

House Price Index: 2010-11 to 2013-14*

The Reserve Bank is compiling quarterly house price index (HPI) (base: 2010-11=100) for ten major cities, viz., Mumbai, Delhi, Chennai, Kolkata, Bengaluru, Lucknow, Ahmedabad, Jaipur, Kanpur and Kochi. Based on these city indices, an average house price index representing all-India house price movement is also compiled. These indices are based on the official data of property price transactions collected from registration authorities of respective state governments. This article presents the trends in price based on HPI in India for the period Q1:2010-11- Q4:2013-14. Also, for understanding the price movements across different size classes, this article presents size wise house price indices and their trends.

Introduction

House is not just an asset but also a durable consumption good for households, providing shelter and other services. A change in the house price affects the households' perceived lifetime wealth and hence influences the spending and borrowing decisions of households. An increase in the house price raises the value of the housing relative to construction costs; hence a new construction is profitable when house price rises above the construction costs. Residential investment is, therefore, positively related with house price increase. House prices also affect bank lending and vice versa. Further, house price gains increase housing collateral. The potential two-way link between bank lending and house prices give rise to mutually reinforcing cycles in credit and real estate markets. These indicate that house prices may affect economic activity through private consumption of households, residential investment and credit allocation of the financial systems. Thus, understanding the price trends of this segment of asset class is important for monetary policy formulation.

Beginning with Mumbai city, the Reserve Bank initiated the work of compiling a house price index (HPI) in 2007 and brought out a quarterly HPI for

Mumbai city (base: 2002-03=100). Over the quarters, the coverage has been extended by incorporating 9 more major cities, viz., Delhi, Chennai, Kolkata, Bengaluru, Lucknow, Ahmedabad, Jaipur Kanpur and Kochi and the base is shifted to 2010-11=100.¹ Besides separate HPI for individual cities, an average HPI representing all-India house price movement is also compiled.

This article presents the trends in price based on HPI in India for the period Q1:2010-11- Q4:2013-14. It also focuses on the house price movements in housing submarkets classified by size of the house. For the first time, this exercise will give an idea on how prices of small, medium and large houses have moved in the recent period. In general, housing submarkets could be segmented by a variety of factors, such as by demand and supply factors, geographical/spatial, structural and neighborhood characteristics. Specifically a housing submarket can be defined as "a set of dwellings that are reasonably close substitutes of one another, but relatively poor substitutes for dwellings in other submarkets"². In a segmented housing market, housing price dynamics need not be similar in each segment. The main purpose of delineating a housing market into segments is to identify distinct groups which could help stakeholders channelize and focus on different issues. One major contribution of market segmentation is to provide a more accurate house price structure across size classes.

The Reserve Bank's HPI uses the data on transacted houses at the point of Registration of houses; the data are collected from the registration departments of respective state governments. The HPI is developed on the basis of this registration price data and estimated as a stratified weighted average measure, stratification being done according to administrative zones within a city. This measure captures prices relating only to those houses sold during a period and not relevant to all houses in

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¹ An earlier article on HPI was published as Reserve Bank of India (2012), "House Price Index", RBI Monthly Bulletin October 2012.

² Bourassa, S. C., Hamelink, F., Hoesli, M., & MacGregor, B. D. (1999). "Defining housing submarkets", *Journal of Housing Economics*, 8(2), 160-183.

the economy. As this information set contains data on floor space area, in this article, size-wise house price indices are compiled and presented using the methodology described in the subsequent section.

This article is organised as follows. Section 2 explains the methodology for the compilation of aggregate house price indices as well as size-wise price indices. The trends in HPI in India are discussed in Section 3. Limitations are presented in Section 4. Section 5 concludes.

