuers and Solicitors (both 71%). Agents and Valuers should be leading the way or near the top, since they are often involved in setting prices/rely on the latest sales information in providing their services.

Not too much should be read into the lesser performances of the owner, developer and analyst groups as their results are heavily influenced by low response rates.

Table 4.7: Group Forecasts Comparison with Overall Forecasts

	Most Accurate Group (%)	Overall Accuracy (%)
Sale Prices	81	76
Sales Volume	62	52

For Auckland the most accurate group's forecasts were marginally ahead of overall forecast accuracy. However, no one group is the most accurate at forecasting changes in both price and volume and the overall forecasts are generally more accurate than the majority of individual group forecasts. These observations suggest that MUREAU Auckland residential market survey results should continue to be published on an overall net response basis rather than the net responses of any individual group.

The volatility of housing sales volumes over the past five years has obviously contributed to the panelists lesser performance in predicting volume changes. It is interesting to note that when sales volume data is seasonally adjusted there is no noticeable improvement in the panelists' forecasts. This suggests that the panelists are building seasonal effects into their responses to the survey questions.

5. CONCLUSIONS

This paper has examined the accuracy of MUREAU Auckland residential property market forecasts since their inception five years ago. It is important to be aware of how a forecasting model has performed in practice; can it be improved upon etc.?

During the past five years housing sales volumes have been quite volatile, while prices have remained stable/show modest growth. Against this background the expert panelists have performed reasonably well. Overall, the panelists appear better at forecasting movement in sale price than movements in volume.

When sales volume data is seasonally adjusted there is no noticeable improvement in the panelists forecasts. This suggests that the panelists are building seasonal effects into their responses to the survey questions.

Market confidence is seen to be in decline over the period, trending from improvement to same. This is expected given New Zealand's current low inflation environment. Results show there is a positive linear relationship between MUREAU confidence and consumer confidence. However, variations between the two remind us that property markets are complex and the reading of consumer confidence is not a reading of property market confidence.

No one group was the most accurate at forecasting changes in both price and volume, and the groups as a whole generally performed better than the majority of individual groups. This suggests that MUREAU Auckland residential market survey results should continue to be published on overall net response basis rather than the net responses of any individual group.

Obviously, any system of forecasting is unlikely to turn out correct all the time. The survey data has its limitations. Unexpected events can influence actual outcomes (examples might be changes to exchange rates, interest rates, political environment, September 11 terrorist attack on the United States etc.). MUREAU surveys are a sample of the population of property professionals; sampling introduces error. Small sample size of some groups, non-responses to parts of questions etc. can be seen as possible limitations. There may also be an element of bias within the surveys, as the respondent groups do not necessarily represent the entire range of property experts.

Despite the foregoing the surveys are still valuable; one of the strengths of quarterly forecasts, is the ability of panelists to quickly adjust their forecasts to incorporate new information. The survey data is not used to represent anything other than the groups involved.

Future research/further analysis should be undertaken in due course on balance MUREAU Real Estate Outlook Surveys. It is not practical to shorten survey-reporting periods from three months. However, analyses using longer time series would be useful, to allow more detailed judgement of overall trends, cyclical effects, and "unexpected events".

In regard to residential markets price change analyses could be carried out using an alternative measure from the REINZ median dwelling price statistic. The median has the advantage of simplicity (calculation and interpretation), but it possesses serious limitations particularly in low volume sales/small markets. An improved method for measuring price changes might be a regression-based index. Such a method would more likely better capture market dynamics.

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Appendix 1

REAL ESTATE MARKET OUTLOOK SURVEY
AUCKLAND REGION RESIDENTIAL PROPERTY

Massey University Real Estate Analysis Unit
Department of Finance, Banking & Property
Massey University
Fax (06) 350-5651

Number:_____

CONFIDENTIAL

Forecast Period: **1 Dec. 2001 - 28 Feb. 2002**

INSTRUCTIONS: This survey relates to residential real estate transactions. The objective is to forecast the volume of transactions, the price levels, and confidence in the market. Please indicate answers by ticking the appropriate boxes. (✓). Please complete the questionnaire as soon as possible and return in the freepost envelope.

