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House Price Measurement in New Zealand and Australia

1 Introduction

House Price Measurement in New Zealand and Australia is a stocktake of the different house price measures available in New Zealand and Australia. We summarise them on a number of dimensions – quality adjustment, timing of data, weighting scheme, coverage – and look at how the measures compare over the short and long term.

The good news is that, despite challenges and limitations on how we can measure house prices, the long-run trends of house prices tend to be very similar. This observation was also the case in a recent study of the seven available UK measures (Wood, 2005), and implies that there are no systematic biases creeping into our measurements. It is the shorter-term measurements (which of course are the ones that are the most influential on a day to day basis) that can vary across different methods.

Around the world, there is increased focus on the measurement of house prices, and Eurostat is currently starting to compile a best practices manual for this.

2 The challenges of house price measurement

The measurement of house prices is challenging for these reasons: quality adjustment, timing, and weighting.

2.1 Quality adjustment

The characteristics and selling price of dwellings vary significantly across the entire dwelling population. We observe these only for the small proportion of houses that sell each month (or quarter). The composition of that sample is not necessarily representative of the entire stock of housing and also, changes in the composition of the sample can affect the estimate of price change.

There are many quality adjustment techniques used in the measurement of house prices, to try to remove the effect of the changing composition on the price measurement, and therefore to extract out the underlying price change that we are interested in. The most common are the hedonic regression, mix-adjustment (or stratification), and repeat-sales methods. New Zealand also uses a sale price appraisal ratio method.

However, even the most sophisticated method can only adjust for compositional change in terms of the variables observed and captured in the data. If the sample of houses sold changes in terms of characteristics that are not observed, and not strongly correlated with the observed variables, there is the risk that our measurement of the price change is being contaminated by the effect of the changing sample composition. Many of the house price measures incorporate only information on region. If, for example, more lower-quality houses are being sold this quarter than last quarter even after controlling for region, then the measured price change will be biased downwards.

The repeat-sales method (used for the well-known Case-Shiller index in the US) answers this issue by using pairs of sales for the same house, therefore ensuring that price changes are based on houses that are the same. This repeat-sales method raises a different set of issues – what if the dwelling had been renovated between sales (in which case the price change measured is due partly to the underlying price change for houses, and partly to the improvements made). Conversely, the house might not have been maintained, and therefore the price difference from one sale to the next would include the effect of a drop in quality. Also, how representative of the entire housing stock are those houses that sell more frequently? There are various ways to try to address these issues.

2.2 Timing

A house sale can be recorded at different points in time – when the sale is agreed, when mortgage finance is approved, when contracts are exchanged, or at the time of settlement.

For the purposes of measuring price changes for houses, it is desirable to select the earliest date at which the final purchase price is set. The point in time at which the price is first determined is when verbal agreement is reached. However, this information may be difficult to obtain and it is possible for the originally agreed sale price to be renegotiated. Approval of mortgage finance data is limited to those sales that involve

mortgages. Exchange of contracts data is timely, but may not always be readily available and could include some transactions that do not proceed. Data obtained from settlements is more accurate, but less timely.

2.3 Weighting

Price indexes can employ a variety of weighting practices: these are usually determined by the purpose and scope of the index and also by factors such as availability of weighting information, and what sort of information needs to be weighted.

With respect to the purpose and scope of the index, the Australian Bureau of Statistics (ABS) project homes index, for example, was designed as a component of the consumer price index (CPI), therefore it concerns the expenditure of consumers on new dwellings, and the weighting has been calculated to reflect this. The ABS established house price index was designed to measure changes in the price of the stock of houses. The weights are calculated as the value of housing stock and the observed prices collected every quarter are taken to represent the prices of the whole set of houses.

Even if the approach is to measure the change in price of some 'representative' house, a decision needs to be made on how changes in these price observations are to be weighted together (providing that there is more than one price observation).

In general, the estimates of house prices tend to be taken as an indication of the change in the entire housing stock, whether or not this has been explicitly built into the measurement methodology.

In practice, however, some indexes might use equal or implicit weights, for example if a geometric mean of price relatives is used (as in the Australian Property Monitor measure).

3 A summary of the situation in New Zealand and Australia

New Zealand does not have an official house price index, although the price of newly constructed houses (not including land) is measured for the New Zealand CPI.

