

Uses of Residential Property Price Indices

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Introduction

2.1 There are many areas of society where individuals or organisations use residential property price indices (RPPIs) directly or indirectly either to influence practical decision making or to inform the formulation and conduct of economic policy. Different uses can have a significant impact on the preferred coverage of the index and also on the appropriate methodology applied for its construction.

2.2 From an individual household's perspective, real estate often represents the single largest investment in their portfolio. It also accounts for the largest share of wealth in most nations' balance sheets. Changes in house prices can have far-reaching implications for individuals. For example, changes in housing equity and household debt levels can permeate through to the overall economy. In fact, consumer spending is often affected by changes in house prices as a result of wealth effects and its effect on consumer confidence. House prices influence home improvement and renovations expenditures, which in many countries are higher than overall spending on new house construction. House prices play a major role in the measurement of the affordability of home-ownership, a key housing policy objective in some countries. House price changes also influence the decision to build new houses (the supply side) as well as the decision to become a homeowner (the demand side).⁽¹⁾ Investors turn to house price indices to not only measure wealth but also to help in assessing current and future rates of return.⁽²⁾

2.3 From a broader perspective, analysts, policymakers, and financial institutions follow trends in house prices to expand their understanding of real estate and credit market conditions as well as to monitor the impact on economic activity, and financial stability and soundness.⁽³⁾ For instance, mortgage lenders will use information on house price inflation to gauge default risk. Central banks often rely on movements in house price indices to monitor households' borrowing capacity and debt burden⁽⁴⁾ and their effects on aggregate consumption.⁽⁵⁾

2.4 In this context it should be emphasised that the different uses of residential property price indices may require different conceptual bases and methodology, although in practice, other factors sometimes come into play, such as data availability.⁽⁶⁾ In general, no single indicator of house price change can satisfy every purpose. For instance, the price dynamics of the housing market for

monitoring house inflation, as experienced by purchasers, may best be estimated by collecting information on current transaction prices and using this information to construct a *price index for the sales of housing units*. In contrast, to estimate an economy's (real) stock of wealth, information on the sample of transacted dwellings must ideally be supplemented by information on the stock of non-transacted dwellings in order to construct a *price index for the housing stock*. This may be done by re-weighting to reflect the different mix of houses in the housing stock compared with transactions but the adequacy of this method depends on whether the dwellings that are actually transacted can act as a proxy for the ones that have not been subject to a change of ownership. If the price of houses that have not changed ownership is not available and information on their numbers and characteristics is limited or even non-existent, the user needs to be assured that the profile of the transactions is representative of the overall housing stock. In practice, the latter condition may not be fully met as different sectors of the housing market can be influenced by different factors and the limited number of transactions may lead to unreliable or even non-existent data on prices for some of these different strata.

2.5 The (price determining) attributes of individual houses often change over time. These changes include improvements to the dwelling in the form of renovations to kitchens and bathrooms, replacement windows with insulated glazing, or the installation of energy efficient heating or air-conditioning systems, and also extensions of the structure which reflect the recent trend in many countries towards larger houses. Improvements and extensions will be partially offset by depreciation of the structures. Irrespective of the purpose of the index, an ideal RPPI should be adjusted for all of those changes. To put it differently, the index should represent changes in the prices of properties that are comparable in quality over time.

2.6 The need for quality adjustment extends beyond controlling for home improvements and depreciation, however. The mix of dwellings that are sold in one period is likely to be different from that in the next period when, say, the sample of houses sold consists of more larger houses compared to the previous period. Such compositional or mix changes may have a cyclical pattern because sales of larger houses will typically decline as an economy enters a recession. Compositional changes of the sample over time, just like quality changes of the individual dwellings, should not be interpreted as price changes – measurement techniques are required to adjust the price changes for quality mix changes. A short overview of the various methods that are available to solve the problems of quality (mix) change will be provided in Chapter 3. A detailed discussion of these methods will follow in Chapters 4-7.

⁽¹⁾ See Duffy (2009).

⁽²⁾ Residential construction investment accounts for about 5% of GDP in the euro area.

⁽³⁾ See Case and Wachter (2005).

⁽⁴⁾ See Finocchiaro and von Heideken (2007).