1) Do you consider that the residential property market in the Auckland Urban Region will improve, remain the same or deteriorate during the next six months?

☐ Improve	☐ Same	☐ Deteriorate	☐ N/A

2) Basing your opinion on the work done in your own office, what has been your experience in the past three months and what changes do you expect during the next three months in relation to change in **SALE PRICES, VOLUME OF SALES, AND CONFIDENCE IN THE MARKET** for each of the following sectors?

SALE PRICE CHANGES

Experienced change in **PAST** three months					Expected change in **NEXT** three months			
Up	Same	Down	N/A		Up	Same	Down	N/A
				Housing less than $200,000				
				$200,000 - $400,000				
				exceeding $400,000				
				Units/Apartments				
				Sections				

VOLUME OF SALES

Experienced change in **PAST** three months					Expected change in **NEXT** three months			
Up	Same	Down	N/A		Up	Same	Down	N/A
				Housing less than $200,000				
				$200,000 - $400,000				
				exceeding $400,000				
				Units/Apartments				
				Sections				

CONFIDENCE IN THE MARKET

Experienced change in **PAST** three months					Expected change in **NEXT** three months			
Up	Same	Down	N/A		Up	Same	Down	N/A
				Housing less than $200,000				
				$200,000 - $400,000				
				exceeding $400,000				
				Units/Apartments				
				Sections				

IMPORTANT: ***Please write any comments on individual markets overleaf.***

REAL ESTATE MARKET OUTLOOK SURVEY

Auckland Region Residential Property

June 2001

Quarterly Survey Volume 6, Number 2

Prepared by Garry Dowse# and Bob Hargreaves#

DATA SOURCE

This survey is based on confidential questionnaires completed each quarter by a panel of Auckland real estate market experts drawn from leading Bankers, Solicitors, Developers, Real Estate Agents, Property Consultants, Property Managers, Valuers, Property Owners and Property Analysts.

Favourable mortgage rates underpin Auckland market

This quarterly MUREAU publication covers the outlook for the residential property market in Auckland City.

Detailed results of the survey are set out on the second page of this publication. The graph on the right compares the predicted confidence for this quarter, broken down into market sectors, with the results from the previous four quarters.

Responses to our latest survey indicate a stable outlook for the Auckland City residential property market. According to the vast majority of respondents (83%) the market will remain the same in Auckland City over the next six months, the balance 17% anticipate an improvement (down from 61% expecting an improvement the previous quarter).

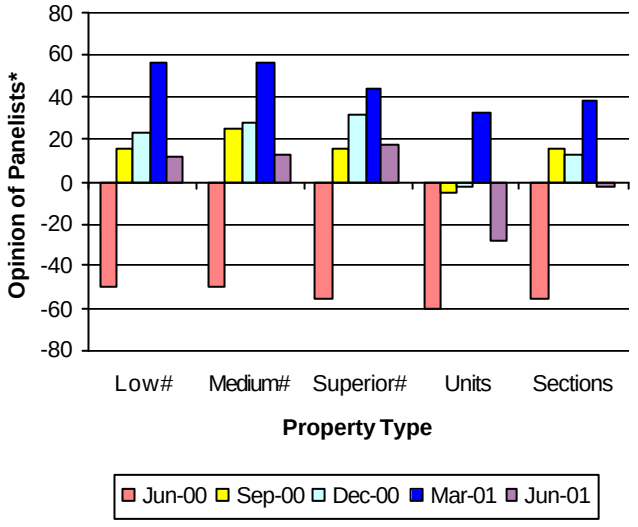
Comments from respondents note the first half of this year has been generally positive for Auckland real estate with low mortgage interest rates, improving activity and stable prices. Results are, however, said to be mixed across the market; while housing is meeting good demand, the apartment sector is characterized by negative sentiment after the recent failure of a number of high profile players and the emergence of poor returns once rental guarantees end.

