

Information Paper

Renovating the Established House Price Index

Australia

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New
Issue

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**Dennis Trewin
Australian Statistician**

AUSTRALIAN BUREAU OF STATISTICS

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PREFACE

PREFACE

The house price index (HPI) is a series of price indexes measuring changes in prices of both established houses and new (project) houses for each of the eight capital cities of Australia and also a weighted average of the eight cities for both. The HPI is published quarterly by the Australian Bureau of Statistics (ABS) in *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0). Data are available back to 1986.

The ABS undertook a review of the established house price index¹ component of the HPI in the second half of 2004. The objectives of the review were to:

- determine specific user requirements for a HPI;
- identify possible data sources;
- assess the costs and the strengths and weaknesses of alternative data sources;
- develop a strategy that delivers an improved HPI in the short term.

Arising from the review, there were four important aspects of the data series identified as needing to be improved:

- the timeliness of the HPI release;
- changing the time at which prices are recorded to date of exchange of contracts rather than settlement date;
- minimising the effects of quality changes by adopting a finer level of stratification to take better account of compositional shifts (note: this will not adjust for quality changes from other sources such as the size of dwellings increasing over time); and
- ideally, expanding the coverage to include 'other dwellings' (townhouses, units and apartments), and dwellings covering the whole of each State/Territory.

A number of users also expressed a strong desire for the ABS to release average prices (mean and/or median) in addition to the price index. Despite some user requests for a monthly HPI, the ABS does not believe that the currently available data are sufficient to support the construction of a reliable monthly series. The data sets underlying the HPI are not large, particularly once the requirement for increased stratification is taken into account. Based on the experience with the quarterly data, the ABS considers that a monthly HPI would be too "noisy" for publication. While a longer-term aim is for separate indexes to be published for houses and other residential dwellings (units, townhouses, apartments etc.), the ABS decided to concentrate initially on upgrading the index for detached houses only. Likewise, a longer-term aim is to produce national, capital city and rest of state HPIs each quarter but, for the immediate future, the geographic scope will be restricted to the 8 capital cities, including a total for them.

The purpose of this information paper is to describe the outcome of the work done as a result of the 2004 review. It discusses some general issues relating to the measurement of house prices and describes the data to be used in compiling the renovated HPI and changes to the methodology used. In this paper, the revamped HPI is presented from March quarter 2002 to December quarter 2004.

The first issue of 6416.0 which incorporates these outcomes will be published on 2 December 2005. This publication will contain estimates up to September quarter 2005.

¹ Referred to as 'the HPI' for the remainder of this information paper.

PREFACE *continued*

PREFACE *continued*

The ABS would like to thank the various State government agencies (Land Titles Offices, Valuers'-General Offices and similar agencies) and the mortgage lending institutions for their cooperation in providing data and assistance to enable us to substantially improve the HPI. This work would not have been possible without their invaluable assistance.

Readers requiring further information should contact:

Ms Merry Branson
Director
Consumer Price Index Section
Australian Bureau of Statistics
PO Box 10
BELCONNEN ACT 2616
Telephone: 02 6252 6006
Facsimile: 02 6252 7060
email: merry.branson@abs.gov.au

Dennis Trewin
Australian Statistician

RENOVATING THE ESTABLISHED HOUSE PRICE INDEX

INTRODUCTION

Several different house price measures are published regularly (including the ABS HPI), each with different methodology, scope, coverage and timing. In late 2003 and early 2004 various commentators criticised the timeliness and reliability of these various measures with specific concerns being expressed about the conflicting signals the different measures were delivering, particularly regarding the timing of turning points in the house price cycle.

In conjunction with the Reserve Bank of Australia (RBA) and Commonwealth Treasury, the ABS held discussions in mid 2004 with the major private sector producers of house price data, industry representatives, other key users and potential data providers to identify user requirements and options for satisfying these.

The user requirements were identified as follows:

- a price index for established residential dwellings (i.e. including land) that abstracts from compositional changes;
- a level estimate (mean or median) of the dwellings actually exchanged (i.e. without adjusting for compositional change);
- a volume measure of the turnover in the established housing market;
- the measures should be based on the prices of those dwellings for which contracts were exchanged during the reference period; and
- the index should be released within 4 to 5 weeks of the end of the reference period.

The ABS HPI was originally designed to meet the specific data requirements for the construction of a price measure for mortgage interest charges, which were included in the CPI from 1986 to 1998. As a result, the timing basis used was the date of final settlement of the contract for the sale of the house because that was the time at which mortgage interest started to be charged. The weighting patterns required for mortgage interest charges were housing finance commitments. The underlying prices were obtained from a range of sources, with varying coverage within each of the eight capital cities. The main sources of data used came from the State/Territory² Land Titles Office or Valuers-General (VGs) Office, or similar equivalent³ and the State Real Estate Institutes (REIs). The details recorded by the VGs in respect of dwelling transfers differ significantly in each State, as does the length of time after the sale when data are provided to the VGs.

The main outcome of the review was the conclusion that the objective of the HPI should be changed to one of providing a more accurate measure of the contemporary rate of change in the prices of the stock of established houses. The major implications are that the HPI is to be compiled using housing stock weights (derived from the 2001 ABS census of population and housing), on an exchange of contracts pricing basis, and controlling as far as possible for compositional change by stratifying the house price observations by a number of regions within each city. The reason for the detailed stratification is that ABS research has confirmed the widely-held belief that location is one of the key determinants of the price of established houses.

² State/Territory is referred to as 'State' in the remainder of this information paper.

³ Data from these sources are referred to as 'VGs data' in the remainder of this information paper.

INTRODUCTION *continued*

It is not possible, at least in the short term, to significantly improve the timeliness of the HPI using existing data sources. However, the ABS has concluded that information from mortgage lenders (banks, etc.) from loan approval documents can be used to produce preliminary estimates for the two most recent quarters.

WHAT THE HPI IS TRYING TO MEASURE

In order to compile a meaningful house price index and address the issues outlined above, it is first important to define precisely what the measurement objective of the HPI ought to be. The ABS is of the view that the most appropriate target should be a measure of price change for the stock of residential dwellings (including the land component) that is unaffected by changes in the qualities of those dwellings over time. Accordingly, the scope of the ABS HPI is restricted to residential dwellings (i.e. buildings that contain one or more dwellings, excluding commercial properties) regardless of ownership or tenure of the occupants (i.e. including government-owned properties and properties owned by private landlords).