⁽⁵⁾ See Case et al. (2001), Phang (2004) and Belsky and Prakken (2004).

⁽⁶⁾ See Fenwick (2006) and also Chapter 9.

A Review of the Different Uses of Residential Property Price Indices

2.7 Residential property price indices have a number of important uses:

- as a macro-economic indicator of economic growth;
- for use in monetary policy and inflation targeting;
- as an input into estimating the value of housing as a component of wealth;
- as a financial stability or soundness indicator to measure risk exposure;
- as a deflator in the national accounts;
- as an input into an individual citizen's decision making on whether to buy (or sell) a residential property;
- as an input into the consumer price index, which in turn is used for wage bargaining and indexation purposes;⁽⁷⁾
- for use in making inter-area and international comparisons.

Each use is considered in turn.

As a Macro-Economic Indicator of Economic Growth

2.8 Rising house prices are often associated with periods of economic expansion while falling house prices often correspond with a slowing economy. Goodhart and Hofmann (2006) show that for 16 industrialised countries there exists a strong correlation between house prices and economic activity. In fact the six major banking crises in advanced countries since the mid 1970s were all associated with the bursting of a housing bubble (Reinhart and Rogoff, 2009).⁽⁸⁾ In the main, house prices are treated as a leading indicator although there is some debate about whether house price change is a leading, lagging or coincident economic indicator.

2.9 What is clear is that rising house prices are often associated with economic growth through at least three channels:

- Higher (relative) house prices tend to *stimulate increased construction activity*, which in turn leads to higher

employment and higher incomes for a wide range of workers involved in the housing market, such as real estate agents, construction workers and professionals in the financial and the legal professions. Expectations of higher future returns on property investment lead builders to start new construction and this is accompanied by higher market demand in property-related sectors from owner-occupiers and property investors.⁽⁹⁾ In addition, building activity will tend to increase from more home renovations.

- Higher house prices tend to lead to *increased sales of existing housing units* and this in turn can lead to additional tax revenues in the form of property transfer taxes generated from the higher volume and value of property sales. These *increased tax revenues* can lead to increased government spending which in turn provides additional economic stimulus.
- Rising real estate prices will lead to improvements in the household sector's balance sheet (*the wealth effect*) and this in turn will generally lead to increased household spending on consumption and investment.⁽¹⁰⁾ According to a report by the U.S. Congressional Budget Office (2007), when house prices surged in the 1990s and 2000s, consumer spending grew faster than incomes. This household wealth effect generally leads to increases in spending by consumers on home renovations and repairs in addition to increased spending on other goods and services.

2.10 Of course, the above stimulative effects of increasing house prices go into reverse when (real) house prices fall. It is therefore important that the public and economic policy makers have at their disposal accurate and timely information on movements in real estate prices.

2.11 Asset prices, including real estate prices, are a key indicator for more fully understanding the dynamics of the economy.⁽¹¹⁾ According to Plosser (2007), asset prices contain important information about the current and future state of the economy and can play an important role in the deliberations of central bankers as they seek to achieve their objectives of price stability and sustainable output growth.

For Use in Monetary Policy and Inflation Targeting

2.12 In addition to the above general interest in monitoring property prices, many central banks have *inflation targets* which can directly involve indices of property prices. For instance, central banks in some countries utilize a Monetary Conditions Index (MCI) as a day-to-day

⁽⁷⁾ The inclusion of a house price index in the calculation of a CPI depends on the objectives of the CPI and, in particular, whether an acquisitions, payments or user cost approach is adopted. Further discussion of these issues is given in the Consumer Price Index Manual (ILO et al., 2004) and the Practical Guide to Producing Consumer Price Indices (United Nations, 2009).

⁽⁸⁾ Claessens, Kose and Terrones (2008; 25) find that "... recessions associated with house price busts are on average over a quarter longer than those without busts. Moreover, output declines (and corresponding cumulative losses) are typically much larger in recessions with busts, 2.2 (3.7) percent versus 1.5 (2.3) percent in those without busts. These sizeable differences also extend to the other macroeconomic variables, including consumption, investment and the unemployment rate."

⁽⁹⁾ See Zhu (2005).

⁽¹⁰⁾ See Campbell and Cocco (2007).

