

**EXPERT GROUP
ON
ASSET PRICE MONITORING SYSTEM**



RESERVE BANK OF INDIA



Letter of Transmittal

January 13, 2010

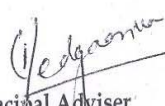
Dr. Subir V. Gokarn
Deputy Governor
Reserve Bank of India
Mumbai

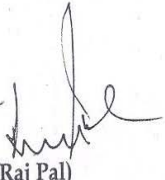
Dear Sir,

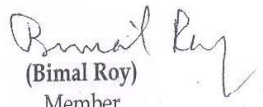
Expert Group on Asset Price Monitoring System

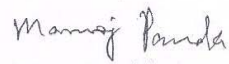
We have great pleasure in submitting the Report of the Expert Group on Asset Price Monitoring System constituted by Reserve Bank of India vide Memorandum dated December 3, 2008.

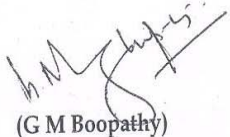
Yours sincerely,

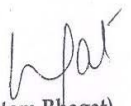

(Principal Adviser)
DSIM, RBI

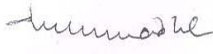

(Raj Pal)
Member


(Bimal Roy)
Member

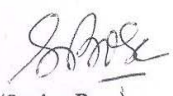

(Manoj Panda)
Member


(G M Boopathy)
Member


(Gautam Bhagat)
Member


(Anuradha Rao)
Member


(Abhay Sakare)
Member


(Sanjoy Bose)
Convenor

Executive Summary

Real estate activity represents a key engine of economic growth. Residential as well as commercial house property forms an important part of asset formation; it provides an assured stream of return and utility value to the owner of the property by way of rental earning, durable consumption in the form of shelter and other residential/ commercial services, as also its use as collaterals for availing loans. Lack of transparency in the residential property market transaction, absence of a single centralised regulator in a vast country like India and limited availability of price information pose important challenges for keeping track of real estate price dynamics and their relationship with financial stability and monetary policy. Therefore, it is crucial to have a realistic measure of aggregate house price in order to understand the behaviour of house price and their influence on the economy. Reserve Bank of India had set up an 'Expert Group on Asset Price Monitoring System' with the objective of developing an information system on asset prices. Accordingly, a group of experts from ISI, CSO, NHB, IGIDR, SBI, ICICI and HDFC has been engaged in working out a framework for quickly deliverable dimensions of Real Estate Prices in quantitative terms, preferably in a frequent manner that could be useful for monetary policy and financial stability purposes.

Recommendations: After several deliberations Group finalized its Report with following observations/recommendations:

- Real estate property price data can be collected in the form of sale/resale price directly from scheduled banks (including both commercial and urban cooperative banks) and selected housing finance companies. Presumably, transaction level data are available in electronic form with these organisations (Para 5.4.3, Page 43).
- House price data can be collected at transaction level from top 13 centres: Greater Mumbai, Chennai, NCR Delhi, Bangalore, Hyderabad, Kolkata, Pune, Jaipur, Greater Chandigarh, Ahmedabad, Lucknow, Bhopal and Bhubaneswar (Para 5.5, Page 43).

- For monitoring purpose, RBI needs to track both sale/resale price index as well as the rent index of real estate prices on a regular basis (Para 5.7, Page 44).
- Considering the practical difficulty of collection of house rent data, the Group recommends using official data on house rent index of CPI (Urban) which is to be released by CSO. (Para 5.7, Page 44)
- The Group recommends compiling real estate price index on quarterly intervals (Para 5.8, Page 45).
- As the data are being sourced from the banks and select housing finance companies, survey schedule is basically a return prescribed for the said purpose. The proposed return includes variables like type of property (including both real estate and commercial), address, type of transaction, valuation price of the property, purchase price of property and loan amount taken from the bank other than the information on certain characteristics of the borrower viz., gender, employment, monthly income, etc. (Para 5.9.1.3, Page 46).
- Price index may be compiled based on Laspeyre's index method with financial year 2009-10 as the base (Para 5.9.1.3, Page 46).
- The Group felt necessary to supplement the bank data through a survey conducted annually so as to ensure robustness of the data available with the banking system (Para 5.10, Page 46).
- The proposed statistical system may be structured organisationally as a separate unit in the Statistics Department of RBI (Para 5.11, Page 47).

1. Introduction

1.1 Real estate activity represents a key engine of economic growth. Residential as well as commercial house property forms an important part of asset formation. It is a source of assured stream of return and utility value to the owner of the property by way of rental earning, durable consumption in the form of shelter and other residential/ commercial services; it can also be used as collaterals for availing loans. Consumption expenditure is also impacted by income and wealth effects derived from real estate and stock ownership. Movement in house prices has now become critical because of the great recession triggered by the sub-prime led financial turmoil. This has led to concerns raised by the academicians, central bankers and governments about adverse macroeconomic implications of a downturn in house and equity prices. Macroeconomic policy is becoming increasingly complex specially, when forward looking monetary stance is envisaged. It has now become contingent to monitor the price movements of the financial assets like equity and houses, lest unintended price rise leads to wasteful speculative investment, particularly by the households that would turn out to be deleterious for growth and consumption in an economy.

1.2 As the cities are built in a country, any comprehensive housing policy requires a developed and resilient housing finance system. Opportunities arise with the evolution of the financial sector when housing demand remains strong within an overall urbanizing world. New risk management, funding tools, and policy instruments are developed to expand sound and more accessible market for housing finance. Housing is being increasingly recognized as a potential growth area in the emerging market economies. Priorities are gaining ground for a strengthened but easily accessible financial sector, an expanding housing market, and an effective urban shelter strategy for the poor. Housing and mortgage finance activities are now the most happening segment in the asset price market in the emerging market economies, particularly so for India where growing population is going to have a

significant say in the form of inclusive growth in the matters comprising both the housing and employment needs.

1.3 Stock market related wealth effects in the Asian countries tend to be larger wherever developed financial markets exist. Housing wealth effect is reported to be statistically significant for some of the Asian majors. However, consumption growth in some of the Asian majors exhibits a substantial persistence. Despite small short-run elasticity of consumption to asset price changes, long-run elasticity could be quite large. This is a potent cause of concern, particularly in case of negative downturn considering the fact that that these economies could witness episodes of economic, financial and currency crises. As a result, the effects of a slowdown of the economic activity may be amplified by this intrinsic characteristic of consumption behaviour in the emerging market economies.