2. Methodology

The methodology for the compilation of aggregate house price is discussed in detail in the RBI Bulletin article of October 2012¹. Aggregate House Price Index is a weighted average price index using Laspeyres' method with 2010-11 as the base year. First, the simple average of price (per square meter) of houses in each category, classified by small, medium and large for each ward/administrative zone in each quarter based on floor space area (FSA) is calculated. Second, the proportion of number of houses transacted in the three categories of FSA within a ward/zone during the period April 2010 – March 2011 is taken as the weights. Then, based on an average per square meter price for three FSA category houses in each ward/zone, price-relatives are calculated for each quarter. The price relative is nothing but a ratio of current period price to the base period price. The quarterly ward/zone weighted average price relatives are calculated next. These weighted relative prices are again averaged, using the proportion of number of houses transacted in each ward to the total number of houses transacted in the city during the period April 2010 – March 2011 as the weights. The city-wise price indices are averaged using the population proportion (based on 2011 census) of the ten cities to its total to obtain the all-India index.

2.1 Size-wise price indices

For compilation of size class-wise price index at all India level, city level indices of small, medium and large houses are constructed first. For compiling the city level size-wise price indices, house transactions in each ward/zone for each city is classified to small,

medium and large³ based on the floor space area. At city level, for each size category price index is estimated as a weighted average price index, again using Laspeyres' method. The detailed methodology is explained as below.

First, the median price (per square meter) of the transacted houses (P_{ijt}) in each size category (i) in ward/zone (j) at quarter t is calculated. Then, based on an average per square meter price for three FSA category houses in each ward/zone, price-relatives are calculated for each quarter. The price relative is basically the ratio of current period price to the base period price. Price relative per square meter for the i^{th} category, j^{th} ward/ zone, t^{th} quarter is given by

$$RP_{i,j,t} = \frac{P_{i,j,t}}{P_{i,j,0}},$$

where $P_{i,j,0}$ is the price in the base period. Then for each of the category - small, medium and large - these relative prices are again averaged, using the proportion of number of houses transacted in each ward to the total number of houses transacted in the city during the period April 2010 – March 2011 as the weight (w_j). The following formula is used for constructing the city-wise price indices for each category (small, medium and large) for t^{th} quarter

$$HPI_i^t = \sum_{j=1}^n (RP_{ijt} * w_j) = \text{for all } t$$

Where i =category of house (small/medium/large) and n =number of ward/zone in each city. The city-wise price indices for each of the category are averaged using the population proportion (based on 2011 census) of the ten cities to its total to obtain the all-India index for small, medium and large category of house.

3. Trends in HPI

Overall house price index growth rates at all-India level are presented in Table 1. It is observed that index of house price, had been growing at an annual average rate of about 20 per cent (y-o-y) in 2011-12

³ The classification broadly in line with the 33rd and 67th percentiles of FSA for transaction in each city.

Table 1: House Price Index and y-o-y change – All-India

Quarter	House Price Index	Y-o-Y change
Q1: 10-11	94.2	NA
Q2: 10-11	99.8	NA
Q3: 10-11	99.4	NA
Q4: 10-11	106.6	NA
Q1: 11-12	116.0	23.1
Q2: 11-12	119.4	19.7
Q3: 11-12	125.5	26.2
Q4: 11-12	134.1	25.8
Q1: 12-13	142.6	23.0
Q2:12-13	147.1	23.2
Q3:12-13	157.0	25.1
Q4:12-13	160.8	19.9
Q1:13-14	162.3	13.8
Q2:13-14	169.2	15.1
Q3:13-14	173.4	10.5
Q4:13-14	179.1	11.4

and 2012-13. However, the pace of growth in the average house prices slowed in 2013-14 at 12.7 per cent, plausibly reflecting a correction in trends on the back of subdued demand. For the latest Q4 of 2013-14 quarter, the y-o-y increase in the House Price Index at the all-India level was 11.4 per cent compared to 10.5 per cent in the preceding quarter.