However, there are two organisations that currently produce house price measures in New Zealand. The Quotable Value house price index (QVHPI) is considered to be the most reliable measure, but has a three-month time lag. The QVHPI is now produced by PropertyIQ Ltd, a joint venture partly owned by QV.

The Real Estate Institute of New Zealand (REINZ) produces a more timely monthly measure (10 days after reference period), but until recently this has been simply a national median price and as such, can be heavily affected by compositional change. Recently, however, REINZ has implemented a stratified median price index which closely tracks the QV measure.

In Australia, the Australian Bureau of Statistics (ABS) compiles a price index for established houses using a stratification approach. It is published in the quarterly publication *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0). This publication also includes the Project Homes Price Index which measures the cost of new houses excluding land, and a series of unstratified median prices of established house sales.

Several private organisations also publish price indexes or measures of average, median, or quality adjusted house price. Australian Property Monitors (APM) publishes stratified median prices on a quarterly and monthly basis; Residex publishes a repeat sales index; the Real Estate Institute of Australia (REIA) publishes median prices; RP Data Rismark uses a variety of methods, including the hedonic approach; and finally, a median price measure of houses purchased by first home buyers is produced by the Commonwealth Bank of Australia.

4 New Zealand's house price measures

4.1 Quotable Value's house price index

Quotable Value Ltd (QV) is a state-owned enterprise and is New Zealand's largest property valuation and information company. QV maintains a comprehensive property database on all property classes in New Zealand. The property database contains historic and current valuation data. QV also acquires sales records for all property sales from territorial authorities (TAs). These sales records include private sales and sales by developers, in addition to sales via real estate agents.

QV uses a sales price appraisal ratio (SPAR) method. Sales data from each quarterly period for each of 74 TAs are used to adjust the full property valuation database. The total net sale price (after editing) of all property sales of the listed residential categories is divided by the total capital value (CV) of the same properties sold in a quarter, producing a ratio for current value against CV at the time of regular assessment. The ratio arrived at is applied to the entire stock of CV values for each TA. Results for each TA are then aggregated to give the national index. Indexes at the TA level are also available for distribution.

Until December 2004, the QVHPI was produced for detached houses only. From that date, a new QVHPI was added which included flats and apartments. This is the 'all residential' HPI. This broader index has been backdated by QV on the new methodology to December 1989.

The data are reported as at sales date and there is a delay between sale date, sale registration with the local authority, and the data being available in QV's database. Therefore a three-month delay for QVHPI calculation, and consequently derivation of dwelling values, is introduced. More than 90 percent of sales from the previous quarter are available by this time. The quarterly QVHPI derived from these sales is not revised.

4.2 Real Estate Institute of New Zealand's median sale price and housing price index

The Real Estate Institute of New Zealand (REINZ) produces a monthly national median sale price, based on the sales made by its members. This measure represents slightly more than 80 percent of all residential sales that are settled. The data (which covers both detached houses and apartments) is captured when sales that have become unconditional are reported by REINZ members. The measure is very timely (within two weeks of the reference month) but can be affected by compositional change in the sample of houses sold.

In August 2009, REINZ began publishing a stratified housing price index, which is based on the same data, but uses mix-adjustment to adjust for compositional change. The index is calculated back to January 1992, the first month for which electronic information is available.

The approach used to calculate REINZ's housing price index is very similar to that outlined in the Reserve Bank of New Zealand's discussion paper *Developing Stratified Housing Price Measures for New Zealand* (McDonald & Smith, 2009). However, as

further improvement, the REINZ housing price index is now calculated using sales for all transactions (rather than the median price for each suburb) within the stratum.

How the stratification works:

- Dwelling sales from approximately 1,800 New Zealand suburbs are ranked according to the median sales price of the suburbs over the relevant comparison period (currently January 2005–June 2009).
- The suburbs are allocated into 10 different groups (or strata). Suburbs accounting for 10 percent of the lowest sales by price are grouped into stratum 1; suburbs with 10 percent of the most expensive sales price are in stratum 10. The allocation of suburbs to each stratum is fixed over the comparison period.
- Using sales data for the individual transactions within the stratum, a median sales price is derived.
- The median sales price for each stratum is averaged to produce a housing price measure from which the housing price index is derived.

The REINZ housing price index is available for New Zealand; and also for Auckland, Wellington, other North Island, Christchurch, and other South Island.

