A comparison of UK residential house price indices

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Summary

The measurement of house prices poses significant conceptual and practical problems, mainly because dwellings are heterogeneous assets whose prices can only be observed when they are sold. There are now seven main house price indices for the United Kingdom. In broad terms, each measures one of three different concepts: the *value* of a representative set of house transactions; the *price* of a house with "typical" characteristics; the *value* of the housing stock. The indices are constructed from different data using different methods. Consequently, the available measures of house prices can give conflicting or misleading signals about house price inflation.

The data and methods used to construct the indices can vary in three key respects: the point in the house purchase process at which the price is measured; the techniques used to adjust for differences in the characteristics of houses; and the weighting scheme used. Indices that measure the price earlier in the purchase process are able to detect price changes first, but will measure final prices with error because prices can be renegotiated extensively before the deal is finalised. This is not necessarily a disadvantage, because it is useful to have a measure of prices at each stage of the purchasing process and those indices measuring prices earlier in the purchase process may lead other indices. Quality adjustment aids interpretation of price changes, and can have significant effects on measured house price inflation. A variety of methods and specifications are used, each with advantages and disadvantages. The choice of weighting scheme allows the index to measure different concepts of house prices and movements in price for different sets of dwellings. Again, a variety of methods are used.

All the available indices have advantages and disadvantages so it is important to look at a wide range of indicators and examine the reasons for the differences between them. Observers and policymakers must always be careful to match the measure of house prices they use with the concept they are interested in, and to ensure that the information in short-run changes in house price inflation is not over-interpreted, because sampling and estimation error in monthly and quarterly house price inflation rates appears to be substantial.

1. Introduction

As with many economic statistics, the measurement of house prices poses significant conceptual and practical problems. This is mainly because dwellings are heterogeneous assets whose prices can only be observed when they are sold. The United Kingdom does not have a definitive dataset of all the characteristics and prices of all transacted houses so there has been, and is, significant scope for various organisations and government departments with access to different proprietary or public datasets to each produce a house price index.

There are now seven main house price indices in the United Kingdom, three of which are "official" indices, in the sense that they are constructed by different government departments; two are

[1] The views expressed in this paper are those of the author, and not necessarily those of the Bank of England. I am grateful for helpful comments and suggestions from Gregory Thwaites, Simon Whitaker and Ian Bond, any remaining errors are my own. Robert Wood, Structural Economic Analysis Division, Monetary Analysis, Bank of England, Threadneedle Street, London, EC2R 8AH; e-mail: Rob.Wood@bankofengland.co.uk.

constructed by the Office of the Deputy Prime Minister (ODPM) and one by the Land Registry.[2] A further two are constructed by two of the main mortgage lenders in the United Kingdom; HBOS (formerly the Halifax Building society) and the Nationwide Building Society. Finally, two companies with an interest in the housing market, Hometrack and Rightmove, have introduced indices in the last few years. In addition to these indices there are two main survey based measures of house price inflation, produced by the Royal Institution of Chartered Surveyors and the House Builders Federation, and a number of less well known indices and surveys some of which are regional or concentrate on specific market segments (such as Buy to Let purchases).

The data and methods used to construct the indices vary. This is because there are several valid concepts of house prices - such as the average transaction price, the price of a typical house and the housing stock deflator - and the methods to calculate each are different. However, the methods used vary even within the set of indices measuring each particular type of house price. The data used are often proprietary to the institution constructing the index.

These issues introduce significant complexity and confusion into determining house price movements in the United Kingdom. The range of available measures of house prices almost always give different estimates of the rate of house price inflation and since the indices use different methods and samples it is difficult to analyse why there are differences. This paper compares the available indices in the United Kingdom; both their construction methods and their outturns. Since there are seven main house price indices that is a difficult task. The focus of the paper, therefore, is to try to identify the advantages and disadvantages of each method relative to the other methods. The paper then compares the outturns of the indices with a view to highlighting the importance of the different methods.

The next section considers how house prices could be measured, and sets up a framework for categorising the various methods and data sets that can be used to measure prices. The third section then categorises the available residential house price indices and compares the methods used to construct the various indices. Section 4 compares the outturns of the indices with a view to considering the impact of the different methods used to construct them.

2. Methods and data sets used to construct residential house price indices

2.1 Why are house prices difficult to measure?

The price of housing is harder to measure than that of most other goods and assets because of three key distinguishing characteristics. First, and most importantly, dwellings are heterogeneous. No two dwellings are identical, if only because they cannot occupy quite the same location. This means that sampled house prices may be a poor indicator of all house prices because we cannot always reliably predict the sales price of a given dwelling from the price of another.

Second, the market price of a given dwelling cannot easily be observed without it being sold. Dwellings are typically transacted at a price reached through negotiation or at auction, so the advertised price can be a poor guide to the eventual selling price. The set of observations that can be used to estimate house prices is therefore usually restricted to transactions prices, so the mixture of prices that can be observed will be determined by the types of houses transacted in any given period. There is, however, no definitive dataset of all the characteristics and prices of all transacted houses in the United Kingdom. Consequently, many similar house price indices can coexist because they use different, mostly proprietary, datasets.

Third, houses are generally sold infrequently: over the 1990s the number of private dwellings sold per year was around 7% of the stock. At that rate, each house would be sold, on average,

[2] The Financial Times (FT) has recently begun publishing an index that is a forecast of a monthly and seasonally adjusted version of the Land Registry index.

approximately once every 14 years. So the most recent price observation for a given house will be, on average, seven years old, and will therefore be an unreliable guide to the price it would fetch today.