1.4 Increased openness to global shocks, accelerated real estate activity backed up by strong wealth effects reflected in the upcoming stratum of the economy coupled with high and resilient growth expectations, call for having a consistent statistical measure of house prices in India. Housing, being marked as a leveraged endeavour, has an inherent inertia to attract flow of money out of saving and borrowed means, which could get accentuated due to lack of a cohesive regulatory structure for property developments and construction activities as well as limited absorptive capacity in the economy. Lack of transparency in the residential property market and absence of a focussed regulatory ambience for real estate activities make it difficult to collect the transaction data on property prices. As a result, keeping track of real estate price dynamics is difficult which in turn inhibits the process of understanding its critical bearing on financial stability as also appropriate monetary policy response.

1.5 It is, therefore, felt to set up an Expert Group in the RBI with the objective of developing an effective information system on asset prices. Accordingly, a group of experts from Indian Statistical Institute (ISI), Central Statistical Organisation (CSO), National Housing Bank (NHB) and Indira Gandhi Institute of Development

Research (IGIDR) and the officials from State Bank of India (SBI), ICICI and HDFC has been engaged in working out a framework of Asset Price Monitoring System for obtaining a workable basis for quickly deliverable dimensions of Real Estate Prices in quantitative terms, preferably in a frequent manner that could be useful for monetary policy and financial stability purposes. Accordingly, an Expert Group was constituted with the following members:

Principal Adviser Department of Statistics and Information Management Reserve Bank of India	Member
Shri Raj Pal Principal Adviser National Housing Bank	Member
Prof. Bimal Roy Professor Indian Statistical Institute	Member
Prof. Manoj Panda Director Centre for Economic and Social Studies (formerly from IGIDR)	Member
Dr. G M Boopathy Deputy Director General Central Statistical Organisation	Member
Shri Gautam Bhagat Chief Executive Officer HDFC Realty	Member
Smt. Anuradha Rao Deputy General Manager, Home Loans State Bank of India	Member
Shri Abhay Sakare Deputy General Manager ICICI Home Finance	Member
Shri Sanjoy Bose Director	Convener

Terms of Reference of the Expert Group

1.6 The Expert Group had the following terms of reference:

- i. to suggest method for establishing a system of real estate price data collection;
- ii. to recommend an appropriate survey format for collection of real estate price, including rent, in select metro cities in India;
- iii. to suggest appropriate methodology for compilation of house price index;
- iv. to consider any other issue relating to construction of house price index.

Acknowledgements

1.7 The Statistical Analysis Division (SAD) of the Department of Statistics and Information Management (DSIM), Reserve Bank of India, provided the secretarial support to the Expert Group. The members of the Group place on record its appreciation and express their gratitude to the officers and staff of SAD for their support in the preparation of this Report. In particular, the efforts put in by Mr. Sanjoy Bose, Director, Dr. Abhiman Das, Assistant Adviser and Ms. Manjusha Senapati, Mr. Joice John, Ms. Nivedita Banerjee and Mr. Sanjay Singh, Research Officers, deserve special appreciation. In many technical issues, Smt. S. Augustine, Director, as a special invitee shared her practical experience of house price data collection. She too deserves special mention.

1.8 The Group deliberated on various issues related to the importance of setting up a system of real estate price data collection system within the Bank and the potential role of such information for monetary policy formulation. At the government level, National Housing Bank (NHB) is already engaged in compiling house price index called NHB RESIDEX. As monitoring of real estate price is important for the overall economic activity, several market participants like CRISIL, and research institutions like National Institute of Bank Management (NIBM), National Council for Applied Economic Research (NCAER), etc., are also engaged in understanding the dynamics

of house price movements. In different occasions, they made presentations on their approach and potential advantage of monitoring house prices. Such presentations were immensely useful to the Group in fine tuning the methodology of data collection. The Group is benefited from valuable inputs provided by the officials from the State Bank of India and the ICICI Bank. These discussions were useful to ascertain the availability of data from banking systems and the problems thereof. Special thanks to all of them.

1.9 The report is organised in six chapters. Chapter 2 gives an overview of the need for house price monitoring in RBI, suggesting thereby a framework for establishing a reliable system of real estate price data collection. Chapter 3 examines the methodology of house price index development. Chapter 4 presents proposed approach for an appropriate methodology for compilation of house price index in the present context. Chapter 6 presents the summary of the findings and sets out the recommendations of the Group.

2. House Price, Monetary Policy and Financial Stability

2.1 Real estate price is conceptually different from the prices of current goods and services. Property prices are evidenced to have a very critical position among all the asset classes. It is, in general, forward looking and it reflects market's expectations of the value of the future stream of services derived from the property. Real estate asset prices contain important information about the current and future state of the economy and could play an important role in monetary policy setting for its overall objectives of price stability and sustainable growth.

2.2 Residential and commercial property accounts for a sizable share in the wealth of a nation. The demand for real estate properties, particularly for the private homes, depend primarily on earning capacity of the prospective owner as also his borrowing capacity, interest rate structure for property loans and taxation policy. The number of new homes, particularly affordable ones, forming only a few per cent of the total stock of housing, varies greatly with the economic conditions. It is evidenced almost routinely that house price fluctuations may amplify the macroeconomic shocks, like supply, demand, or monetary policy shocks. Housing sector may be buoyed up by non-fundamental price movements, giving rise to imbalances in the financial system and the economy.

2.3 The catastrophic financial crisis led by sub-prime mortgage debacle against a backdrop of the biggest home-price boom in the US is a testimony to the fact that how surging money flowing to housing sector can create a severe debt crisis in the history of banking. It extended unabatedly after beginning in the late 1990s via 'doubling the stake' investment behaviour when the prices soared by hundred per cent till it started busting in the seams 2006 onwards. Such spectacular exuberance propelled the entire world economy and stock markets, via several engineered innovative tools, spilling across entire segments of financial markets across the globe. Post the great depression of the 1930s, the so-called sub-prime crisis has led to

unprecedented crisis in the credit market, failures of big banks and a total lack in business and consumer confidence.

2.4 Only comparable kin of the ongoing stressed financial market and protracted slackening macroeconomic situations are the adverse and persistent deflationary situations witnessed in the US during the Great Depression (1929-39) and Japan after the biggest financial crash when the real estate bubble burst (1991-2002). The added dimension of the financial crisis of 2008-09 is that it has led to a near global economic catastrophe due to increased linkages and coupled leveraged condition across the globe.