⁽¹¹⁾ See Turvey (1989) and Goodhart (2001).

operating target for the conduct of monetary policy. In an expanded version of this index, as that suggested by Jarociński and Smets (2008) and Goodhart and Hofmann (2007), the MCI would include some measure of house prices because of the important role this variable plays in the inflationary process and for economic performance. Other central banks who have an inflation target based on the Consumer Price Index (CPI) will indirectly take into account the movement in house prices when setting interest rates, depending in part on the treatment of Owner Occupied Housing (OOH) in their country's CPI. This issue is discussed further in Chapter 3.

2.13 It can be argued that in the future, residential property prices are likely to play an increasing role in the conduct of monetary policy. Over recent years an inflation target has been used by a growing number of countries to define and operate their monetary policy frameworks. The IMF (2007) provides a list of 28 countries classified as inflation “targeters” according to their “exchange rate arrangements” (without specifying the target or inflation measure). Carare and Stone (2003) extend this analysis further by classifying countries that use an inflation target for monetary policy, into fully-fledged inflation “targeters”, eclectic “targeters” and inflation targeting lite regimes, using the clarity and credibility⁽¹²⁾ of the commitment to the inflation target to classify individual countries. The authors then identify 42 medium and large country central banks who have some form of floating exchange rate mechanism (i.e. not adopting a fixed exchange rate) leaving their degree of commitment to an inflation target as the defining monetary objective. They estimated that by 2001 some 7 industrial and 11 emerging markets operated fully-fledged inflation targeting, that is “have a medium to high level of credibility, clearly commit to their inflation target and institutionalize this commitment in the form of a transparent monetary framework that fosters accountability of the central bank to the target”. The number of countries operating fully-fledged inflation targeting has been increasing over the years.

As an Input for Estimating the Value of Housing as a Component of Wealth

2.14 House prices are an input into the measurement of aggregate wealth in the economy. Existing dwelling units are part of the balance sheet accounts in the System of National Accounts (SNA). Thus it is necessary to have a price index for this asset class in order to form estimates of real household wealth. As was mentioned in the introduction to this chapter, rising house prices will generate a

wealth effect that can lead to increases in consumption and increased household borrowing.

2.15 More generally, individuals will have an indirect stake in real estate asset prices, including residential property, through pension funds and other direct investments in real estate.

As a Financial Stability or Soundness Indicator to Measure Risk Exposure

2.16 Financial Soundness Indicators (FSIs) are indicators of the current health and soundness of the financial system and institutions of a country and of their corporate and household components. They include both aggregated individual institution data and indicators that are representative of the markets in which the financial institutions operate, including statistics on real estate prices. FSIs are calculated and disseminated for the purpose of supporting national and international surveillance of financial systems. The IMF developed FSIs with a view to monitoring and strengthening the global financial system and to increasing stability following the financial market crises of the late 1990s, and as a way of combating the subsequent growing number of banking crises that have occurred globally. The compilation guide for financial soundness indicators provides some advice on compiling house price indices whilst acknowledging the relative absence of international experience and guidance and the absence of a comprehensive framework for constructing such indices. More recently, the October 2009 Report to the G-20 Finance Ministers and Central Bank Governors on the *Financial Crisis and Information Gaps*⁽¹³⁾ mentions that information on dwellings and their associated price changes are critical ingredients for financial stability policy analysis.

2.17 Sharp falls in real estate prices have a detrimental impact on the health and soundness of the financial sector and on the financial situation of individuals and of individual households, by affecting credit ratings, the value of collateral, and the debt to equity ratio.

2.18 It should come as no surprise that the relationship between real estate cycles and economic cycles is well documented and that the role of real estate prices in debt finance and financial crises has long been recognised. This has led to the use of residential property price indices as indicators of financial stability, particularly in countries where real estate accounts for a significant proportion of national and household wealth, and where the propensity of home ownership is relatively high.

2.19 The use of trends in residential property prices, and real estate prices more generally, as an indicator of financial soundness, has been supported by in-depth analytical

⁽¹²⁾ Clarity is gauged by the public announcement of the inflation target and by the institutional arrangements for accountability. Credibility is measured indirectly using as a proxy the actual inflation outturn and by market ratings of long-term local currency government debt.