As well as prices being hard to measure, there is no single definitive concept of the UK house price. A simple average of transaction prices in a given period has a clear interpretation: the mean price of houses sold in that period. This is a useful measure if one wants to estimate the value of turnover in the housing market (which will be related, for example, to stamp duty receipts and estate agents' turnover). But, we may equally well be interested in the value of the total housing stock - sometimes referred to as housing wealth - or the price of a representative house. To calculate indices consistent with those other concepts the data must be quality adjusted - because changes in the mean price over time may reflect changes in the mix of houses being sold rather than in the value of the stock of dwellings or the price of a typical house - and weighted correctly - because the mix of houses sold each period is unlikely to be a consistently reliable indicator of the mix of houses whose price the index is trying to measure eg the mix of houses typically transacted or the mix of houses in the housing stock.

2.2 Methods for quality adjusting data and their advantages and disadvantages

Constant-quality measures of house prices try to standardise, and make comparable over time, the information available in the data, to overcome the limitations of simple averages. Three main methods can be used: hedonic regression; mix-adjustment; and the repeat-sales method:

- *Hedonic regression*. The price of a house depends on its location and its physical characteristics. Hedonic regression is a way of estimating the value the marketplaces on each of those attributes. The estimates are then used to construct the price of a synthetic house with a representative amount of each characteristic.

- *Mix adjustment*. House price observations are grouped into sets or "cells" of observations on houses with similar location and physical attributes. For instance, the old ODPM index contained around 300 cells (the new ODPM index contains around 150,000 cells). The mean prices in each cell are weighted together to give a "mix-adjusted" price. A change in the composition of the sample will alter the number of observations in each cell. But if the cells are defined sufficiently precisely, so that all elements of the cell have similar prices and price trends, then such compositional changes will not systematically affect the mix-adjusted house price.

  The mix-adjustment and hedonic regression techniques can give very similar results if they control for the same house characteristics.

- *Repeat sales*. Both of the previous methods require a large number of dwelling characteristics to be recorded if they are to be reliable. In some cases this information is not readily available. Instead, there may be information on the history of transactions for a large sample of dwellings, which allows us to examine the price changes of individual houses. Observing the sale prices of a given house at two points in time will give an estimate of general house price inflation between those two transactions. With a sufficient number of estimates from partially overlapping periods, house price inflation could be estimated. No repeat sales indices yet exist for the United Kingdom.

All these methods have disadvantages. Both hedonic and mix-adjusted indices will suffer from the same problems as simple averages if they do not control for all relevant characteristics. If some characteristics were omitted from the hedonic regression or cell structure a change in the distribution of these characteristics over time would create inaccuracies in the estimated change in the price of a constant-quality house. For example, if fitted kitchens became more common, but were not recorded as a characteristic of the houses in the sample, the price index may rise too quickly: higher prices from the inclusion of fitted kitchens may be mistaken for an increase in the price of a constant-attributes house.[3] To the extent that the existing house price indices do not measure such quality improvements

[3] It should be noted that the impact of an excluded variable is particularly complicated if the existence of that characteristic, for instance fitted kitchens, is correlated with some other characteristic that is included in the hedonic regression or mix-adjustment.

as they become more prevalent, they may overstate the rate of constant-quality house price inflation. Furthermore, if these unobserved attributes were more common in properties sold at certain phases of the cycle (for example, if the top end of the market were relatively active during booms) then the amplitude of fluctuations in house price inflation may be understated or overstated accordingly.

Changes in the sample mix between houses with different inflation rates would affect the estimates from simple repeat-sales indices. For example, if detached and terrace houses appreciate at 0% and 5% per year respectively, a shift in the sample towards terrace houses will increase the estimated average inflation rate, because no account is taken of the characteristics of the sample. Furthermore, the estimated appreciation rate will also be biased if the property is altered or its condition changes between the two price observations. Hybrid hedonic repeat-sales indices can remove this problem by controlling for the characteristics of the sample, but such indices will be subject to similar disadvantages to those for hedonic indices and will have similar data requirements.

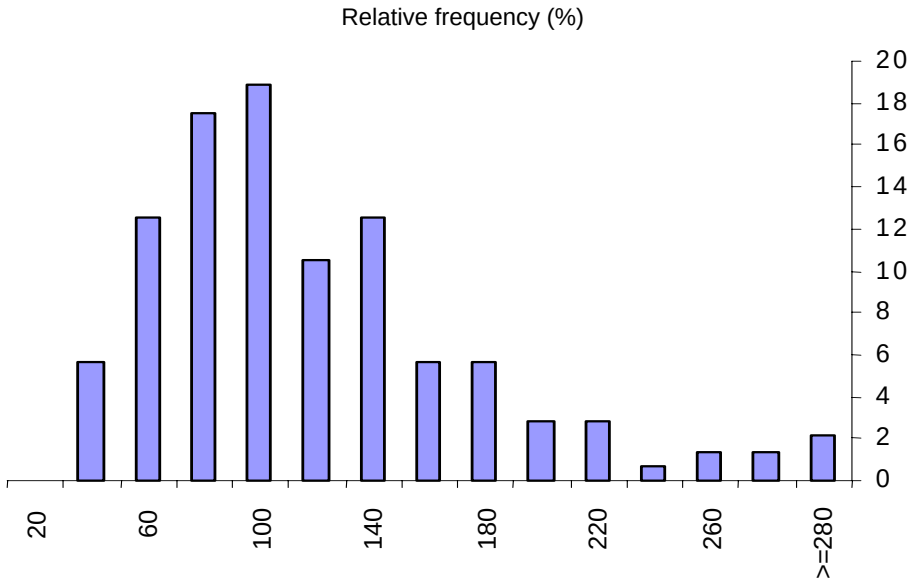
2.3 Weighting

The levels and inflation rates of house prices in the United Kingdom are widely dispersed - the prices of similar dwellings in different locations can vary by a factor of more than seven (see Chart 1) - so the choice of weights for an index could have significant effects on measured house prices and inflation. The weighting scheme will depend on two factors:

- Which constant notional house or set of houses the index is representing. For instance, is the index measuring the price of typically transacted houses or the stock of dwellings?
- Whether the index is measuring the change in *value* of a set of houses or the change in *price* of a typical member of a set of houses (which need not be an actual house, it could be the average or median house in a group). In other words, the weighting scheme will depend on whether expensive houses in the set should receive more weight, commensurate with their share of expenditure on the set? We can choose to represent the price of a house with typical characteristics, where all houses in a set have equal weight in determining what is typical. This would involve "volume weighting". Alternatively, we can represent the price of a representative collection of houses, where more expensive houses have an accordingly higher weight. This would involve "expenditure weighting".

Chart 1

Distribution of average transacted flat and maisonette prices in localities in England and Wales in 2002 Q3



Source: Land Registry.

If all houses were appreciating at a common rate, both price indices reflecting expenditure and volume weights would appreciate at that rate. But if low- and high-value houses were to exhibit different price trends, the inflation rates of volume and expenditure-weighted indices would diverge.

2.4 Available datasets

The Land Registry dataset[4] contains the prices of all transacted houses in England and Wales, including those purchased without a mortgage (so called cash transactions). However, it has two disadvantages. First, only a very limited number of characteristics are recorded for each house so it is unsuitable for use in an hedonic regression; it does not include house size which is one of the more important characteristics. Second, it is only available quarterly and with a six week lag. Missing observations are then added to the dataset a further three months later; so the final dataset is not available until four and a half months after the quarter to which it refers. The Council of Mortgage Lenders (CML), an organisation representing the industry, compiles a sample of its members' mortgage approvals called the Survey of Mortgage Lenders (SML). However, until recently the sample proportion has been small (it has only increased from a 5% sample in the last couple of years) to date and it is not available until four weeks after the end of the month.

The problems with the Land Registry and SML datasets mean there is significant scope for other organisations with access to house price data, such as mortgage lenders, estate agents and advertisers, to produce house price indices based on that data. This, of course, makes comparison of the indices difficult because differences could be due to two factors: differences in the data or differences in the construction methods.

3. Comparison of the methods used to construct the seven main UK house price indices

3.1 UK house price indices

Table 1 describes the seven main UK house price indices.[5] The first three could be considered "official" indices because they are produced by government departments. The old and new ODPM indices both use the SML dataset but use different methods. The new index replaces the old one; it is based on a much larger sample of mortgage approvals than the old ODPM index and uses a more sophisticated mix-adjustment method.[6] It is intended that the new index will, in due course, become a National Statistic, but currently only a short back-run of data is available (extending back to February 2002) and it was published for the first time in September 2003, so both the old and new indices have been included in this analysis.

The Land Registry index has been discussed previously. The Halifax and Nationwide indices are produced by two UK mortgage lenders. Rightmove is a website on which estate agents post adverts for properties for sale or to rent. They use the posted asking prices on their internet site to construct a house price index. Hometrack use a survey of estate agents to construct an index.

3.2 Housing market timeline

The main indices measure the price of dwellings at different points in the house purchase process, shown in Chart 2. Indices nearer the beginning may detect changes in house prices first: the house

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[4] The "Land Registry" is a government department that maintains a register - the Land Register - of the ownership of all property and land in the United Kingdom. The Land Registry must be informed of changes in ownership for them to be legally recognised, so it is able to maintain a database of all housing market transactions.

[5] The Land Registry, Hometrack and Rightmove indices cover only dwellings in England and Wales but are included because transactions in England and Wales account for a large proportion of those in the whole of the United Kingdom.

[6] See Wall (1998) and Fenwick and Duff (2002). Further information about the new index is also available from the ODPM website: http://www.odpm.gov.uk/stellent/groups/odpm_control/documents/contentservertemplate/odpm_index.hcst?n=1618&l=3.

prices appearing in the September Halifax and Nationwide indices will not appear in the ODPM sample until October or November. However, because house prices are usually reached through negotiation the sale price may change through the process. A buyer may agree a price with a seller somewhat below the seller's initial asking price (recorded by the Rightmove index). A survey of the property carried out for the mortgage lender at the mortgage approval stage may lead to further revisions of the price. This may occur if, for instance, the surveyor suggested to the mortgage lender that the house was not worth the price agreed between buyer and seller. Finally, the price may be renegotiated following the approval of a mortgage (the stage at which the price is measured by the Halifax, Nationwide and Hometrack indices).