In an ideal world, the HPI would be constructed by reference to the current and historical market prices of the entire stock of residential dwellings. In practice, market prices for any particular period are only available for those dwellings that are actually traded (sold/purchased) in the period, which generally account for only a very small proportion of the total stock. In order to draw appropriate inferences about the price behaviour of the population from such small samples, the HPI is to be initially limited to detached houses in each of the eight capital cities of Australia. The information is to be presented in the form of a price index. The capital city indexes measure price movements over time in each city individually; they do not measure differences in price levels between cities.

DATA ISSUES WITH HPI COMPILATION

Available house price data

Each property transaction, regardless of type or location, needs to be registered at some point to enable the relevant State government authority to maintain a record of property ownership. The most obvious sources of comprehensive information on house prices are the VGs in each State. The data held by these organisations represent the ABS's preferred source for compiling the HPI because they provide the most comprehensive data set currently available on house sales. The information contained in these records varies from one jurisdiction to another, and includes not only data on the sale of the property (date, price, etc.) but also, in some jurisdictions, information on the physical characteristics of the property. The main disadvantage of these administrative data sets is that lengthy delays are often involved in all the data becoming available. Different jurisdictions have different legislation governing the reporting responsibilities of parties to property transfers. In general, the requirement is for the property transfer to be registered within 60-90 days of settlement. When combined with a lag between exchange of contracts and final settlement of 4 to 6 weeks on average, but up to 3 or 4 months in some cases, the delay between exchange and all transactions relating to a particular month being received by the ABS is around 6 months or so.

A further concern for reliable price measurement is that properties with higher prices generally take longer to settle. The implication is that details received by the ABS relating to the property sales in a particular quarter are distributed in a biased way. Because cheaper properties tend to be settled more quickly than more expensive properties, the average price of properties exchanged in a particular quarter increases as

Available house price data continued

the data set becomes more complete. The resulting bias of early reported data is always downwards but its magnitude is not consistent, either between cities or over time within any one city. As a result, it is necessary to obtain an almost complete data set for each quarter before it is possible to obtain an accurate measure of the house prices for the quarter. As noted above, it takes several months for all transactions relating to a particular quarter to be finally settled, recorded by the relevant State agency and then passed on to the ABS. Clearly, it is not possible to produce a timely HPI from this administrative data source, although it is the preferred source as far as coverage and comprehensiveness are concerned.

Alternative data sources

The HPI review investigated alternative data sources that might provide an earlier indicator of price movements. The sources considered are set out below.

REAL ESTATE INSTITUTES (REI)

Each of the State REIs publish data on house prices. However, most REIs source their data from VGs' offices or third party providers so offer no real benefit over the VGs' data. However, the REIs undertake direct collection from members in three states (Victoria, Western Australia and Tasmania) and tend to receive data much earlier than the VGs (shortly after exchange of contracts). Coverage, though, is restricted to member real estate agents of the state REI, and reporting is not compulsory so coverage from this source is neither complete nor uniform across a city over time.

REAL ESTATE AGENTS

A comprehensive set of house price data could be obtained through a quarterly census of real estate agents (although not all transactions in houses involve real estate agents). By surveying all real estate agents in Australia, every property transaction occurring within a given period could be captured, and the data received as soon after exchange of contracts as is possible. Given the number of real estate agents in Australia and the resources needed to create, dispatch, query and collate forms, this approach would be quite costly, requiring a significant investment of time, money and staff. It would also impose a significant reporting burden on real estate agents. Additionally, the elapsed time required to run a collection of this magnitude would provide little potential for improving the timeliness of the HPI publication. For these reasons, this option has not been pursued further.

MORTGAGE LENDERS' DATA

As a large percentage of house sales involve mortgages, loan approval documents created by mortgage lenders have been identified as a source of timely house price data. Applications for finance to purchase residential dwellings are generally processed, at the latest, shortly after the exchange of contracts. Although the data do not cover all house sales, they have sufficient coverage for them to be used as a means of estimating the movements in the established house prices for the latest two quarters.

Alternative data sources continued

OUTCOME

The ABS concluded that the best approach would be to use two different data sets to compile the HPI. The first is to use the prices from the VGs to compile the price indexes up to the point for which a complete set of data can be obtained on an exchange date basis (i.e. to the quarter ending two quarters prior to the most recent quarter). This is referred to as the benchmark series. The second is to use the mortgage lenders' data to project the HPI for the two most recent quarters to provide a more timely indicator of changes in house prices. The ABS is receiving loan approvals data from a number of financial institutions. The data were comprehensively analysed and compared with the results obtained using the VGs' data. The ABS has concluded that these data provide sufficient coverage of the housing market for changes in the overall prices to be estimated reasonably accurately for the two most recent quarters in the HPI. As VGs' benchmark data become available, they will be used to replace the leading indicator component. As a result, the most recent two quarters' estimates of the revamped HPI will be preliminary, and subject to revision.

The loan documents and the systems used by most mortgage lenders do not capture the actual date of exchange. However, it has proved possible to model the loan approval date to emulate the exchange date.

Which date?

There are 4 significant dates related to the purchase of a residential property relevant to the construction of the HPI:

- verbal agreement to purchase at a negotiated price,
- approval of mortgage financing
- exchange of contract,
- settlement and registration of property documents (note, (2) may occur at anytime before (4), or may not occur at all, and this does vary by State).

Although the current HPI is not entirely consistent in the timing point applied, it is generally based on the date of settlement. As a result, the current HPI is likely to lag in identifying the turning points in housing prices because the settlement date is generally several weeks, and can be several months, after the exchange of contract. In measuring house prices, the ABS and key users have all selected the exchange of contract (3) as the preferred date to use in compiling the upgraded HPI series because it most closely approximates the time at which the market price is determined. The upgraded HPI will be based on this pricing point as closely as possible.