⁽¹³⁾ Available at: <http://www.imf.org/external/np/seminars/eng/2010/infogaps/index.htm>.

studies. Included amongst the vast amount of material published on this subject is a paper by Nabarro and Key (2003) who present a model for real estate and lending cycles, supported by case studies. Their paper traces the cyclical evolution from initial indicators provided by the rental market, to property prices and through to balance sheets of borrowers and lenders, and draws attention to a number of relevant indicators of the real estate market. It describes what the authors call “the dangerous interdependence between real estate cycles and financial systems”. Whilst the authors acknowledge the highly unpredictable nature of the real estate cycle and its different characteristics and properties from one cycle to the next, they discuss the linkages between real estate cycles and debt finance to identify areas where improved information could support effective counteracting strategies and policies. They explain how a reliable and cost-effective system of performance measurement and monitoring can be developed and implemented and suggest how such a system can provide a mechanism for analytical decision making, designed to impact upon the behaviour of the real estate sector.

2.20 Information on residential property and other property prices needs to be supplemented by relevant and timely detailed analyses, and by other information such as the proportion of houses being purchased with cash rather than being financed through a loan. The average ratio of loan to property price, and how this is distributed, provides an indication of the exposure of the borrower and the lender, as does the price to earnings ratio and, to a certain extent, the volume of transactions.⁽¹⁴⁾ Similarly, a more detailed analysis of the types of houses being sold by region will show whether activity in the housing market is concentrated in particular segments of the market such as high-end properties or in certain geographical locations such as the capital city or large urban areas.

As a Deflator in the National Accounts

2.21 National statistical agencies use house price indices in at least two ways. First, the structures component of a price index for newly-built houses is often used to deflate current price values for residential construction in the national accounts; see Bover and Izquierdo (2003). Second, house price indices may be included in the construction of the CPI, depending on the choice of its conceptual basis. This second use is considered below and in more detail in Chapter 3.

2.22 Price indices and deflators are seemingly different entities within a wider group of statistics relating to prices.⁽¹⁵⁾ It is pertinent to note against this background

that two of the most recent and widely available references on the compilation and use of national accounts deflators, SNA (1993) and the Eurostat (2001) *Handbook on Price and Volume Measures in National Accounts*, pre-date the CPI Manual (2004) and PPI Manual (2004).

2.23 The CPI and PPI Manuals were developed in parallel and take advantage of the latest research into index number theory and practice, which is not fully reflected in the official literature on national accounts.⁽¹⁶⁾ The two manuals are essentially based on the same underlying economic principles and statistical theory. They provide a comprehensive and coherent overview of the conceptual and theoretical issues associated with consumer and producer price indices and translate these into available options for practical measurement. The CPI Manual also acted as a catalyst for the new ILO Resolution on Consumer Price Indices, which was passed in 2003.

As an Input into an Individual Citizen's Decision Making on Whether to Buy (or Sell) a Residential Property

2.24 The buying or selling of a dwelling is typically the largest financial transaction a household will enter into during his or her life. Changes in house prices are therefore likely to influence substantially whether a household purchases a property and also the budget plans and savings decisions of the prospective house buyers and sellers. The purchase of a house is considered by many owner-occupiers both as a means of obtaining shelter services and as a capital investment, the latter potentially providing an opportunity for significant capital gains in the longer-term. Current price levels and trends, together with expectations about future trends in house prices and mortgage interest rates,⁽¹⁷⁾ will influence an individual's decision on whether to purchase now or postpone the purchase. The opportunity cost associated with the sums of money involved will also come into play as prospective purchasers evaluate the alternative choices available to them. For instance, prospective purchasers will often take into account the impact of changes in house prices on market rents.

2.25 More generally, individuals also have an indirect stake in real estate asset prices through pension funds and other investments for which house prices will likely have an effect. For instance, the portfolios of some pension funds include apartment blocks whose rents provide an

⁽¹⁴⁾ Past observation suggests that when price-to-earnings ratios get to an unsustainable high level, the adjustment is initially seen in a reduction in the volume of housing turnover rather than in transaction prices.