Table 1

Main UK house price indices

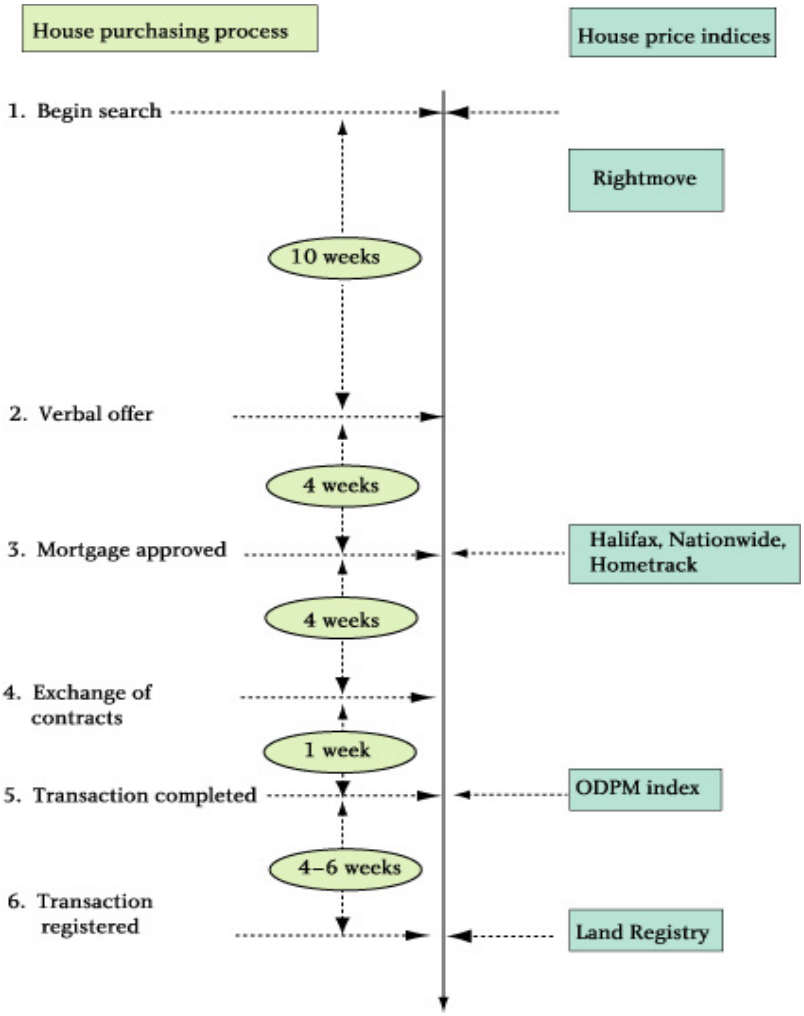
	Data	Quality adjustment method	Seasonally adjusted?	Weights used	Weighting method	Measures
"Old" ODPM	SML 5% sample of CML eligible completions	Mix adjustment	No	Rolling average of SML transactions	Expenditure	Value of average set of transacted dwellings
"New" ODPM	SML 30-50% sample of CML eligible completions	Mix adjustment	No	Rolling average of Land Registry transactions	Expenditure	Value of average set of transacted dwellings
Land Registry	100% of sales registered in England and Wales	Simple average	No	None	Expenditure	Value of set of transacted dwellings
Halifax	Loans approved for house purchase by Halifax	Hedonic regression	Yes	1983 Halifax loan approvals	Volume	Price of "Halifax" representative dwelling
Nationwide	Loans approved for house purchase by Nationwide	Hedonic regression	Yes	Rolling average of SML, Land Registry and Nationwide transactions	Volume	Price of "Nationwide" representative dwelling
Hometrack	Survey of approx 4,000 estate agents' estimated local average prices	Mix adjustment	No	England and Wales housing stock	Expenditure	Value of housing stock
Rightmove	Sellers' asking prices posted on internet site	Mix adjustment	No	England and Wales housing stock	Expenditure	Value of housing stock

The prices at each stage of the house purchase process have uses. For instance, estate agents may be interested in the extent to which sellers are changing asking prices. But in general the indices exist, or are used by many observers, to provide an estimate of changes in the final or actual "price of housing". Indices based on mortgage approval data will exclude some transactions, cash transactions, from their datasets. This may be important if the sample also does not include houses similar to those purchased with cash. But to the extent that the price of houses purchased with cash do not behave differently to those purchased with a mortgage and that the size and incidence of price revisions do

not vary over time, an index positioned at any point in the house purchase process should measure changes in the final agreed prices correctly. Both these conditions are, however, unlikely to hold.

Chart 2

House purchase timeline and house price indices



Sources: Bank of England; ODPM.

Comparing the indices, the Rightmove index will detect price changes earliest in the timeline, but the prices used by Rightmove will be the most likely to be revised. At the other extreme, the prices in the Land Registry index will never be revised (because they record how much buyers *have* paid for a dwelling), but price changes will be captured by Rightmove six months earlier than by the Land Registry (nearly eight months if the lag in compiling the Land Registry dataset is taken into account).

The Halifax and Nationwide indices are in many ways a good compromise between accuracy and timeliness. Their data is likely to measure final prices more accurately than the Rightmove data, but less accurately than the Land Registry data. Their datasets will be subject to sample selection bias to some extent, since each index relies only on the lender's own mortgage approvals, which may depend on the competitiveness of the mortgage rates offered by each lender. However, the Halifax and Nationwide indices will measure price changes nearly three months earlier than the Land Registry index (nearly five months if the lag in compiling the Land Registry dataset is taken into account).

Price revisions between mortgage approval and transaction completion stage may, however, be systematic and wide-spread. In times of house price rises, price revisions are likely to be systematically positive, whilst when prices are falling revisions are likely to be negative. In England

and Wales, an agreed sale can be cancelled by either side of the transaction at any point until ownership changes (transaction completed). This leaves each side an alternative option should the value of a house change after a sale is agreed. Sellers can accept a higher offer from another buyer (called "gazumping"), and buyers can agree a price for another property. Consequently, when prices are rising sellers may be able to take advantage of the outside option of accepting another offer to revise the price upwards. When prices are falling buyers may be able to take advantage of the outside option of purchasing another, cheaper property. Transactions and search costs complicate this simplistic picture, but the broad point is likely to stand.