4.3 New Zealand's consumers price index

New Zealand's consumers price index uses a net acquisitions conceptual approach, and so the expenditure weight allocated to purchase of housing represents the value of the net increase in the stock of owner-occupied housing during the weight reference period. Expenditure on newly constructed dwellings by owner-occupiers is included, as are any net shifts between owner-occupied dwellings and rental properties, and alterations and additions to established owner-occupied dwellings. Home ownership contributed 5.51 percent to the all-groups CPI expenditure weight as at the June 2008 quarter.

The price movement of new housing is estimated from a survey of builders that construct standard-plan houses. Respondents are asked to provide a quote for one or two house plans that they build fairly regularly.

So, the index for 'home ownership' gives the price movement for newly constructed houses, not including the sections they are built on.

5 Australia's house price measures

5.1 ABS's Established House Price Index

The Australian Bureau of Statistics (ABS) has been publishing an established house price index (HPI) since 1986. A 2004 review aimed to make a number of methodological and timing improvements. The outcome of this review is the current HPI series, compiled using an improved stratification approach and back-cast to 2002. Besides improving the method of stratification, the new series saw significant improvements in timing due to the use of bank data to supplement valuers general (VGs) data. A stock weighting approach was also introduced.

The stratification method involves assigning the stock of houses in a city to clusters, based on criteria that aim to maximise the homogeneity of houses in each cluster (while ensuring sufficient observations to enable measurement of reliable medians). The approach that resulted from the 2004 review used structural, locational, and neighbourhood variables to determine clusters. Later, some shortcomings were identified in this method and a 2007 review looked at the stratification and took into account some new work from the Reserve Bank of Australia (Prasad and Richards, 2006). The outcome of the 2007 review was a refined stratification method based on the ABS's Socio-Economic Indexes for Areas (SEIFA) measure and long term median prices and updated weights based on the 2006 Census of Population and Housing.

The stock weighting approach involves calculating weights as the value of the stock of established houses in capital cities, with the quantities (stock) derived from the count of separate houses recorded in the census. An initial value of the stock of houses in each cluster is estimated by valuing the aggregated number of detached houses in the cluster with a measure of the average price of houses in the cluster at the base period or link period. Quarter-to-quarter changes in the median price of observed sales in the clusters are then used to price update the value of the housing stock in the cluster. Cluster values can be aggregated to capital city totals. A price index is produced by comparing the current value of the housing stock with the base or link period value of the housing stock. The price index therefore, effectively measures changes in the value of the stock of houses by using the median sales prices of the houses traded each quarter to represent the median prices of all houses.

Sales data from banks is used to supplement valuers general data for the two most recent quarters in every publishing cycle: these are called the indicator quarters and are subject to revision in following publications as more valuers general data relating to the time period are collected. The third most recent quarter in any publication cycle (for example, the March 2009 quarter in the September 2009 quarter cycle) is referred to as the benchmark: it is produced only from valuers general data and is no longer subject to revision.

The combination of banks and valuers general typically changes over time as a reference period moves from being the first indicator for a quarter (P1), to the second indicator for a quarter (P2), to the benchmark for a quarter (BM). To deal with the changing compositions of these sets of prices, the ABS only ever calculates price relatives from comparing BM with BM, P1 with P1, and so on.

5.2 ABS's Project Home Price Index

The index for project homes is used in calculating the house purchase expenditure class of the Consumer Price Index (CPI). Price information is obtained each month from a sample of project home builders in each capital city. For the purpose of the CPI, a project home is defined as a dwelling for construction on a client's block of land, and price changes therefore relate only to the price of the dwelling (ie excluding land).

The index is compiled for the eight capital cities and a weighted average of those cities. The city weights are derived as the value of additions to the stock of houses in the city, calculated using average price data derived from the Building Activity Survey and quantity data from house counts recorded in consecutive censuses.

The index is calculated using the matched model method. There is a sample of small and large homes, all based on actual specifications of dwellings constructed to order by a number of major home building companies. Each quarter, prices are collected on a matched sample basis: the same models are priced in consecutive quarters.

Adjustments are made to remove the effects on price caused by changes in quality, such as special deals (ie a 'free' garage).

The Project Home Price Index is published in *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0). Price movements are not comparable with those of the house purchase expenditure class of the CPI, which is the lowest published level of the index and in addition to the project homes component, also includes components for installed appliances, and components which take account of any subsidies received (eg the first home-owner grant).