2.5 Recent occurrence of the Dubai's Debt repayment crisis is again due to highly leveraged investment undertaken by Dubai's largest state-owned conglomerate to build up a non-oil economy based on property development activities, trade and tourism. This debacle started because of solvency issue created by steep fall in earning led by sizable correction in property prices as also general slack in trade and tourism ongoing recession in the developed economies. It may be mentioned that house prices almost quadrupled in Dubai within a very short span of five years during 2002-07 which since then have been halved.

2.6 The sub-prime meltdown is a huge one creating a total loss in faith and trust within the banking system, leading to the collapsing condition of the banking operation in the world for few days after Lehman Brothers' collapsed. House price fluctuations may jeopardise economic activity and the financial stability, particularly when bubbles get fuelled by bank loans. Any misreading and regulatory lapses would hit bankers and realtors hard, so that close monitoring of asset price movements are being increasingly pushed into the core macroeconomic policy framework.

Importance of house prices for monetary policy

2.7 Property market is of central concern to monetary policy makers. To achieve the dual goals of price stability and a sustainable level of growth and employment, monetary policy makers must persevere to factor in the monetary transmission mechanism the dynamics of the housing market behaviour. “Central bankers naturally play close attention to interest rates and asset prices,...[they] are potentially valuable sources of timely information about economic and financial conditions...[and] should embody a great deal of investors’ collective information and beliefs about the future course of the economy.”¹ In the past, dominant central bankers used to feel either the asset prices have only an indirect effect on interest rates or could be largely ignored. As history now speaks, implications of house prices could be as tricky as that even Greenspan could misread the signs; he saw early, probably the first to have a very clear understanding of housing prices that the Americans treated their homes as a source to refinance or taking home-equity loans to turn home’s value into spending money.

2.8 Despite several poignant signals getting highlighted in the form of unsustainable rise in house prices compared to realisable rents, the strong belief was that house prices can at best form localised bubbles and would never give rise to a nationwide crisis. Steeply descending house prices at a national level was deemed to be highly improbable. Another riddance for not to consider a continuously rising asset prices within any direct actionable monetary stance is that it is well nigh impossible to distinguish a transitory bubble from a self-fulfilling rise in asset prices. Any hawkish actionable stage was assumed to be solely dependent upon if the rising asset prices were pushing up prices of goods and services, as revealed in conventional measures of inflation. All these are now set to change. Before making regulatory ambience more stringent, monetary policy perspective now may get redressed so as to consider probable proactive response to mitigate self-fulfilling impetus behind runaway asset price movement, at least for the segment when it is led by bank loans.

¹ House Price Indices (HPIs) have been produced in the UK since around 1973, initially by mortgage-providers, and subsequently by government bodies. More recently, the work of monitoring house prices of UK has been transferred to the Bank of England.

2.9 Real estate prices are critical for the financial sector and in terms of measuring the wealth of the country. It has been evident that monitoring real estate prices has become critical for financial stability analysis. But, it is an area where information is lacking in India. There is no agency that collects real estate market prices on a regular basis. Housing in India is, however, very different from housing in the US, Canada, UK Japan or say, even in Dubai, where it is also seen as a prospective investment for future needs. India's property market is largely end-user based. Besides, financing pattern for ownership of individual homes differs between the developed economies, emerging market economies and the developing or underdeveloped countries. For example, ownership of individual homes is very high in the United States or Canada, whereas in Hong Kong, more than fifty percent units are supplied by the government. In India, the depth of housing market is very low; it is a huge need-based requirement and yet to attain a broad-based utilitarian means of wealth formation and effective investment vehicle carrying assured stream of future flow of money.

2.10 It is true that housing market in India is yet to achieve a status of ascendancy that has been achieved by the likes of stock or bond market. However, governments and the central banks across Asia have been taking steps to rein in property prices on concern that speculative money would flow into nascent house market sector to jack up prices which may react, though mostly as a demonstrative effect seeing the asset bubble bursting in the neighbouring regions like Dubai or elsewhere in the emerging market economies. This could be very much relevant for some of the upcoming segments in the major metropolitan centres like Mumbai, Delhi, etc. Moreover, India's monetary and financial market authorities are committed to keep stable and orderly market behaviour as well as solvency and liquidity of the financial system. The latest episode of Dubai's best-performing property market going down to the worst within a year, now underscores the challenge central bankers face in ensuring rapid credit growth not leading to bubbles.

2.11 With easy money stance from the central bank, mortgage rates become easy so that monthly cost of homeownership would drop and the demand for housing rises. Initial reaction would however be in the prices of the houses already built, which in turns motivates builders to start new projects and the flow of new housing investment picks up. Here comes the absorptive capacity of the system and gestation lags and procedural hurdles which delay new housing projects. Over time, enough homes are built to satisfy the new higher level of demand; housing prices and new housing investment then drop back toward their original level. This kind of cyclical movements is inevitably revealed in the house price movements across all the countries.

2.12 House prices enter the monetary policy transmission mechanism primarily through the wealth channel (the value of the net equity of households and firms being of key importance) and via the balance sheet of the banking sector. Specifically, this effect operate via: (i) household consumption through the wealth channel, as a rise in house price is perceived as a rise in wealth and a source of consumption financing, and/or (ii) the balance sheet of the banking sector, as house prices often act in the role of collateral in lending transactions. Although these two channels are not the only, or probably even the dominant, channels of monetary policy transmission (exchange rate, interest rate and credit channels also operate), it is the interconnections between all these channels from which the power of monetary policy stems. It is obvious, meanwhile, that these channels vary in strength from one economy to another in terms of their effects on the real economy; it determines whether or not asset prices are incorporated into the forecasting system (for example, the BoE takes into account both asset prices and house prices)². The table below shows the position of housing in the monetary policies of selected central banks. It may be mentioned that all these central banks monitor house prices, but none of them includes house prices in its decision rule.

Table 2.1: Housing and monetary policy

²The main model (BEQM) directly includes an asset price channel, which models the wealth effect and includes housing in addition to financial assets.