Finally, the Hometrack index is a measure of house prices at the mortgage approval stage. But it makes use of estate agents' estimates of average prices by postcode and house type (detached, semi-detached, terraced, bungalow). Estate agents are exposed directly and frequently to the market so they might be considered the correct group to survey about house prices. Such a survey requires estate agents to accurately estimate local average prices. But as long as any errors made are not systematically biased then they should have little effect on measured of house price inflation.

3.3 Quality adjustment

All indices other than the Land Registry use hedonic regression or mix-adjustment methods to quality adjust their data to take account of the effect of changes from one period to the next in the mix of houses transacted. The mix adjustment and hedonic regression methods for quality adjusting the data can be similar under certain circumstances. If mix-adjustment is undertaken with the same house characteristics as in an hedonic regression, both indices use the same weights, and the mix-adjusted index is a geometric mean of the cell prices, then the two indices should give similar results.

In practice, the hedonic regression methods used by the Halifax and Nationwide have been more encompassing than the mix-adjustment method used to construct the "old" ODPM index. The old ODPM index was mix-adjusted using a small number of characteristics: region; number of bedrooms; house type (ie detached/bungalow/flat, semi-detached, terraced); old or new; type of buyer (first time buyer or former owner occupier). Consequently, the old index had only 300 "cells". Table 2 below shows that the Halifax and Nationwide indices control for the effects of many more characteristics, and so are less likely to be affected by changes in the mix of houses sold than the old ODPM index; the ODPM index may change if the number of houses in the sample with, for instance, bathrooms, or garages, or a garden, changes. The Halifax and Nationwide indices are unlikely to be affected to the same extent.

The new ODPM index controls for more characteristics than the old version and each characteristic is included in more detail. For instance, local authority district is used instead of region; the exact number of rooms is used instead of allocating dwellings to a group eg five or less rooms, five to seven rooms etc. The seven characteristics used are: location (local authority district); cluster (an ONS classification of local authorities); type of neighbourhood (ACORN classification); dwelling type (detached, semi-detached, bungalow, flat, terraced); number of rooms; old or new; type of buyer (first time buyer or former owner occupier). The new index has over 150,000 cells instead of 300 in the old index.

Turning to comparing the Halifax and Nationwide indices, Table 2 shows that the hedonic regressions employed by the two indices differ to some extent in the judgements they embody: each is based on a somewhat different set of characteristics, and some characteristics contribute to the house price in different ways. For instance, both lenders assume that the number of bathrooms affects the price of a house. But the Halifax index treats each successive bathroom as contributing the same additional amount to the house price, whereas the Nationwide index makes no distinction between a house with two bathrooms and one with three or more.[7] Such discrepancies may give rise to differences in the two indices' estimates of the rate of house price inflation; the inclusion of a variable in one equation but not another is likely to affect the coefficients on other variables in the equations. So even if the Halifax and Nationwide used the same data and definition of a typical house, their estimates of the price of a typical house would be likely to differ.

[7] The method used to construct the Halifax index is discussed in some detail in Fleming and Nellis (1984), available on request from the Halifax.

The Hometrack and Rightmove indices mix-adjust data by postcode and property type. The location used is defined at a lower level of aggregation than that in any other index, but both indices exclude a large number of other relevant characteristics (such as number of bedrooms). The mix-adjustment used in these two indices can be considered to be broader than that in the Land Registry index but narrower than used in other indices.

Table 2

Characteristics in the Nationwide and Halifax hedonic regressions

Characteristic	In the Nationwide regression?	In the Halifax regression?
Detached house	✓	✓
Terraced house	✓	✓
Detached bungalow	✓	✓
Semi-detached bungalow	✓	But uses one bungalow dummy variable rather than two
Purpose built flat/maisonette or new converted	✓	✓
Converted flat/maisonette	✓	But uses one flat dummy variable rather than two
Tenure	✓	✓
Number of bedrooms	✓	x
Number of habitable rooms	x	✓
Double garage	✓	x
Number of garages	x	✓
Number of garage spaces	x	✓
Parking space or no garage	✓	x
Central heating type	✓	✓
Floor size (sqft)	✓	x
Number of acres	x	✓
More than one bathroom	✓	x
Number of bathrooms	x	✓
Number of toilets	x	✓
Garden	x	✓
Subject to a road charge	x	✓
Property age	x	✓
New	✓	x
Region	✓	✓
ACORN (A Classification of Residential Neighbourhoods) classification	✓	x
Parliamentary constituency	✓	x

3.4 Weighting

There are two issues to consider when comparing the weighting schemes of the indices. First, which constant notional house or set of houses is the index representing? Second, is the index volume or expenditure weighted?

In terms of the first issue, the indices can be put into one of two groups with respect to the type of price they are trying to measure.

- *Transactions weights* (Old ODPM, New ODPM, Land Registry, Halifax and Nationwide). Indices in this group measure either the price of a typically transacted house, or the value of a set of typically transacted dwellings. The Land Registry index is a special case in this group because, in a strict sense, the average price uses transactions weights from the most recent month or quarter.
- *Housing stock weights* (Hometrack and Rightmove). Indices in this group measure either the price of a typical member of the housing stock, or the value of the housing stock.

The indices also differ in their use of current or base weights:

- *Base weights* (Halifax and Rightmove). The weights are defined by the transactions or housing stock from a particular year and are never changed. For instance, the Halifax index measures the price of a dwelling that has characteristics typical of dwellings transacted in 1983.
- *Rolling weights* (Old ODPM, New ODPM, Nationwide, Hometrack and Land Registry). The weights are updated periodically, usually annually, with new data on transactions or the housing stock.