Exchange date compilation

For most States, the VGs' data source capture exchange date information. However, the contract exchange date is not available for either Adelaide or Darwin. In these cases, the ABS has estimated the exchange date using simple models based on the relationships found between the settlement and exchange date of Brisbane, for which similar administrative arrangements apply. Under South Australian legislation, payment of stamp duty should occur within 63 days of exchange of contracts. Similar arrangements are in place in the Northern Territory and in Queensland, with penalties for non-compliance occurring after 60 days in these states. These are the only States in Australia with an approximate 2 month settlement requirement (other States generally have a 90 day requirement). From this relationship the assumption has been made that

*Exchange date
compilation continued*

the pattern of delay in settlement in Adelaide and in Darwin is comparable to that in Brisbane, and estimated contract exchange dates have been determined accordingly.

METHODS TO CONTROL FOR THE 'QUALITY' EFFECT

The standard procedure for constructing price indexes is to select a sample of representative items and to reprice the identical items through time. This approach is not viable in the case of established houses as the observable prices in each period invariably relate to a different set of dwellings.

There is little in the way of international guidance for the construction of dwelling price indexes. The most comprehensive discussion is contained in the International Monetary Fund's (IMF) '*Compilation Guide on Financial Soundness Indicators*' - *Chapter Nine 'Real Estate Price Indices*'. The following extract from that guide (paragraph 9.4) is instructive:

'Constructing representative real estate price indices is challenging. Difficulties can arise because real estate markets are heterogeneous, both within and across countries, and illiquid. There may be no unambiguous market price. Moreover, such diversity and lack of standardization results in the need to gather a wide range of data to compile indices that are characteristic of the various market segments; this would contribute to high data collection costs and may require greater technical sophistication. Representative real estate prices in residential and commercial markets can be hard to measure accurately given the small samples that are often available, as there may be disparate prices for apparently similar properties and prices may be volatile. Experience has shown that there are particular difficulties in measuring commercial real estate prices across the economy.'

The Guide goes on to say (paragraph 9.8):

'Given the relative lack of international experience in constructing real estate price indices, the cost of creating real estate price indices, and the diversity of users with needs for different types of real estate information, the Guide does not recommend a single set of indices or compilation methods, but describes a range of techniques whose application can be based on local needs, conditions, and availability of resources. . . . In order to capture changes in real estate price trends, the Guide advocates quarterly compilation of data. Metadata describing in detail the content and coverage of, and the conceptual approach underlying, any price index disseminated is essential.'

Although the Guide does discuss a number of techniques, the material is neither exhaustive nor comprehensive.

The central issue is how to utilise prices for an essentially heterogeneous set of dwellings to construct measures of price change for characteristic or homogeneous dwellings? There are three general approaches that might be used: hedonics, repeat sales and stratification.

The hedonic approach

The hedonic approach utilises regression techniques to estimate a price for each of the characteristics of dwellings and so determine an overall market price. There are several ways in which this approach can be employed in practice. A hedonic technique has recently been introduced with respect to the pricing of computers in the 15th Series CPI. Details of the methods used for computers are set out in *Information Paper: The Introduction of Hedonic Price Indexes for Personal Computers* (cat. no. 6458.0). A

The hedonic approach continued

similar approach would be adopted for housing although, of course, the type and number of price-determining characteristics would be different. The advantage of this approach is that it generally makes use of a greater proportion of the available price data than other approaches.

The effectiveness of this approach is critically dependent on the availability of price determining characteristics data for use in the hedonic model. Investigations undertaken by the ABS have shown that the single most important price-determining characteristic is location, followed by the physical characteristics of the dwelling (such as outer-wall construction, overall size, number of rooms, number of bathrooms).

While various characteristics exist for different data sets for different cities, the characteristics data required to support the hedonic approach are not readily available nationally for house sales in Australia at this time.

The repeat sales approach

The repeat sales approach controls for quality change by maintaining a longitudinal database of properties and, when properties are sold more than once, calculating price changes between successive sales dates. Regression techniques are used to calculate the overall price index for each period.

To be effective, this approach requires a long time series of price data for individual properties, given their infrequent turnover. As the methodology is premised on the assumption that the 'quality' of the individual properties is constant over time, this approach may be more suited to some property types than others (e.g. units), or require supplementary information on property renovations. The nature of the estimation technique also means that at least the tail end of the series is subject to potentially significant revision. Again, sufficient data to enable the use of this method are not currently available.

The stratification approach

The stratification approach involves stratifying the observations in such a way as to group the prices for the 'most like' or 'most similar' dwellings. The objective is to minimise the physical heterogeneity of dwellings within each stratum. An example might be to stratify by suburb or postcode and dwelling type (house, unit), number of bedrooms and overall size, as well as including neighbourhood characteristics such as proximity to shops, hospitals and schools, levels of crime etc. In each period an 'average' price movement (derived from the mean or median) is calculated for each stratum and used to construct a stratum level price index. The aggregate index is calculated by weighting together the individual stratum indexes, where the weights represent the relative significance of the stock of dwellings in each stratum (in value terms).

The effectiveness of this approach is determined by the degree of stratification possible. This is a function of the amount of dwelling characteristics detail available (location, size, etc.), and the volume of market activity. Even with comprehensive dwelling characteristics data it may not be feasible to employ fine level stratification if there are insufficient observations per stratum to produce reliable stratum movements. The HPIs for Canberra, Hobart and Darwin tend to be more volatile than those for the larger cities because of the problem of them not having sufficient sales to enable as fine a level of stratification as is possible in the larger cities.

Outcome

Given the absence of a comprehensive data set to enable the use of either the hedonics or repeat sales approaches, the only option currently feasible for controlling compositional effects is the stratification approach. Further, the limited and variable quality data on dwelling characteristics limit the stratification variable to location. The level of stratification being used in the upgraded HPI ranges from 5 strata in Darwin to 55 strata in Sydney. This compares with 1 and 7 respectively in the pre-existing HPI.