	Fed ³	ECB ⁴	MNB ⁵	NBP ⁶	BoE ⁷	Riksbank ⁸	RBNZ ⁹
Inflation target or monitored aggregate	PCE	HICP	CPI	CPI	CPI (conceptually HICP)	CPI	CPI
Housing explicitly in analytical and forecasting system	YES	NO	YES	YES	YES	NO	NO
House prices directly in targeted inflation	NO	NO	NO	NO	NO	YES	YES

2.13 How can central banks take house prices into account? The first way is merely to track the housing market and house prices, and not to react to or interfere with them, even when imbalances arise. The second way is exactly the opposite: to include house prices directly in the central bank's decision (interest rate) rule or "reaction function" as another component over and above the deviation of inflation from the inflation target, etc. However, this approach is also inappropriate, as dual targets introduce further volatility into the economy. This is probably why none of the central banks monitor targets or reacts directly to house prices. The other options lie somewhere between these two extremes. The third approach consists in taking house prices, or their aforementioned transmission channel, explicitly into account in the central bank's analytical and forecasting system and in the related source materials for monetary policy decision-making. The fourth option is to include expenditure related to the use of housing in consumer price indices, for example using the concept of imputed rent. In this case, consumer prices do not reflect house prices directly, but reflect the prices of services consumed or the utility hypothetically realised by property owners, in line with the fundamental CPI

³ Federal Reserve, US.

⁴ European Central Bank.

⁵ Magyar Nemzeti Bank (The *Central Bank* of Hungary).

⁶ National Bank of Poland. The Polish central bank on 30 June 2008 unveiled its new macroeconomic model NECMOD, which incorporates the housing market and models both the supply and demand sides of that market.

⁷ Bank of England.

⁸ Sweden's central bank.

⁹ Reserve Bank of New Zealand.

methodology. The fifth approach is a methodological extension of the CPI concept directly to include asset prices (including house prices) so that the indices measure the cost of living via the prices of present and future goods. The last two techniques assume that CPIs have the relevant content, i.e., there is some degree of coordination between the central bank and the government statistics agencies responsible for the methodology, collection and publication of consumer price data.

2.14 All this means, among other things, that the conceptual differentiation of whether housing is being purchased/used for investment or consumption is important in terms of the inclusion of housing related prices in the CPI. Housing can be viewed on the one hand as a durable good that provides a service to households. On the other hand, a property purchase can be regarded as an investment. It is solely up to the owner to decide whether to realise his potential profit by selling in the future and how to handle the investment while it is in his possession (whether to collect returns in the form of rents, etc.). However, if we take into account the expenditure associated with the use of housing (maintenance, wear and tear, etc.), such expenditure can be counted as consumption. This is how government statistics agencies usually treat it when designing consumer price indices.

2.15 To sum up, most of the central banks monitor and pay adequate attention to developments in the housing area. House prices rarely enter consumer price indices directly; they are usually substituted by the imputed rent concept. Likewise, direct inclusion of house prices in analytical and forecasting systems is in the minority. Nonetheless, house purchase expenditure in relation to the consumption of economic entities and the investment decisions of agents is often contained in central banks' macroeconomic models. House prices do not play a very important role explicitly in central bank decision-making but in many cases, related consumer spending is captured in the monetary policy through relevant consumer price indices.

Determinants of Commercial and Residential Prices

2.16 The determinants of property prices are in many ways similar to those of other assets, namely the expected service stream (consumption service) or expected future cash flow (rents) and the required rate of return (the long-term interest rate plus the risk premium) as a discount factor. In the long run, property prices therefore depend on demand factors, such as national income and average discount rates, and on supply factors, such as cost of construction, land availability and the quality of the existing stock.

2.17 Property markets also have a number of distinctive features compared with other types of asset. The supply of property is intensively local; delivery of the new stock can take quite a long time owing to the length of the planning and construction phases; rents can be very sticky because of the use of long-term rental contracts; market prices lack transparency and most transactions occur through bilateral negotiations; the liquidity of the market is constrained because of the existence of high transaction costs; borrowers rely heavily on external finance; real estate is widely used as collateral; and short sales are usually not possible. These features cause property prices to behave differently. In particular, in the short run, property prices are more likely to deviate from their long-term fundamentals. The fluctuations in property prices can arise not only owing to cyclical movements in economic fundamentals, interest rates and the risk premium, but also as a result of the intrinsic characteristics of the property market itself.

2.18 Business cycle causes property price fluctuations for obvious reasons. Improvements in overall economic conditions tend to increase the average income of households and therefore boost the demand for new homes, putting upward pressure on house prices. Similarly, businesses see profitable opportunities and seek to expand the scale of their investments. Such an expansion implies a higher demand for office space and storage, driving up commercial property prices. In addition, the market perception of risk changes with the phases of the cycle. During a booming phase, the risk involved in a given project is considered to be lower than in a downward phase. The changing risk premiums, in combination with time-varying

interest rates (decided by policymakers), determine the discount rates and by extension have a sizeable impact on real estate prices.

2.19 Property price oscillations are also driven by endogenous factors, most notably supply lags and the historical dependence of investment decisions. On the one hand, the supply response in the property market is much slower compared with that of other goods, mainly as a result of limited land supply and the length of the approval process and the construction phase. On the other hand, the flow of information in the property market is usually inefficient. Beyond these common characteristics, the dynamics of property prices can vary substantially across sectors (residential vs. commercial, office vs. retail, etc) and across countries as a result of differences in a number of specific demand and supply factors. Such national and sectoral differences can be attributed to asynchronous business cycles, as well as to distinctive local factors (elasticity of supply, funding methods, subsidy/tax policies, legal framework, etc.).

2.20 A house is a long-lived asset that delivers consumption services over many periods. In many respects it is more like a durable good than an investment asset. Given that residential property can provide accommodation to its owner, it has an intrinsic reservation value determined by the discounted value of the expected service stream. As a result, nominal housing prices are usually less likely to fall as sharply as equity prices and commercial real estate prices. Indeed, in many situations the downward pressure on the housing market is typically reflected in shrinking transaction volumes rather than in a collapse in nominal prices, as owners refrain from selling at a loss. As noted, housing price fluctuations can be driven by macro factors and intrinsic characteristics of the housing market itself. Empirical evidence suggests that the market has its own distinct dynamics. On average, almost three fifths of the overall variation in housing prices can be explained by innovations in the housing market itself. The combined effect of other explanatory factors, such as GDP, interest rates, bank credit and equity prices, accounts for the rest.