The differences are summarised in Table 3. If the type of houses transacted or the characteristics of the housing stock changeover time the indices using base weights are most likely to measure the change in price of a currently representative house or group of houses with error.

Table 3

Weights used in UK house price indices

	Transactions weights	**Stock weights**
Base weights	Halifax	Rightmove
Rolling weights	Old ODPM New ODPM Nationwide Land Registry	Hometrack

The Halifax “standard house” is defined by the characteristics of the average house on which the Halifax approved a mortgage in 1983. All other indices base their weights on information from a wide range of mortgage lenders (SML transactions) or on all transactions (from the Land Registry) or the housing stock. These other weights may be more representative of the UK housing market than those based on dwellings on which mortgages were approved by the Halifax alone. For instance, the North of England may be over-represented, compared to the true regional distribution of housing market transactions, in the Halifax weights because the Halifax used to have a larger presence in the North of England than in the South.

Comparing the weights used in the other indices, those using transactions weights based on Land Registry information are likely to be the most representative of the typically transacted house or typically transacted set of houses, because the Land Registry records all housing market transactions. Those indices using weights based on SML transactions will not be quite as representative because, whilst the survey includes data from almost all mortgage lenders, it excludes cash transactions which account for approximately 25% of all housing market transactions in the United Kingdom. Of course, indices using SML transactions weights will be representative of the change in price of a typical house or set of houses purchased with a mortgage, which might be a useful price for mortgage lenders’ to monitor.

Comparing stock and transactions weights is difficult. The different weights just allow the index to measure a different concept of the price. The preferred weights will depend on which measure the user is interested in.

The second issue was whether the indices were volume or expenditure weighted. Of the seven main UK house price indices, two are volume weighted and five are expenditure weighted. Neither weighting method is better than the other for all applications; they measure different concepts of the price of housing which are useful for different applications. Observers and policymakers must be careful to match the measure they use with the concept they are interested in.

3.5 Where does the comparison of the methods used to construct the indices leave us?

One point apparent from the discussion in this section is that it is complicated to compare the indices because of the wide variety of samples, methods, and weighting schemes used. However, we can draw some conclusions from the analysis of this section:

- The main indices measure the price of dwellings at different points in the house purchase process. The Rightmove index measures asking prices, the Hometrack, Halifax and Nationwide indices measure prices at the loan approval stage, the ODPM index measures prices at the loan completion stage and the Land Registry index measures final transaction prices. It is therefore important for observers to match the measure of house prices used with the concept they are interested in eg it may be unwise to use the ODPM instead of the Rightmove index to analyse asking prices.

But there are further conclusions we can draw, some of which depend on the extent to which the indices are used to measure final transaction prices:

- The Land Registry index uses the largest dataset; it covers all transactions in England and Wales. But the dataset is not timely and does not record many dwelling characteristics, so quality adjustment is difficult.
- For the purposes of measuring final transaction prices the Halifax and Nationwide datasets can be considered a good compromise between accuracy and timeliness.
- The Rightmove dataset appears to have the least accurate measure of final transaction prices. Asking prices are the earliest in the housing market timeline and so most likely to be revised during the transaction process.
- The Hometrack index places a significant computational burden on estate agents, and so may be subject to greater measurement error.
- The Halifax and Nationwide datasets are the most likely to be affected by sample selection bias. This is particularly the case for the Nationwide index, whose dataset is somewhat smaller than the Halifax's.
- The Land Registry index uses the simplest possible price measure - the average price of transacted houses. So it is likely to be most affected by changes in the mix of houses sold each quarter.
- The Halifax and Nationwide have until recently used the most comprehensive quality-adjustment methods, and were therefore least likely to be affected by changes in the mix of houses sold. It is difficult to judge whether their methods are more or less comprehensive than those used to construct the new ODPM index, since both have advantages and disadvantages.
- Current weights based on Land Registry data will be most representative of all current housing market transactions in England and Wales.

4. Empirical comparison of the available UK house price indices

In this section we consider the implications of the different methods used to construct the main UK house price indices; to what extent can the different methods of construction explain the differences between the outturns of the indices.

4.1 Long-run vs short-run

Chart 3 shows that the main house price indices have very similar long run trends. In other words, the estimated rate of house price inflation over long time horizons is similar across all the main indices. Chart 4 shows, however, that in the short run the indices - even those purporting to measure the same price - can give quite different estimates of house prices.[8]