THE METHODOLOGY FOR COMPILING THE BENCHMARK SERIES

*Using regional
stratification to control for
the 'quality' effect and
compositional change*

The aim is to use location (suburb, postcode) to define regional strata that group together (or 'cluster') houses that are 'similar' in terms of their price determining characteristics. Apart from their physical characteristics, houses that are close share the same neighbourhood characteristics and so the finer the level of stratification available, the more similar or homogenous the cluster of houses will be. However, the finer the level of stratification, the fewer observed property sales will occur. So the clusters defined have to balance the homogeneity of housing characteristics and the number of observations required to produce a reliable median price. The lowest level geographical classification that is commonly available across data sets is the suburb. Therefore, suburbs are the building blocks on which the clusters are based.

Ideally, each suburb would form its own cluster as this would maximise the homogeneity of the cluster. However, there are insufficient numbers of observations from quarter to quarter to support this methodology. The ABS has grouped similar suburbs to form clusters with sufficient ongoing observations to determine a reliable median price.

The clusters for each capital city are formed based on principal component analysis. It groups suburbs into clusters so that observations in the same cluster are more similar to one another than they are to observations in other clusters.

There were a number of different factors that were considered to impact upon the median price of houses sold in the property market.

- percentage of three bedroom houses
- percentage of four bedroom houses
- percentage of detached houses
- percentage of townhouses
- percentage of owner-occupied houses
- percentage of rented houses
- SEIFA - Socio-Economic Indexes for Areas (SEIFA) group suburbs according to their social and economic conditions (see *Information Paper: Census of Population and Housing -- Socio-Economic Indexes for Areas, Australia* (cat. no. 2039.0))
- distance to the CBD
- distance to hospitals
- distance to shops.

An analysis was undertaken to identify which of these variables were the 'principal components' or, in other words, which variables were the most significant determinants of price. After undertaking this principal component analysis it was determined that, in each cluster, the SEIFA index, percentage of three bedroom houses, and percentage of owner-occupied houses could be considered as the primary determinants of price. In practice, many of the above factors were highly correlated with the SEIFA index, meaning that the variability in price was largely described by this index. The result was that

Using regional stratification to control for the 'quality' effect and compositional change continued

clusters could be most effectively compiled using the SEIFA index, the percentage of three bedroom houses and the geographical location of the suburb.

Another primary indicator of the similarity of a variety of houses is the market derived price. After the theoretical stratifications were determined, they were tested using available transaction to assess the performance of median prices over time and the distribution of prices within clusters. The clusters were split further or, sometimes, merged to ensure the best control was achieved for the 'quality' effect and compositional change in the houses priced.

Compiling the benchmark index

WEIGHTING PATTERNS

The weights used in the index are the value of the housing stock in each cluster in each city. Data from the 2001 Census of Population and Housing on the number of houses in each suburb provide the starting point for the weights. A value of the dwelling stock in each cluster was estimated by aggregating suburb counts to clusters and valuing them at average March quarter 2002 mean prices (March quarter 2002 is the first quarter for which the redeveloped HPI is available).

BENCHMARK HPI

The 'benchmark HPI' is produced from VGs' data as a weighted average of indexes of median house prices, stratified by cluster, for each city. The weighted average of the eight capital cities is then derived for the national index. The benchmark index number series and percentage changes from March quarter 2002 to December quarter 2004 are presented in Appendix 1. They will be included in tables 1 and 2, respectively, in the September quarter 2005 issue for the *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0).

REFERENCE BASE YEAR

The reference base period is the 2003-04 financial year (i.e. 2003-04 = 100.0).

THE METHODOLOGY FOR COMPILING THE 'LEADING INDICATOR' TERMS

The 'leading indicator' terms to extend the benchmark series for the two latest quarters are compiled using early VGs' data combined with mortgage lenders' data. These most recent (projected) observations will be labelled with a 'p' indicating a preliminary estimate. They will initially carry an 'experimental' tag until the ABS has a sufficient time series to fully analyse the relationship between these preliminary data and the benchmark series that they are being used to project.

Data issues with 'leading indicator' compilation

As mentioned previously, different States have different legislation in place concerning the length of time an owner has to register the housing transaction. The issue that arises is a bias in early VGs' data caused by properties with higher prices taking longer to settle and so a longer time to appear in the VGs' data set. The early VGs' data the ABS uses in this series are distributed in a biased way, because cheaper properties tend to be settled quicker than more expensive properties. The resulting bias in this early VG's data is always downwards.

Data issues with 'leading indicator' compilation continued

Mortgage lenders' data are also biased. Loan documents do not necessarily record the actual sale price of the property in all cases. Some loan approvals data contain the security valuation. Analysis has shown that median prices derived from mortgage approvals data are always higher than median prices derived from the complete VGs' data set.

Most mortgage lenders do not capture the actual date of exchange, but it has proved possible to model the loan approval date to emulate the exchange date.

Modelling the loan approval date to emulate the exchange date

As the exchange date is not available from the mortgage approvals data, the loan application or loan approval date is used as a proxy. By historically comparing records that match across data sources, relationships between the reported dates have been determined. Depending on the data source and the range in which the price of the house falls, the mortgage approval date is adjusted to estimate the actual exchange date. The resulting adjusted date is then used in the compilation of the 'leading indicator' index.

Correcting for biases

As pointed out earlier, both the data sets which are combined in calculating this series are biased at the time they are being used in this way. It is necessary to identify outliers in the data in each stratum. Historical relationships between this early combined data and the finalised VGs' data are used to set outlier limits in each stratum.

Compiling the leading indicator indexes

The 'leading indicator' indexes for the two latest quarters are based on a combination of early VGs' and mortgage lenders' data. They are compiled as a weighted average of indexes derived from movements in median house prices, stratified by cluster, for each city. The national index is compiled in the same way as that for the benchmark series (i.e. as a weighted average of the eight capital cities).

The weights used in compiling the leading indicator index are the value of the housing stock in each cluster in each city, as is the case for the benchmark series. In some cases, only postcode, rather than an address which identifies a suburb, is available so clusters are more broadly defined than those used in the benchmark series. Records containing only postcode are allocated to a cluster based on the best match between postcode and cluster in those cases for which there is not a 1:1 correspondence between postcode and cluster.

The VGs' and mortgage lenders' data sets are compared and any duplicate records are removed from the mortgage lenders' data set. The data set for the latest quarter contains a much smaller proportion of VGs' records compared with the data set for the second-last quarter. Therefore, the (revised) projection for the second-last quarter is generally more accurate than that for the latest quarter. The movements in the index for each city are calculated and then applied to the final quarter HPI benchmark index number, to provide the published preliminary indexes and movements for the two latest quarters.