2.21 Commercial property markets have some unique characteristics, such as longer construction lags, long-term leases and volatile income streams, which cause the commercial and residential property cycles to show distinct patterns. Moreover, commercial property cycles may be asynchronous across regions and sectors. Depending on the elasticity of supply, development lags, durability of assets and funding methods, different types of commercial property may themselves have varying dynamics. Unlike residential real estate, commercial property is more of a pure investment asset and its value is determined by the discounted value of future rents. When macroeconomic conditions weaken, shrinking business activity cuts down the demand for commercial property and results in higher vacancy rates. Rising vacancy rates and lower rental rates lead to a deterioration of real estate market fundamentals and cause prices to fall. Compared with a residential property, the reservation value for a commercial property is much lower, because its consumption value is low while its maintenance cost is very high. As a result, commercial property prices tend to be more responsive to macroeconomic conditions, and it is common to observe a sharp decline in nominal commercial property prices during an economic downturn.

2.22 Movements in property prices could affect aggregate demand and economic activity in various ways. First, rising property prices lead to more optimistic expectations of the returns on property investment. As a result, builders start new construction and market demand in property-related sectors increases. Second, rising house prices induce households to increase private expenditure and therefore provide a big support for private consumption. Third, changes in commercial property prices may significantly change the investment decisions of those firms that are financially constrained. Similarly, movements in house prices influence the financial behaviour of homeowners and would-be home purchasers.

Real Estate Prices and Financial Stability

2.23 The role of real estate prices in the conduct of monetary policy has attracted much attention among researchers and policymakers in recent years. There has been

extensive evidence that property price movements have a large impact on private consumption and the real economy. The results show that increases in property prices tend to have a positive impact on real GDP in many countries. Importantly, the magnitude of this impact is different across countries and sectors. The commercial property sector seems to have a larger impact on the real economy, reflecting the fact that it is more important in affecting the investment decisions and financial conditions of corporate firms. Besides, the national difference suggests that the role of property prices in monetary policy transmission might be influenced by local factors.

2.24 The link between property prices and aggregate demand suggests that the monetary authorities can benefit from monitoring developments in property markets. The view that policymakers should respond to excessive increase in property values which are manifestations of excess demand in the economy as a whole has received much attention within central bank circles. In particular, monetary policymakers need to identify the sources and nature of property price fluctuations in order to understand their implications for price stability and the general economy, and then to formulate the appropriate policy response. However, in practice, it is not an easy task. It is often not straightforward to identify “excessive” property price inflation at an early stage. Lack of reliable data, diversity in valuation methods and unpredictability of market movements make it difficult for policymakers to design an early warning signal of asset price imbalances in the property market with a comfortable degree of confidence.

2.25 Bank lending is the primary source of real estate funding. Not surprisingly, there are close connections between real estate prices and bank credit. On the one hand, sharp falls in property prices can lead to a large-scale deterioration in asset quality and in the profitability of the banking industry, particularly for those banks that are deeply involved in property or property-related lending businesses. They also undermine the value of bank capital, reducing the banks’ lending capacity. On the other hand, banks’ lending attitude has important implications for property prices. Bank credit to property buyers and constructors may change the balance

between the demand and the supply side and cause property prices to fluctuate. Studies done in the past suggest that bank credit and property prices are positively related in the long run. The impact of property prices on bank credit is found to be significantly positive, yet the impact in the reverse direction is less clear.

III. House Price Indices: An Overview

3.1 Traditionally, house price data in India only in the form of rent is captured by both CPI (UNME) and CPI (IW) at half-yearly intervals.¹⁰ For CPI(IW), the change in rent and related charges, which constitute a single item under housing group, is captured through Repeat House Rent Surveys, which are conducted in the form of six-monthly rounds. This survey is conducted on a sub-sample of dwellings covered during the main income & expenditure survey in 1999-2000. The index is calculated once in every six months and is kept constant for the entire six months on account of the tendency of house rent to remain more or less stable over short periods. Under the house rent survey, three types of dwellings viz. rented, rent free and self-owned are covered uniformly across all the centres. As the names suggest, both these indices capture house rent price movements for specific target population. Therefore, rent price movements based on these indices do not necessarily reflect true rent price movement of a city as a whole.

3.2 At present, CPI(IW) partially capture different segments of the urban population as the reference population for CPI(IW) covers parts of both rural and urban industrial workers mostly residing in urban areas and employed in 7 industrial sectors. A major section of urban people is not adequately captured. Therefore, house rent index captured in CPI (IW) in India has limited utility. However, it may be mentioned that CPI (Urban) being proposed recently by CSO would cover the entire gamut of urban population.

3.3 Changes in asset prices influence household wealth and therefore impact consumer spending and aggregate demand. Asset prices also contain important information about the current and future state of the economy and play an important role in monetary policy setting. International organizations like the Bank for International Settlements (BIS) and the European Central Bank (ECB), government agencies in several developing and industrial countries, and private

¹⁰ Compilation of CPI (UNME) has since been discontinued since April 2008.

sector companies in some countries have been compiling indices at the regional and national levels to measure developments in real estate or other segments of asset markets. In absence of any comprehensive information system for India, the National Housing Bank (NHB), at the behest of Ministry of Finance, launched NHB RESIDEX for tracking prices of residential properties in July 2007 with 2001 taken as the base year. Based on the data from housing finance companies along with the data collected by NCAER, the updated NHB RESIDEX is now available up to June 2009. NHB's data base, however, does not cover commercial properties. Another limitation is that though NHB RESIDEX is very broad based, it is available with half-yearly frequency with a time-lag. However, by tapping the vast data lying within the banking system as also with Department of Registration and Stamps (DRS) across the States one can obtain a rapid estimate about the current trend and direction of house prices on a quarterly basis.

3.4 With the objective of obtaining an index representing the aggregate house price movements in India, National Housing Bank (NHB) developed and released NHB RESIDEX for five selected cities in the country during July 2007 under the guidance of a Technical Advisory Group of which, the RBI was one of the members and department provided technical inputs for firming up of the methodology and construction of the index. NHB launched the first official residential property index (NHB RESIDEX) for 5 cities namely Mumbai, Delhi, Bangalore, Kolkata and Bhopal. NHB RESIDEX was the annual housing price index for a year 2001 to 2005, by undertaking a field survey as a pilot study of selected groups of respondents (20 transactions per annum in each zone) in 25 colonies across different administrative/property zones in different cities and prices are as reported by the real estate agents through questionnaires. Stratification of the colonies was based on the house stock distribution as available in census 2001.