The panelists believe similar will extend into the next quarter. Better than two-thirds of respondents are forecasting housing turnover and prices to stay the same over the next three months. The balance of opinion is weighted towards increases (for the lower and upper ends of the market). In regard to units/apartments the panelists are less positive. While the majority of respondents forecast sales volumes and prices to remain the same, the remainder is expecting falls.

The survey also captures information on the Manukau, North Shore and Waitakere residential markets. Panelist expectations for these areas are generally consistent with the Auckland City predictions.

Readers should note that this survey takes a 'broad brush' approach to forecasting changes in the Auckland Region residential property market. It is acknowledged that individual properties and subsections of the market may not move in tandem with overall market changes.

Expected Confidence in the Market
Quarterly Comparisons



Price ranges for residential housing.

*This represents the percentage of panelists responding that the market will increase minus the percentage saying it will decrease.

Appendix 2

#Property Studies Group

*The numbers in the boxes are expressed as percentages

Quarter: **1 June - 31 August 2001**

1) Do you consider that the residential property market in **Auckland City** will improve, remain the same or deteriorate during the next six months?

Improve	Same	Deteriorate	N/A
17	83	0	0

2) Basing your opinion on the work done in your own office, what has been your experience in the past three months and what changes do you expect during the next three months in relation to change in **SALE PRICES, VOLUME OF SALES, AND CONFIDENCE IN THE MARKET** for each of the following sectors?

Sale Price Changes

Experienced change in **PAST** three months (%)				Expected change in **NEXT** three months (%)			
Up	Same	Down	N/A	Up	Same	Down	N/A
11	72	17	0	17	72	11	0
5	85	5	5	5	85	5	5
28	56	11	5	17	78	0	5
5	50	40	5	0	78	17	5
5	73	5	17	0	78	11	11

Housing less than $230,000
$230,000 - $400,000
exceeding $400,000
Units / Apartments
Sections

Volume of Sales

Experienced change in **PAST** three months (%)				Expected change in **NEXT** three months (%)			
Up	Same	Down	N/A	Up	Same	Down	N/A
56	39	5	0	22	67	11	0
56	39	0	5	11	73	11	5
56	34	5	5	17	73	5	5
11	73	11	5	5	68	22	5
17	66	0	17	5	61	17	17

Housing less than $230,000
$230,000 - $400,000
exceeding $400,000
Units / Apartments
Sections

Confidence in the Market

Experienced change in **PAST** three months (%)				Expected change in **NEXT** three months (%)			
Up	Same	Down	N/A	Up	Same	Down	N/A
50	39	11	0	22	67	11	0
50	45	0	5	17	73	5	5
45	50	0	5	17	78	0	5
5	50	40	5	0	67	28	5
17	61	5	17	10	62	11	17

Housing less than $230,000
$230,000 - $400,000
exceeding $400,000
Units / Apartments
Sections

Massey University Real Estate Analysis Unit

The primary objective of the Massey University Real Estate Unit (MUREAU) is to provide reliable property information to the property industry, the land related professions and the public.

The Director of MUREAU is Professor R.V.(Bob) Hargreaves. MUREAU also offers a consulting service for individual clients. MUREAU publications, free on request, are:

1 AMP Banking Home Affordability Report (Quarterly)
2 Rural Real Estate Market Outlook (Quarterly)
3 Auckland Commercial Market Outlook (Quarterly)
4 Christchurch Commercial Market Outlook (Quarterly)
5 Wellington Commercial Market Outlook (Quarterly)
6 Auckland Residential Market Outlook (Quarterly)
7 Christchurch Residential Market Outlook (Quarterly)
8 Wellington Residential Market Outlook (Quarterly)
9 NZ Residential Rental Market (Quarterly)

Enquiries

Concerning this publication and other research papers prepared by MUREAU may be addressed to:

MUREAU
Department of Finance, Banking and Property
Massey University
Private Bag 11 222
Palmerston North

Telephone: ☎+64 6 350 5799 ext. 2323
Facsimile: 📠+64 6 350 5651

http://property-group.massey.ac.nz/mureau/mureau.htm