The most recent observation (to be labelled with a 'p') in the Established house price index tables will be the first preliminary prediction based on a combination of the available VGs' data and mortgage lenders' data. The penultimate observation (also labelled with a 'p') will be the revised estimate from the previous quarter's publication

Compiling the leading indicator indexes *continued*

and will be the second preliminary prediction based on available VGs' data (more than were available for the first prediction) and mortgage lenders' data. The third last observation (labelled with an 'r') is the first publication of the benchmark series compiled from a comprehensive set of VGs' data only.

For the first release on 2 December 2005 the ABS will be running four different projection models and will analyse the range of estimates to derive the 'leading indicator' terms for the June and September quarters in 2005. With the relatively small number of overlapping observations currently available it is not possible to discriminate between the different models because the short time series of data available does not allow a comprehensive historical simulation of the various projection models.

Over time, the effectiveness of these models will be reviewed and they will be refined as more historical data matches between VGs' and mortgage lenders' data become available. The intention is to produce a progressively more accurate model as a lengthier historical series of data available for matching across sources is established. There are some indications that the prices could be seasonal, particularly in the March quarter (seasonal low) and the December quarter (seasonal high). The ABS will continue to monitor the possibility of such seasonality as longer time series of loan approvals data become available.

CITY-WIDE MEDIAN PRICE OF HOUSES SOLD EACH QUARTER

One of the major user requirements was the publication of price levels, or median prices by city. The ABS will publish a city-wide median price of the VGs house sales data for the quarters for which the benchmark HPI is available. These median prices are 'raw' medians from the available data set and will not concord with the published Established house price index. The city-wide median is calculated using all available records for the city each quarter with no clustering or weighting applied. These city-wide median prices will not show price movements that are consistent with the HPI as they are subject to the compositional effects that the benchmark index controls for through its regional stratification. City-wide median prices of established house transfers are presented in Appendix 1. They will be included in table 7 in the September quarter 2005 issue of the *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0).

VOLUME MEASURE

Another user requirement is for a volume measure of the turnover in the established housing market. Numbers of established house transfers recorded each quarter by the VGs are presented in Appendix 1. They will be included in Table 8 in the September quarter 2005 issue of the *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0).

PUBLICATION AND RELEASE STRATEGY

The ABS publication *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0) will include a benchmark series from March quarter 2002 and a leading indicator series for the most recent two quarters. In the first issue of the new HPI (the September quarter 2005 issue) to be released on 2 December 2005, the benchmark series will run from March quarter 2002 until March quarter 2005 and the experimental preliminary indexes will relate to the June and September quarters 2005. The ABS considered splicing the old HPI series to the benchmark series at the March quarter 2002 overlap (the first quarter available in the new benchmark series). However, on balance, the ABS decided it would not be a useful exercise because of the significant differences in the timing basis

PUBLICATION AND RELEASE STRATEGY *continued*

between the old and new series and the large revisions in some cities as a result of the improved scope of the data available to produce the HPI.

Graphs comparing the old HPI and the new benchmark series for each capital city and the weighted average of eight capital cities are presented in Appendix 2.

It is important to understand that these leading indicator estimates will be revised each quarter, as more data relating to that quarter become available from the VGs. The expectation is that the second preliminary estimate published for a quarter will be closer to the final estimate than was the first preliminary estimate published.

The reference base of an index series is that period for which the value of the index is set to 100.0. For the house price indexes, 1989-90 has previously been used as the reference base. With the introduction of the new methodology for its calculation, the established house price index will now be presented on a reference base of 2003-04. The price index for construction industry total hourly rates of pay is already presented on a reference base of 2003-04, so for ease of comparison, it has been decided to re-reference the remaining indexes presented in this publication to the same reference base. Accordingly, the price indexes for project homes, materials used in house building and national accounts private housing investment will also now be presented on a reference base of 2003-04. Details about the re-referencing process and how to convert the rebased quarterly series of index numbers back to the previous reference base of 1989-90 = 100.0, will be included in an appendix to the September quarter 2005 issue of *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0).

IMPROVEMENTS IN TIMELINESS

It is intended in the future to improve the timeliness of the HPI publication. The target the ABS is aiming for is about 40 days after the reference quarter rather than the current 60 days. However, there is a tradeoff between timeliness and accuracy. During 2006 the ABS will be investigating ways of improving the timeliness of the projections for the latest two quarters without affecting the accuracy of the projections.

APPENDIX 1 NEW ESTABLISHED HPI DATA

INTRODUCTION

Set out in this appendix are the tables for the benchmark series (index numbers and percentage changes), the unstratified city-wide median and the numbers of established house transfers for each city.

The table numbers refer to those in the *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0), the next issue of which will be released on 2 December 2005.

1. ESTABLISHED HOUSE PRICE INDEX NUMBERS (a): (benchmark)

Period	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra	Weighted average of eight capital cities
2001-02	..	..	..	..	..	..	..	..	..
2002-03	89.3	89.9	75.5	83.1	84.4	69.0	87.7	82.7	86.6
2003-04	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2002									
March	75.9	79.3	61.9	69.7	75.5	56.3	81.6	66.5	74.3
June	81.6	84.3	64.5	73.3	77.2	57.6	81.6	70.7	78.8
September	85.4	86.3	69.3	76.1	79.0	60.5	84.1	74.9	82.0
December	88.5	88.3	72.5	80.3	82.4	63.9	86.0	80.1	85.0
2003									
March	89.7	90.2	77.1	85.5	85.9	71.9	89.3	84.7	87.4
June	93.7	94.9	83.1	90.5	90.2	79.7	91.3	90.9	92.0
September	98.4	99.0	93.3	97.0	94.0	91.4	93.6	97.7	97.4
December	102.4	102.0	100.6	99.6	98.8	99.3	98.5	101.7	101.5
2004									
March	101.5	99.6	102.3	101.0	102.3	101.6	104.8	100.3	101.2
June	97.7	99.4	103.8	102.4	104.9	107.8	103.0	100.3	100.0
September	97.1	99.7	102.6	104.5	106.9	108.6	108.2	98.7	100.0
December	97.6	102.4	104.0	106.5	111.8	111.4	112.7	100.3	101.7

.. not applicable

(a) Base of each index: 2003-04 = 100.0.