3.5 NHB RESIDEX has been updated up to June, 2009 with half yearly update (Jan - June, 2009) with 2007 as the Base Year. This updating has been done by using data on housing arranged by NCAER. As in the case of updating of NHB RESIDEX after

2005, the NCAER had used Magic Bricks (Times Business Solutions Ltd.) a company of the Times of India Group for primary data collection which was then duly analysed and vetted by them. Further, data from other sources, i.e. housing transaction prices covered under the housing loans provided by housing finance companies and banks during the above mentioned period, have also been utilized to supplement and cross verify the information received from NCAER for updating NHB RESIDEX. NHB RESIDEX will be up dated on half yearly basis, for the present. In the first phase NHB RESIDEX will be expanded to cover 35 cities having million plus population. The proposal is to expand NHB RESIDEX to 63 cities which are covered under the Jawahar Lal Nehru National Urban Renewal Mission to make it a truly national index. It is envisaged to develop a residential property price index for select cities and subsequently an all India composite index by suitably combining these city level indices to capture the relative temporal change in the prices of houses at different levels.

3.6 A similar study, at the instance of the Bank, was taken up in its Department of Statistics and Information Management to study the house price movement in Mumbai, where the price data on transacted houses were collected from the Department of Registration and Stamps (DRS), Government of Maharashtra. The department's study was based on the officially declared prices by buyers, covering about 3 lakh official transactions collected from DRS, Government of Maharashtra. Based on the official data a quarterly index was constructed till Q2: 2007-08 with 2002-03 as the base year. House Price Index was constructed based on stratified weighted average measures, where transactions were stratified in three categories viz. small, medium and large houses and 16 administrative wards. House price indices were calculated using two methods, viz. weighted average method and time dummy hedonic method. Two different weighting diagrams based on number of houses transacted and value of houses transacted were used to construct the weighted average based indices.

Methodology of compiling house price index: an international comparison

3.7 Besides official agencies, several central banks are involved in compiling house price index. For example, Bank of Canada, Deutsche Bundesbank and Bank of England do collect house price information on a regular basis through direct surveys (Table 3.1). Furthermore, almost all central banks around the world monitor and analyze house price movements for monetary policy formulation. Methodology of compilation of housing price index for major developed countries is summarized in Table 3.1. There are mainly 4 different methods which are discussed below.

3.8 Based on median/mean transactions price: Here, for a particular area, the median or the mean of all transactions during a reference period is used as the representative price. The main problems with median and mean prices are that they are subject to distortion by ‘compositional’ factors. Compositional factors include the volume of property sales within specific price bands. For example, if mainly low value properties in an area are sold in a month (and few of the superior properties in that area) then this can indicate a drop in the median or average. However, in the next month most sales in that area may be superior properties (i.e., higher values) and this would then show that the median and average house price had increased when in fact values overall may have fallen.

3.9 The fact that median prices are affected by compositional change and seasonality, there is evidence that samples of observed transactions cannot be considered to be random. Since there exists no *ex ante* way of ensuring a random sample of housing transactions, techniques are required *ex post* to deal with the non-randomness. While median prices are widely used, alternative methodologies are employed in a number of countries to deal with the problem of compositional change and to obtain improved measures of housing prices.

3.10 Mix-adjusted: One means of controlling for changes in the mix of properties sold is to use the technique of stratification to construct a mix-adjusted measure of house prices. This is the methodology used by the Australian Bureau of Statistics (ABS) in its indices for established house prices. Mix-adjusted measures have also

been used in a number of other countries including Canada, Germany and the United Kingdom, although there are differences between the approaches used in each country reflecting the diverse nature of housing markets across regions. Typically, small geographic regions (e.g., suburbs) are clustered into larger geographic regions and then a weighted average of price changes in those larger regions is taken.

Table 3.1: Housing Price Series in Selected Countries

Country	Index	Organisation	Data source	Methodology
Canada	New Housing Price Index (NHPI)	Statistics Canada	Builders/Developers are under obligation to respond to survey for NHPI. Face to face interview as well as telephonic interviews. System on disclosure control exists.	Data collected on house price, estimated cost of land and on detailed attributes of model house. Samples are given equal weight; Amongst metropolitan areas weights are based on housing completion data; Chain-Laspeyre's formula; 1997=100. updated monthly
UK	Land Registry HPI	Land Registry	Land Registry's own data	Simple average (median) of 100 % of sales registered.
	ODPM-HPI	Office of Deputy Prime Minister	Survey of Mortgage Lenders and Council of Mortgage Lenders	Mix adjustment; measure the value of average set of transacted dwellings
	Halifax	Halifax	Loan approvals by Halifax	Hedonic regression; weights based on 1983 Halifax loan approvals; measure the price of Halifax representative dwelling; updated quarterly.
	Nation wide	Nation wide	Loan approvals by Nation wide	Hedonic regression; weights based rolling average of SML, land Registry and Nationwide transactions ; measure the price of Nation wide representative dwelling; updated quarterly.
	Home track	Home track	Survey of aprox. 4000 estates agents' average price	Mix adjustment, weights based on housing stock, measure value of housing stock.
	Right move	Right move	Sellers' asking prices posted on internet platform	Mix adjustment, weights based on housing stock, measure value of housing

				stock.
USA	FHFA- HPI	FHFA	Mortgage transaction from Fannie Mae and Freddie Mac.	Weighted-Repeat-Sales; updated quarterly.
	NCREIF Property Indices	NCREIF	NCREIF collects data both for individual and commercial properties and collective investment funds. NCREIF publishes the NCREIF Property Index (NPI) and other statistical measures of performance on a quarterly basis.	NCREIF Property Index is a quarterly time series composite total rate of return measure of investment performance of a very large pool of individual commercial real estate properties. NPI is often referred as an "appraisal based index."
	S&P/Case-Shiller HPI	Standard & Poor's	Deed records of residential sales transactions	Weighted-Repeat-Sales; updated quarterly.
	National Association (NAR) of Realtors- Existing home median value	NAR	Survey of over 150000 transactions of existing single family homes.	Median price is calculated on the basis of transaction covered under monthly survey.
France	National Institute of Statistics and Economic Studies (INSEE) - Indices	INSEE	Data collection and computation of index by Notaries, who draw up deeds and collect stamp duty. Data on house price and other attributes.	Hedonic regression; with fixed baskets houses in some 300 geographic zones; up dated quarterly.
Australia	Australian Bureau of Statistics (ABS)-HPI	ABS	Prices from State Government Authorities and data from mortgage lenders	Weighted average (Median); weights based on housing stock in each cluster.
	Australian Property Monitors (APM) house price series	APM	Transaction data from State Government Authorities.	Composition adjusted National house price (Median) series quarterly and monthly to calculate growth in prices
Austria	Austrian Central Statistical Office -output price indices	Austrian Central Statistical Office	Data from building companies through questionnaire	Indices compiled according to Laspeyre's formula ; updated quarterly (Basically cost of construction Indices)
Germany	Federal Statistic Office of Germany - construction price indices	Federal Statistic Office of Germany	Surveys conducted by regional and federal statistical offices	Indices compile according to Laspeyre's formula ; updated half yearly (Basically cost of construction Indices)