The HPIs and year-on-year variation in prices across various cities are presented in Table 2 and Table 3 respectively. The growth in house prices has moderated in 2013-14 for Mumbai, Delhi, Kolkata, Jaipur and Kanpur. For instance, the house price in the city of Mumbai increased on an average annual basis by 30.0 and 18.5 per cent respectively for 2011-12 and 2012-13. This has declined to 8.7 per cent in 2013-14. However, in the cities like Bengaluru and Ahmedabad house prices grew at relatively slower pace during 2012-13, but picked up momentum in the 2013-14. Kolkata and Delhi which picked up momentum in the 2012-13 showing some moderation in price increase in 2013-14.

The size-wise HPI at all India level as well as point-to-point annual inflation rates are presented in Table 4. The prices in the small size category have gone up at an average annual rate of 23.7 per cent in the last 4 years. The average increase has been lower for medium and large categories at 18.2 and 18.6 per cent, respectively. However, the price variations are more pronounced in the small-size category compared to the other two size categories. In 2013-14, the price increase in the small and medium size category moderated to 8.7 and 10.7 per cent respectively, while that in the large size category remained almost at the average level.

Table 2: House Price Index - City wise

Quarter	Mumbai	Delhi	Bengaluru	Ahmedabad	Lucknow	Kolkata	Chennai*	Jaipur	Kanpur	Kochi
Q1: 10-11	90.6	100.7	98.6	93.2	88.8	77.9	102.7	95.3	91.7	89.6
Q2: 10-11	99.7	95.6	97.9	102.5	98.7	103.2	109.5	99.0	99.4	92.4
Q3: 10-11	100.9	92.1	97.9	102.0	104.7	106.6	94.6	103.6	103.7	113.8
Q4: 10-11	108.8	112.1	105.5	102.2	107.8	112.3	93.1	102.1	105.1	104.2
Q1: 11-12	122.1	126.8	110.7	121.3	118.0	103.0	101.2	106.3	104.7	120.9
Q2: 11-12	131.4	124.8	107.8	130.4	123.1	105.0	110.4	109.6	106.8	105.0
Q3: 11-12	122.8	136.7	138.6	137.1	131.9	103.2	110.7	108.3	108.5	103.1
Q4: 11-12	143.5	158.2	133.3	141.0	129.4	106.1	108.2	108.6	114.9	97.8
Q1: 12-13	147.6	177.3	133.3	140.8	136.4	135.2	119.2	113.4	114.4	98.8
Q2:12-13	148.1	183.2	136.6	146.4	156.6	149.1	117.8	117.4	106.0	127.5
Q3:12-13	158.9	200.7	141.2	150.6	169.3	162.5	137.6	118.9	92.8	136.5
Q4:12-13	159.5	213.1	141.9	155.0	166.2	169.4	137.4	129.4	90.9	124.2
Q1:13-14	160.0	214.8	142.3	161.9	173.9	171.8	138.3	129.4	82.4	127.0
Q2:13-14	169.2	215.7	150.4	171.7	186.7	173.5	150.0	128.0	92.0	161.6
Q3:13-14	169.2	211.1	169.3	172.6	203.6	168.2	174.3	127.3	81.6	189.4
Q4:13-14	169.2	229.3	184.3	169.4	212.5	169.8	179.3	120.0	78.4	166.2