APPENDIX 1 NEW ESTABLISHED HPI DATA *continued*

2. ESTABLISHED HOUSE PRICE INDEX NUMBERS: **Percentage changes (benchmark)**

<i>Period</i>	<i>Sydney</i>	<i>Melbourne</i>	<i>Brisbane</i>	<i>Adelaide</i>	<i>Perth</i>	<i>Hobart</i>	<i>Darwin</i>	<i>Canberra</i>	<i>Weighted average of eight capital cities</i>
PERCENTAGE CHANGE (FROM PREVIOUS FINANCIAL YEAR)									
2001-02	..	..	..	..	..	..	..	..	..
2002-03	..	..	..	..	..	..	..	..	..
2003-04	12.0	11.2	32.5	20.3	18.5	44.9	14.0	20.9	15.5
PERCENTAGE CHANGE (FROM CORRESPONDING QUARTER OF PREVIOUS YEAR)									
2002									
March	..	..	..	..	..	..	..	..	..
June	..	..	..	..	..	..	..	..	..
September	..	..	..	..	..	..	..	..	..
December	..	..	..	..	..	..	..	..	..
2003									
March	18.2	13.7	24.6	22.7	13.8	27.7	9.4	27.4	17.6
June	14.8	12.6	28.8	23.5	16.8	38.4	11.9	28.6	16.8
September	15.2	14.7	34.6	27.5	19.0	51.1	11.3	30.4	18.8
December	15.7	15.5	38.8	24.0	19.9	55.4	14.5	27.0	19.4
2004									
March	13.2	10.4	32.7	18.1	19.1	41.3	17.4	18.4	15.8
June	4.3	4.7	24.9	13.1	16.3	35.3	12.8	10.3	8.7
September	-1.3	0.7	10.0	7.7	13.7	18.8	15.6	1.0	2.7
December	-4.7	0.4	3.4	6.9	13.2	12.2	14.4	-1.4	0.2
PERCENTAGE CHANGE (FROM PREVIOUS QUARTER)									
2002									
March	..	..	..	..	..	..	..	..	..
June	7.5	6.3	4.2	5.2	2.3	2.3	0.0	6.3	6.1
September	4.7	2.4	7.4	3.8	2.3	5.0	3.1	5.9	4.1
December	3.6	2.3	4.6	5.5	4.3	5.6	2.3	6.9	3.7
2003									
March	1.4	2.2	6.3	6.5	4.2	12.5	3.8	5.7	2.8
June	4.5	5.2	7.8	5.8	5.0	10.8	2.2	7.3	5.3
September	5.0	4.3	12.3	7.2	4.2	14.7	2.5	7.5	5.9
December	4.1	3.0	7.8	2.7	5.1	8.6	5.2	4.1	4.2
2004									
March	-0.9	-2.4	1.7	1.4	3.5	2.3	6.4	-1.4	-0.3
June	-3.7	-0.2	1.5	1.4	2.5	6.1	-1.7	0.0	-1.2
September	-0.6	0.3	-1.2	2.1	1.9	0.7	5.0	-1.6	0.0
December	0.5	2.7	1.4	1.9	4.6	2.6	4.2	1.6	1.7

.. not applicable

APPENDIX 1 NEW ESTABLISHED HPI DATA *continued*

7. MEDIAN PRICE OF ESTABLISHED HOUSE TRANSFERS (UNSTRATIFIED), \$'000

<i>Period</i>	<i>Sydney</i>	<i>Melbourne</i>	<i>Brisbane</i>	<i>Adelaide</i>	<i>Perth</i>	<i>Hobart</i>	<i>Darwin</i>	<i>Canberra</i>
2002								
March	365.0	241.0	185.0	166.0	190.0	123.3	180.0	245.0
June	393.0	260.0	182.5	175.0	190.0	116.0	180.0	258.0
September	413.0	265.0	197.6	181.0	195.0	124.0	186.0	275.0
December	444.0	280.0	208.0	195.0	205.8	128.0	195.0	291.0
2003								
March	434.0	270.0	225.0	208.0	216.0	144.3	198.0	300.0
June	460.0	287.4	240.0	219.0	225.0	148.0	195.0	330.0
September	480.0	295.0	269.0	230.0	236.0	165.0	208.0	355.0
December	520.0	320.0	297.0	245.0	250.0	182.8	220.9	373.0
2004								
March	523.0	305.0	302.0	250.0	255.0	200.0	221.5	375.0
June	498.0	307.0	305.0	255.0	262.0	225.0	225.0	374.3
September	500.0	301.8	304.7	257.5	259.9	227.4	235.0	351.0
December	515.0	320.0	310.0	265.0	280.0	240.0	247.0	372.0

8. NUMBER OF ESTABLISHED HOUSE TRANSFERS

<i>Period</i>	<i>Sydney</i>	<i>Melbourne</i>	<i>Brisbane</i>	<i>Adelaide</i>	<i>Perth</i>	<i>Hobart</i>	<i>Darwin</i>	<i>Canberra</i>
2001-02	..	..	..	..	..	..	..	..
2002-03	62 190	62 855	49 938	21 081	34 313	6 095	2 111	5 805
2003-04	50 860	57 349	41 228	19 354	29 544	5 149	2 671	4 621
2002								
March	13 033	15 877	11 008	5 534	8 920	1 474	473	1 550
June	15 520	17 120	11 927	5 574	8 280	1 465	524	1 764
September	16 706	15 722	11 742	4 983	7 328	1 484	540	1 407
December	15 398	16 137	11 547	5 139	7 662	1 463	469	1 497
2003								
March	13 700	14 558	13 566	5 438	9 434	1 595	497	1 352
June	16 386	16 438	13 083	5 521	9 889	1 553	605	1 549
September	16 993	17 064	14 480	5 117	8 237	1 584	680	1 363
December	11 809	14 359	9 196	4 771	6 876	1 246	668	1 181
2004								
March	10 183	12 571	9 153	4 800	7 667	1 246	644	987
June	11 875	13 355	8 399	4 666	6 764	1 073	679	1 090
September	10 174	13 694	8 481	4 591	8 495	948	693	814
December	10 737	14 510	8 119	4 735	7 632	972	672	1 158