	Hypoport AG – German house price index	Hypoport AG	Home sales data from EUROPACE internet- based platform	Mix adjustment; updated monthly.
Sweden	Swedish Statistical Office (SCB) – building price indices	Swedish Statistical Office (SCB)	Data obtained from investors and from application forms submitted to Government Authorities to obtained housing aid for new construction	Hedonic price methodology according to Paasche chained formula.
Hong Kong	Property Market Statistics - Price Indices	Rating and Valuation Department (R&VD), Government of Hong Kong.	Actual transaction prices are reviewed by the R&VD for stamp duty purposes.	Price indices are compiled in the basis of ratable values of various properties. A composite index for a certain class of properties is calculated as a weighted average of the component indices. Weights being the number of transactions during current and previous 11 months in case of residential properties; whereas the weights in case of non-residential properties are based on floor area of the components.

Source: National Housing Bank, Occasional Paper – III (A Study of Cross Country Experiences in preparing and publishing Housing Price Indices)

3.11 Another approach along these lines uses price-based stratification, based on the evidence of marked compositional change between lower- and higher-priced suburbs. This appears to be highly effective in reducing the influence of compositional change. In particular, houses and societies sold in any period can be divided into groups (or strata) according to the long-run median price of their respective suburbs. The mix-adjusted measure of the city-wide average price change is then calculated as the average of the change in the medians for each group.

3.12 Hedonic method: Regression-based approaches have also been used by researchers and are used in the official measures produced in some countries,

including the UK and US. One method is the hedonic approach, which involves attempting to explain the price in each transaction by a range of property attributes, such as the location, type and size of a property, as well as the period in which it was sold. The index of house prices that results can be thought of as the average price level of the transactions that occurred in each period, after controlling for the observable attributes of the properties that were sold. Hence, a hedonic approach can take account of shifts in the composition of transactions in each period. In principle it can also control for quality improvements, although the ability to do so in practice will depend on the comprehensiveness of data on housing characteristics. Various hedonic methods for house price measures are presented in **Annex 1**.

3.13 Repeat-sales: An alternative regression-based approach is the repeat-sales methodology. Rather than focusing on the price level in each transaction, this approach relies on the observed changes in price for those properties that have been sold more than once. Using a regression framework, it seeks to identify the common component in price changes over time. One limitation of a pure repeat-sales approach is that it uses only the data from those transactions involving properties for which there is a record of an earlier sale. An additional factor is that estimates of price changes in any quarter will generally continue to be revised based on sales that occur in subsequent quarters.

3.14 In principle, both regression approaches can provide a broader control for compositional change than a mix-adjusted measure, as they can control for more characteristics of sales than a mix-adjusted measure. However, the possible advantages come at a cost of requiring the use of statistical techniques that are more complex, more data-intensive, and often require assumptions on the part of the individual.

IV. Data Availability and Compilation of House Price Index in India

4.1 It is well acknowledged that property prices are an essential input into the proper construction of measures of GDP and inflation. But, as the current global crisis makes it clear, we may not undermine the importance of tracking property price data in laying out the macroeconomic dimensions of our economy. It is, however, necessary to consider alternative methodologies keeping in view of certain constraints on the availability of data before proposing any specific choice. This is more so in the context of India, where a proper statistical system of house price data collection is yet to be established. Hence, we discuss below some of the existing house price index methodologies in India purely from the view point of availability of price data.

4.2 *Based on the registration price data*

4.2.1 Registration of property price is a legal and official necessity for any property transaction in India. Therefore, in principle, the official authority of property registration has the details of all transactions during a reference period. When explored in Mumbai, we observed that the house price index for Greater Mumbai could potentially be compiled based on the officially declared data on house transactions obtained from the Department of Registration and Stamps (DRS), Government of Maharashtra. The DRS provides the computerized data on the registration of transactions (about 4.5 lakhs) of properties including shops, land and residential flats located in Greater Mumbai, which were registered since March 2002 to the recent period. The data are available in a month lag, reported on a daily basis. Basic information for Mumbai is available in Marathi. The data structure includes the following fields: Date, registration number, village, survey no, area, giving party name, taking party name, consideration amount and market value. From this, data related to residential flats could be easily extracted and analysed for the compilation of house price index in Mumbai on monthly or quarterly interval.

4.2.2 For example, taking year 2002-03 as the base year, house price indices could be estimated from Q1: 2003-04 onwards. However, the data on prices of residential

flats require careful scrutiny to remove unacceptable data points. Certain 'outliers' could be taken care of using z-scores calculated separately for each stratum in each month/quarter¹¹. All the observations where z-score values lie within -3 and +3 could be accepted. Since the data do not include the information on type of house, i.e., under-construction or new or resale house, the date of registration is considered as date of sale of the house. Since registration is done at government rates, the DRS data include both prices, viz., government price and transaction price. The analysis of data as well as compilation of the index is done on the transaction price. While interpreting the results, the fact may be taken into account that this price is the price officially declared by the buyer. As the aim is to obtain the movement in the house price, the data of officially declared price can be used to extract the house price index.

4.2.3 For administrative purposes, Brihanmumbai Mahanagarpalika Corporation (BMC) has divided Greater Mumbai into six zones, each consisting of three to five wards, denoted by alphabets A to T. The data of the DRS has location as one of the attributes. Based on the location of the house, its ward and zone can be identified. Based on each flat's floor space area (FSA) data, for example, could be classified into three categories namely <45 sq mt.(small house) , 45-90 sq.mt. (medium size house) and >90 sq.mt.(large house). These classifications could be used for stratification in weighted average methodology.