Chart 3

Halifax, Nationwide, old ODPM and Land Registry indices

1997 Q1 = 100

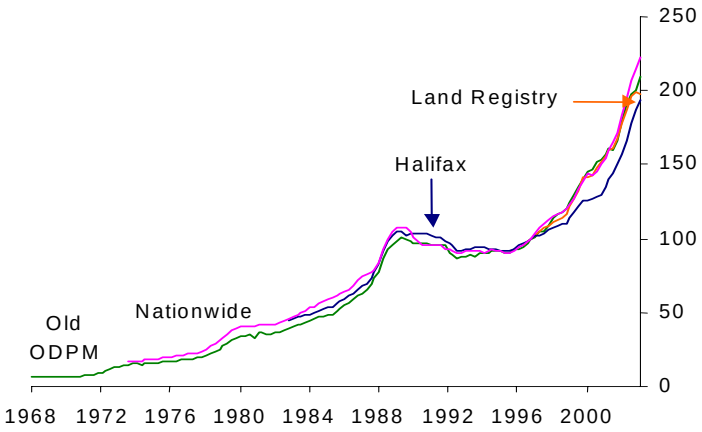
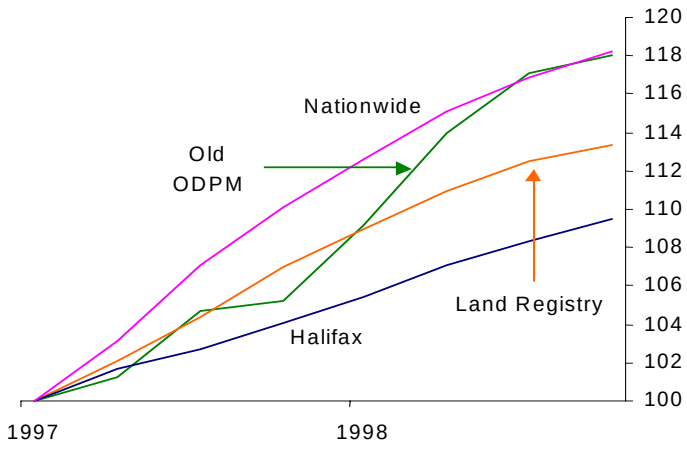


Chart 4

Halifax, Nationwide, old ODPM and Land Registry indices

1997 Q1 = 100



[8] Some indices were not included because only a short back run of data is available for them.

In times of uniform market-wide inflation, all measures of house prices will move by similar amounts. Consequently, these charts suggest that differences in methodology have an effect in the short run because different house types appreciate at different rates, but over a long-period of time all houses appreciate by a similar amount. So the choice of house price measure matters much more for analysis of short-run movements in prices than long-run movements.

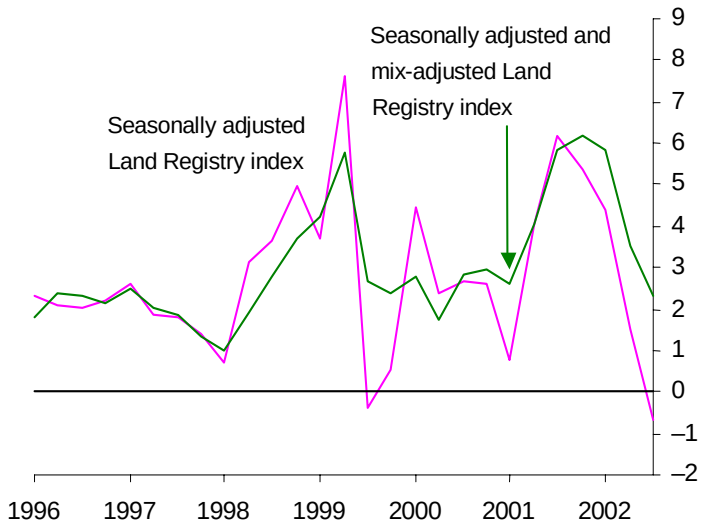
4.2 Effect of quality-adjustment

Chart 5 shows the quarterly house price inflation rate measured by a seasonally adjusted version of the Land Registry index and a mix-adjusted and seasonally adjusted version. The mix-adjustment is simple since it controls for the effect of only two house price characteristics: location (defined by county and London Borough); and house type (detached, semi-detached, terraced, flat/maisonette). Nevertheless, the mix-adjustment has a marked effect on the estimated quarterly inflation rate. Using the mix-adjusted index would have led to a very different interpretation of developments during late 1999, than if the not mix-adjusted index had been used. More recently, both indices have shown a slowdown in house price inflation, but the rate of inflation of the not mix-adjusted index has fallen about twice as much from its peak than the mix-adjusted index. So even the most basic mix-adjustment has empirically significant effects and can aid interpretation of house price movements.

Chart 5

Effect of quality-adjustment on the Land Registry index

Percentage change on previous quarter



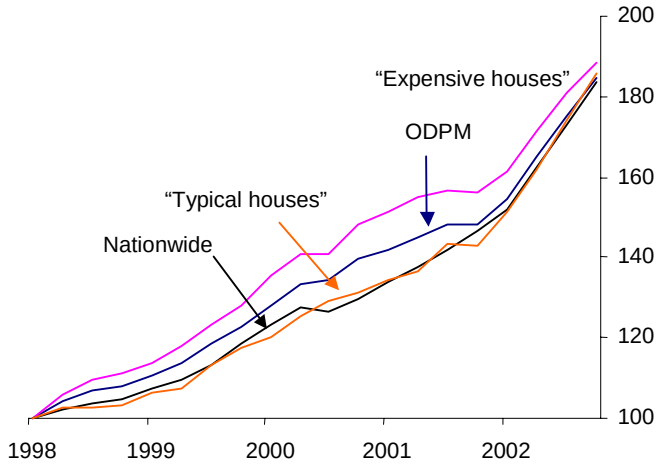
4.3 Volume vs expenditure weights

To demonstrate the practical effect of the difference between volume and expenditure weights Chart 6 shows two sub-indices based on the most expensive quartile and the middle-priced 50% of the cells in the old ODPM index, which can be interpreted as indices of “expensive” and “typical” houses. The ODPM and Nationwide indices are also shown. As expected, the ODPM index, which is expenditure weighted, is more in line with the expensive index than the Nationwide index is.

Chart 6

Effect of volume weighting

Index (1998 Q1 = 100)



4.4 Can the differences between the Halifax and Nationwide indices be explained?

The Halifax and Nationwide indices both use similar methodology, but Charts 7 and 8 show that the short-term (ie month on month) and long-term (ie annual) growth rates of the two indices can diverge significantly and sometimes for relatively long periods of time. This might be expected because the definition of the typically transacted dwelling differs slightly between the indices, the characteristics they control for in their regressions are somewhat different (see Table 2), and they use different samples. But how important are these methodological differences?