5.3 Australian Property Monitors' composition adjusted housing price series

Australian Property Monitors (APM) produces a quarterly composition adjusted housing price series for houses, apartments, and units. The measure is produced for eight capital cities and Australia and is released four to five weeks after the end of the quarter. APM uses sales data sourced from valuers general, real estate agents, and auction results.

APM calculates a median house price for each of 10, 5, or 3 economic strata (whether it is a decile/quintile/tricile grouping depends on the size of the city, and the groupings are determined on the basis of similarities in the long-term price level of suburbs in the groupings). A city wide median is simply calculated as the unweighted geometric mean of the individual strata. The Australian aggregate figure is produced using stock weights.

On their website, APM reports that the stratified median price methodology it employs was developed by the Reserve Bank of Australia (RBA) in its Research Discussion Paper RDP 2006-04, "Measuring Housing Price Growth – Using Stratification to Improve Median-based Measures". APM also reports that, in partnership with the RBA, this methodology has been further refined "to better address the issue of compositional change within the Australian property market", (Australian Property Monitors, 2010).

5.4 Residex's Non-Revisionary Repeat Sales Index

From 1990 Residex has produced a price index using the repeat sales methodology. According to Hodge (2006), "we take 'sale pairs' on every property for which we have

two or more sales, and measure the growth between those two sales. Only then do we undertake a form of averaging (a statistical linear regression, to be precise) to calculate growth rates for each time period."

In the last few years Residex has made some changes to its measure to eliminate the need for revision. According to its website: "this approach, while based on the basic repeat sales concept, uses all sales data in the market (not merely sales on properties that have sold more than once)" and "allows monthly indices as low as a suburb level to be calculated with sufficient accuracy so as not to be revised when further data comes in."

The index is produced on a monthly and quarterly basis and is released 15 days after the end of the month. It is produced for eight capital cities and Australia. However, it appears that indexes beneath the capital city aggregation level are possible.

5.5 RP Data-Rismark's Home Value Index

RP Data and Rismark International have a suite of property price indexes which they call the RP Data-Rismark Home Value Index. According to their website (RP Data, 2010) : "The RP Data-Rismark Home Value Index is available on a monthly and quarterly basis for every geographic demarcation including suburb, postcode, capital city and state in Australia." The website goes on to say that the index is produced from information "on the most comprehensive property database in Australia" and will soon be published on a daily basis. RP Data-Rismark also produce customised indexes based on "property sales data relating to the latest possible month, thereby avoiding the 6 to 8 week reporting lags that have previously plagued other published indices."

The measures are calculated with stratified median price, hedonic and repeat-sales approaches and cover all properties. Data used in these measures is sourced from valuers general and real estate agents.

5.6 Real Estate Institute of Australia

The Real Estate Institute of Australia publishes quarterly median prices for houses and for other dwellings for all state and territory capital cities, for some regional cities, and for the weighted average of the capital cities. Most series commence in 1980. The measure for Sydney is described as a compositional adjusted series, where median prices have been stratified by market segment. The method for other cities is an unstratified median. Data is sourced primarily from real estate agents.

5.7 HIA-Commonwealth Bank's Median First Home Price

The HIA-Commonwealth Bank's *Affordability Report* publishes a quarterly housing affordability index between five and six weeks after the end of the reference period. One of the components used to calculate the index (also published) is a median price for a first home. The publication states that: "The dwelling prices used in this publication are medians of those financed by the Commonwealth Bank. As such they cannot and do not take account of changes in the mix of size, location and quality of dwellings financed. Quarter-to-quarter variations therefore reflect any changes in the composition of housing financed, as well as changes in the price of a house of a given size, location,

and quality", (HIA CBA, nd). The report publishes a median price for Australia, and quarterly and annual changes in median price for capital cities and rest of State (except Darwin and Northern Territory).

6 Future directions for SNZ and ABS

6.1 New Zealand

Statistics New Zealand recently undertook a review of housing statistics (Statistics New Zealand, 2009). One of the recommendations of this review is that "Statistics NZ, with input from Quotable Value/PropertyIQ, the Treasury, the Reserve Bank, the Department of Building and Housing, and Housing New Zealand Corporation, should lead an investigation into different methodologies and data sources for quality adjusted house and land price indexes with a view to confirming or upgrading existing measures, or developing new measures." This investigation is underway.

6.2 Australia

The ABS is currently investigating the feasibility of extending the coverage of its HPI to include dwellings other than detached houses. The current weights of the HPI, based on the 2006 Census, will be updated once data becomes available from the 2011 Census. At that time the ABS will assess the performance of the stratification method. In addition, the ABS will investigate ways to update the weighting between census collections.