⁽¹⁵⁾ However, the underlying theory of deflators and (direct) price indexes is the same; see Chapter 16 in SNA (1993). Samuelson and Swamy (1974) note the following: “Although

most attention in the literature is devoted to price indices... Once somehow estimated, price indices are in fact used, if at all, primarily to deflate nominal or monetary totals in order to arrive at estimates of underlying “real” magnitudes”.

⁽¹⁶⁾ The CPI and PPI Manuals are consistent with the material in Chapter 16 of SNA (1993) and also with the 2008 System of National Accounts but delve deeper into the problems associated with the construction of price indexes, particularly at lower levels of aggregation.

⁽¹⁷⁾ Interest rate policy will have an impact both on inflation and on net disposable income after the payment of interest.

income and where a capital gain is expected to materialise from an increase in the property value.

As an Input into the Construction of a Consumer Price Index (CPI)

2.26 House prices will directly affect measured inflation when the CPI includes owner-occupier housing costs and the method of measurement draws on house prices as one of the inputs. Measured inflation is indirectly affected if house prices influence market rents, which constitute another element of a CPI, and where additionally imputed rents are used as a proxy for owner-occupied housing costs. Renting and buying can be substitutes and the level of house prices will have an impact on the rate of return obtained by a landlord on his or her investment and also on the rent charged.

2.27 The treatment of Owner Occupied Housing (OOH) is one of the most difficult challenges faced by compilers of consumer price indices. There are a number of alternative conceptual treatments and the choice between them can have a significant impact on the overall index, affecting both the weight attributed to OOH (and by implication to an RPPI) and the measured rate of inflation. In essence there are four possible main approaches to including OOH in a CPI: the acquisitions approach, the payments or money outlays approach, the user cost approach and the rental equivalence approach. The first three approaches require the construction of a housing price index. These various approaches to the treatment of OOH are reviewed in more detail in Chapter 3.

For Use in Making International and Inter-area Comparisons

2.28 House price indices are also used in conjunction with (comparable) benchmark data on house price levels across regions or countries to generate inter-area or international comparisons of living cost differentials. The problems that arise in attempting to price the services of OOH in a national context also arise in the context of inter-area and international comparisons. In the latter context, however, the problems are somewhat more difficult

than making, say, national comparisons over time because inter-area/international comparisons require comparable types of housing across the regions/countries being compared (or comparable information on the characteristics of housing units across the regions if a hedonic regression technique is used) in order to construct a constant quality price index.

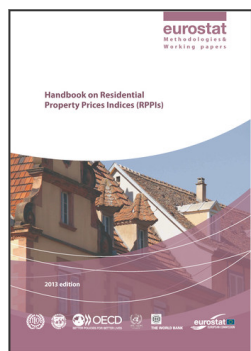
2.29 The European Central Bank (ECB) – in co-operation with the central banks of the individual countries of the euro-zone and the European Union – has an interest in comparative measurement of changes in residential property prices across different euro-area countries and for the euro-area as a whole. The raw data used here come from various national sources and have primarily been collected and documented by the Bank for International Settlements (BIS).⁽¹⁸⁾ Since 2001, the ECB has compiled an aggregate index for the euro-area by weighting together changes in prices for houses and flats for the euro-area countries.⁽¹⁹⁾ The national methodologies associated with the figures available for each individual country and for the euro-area aggregate, have improved over recent years but perhaps fall short of the standards applied to other economic statistics and price indicators for the euro-area.⁽²⁰⁾ The BIS has also brought together residential property price statistics for the non-euro area countries of the European Union and has in many cases been confronted with even more pronounced issues concerning data comparability and quality.

2.30 Such comparisons can be confounded by methodological and coverage differences and also by differences in the frequency and timeliness of the data. Some of these differences arise from the different sources of data used to compile national indices. Chapter 9 explores these data sources in more detail and Chapter 10 gives an inventory of the different methods used by countries to compile their indices of residential property prices. It can be observed that a notable proportion of countries, including some developed countries, do not have reliable residential property price indices.

⁽¹⁸⁾ The BIS data set of residential property price statistics is available at: <http://www.bis.org/statistics/pp.htm>.

⁽¹⁹⁾ See box "Preliminary evidence on developments in euro area residential property prices" in the October-2001 issue of the ECB Monthly Bulletin.

⁽²⁰⁾ See Eiglsperger (2010), page 233.



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