Chart 7

Monthly Halifax and Nationwide house price inflation

Percentage change on previous month

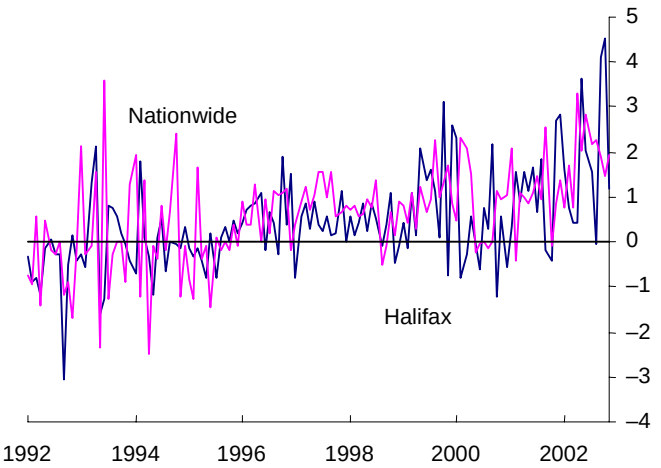
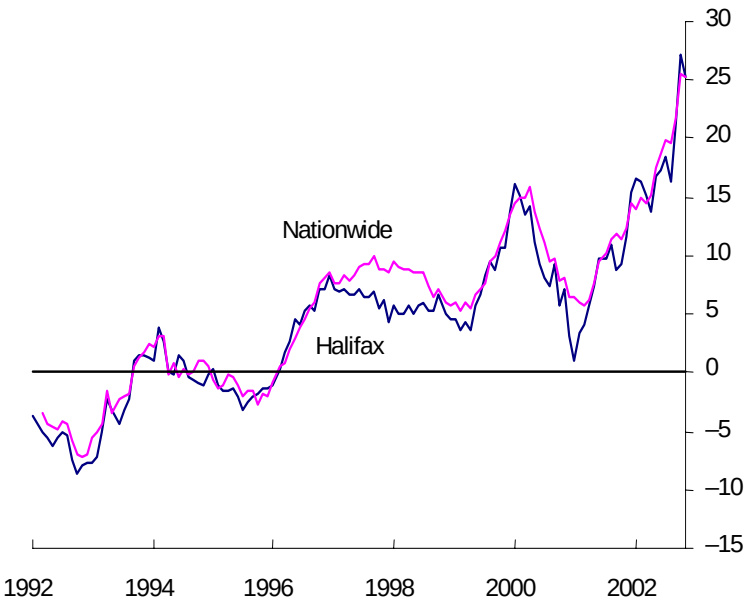


Chart 8

Annual Halifax and Nationwide house price inflation

Percentage change on previous year



The common framework used by the two indices for estimating prices means there are four possible explanations for the divergence between their growth rates: different typical house; different specification of the hedonic regression equations; different data; estimation error. However, these explanations cannot be assessed without access to the underlying data. Some work has found that the differences between the weights used in the two indices do not explain much of the differences between the monthly growth rates of the two indices. The most likely candidate for the differences between the monthly growth rates of the two indices appears to be estimation error. It may be reasonable to expect that estimation error in an individual month would dominate the effect of there being different typical houses, but over a longer time period the effect of the different typical house becomes more marked.

4.5 Summary of empirical comparison of the main UK house price indices

We have seen that all the indices give similar estimates of house price inflation over long periods (10-20 years) but they can differ in the short run. Considering the reasons for the differences we found that quality adjustment and the choice of expenditure or volume weights can have significant impacts on measured house price inflation. But, estimation error is likely to dominate other explanations for differences in measured monthly or quarterly house price inflation rates from different mix-adjusted indices.

5. Conclusions

There are several valid concepts of house prices and many possible ways of constructing an index to measure each type of price. Combinations of methods and datasets have given rise to seven main UK house price indices, and a large number of other indices and surveys.

Comparing the available indices is complicated, although some conclusions can be drawn from an analysis of the methods and data sets used. The most important point to note is that no one method of constructing an index or concept of the price of a house is “right”. The main indices in the

United Kingdom use a variety of methods and measure the price of dwellings at different points in the house purchase process, so they have distinct uses. But, we can still learn from the advantages and disadvantages of the methods used by the main UK indices.

The Land Registry index uses the most complete dataset, in the sense that it covers all residential housing market transactions. But that dataset does not record details of many dwelling characteristics so only very simple quality adjustment can be applied to the data. However, we have seen that even simple quality adjustment can have a large impact on measured rates of house price inflation. The Hometrack and Rightmove indices are likely to measure final transacted prices with error, and use, relative to other indices, narrow quality adjustment methods. The Halifax and Nationwide indices use the broadest quality-adjustment techniques and a dataset that, for measuring final transacted prices, represents a good trade-off between accuracy and timeliness. But their samples exclude cash purchases and are smaller than that used by the new ODPM index.

The indices available in the United Kingdom are useful because they allow observers to examine a range of information when assessing past or prospective changes in house prices. But the existence of a large number of indices, whose differences are hard to analyse and interpret because they rely on proprietary data, can create confusion and complexity in what is anyway a difficult area to monitor - because house prices are inherently difficult to measure. Observers and policymakers must, therefore, always be careful to match the measure of house prices they use with the concept they are interested in, and to ensure that the information in short-run changes in house price inflation is not overstated, because sampling and estimation error in monthly and quarterly house price inflation rates appears to be substantial.

References

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