7 Appendix 1 Comparison of New Zealand's house price measures

Table 1

House Price Indexes	
Quotable Value – detached only	<p>Frequency: quarterly</p> <p>Timeliness: 3.5 months</p> <p>Measure: price index</p> <p>Scope of output: freehold open market sales – detached houses only</p> <p>Geographical scope: all of New Zealand</p> <p>Sources of price data: sales data from territorial authorities and valuation data</p> <p>Method: sales price appraisal ratio (SPAR) method</p> <p>Weighting: valuation data weights to entire New Zealand housing stock</p> <p>Timing of transaction: settlement date</p> <p>Revised: no</p>
Quotable Value - all residential	<p>Frequency: quarterly</p> <p>Timeliness: 3.5 months</p> <p>Measure: price index</p> <p>Scope of output: freehold open market sales – all residential housing</p> <p>Geographical scope: all of New Zealand</p> <p>Sources of price data: sales data from territorial authorities and valuation data</p> <p>Method: sales price appraisal ratio (SPAR) method</p> <p>Weighting: valuation data weights to entire New Zealand housing stock</p> <p>Timing of transaction: settlement date</p> <p>Revised: no</p>

Table 1 continued next page

Table 1 continued

<p>REINZ median</p>	<p>Frequency: monthly</p> <p>Timeliness: approximately two weeks</p> <p>Measure: median price</p> <p>Scope of output: freehold open market sales of detached houses and apartments by REINZ members</p> <p>Geographical scope: all of New Zealand</p> <p>Sources of price data: sales by REINZ members</p> <p>Method: national median price</p> <p>Weighting: none (so, implicitly weighted to represent sales rather than stocks)</p> <p>Timing of transaction: when the sale is reported by a REINZ member (ie when the price is agreed and the contract/agreement has become unconditional)</p> <p>Revised: no</p>
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Table 1 continued

REINZ stratified	<p>Frequency: monthly</p> <p>Timeliness: approximately two weeks</p> <p>Measure: price index and median price</p> <p>Scope of output: freehold open market sales of detached houses and apartments by REINZ members</p> <p>Geographical scope: all of New Zealand</p> <p>Sources of price data: sales by REINZ members</p> <p>Method: stratified medians, based on historical sales price of suburbs</p> <p>Weighting: none (so, implicitly weighted to represent sales rather than stocks)</p> <p>Timing of transaction: when the sale is reported by a REINZ member (ie when the price is agreed and the contract/agreement has become unconditional)</p> <p>Revised: no</p>
New Zealand CPI – home ownership	<p>Frequency: quarterly</p> <p>Timeliness: 10 working days after reference quarter</p> <p>Measure: price index</p> <p>Scope of output: new standard-plan houses (excluding land)</p> <p>Geographical scope: all of New Zealand</p> <p>Sources of price data: survey of builders</p> <p>Method: pricing constant-quality house specification</p> <p>Weighting: consents for selected builders in sample weighted to reflect all building consents, within the five broad CPI regions</p> <p>Timing of transaction: 15th of middle month of each quarter</p> <p>Revised: no</p>

Figure 1

New Zealand house price measures, 1992 to 2009
 Base: January 1992 month (=1000)