Note: * Chennai Index is based on both residential and commercial properties

Table 3: House Price Index (y-o-y change in per cent) - City wise

Quarter	Mumbai	Delhi	Bengaluru	Ahmedabad	Lucknow	Kolkata	Chennai*	Jaipur	Kanpur	Kochi
Q1: 11-12	34.7	25.9	12.2	30.1	32.9	32.3	-1.5	11.5	14.1	34.9
Q2: 11-12	31.8	30.6	10.1	27.2	24.7	1.8	0.8	10.6	7.3	13.6
Q3: 11-12	21.7	48.5	41.5	34.4	26.0	-3.2	17.0	4.5	4.7	-9.5
Q4: 11-12	31.9	41.2	26.4	37.9	20.1	-5.5	16.2	6.4	9.3	-6.1
Q1: 12-13	20.9	39.8	20.5	16.0	15.6	31.2	17.8	6.7	9.3	-18.2
Q2:12-13	12.7	46.8	26.7	12.2	27.2	42.0	6.8	7.1	-0.7	21.5
Q3:12-13	29.4	46.8	1.9	9.9	28.3	57.5	24.2	9.9	-14.5	32.4
Q4:12-13	11.2	34.7	6.4	9.9	28.4	59.7	27.1	19.1	-20.9	27.0
Q1:13-14	8.4	21.1	6.7	15.1	27.6	27.1	16.0	14.1	-28.0	28.5
Q2:13-14	14.3	17.8	10.1	17.3	19.2	16.4	27.3	9.1	-13.2	26.7
Q3:13-14	6.4	5.2	19.9	14.6	20.3	3.5	26.7	7.0	-12.1	38.8
Q4:13-14	6.1	7.6	29.8	9.3	27.9	0.2	30.4	-7.3	-13.8	33.8

Note: * Chennai Index is based on both residential and commercial properties.

Table 4: Size-wise House Price Index and y-o-y change – All-India

Quarter	House Price Index			Y-o-Y Change		
	Small	Medium	Large	Small	Medium	Large
Q1: 10-11	95.0	95.4	92.3			
Q2: 10-11	99.6	100.4	101.7			
Q3: 10-11	97.3	97.7	100.4			
Q4: 10-11	108.1	105.3	105.6			
Q1: 11-12	119.4	116.0	113.0	25.7	21.6	22.5
Q2: 11-12	121.7	118.6	113.5	22.2	18.1	11.6
Q3: 11-12	125.3	122.5	121.4	28.7	25.4	20.9
Q4: 11-12	135.4	130.1	128.1	25.3	23.5	21.4
Q1: 12-13	156.6	143.5	130.9	31.2	23.7	15.8
Q2:12-13	168.9	145.4	136.8	38.8	22.6	20.5
Q3:12-13	182.5	150.8	146.7	45.7	23.1	20.8
Q4:12-13	188.4	157.9	149.0	39.1	21.4	16.3
Q1:13-14	179.6	154.8	158.0	14.7	7.8	20.8
Q2:13-14	189.0	162.9	166.4	11.9	12.0	21.6
Q3:13-14	194.4	169.6	165.9	6.5	12.5	13.1
Q4:13-14	193.8	174.0	177.3	2.9	10.2	19.0

4. Limitation of the data and methodology

The HPI presented here uses registration price data. It is often believed that registered prices of houses are in general underestimated due to various reasons like high registration fees and stamp duty, obligations for the payment of property tax, etc. Further, the differences in the time gaps between the actual transactions and registrations also do not always follow the similar pattern across different states. Moreover, registrations of the properties are done taking into account different criterion in different states, some of which are (a) partial consideration of un-divided share of land (b) partial consideration of sale of terrace rights, (c) consideration of agreement

to sale at the time booking for total price, (d) sale deed only post completion of property. On the other hand, the registration procedure and records maintenance are not computerized in some states and the records in most states are maintained in the regional languages which necessitates further work with respect to bringing them into common format. Getting segregated transactions on land, agreement, whether a land is an agricultural land, sale deed, power of attorney etc. is another challenge. The ten-city average HPI compiled using Laspeyres' approach is a weighted average of city-level HPis. Ideally, the number of transactions at city level could have been used as weight. However, in the existing data collection mechanism, separate information on the type of the property (residential/commercial) of Chennai is not available. As a result, the proportion of population of the city (to the total population of ten cities together) is used as the weight, as a proxy to the number of transactions.

5. Conclusion

This article presents the trends in house prices in India in the recent period based on a HPI. Further, for the first time, it presents an approach for compiling a size-wise house price index in Indian context. These indices are based on the official data received from registration authorities of various state governments and are compiled at city as well as all India level. Recent trends in the house price index reveal that increase in the house price which was steep in the last few years has moderated in 2013-14. In particular, the house price increase in the small and medium size category has moderated more sharply compared to the large size category.