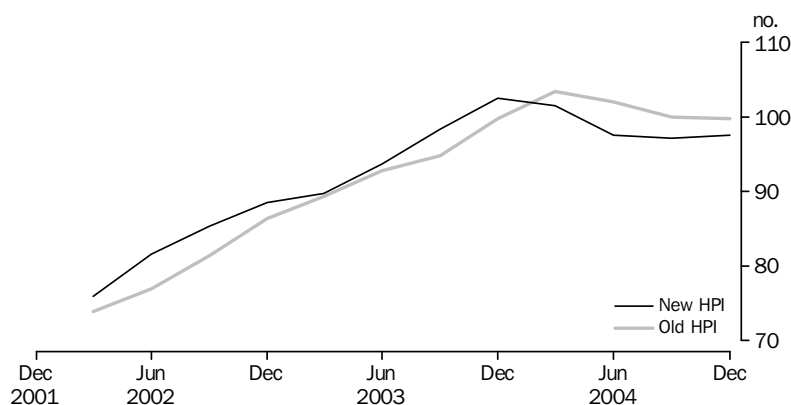
.. not applicable

APPENDIX 2 COMPARISON BETWEEN OLD AND NEW HPI

COMPARISON OF OLD AND NEW ESTABLISHED HOUSE PRICE INDEX

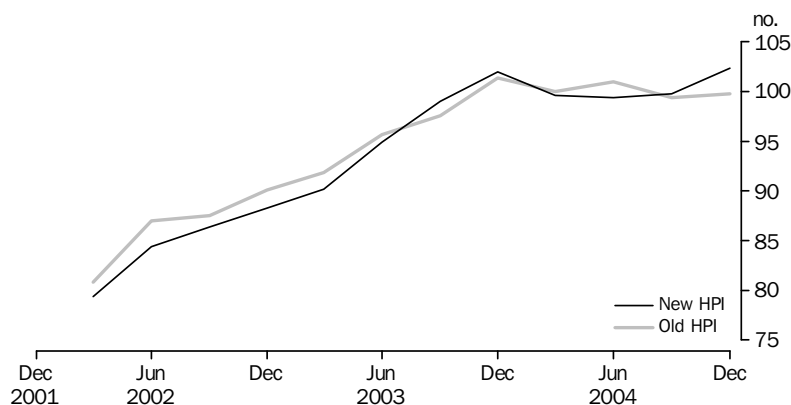
This appendix compares the old established house price index with the new benchmark series for each capital city and for the weighted average of eight capital cities, in graphical format. For ease of comparison, the old established house price index series have been re-referenced to a base of 2003-04 = 100.0. These graphs clearly demonstrate that there is an obvious impact of the earlier exchange of contract basis for the new HPI compared with the settlement basis of the old HPI. Where turning points or points of inflection exist, they occur earlier.

ESTABLISHED HOUSE PRICE INDEX(a), Sydney



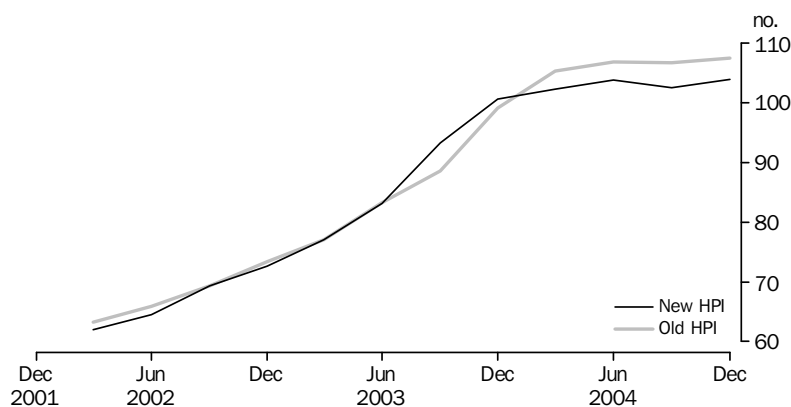
(a) Base of each index: 2003-04 = 100.0.

ESTABLISHED HOUSE PRICE INDEX(a), Melbourne



(a) Base of each index: 2003-04 = 100.0.

ESTABLISHED HOUSE PRICE INDEX(a), Brisbane

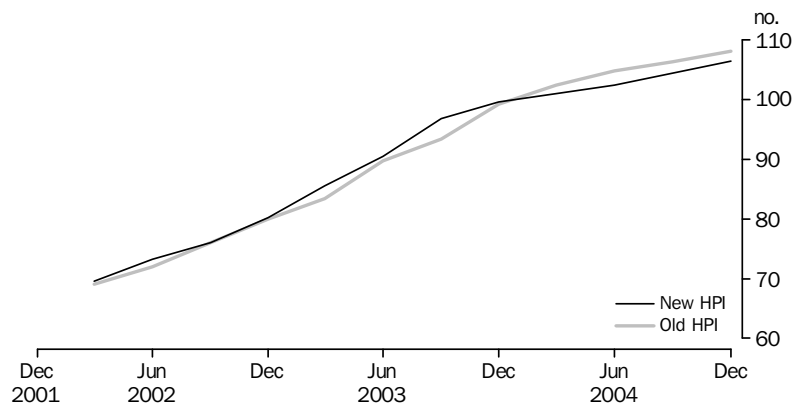


(a) Base of each index: 2003-04 = 100.0.