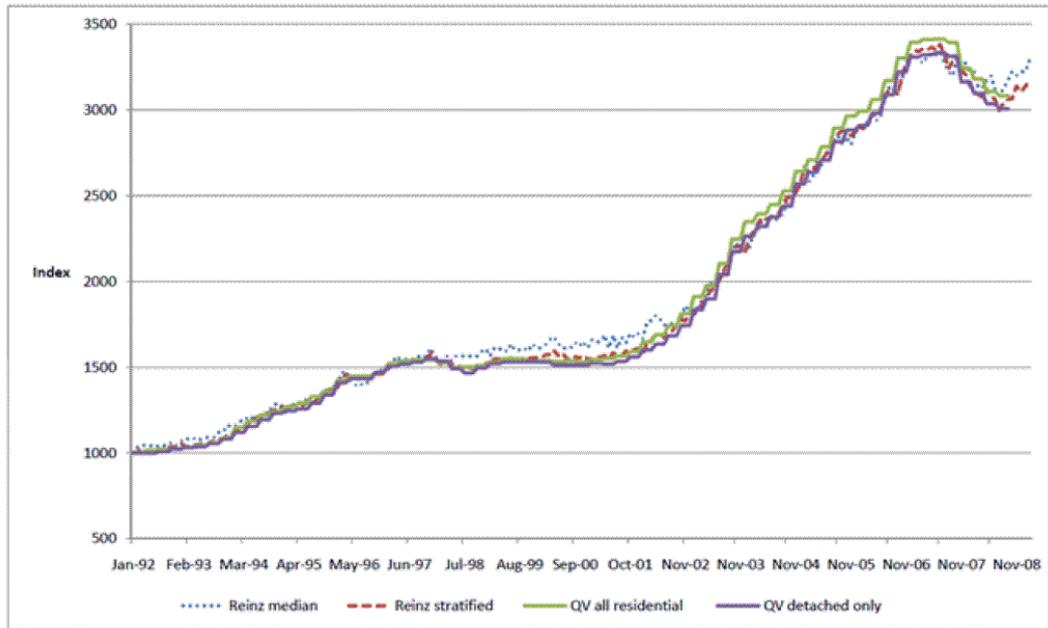
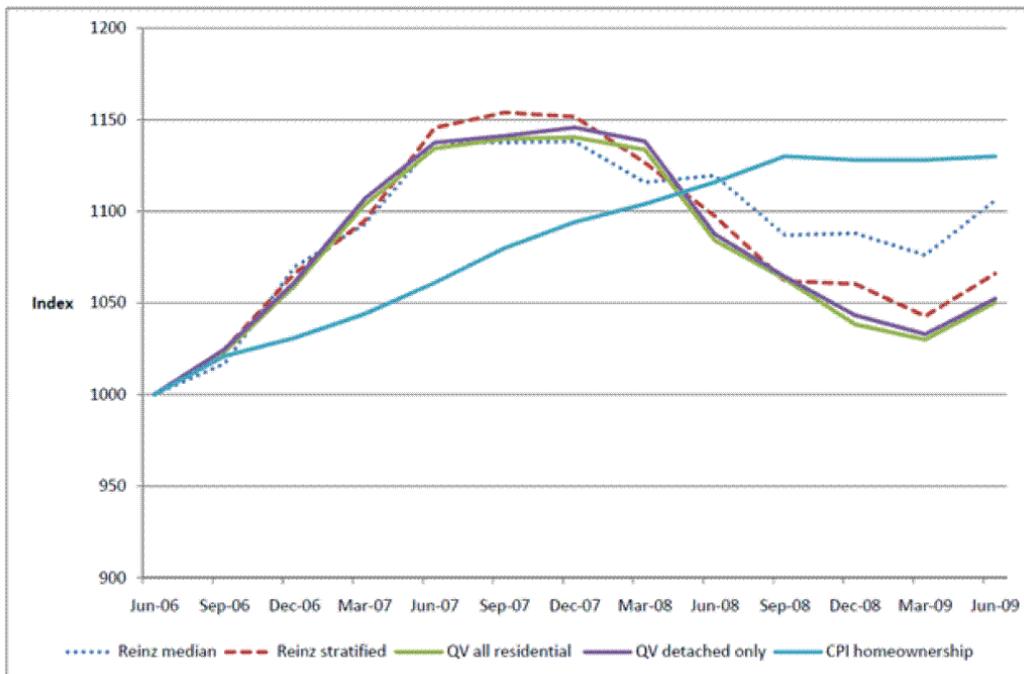


Figure 2

New Zealand house price measures, 2006–09
 Base: June 2006 quarter (=1000)



8 Appendix 2 Comparison of Australia's house price measures

Table 2

House Price Indexes	
ABS HPI	<p>Frequency: quarterly</p> <p>Timeliness: four to five weeks after end of quarter</p> <p>Measure: price index and median price</p> <p>Scope of output: detached houses</p> <p>Geographical scope: eight capital cities and eight capitals aggregate</p> <p>Sources of price data: valuers general and banks (a combination for the most recent two quarters, valuers general only for earlier quarters)</p> <p>Method: stratification (based on suburb long-term median price and SEIFA)</p> <p>Weighting: stock weights – value of housing stock based on 2006 Census house counts and mean adjusted median</p> <p>Timing of transaction: exchange date; price data collected throughout quarter</p> <p>Revised: every quarter, previous two periods are revised as more valuers general data is collected</p>

Table 2 continued next page

Table 2 continued

ABS Project Homes	<p>Frequency: quarterly</p> <p>Timeliness: four to five weeks after end of quarter</p> <p>Measure: price index</p> <p>Scope of output: new project houses (house only – land excluded)</p> <p>Geographical scope: eight capital cities and eight capitals aggregate</p> <p>Sources of price data: CPI monthly collection of prices from project home builders</p> <p>Method: matched model</p> <p>Weighting: value of expenditure on new homes derived using BACS data and changes in stock of housing from population census data</p> <p>Timing of transaction: purchasers price collected monthly at a pricing point in the month</p> <p>Revised: no</p>
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Table 2 continued

APM	<p>Frequency: quarterly</p> <p>Timeliness: approx. 30th of month following reference period (in advance of HPI by approx. two working days)</p> <p>Measure: median price</p> <p>Scope of output: houses and units</p> <p>Geographical scope: eight capital cities and Australia</p> <p>Sources of price data: valuers general, real estate agents, auctions</p> <p>Method: stratification (unweighted geometric mean of decile/quintile/tricile (depending on the city) median)</p> <p>Weighting: cities dwelling stock weighted to produce national figure. Unweighted at lower level than city.</p> <p>Timing of transaction: contract exchange date (or date of agreement)</p> <p>Revised: yes</p>
RP Data-Rismark	<p>Frequency: monthly and quarterly (quarterly index compares month-on-month index results)</p> <p>Timeliness: last business day after end of month</p> <p>Measure (all expressed as median values) : derivative index – capital gains and accumulation; median price indexes; hedonic indexes; repeat sales index [note: for purchase on request]</p> <p>Scope of output: houses, units, and all dwellings</p> <p>Geographical scope: suburb, postcode, eight capital cities, state and national [according to their website – but the ABS has not seen output of this detail – maybe for purchase on request]</p> <p>Sources of price data: valuers general and real estate agents</p> <p>Method: stratification for the median price index (for units – long-term median price of suburb, for houses – long-term median price of land), and hedonics and regression for the other indexes</p> <p>Weighting: national average supply weighted by total number of properties. No information on weighting of suburbs.</p> <p>Timing of transaction: no information (probably exchange date or date of verbal agreement)</p> <p>Revised: previous month</p>

Residex	<p>Frequency: monthly and quarterly</p> <p>Timeliness: 15 days after end of month</p> <p>Measure: price index</p> <p>Scope of output: houses</p> <p>Geographical scope: eight capital cities and Australia</p> <p>Sources of price data: valuers general and real estate agents</p> <p>Method: repeat sales</p> <p>Weighting: no information</p> <p>Timing of transaction: no information (probably exchange date or date of verbal agreement)</p> <p>Revised: no</p>
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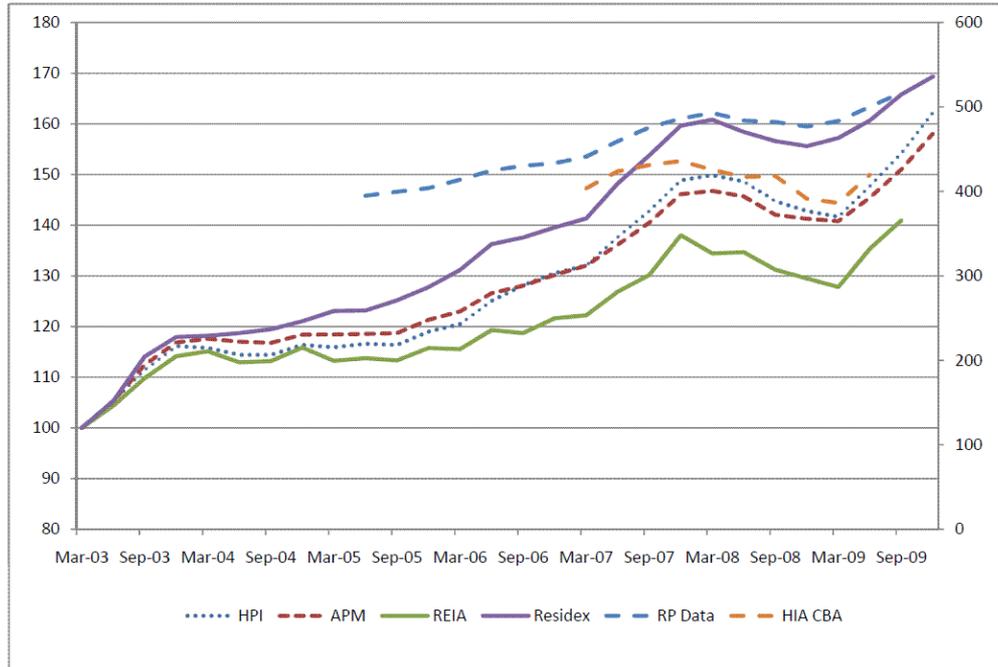
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Table 2 continued