APPENDIX 2 COMPARISON BETWEEN OLD AND NEW HPI *continued*

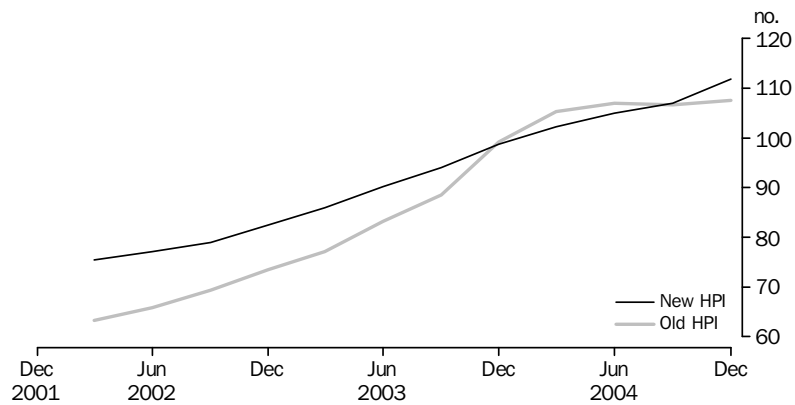
COMPARISON OF OLD AND
NEW ESTABLISHED HOUSE
PRICE INDEX *continued*

ESTABLISHED HOUSE PRICE INDEX(a), Adelaide



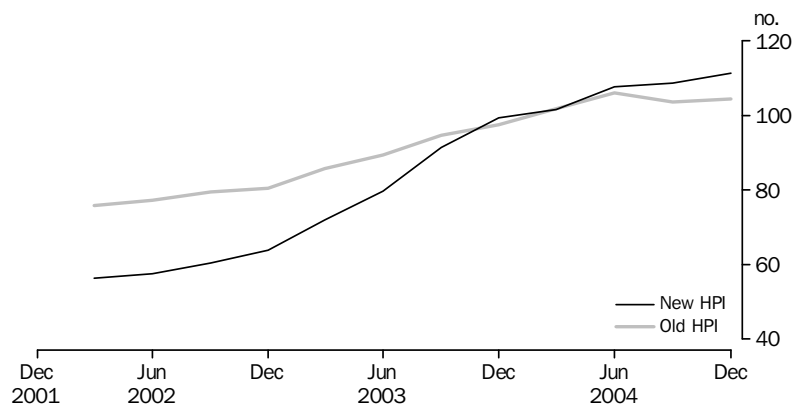
(a) Base of each index: 2003-04 = 100.0.

ESTABLISHED HOUSE PRICE INDEX(a), Perth



(a) Base of each index: 2003-04 = 100.0.

ESTABLISHED HOUSE PRICE INDEX(a), Hobart

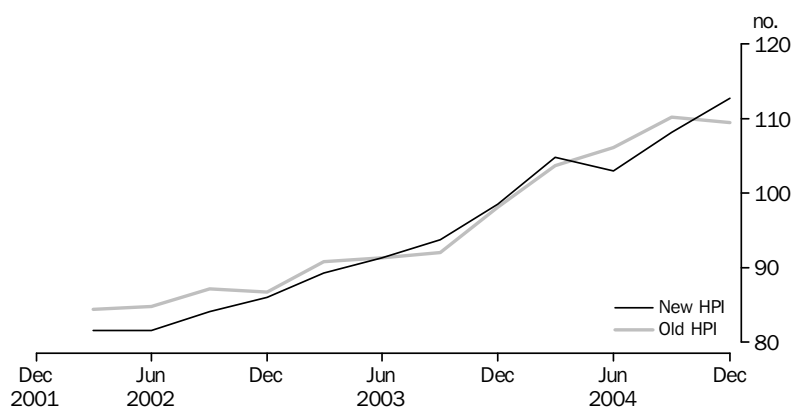


(a) Base of each index: 2003-04 = 100.0

APPENDIX 2 COMPARISON BETWEEN OLD AND NEW HPI *continued*

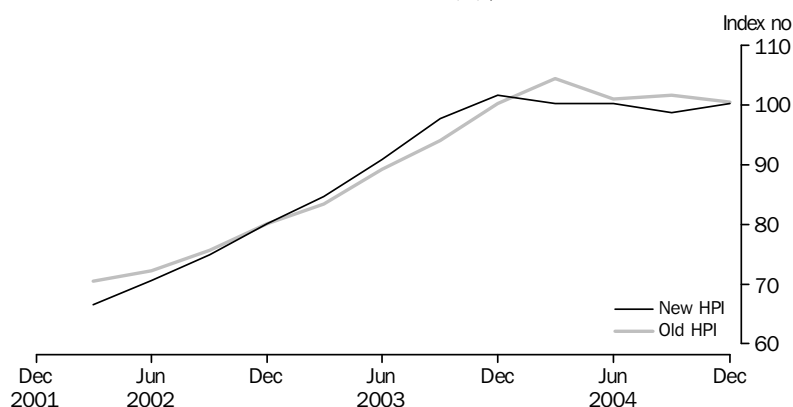
COMPARISON OF OLD AND
NEW ESTABLISHED HOUSE
PRICE INDEX *continued*

ESTABLISHED HOUSE PRICE INDEX(a), Darwin



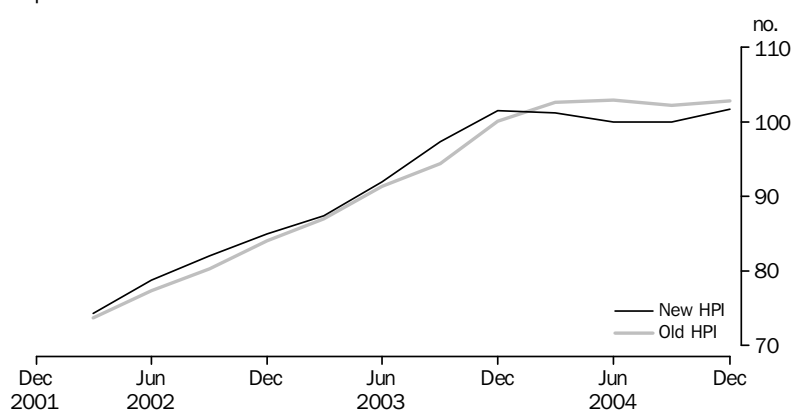
(a) Base of each index: 2003-04 = 100.0.

ESTABLISHED HOUSE PRICE INDEX(a), Canberra



(a) Base of each index: 2003-04 = 100.0.

ESTABLISHED HOUSE PRICE INDEX(a), Weighted average of eight capital cities



(a) Base of each index: 2003-04 = 100.0.

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