REIA	<p>Frequency: quarterly</p> <p>Timeliness: eight to ten weeks after end of quarter</p> <p>Measure: median price</p> <p>Scope of output: houses and other dwellings</p> <p>Geographical scope: eight capital cities and Australia (plus zones within capitals)</p> <p>Sources of price data: valuers general and real estate agents</p> <p>Method: unstratified median price in all cities except Sydney where median prices are produced for stratified market segments</p> <p>Weighting: no information</p> <p>Timing of transaction: contract date</p> <p>Revised: yes, depending on state</p>
<p>HIA/CBA</p> <p>Available through the quarterly HIA/CBA Housing Affordability Report</p>	<p>Frequency: quarterly</p> <p>Timeliness: five to six weeks after end of period</p> <p>Measure: first home buyer median price</p> <p>Scope of output: houses and units, all dwellings</p> <p>Geographical scope: eight capital cities and rest of state (except Northern Territory and Darwin) and Australia</p> <p>Sources of price data: CBA home loan approvals data</p> <p>Method: median price</p> <p>Weighting: no weights</p> <p>Timing of transaction: no information (but likely to be exchange date or loan application approval due to the timeliness of the measure)</p> <p>Revised: unknown</p>

Figure 3

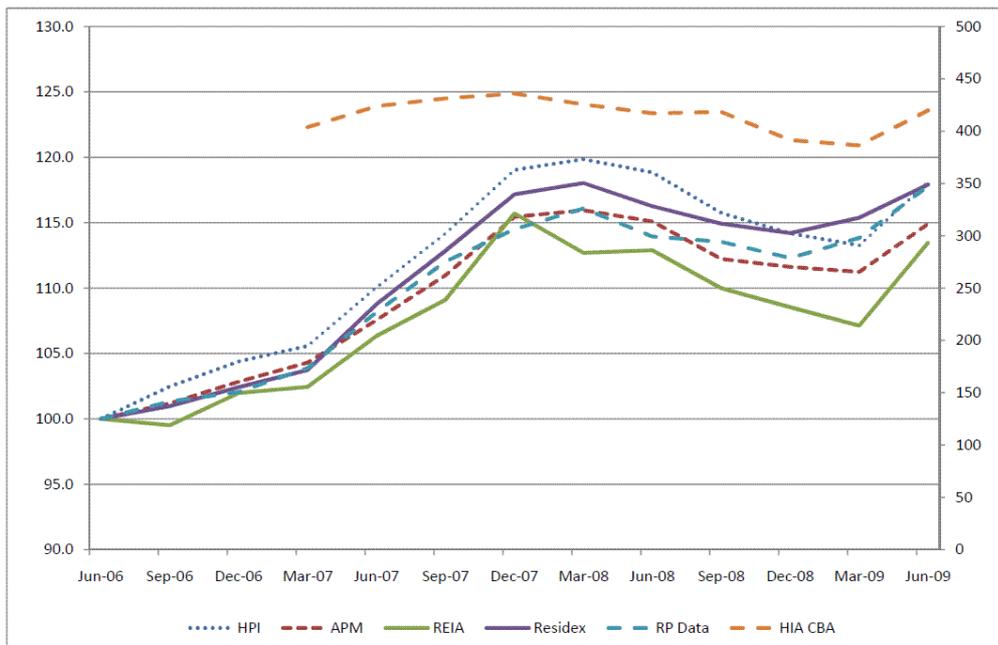
Australian House Price Measures 2003 to 2009: Aggregate (all cities)
 Base: March 2003 quarter (=100)



Note: RP Data and HIA CBA series are presented as median prices, all other series are presented as index numbers.

Figure 4

Australian House Price Measures 2006 to 2009: Aggregate (all cities)
 Base: June 2006 quarter (=100)



Note: The HIA CBA series is presented as median prices, all other series are presented as index numbers.

References and further reading

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Further reading

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