4.2.4 Finally, the house price indices could be calculated using weighted average method. In the case of weighted average method, generally median is used as an average. Also two different weighting diagrams could be used for obtaining two different house price indices in weighted average method. One set of index could be calculated with proportionate number of houses transacted as the weight, which reflects the price appreciation. The other could be constructed with proportionate

¹¹ The z- score is $z=(x-\mu)/\sigma$ where: x is the variable to be standardized, μ is the mean and σ is the standard deviation. The quantity z represents the distance between the individual observations and the population mean in units of the standard deviation. However, if median is used, z-score need not be used to eliminate extreme values.

amount transacted as the weight, which provides the measure of capital appreciation and investment return. In the case of weighted average method, data could be segregated in different dimensions namely size-wise, ward/zone-wise and four types of indices could be constructed, viz., ward/zone HPI, FSA-HPI and City HPI. The methodology for computing the respective indices is described in detail below.

4.2.5 Weighted Average Method

(i) Ward/Zone HPI

To begin with a simple average (Median) of price (per square meter) of houses (P_{ij}) in each category classified by FSA in each quarter and for each ward/zone could be calculated. Suppose, the proportions of number of houses transacted during in three categories of FSA within a ward/zone during the period April 2002 – March 2003 are taken as the weights (w_{ij}). Based on an average per square meter price for three FSA category houses in each ward/zone, price-relative could be calculated for each quarter. This price relative is nothing but a ratio of current period price to the base period price. The quarterly ward/zone index could be calculated by taking weighted average of those price-relatives in each ward.

Price relative per sq.mt for the i^{th} FSA, j^{th} Ward/Zone, t^{th} Quarter

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

$$i \in \{< 45, 45 - 90, > 90\}$$

$$j \in \{A, BC \& E, D, F, G, H, K, L, M, N, P, R, S, T\}$$

$$j \in \{Zone1, Zone2, Zone3, Zone4, Zone5, Zone6\}$$

$$t \in \{Q1: 2003 - 04, Q2: 2003 - 04, ..., Q1: 2009 - 10\}$$

$P_{i,j,0}$ is the prices in the base period 2002-03.

The following formulae could be used for constructing the ward/zone HPI for the j^{th} ward/zone for t^{th} quarter

$$\text{Ward/Zone } HPI_{j,t} = \left(\sum_i RP_{i,j,t} \times w_{i,j} \right) \times 100 \quad \text{for all } j \text{ and } t.$$

(ii) Size (Floor Space Area)-wise HPI

For deriving the FSA wise HPI, price relative indices for each category of houses could be derived and then HPI could be constructed using proportion of number of houses transacted in each ward to the total number of houses transacted in the city (W_j) during the period April 2002 – March 2003 as the weight. Thus, the FSA (Floor Space Area) wise HPI for the i^{th} category, for t^{th} quarter could be calculated using following formulae.

$$\text{FSA wise } HPI_{i,t} = \left(\sum_j RP_{i,j,t} \times W_j \right) \times 100 \quad \text{for all } i \text{ and } t$$

(iii) *City-wise HPI*

Finally, the city HPI could be constructed by first finding the weighted relative prices for each wards with weights being the proportions of number of houses (value of houses) of different categories of FSA in each ward ($w_{i,j}$) during the period April 2002 – March 2003. These weighted relative prices could then be averaged using proportion of number of houses (value of house) in each ward to the total number (value) of houses in Mumbai during the period April 2002 – March 2003 as the weight (W_j). The City HPI could thus be constructed using the following formulae: City $HPI_t = \left(\sum_j \left(\sum_i RP_{i,j,t} \times w_{i,j} \right) \times W_j \right) \times 100$ for all t .

4.2.6 Limitations: It is well known that the registered prices of houses are grossly underestimated due to very high registration fees and stamp duty. The subsequent obligations for the payment of property tax acts as a disincentive to individual purchasers (except corporate bodies) for revealing the exact purchase price of a house. There are certain other limitations in getting the registered property prices data at regular intervals as property is a state subject. 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 most of the states and the records 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.

4.3 *The Methodology and Framework of NHB RESIDEX*

4.3.1 Pilot study for development of NHB RESIDEX covered 5 cities viz., Delhi, Mumbai, Kolkata, Bangalore and Bhopal representing various regions of the country. Actual transactions prices (including land, but excluding registration fee, stamp duty, brokerage fee, etc.) were considered for the study in order to arrive at an index which will reflect the market trends. The year 2001 was taken as the base year for the study to be comparable with the WPI and CPI. Year to year price movement during the period 2001-2005 were captured in the study, and subsequently updated for two more years, i.e., up to 2007. NHB RESIDEX was expanded to cover ten more cities, viz, Ahmedabad, Faridabad, Chennai, Kochi, Hyderabad, Jaipur, Patna, Lucknow, Pune and Surat.

4.3.2 Further, NHB RESIDEX has been updated up to June 2009, with two half yearly releases (Jan - June and July - Dec) during June 2009. At the time of last updation and expansion of coverage of NHB RESIDEX to 10 more cities, the base year was shifted from 2001 to 2007. NHB RESIDEX will be updated on half yearly basis, for the present. In the first phase NHB RESIDEX will be expanded to cover 35 cities having million plus population. The proposal is to expand NHB RESIDEX to 63 cities which are covered under the Jawahar Lal Nehru National Urban Renewal Mission to make it a truly national index. Prices have been studied for various administrative zones/property tax zones constituting each city. The index has been constructed using the weighted average methodology with Price Relative Method (Modified Laspeyre's approach).

4.3.3 In order to ensure representative coverage in the choice of the houses, market segmentation was done in the following manner: (i) selected city level market was segmented on the basis of the municipal administrative zones or property tax zones, based the applicable zonal segmentation done by city authorities. (ii) Thereafter,

selection of locations was done on the basis of their spatial distribution across the city. (iii) In each of the selected colony, both new and resale housing units have been incorporated, including flatted and plotted developments, developed by various housing agencies, including public housing agencies, private developers, cooperative and informal land assembly mechanisms. (iv) Finally, to arrive at the representative basket, the following category of housing products were covered: (a) Economically Weaker Section (EWS) and Low Income Group (LIG) housing, upto 2 rooms and covered area less than 45 sq. m. (<500 sq. ft.), (b) Middle Income Group (MIG) housing with 2 bed rooms and covered area between 45 and 90 sq. m. (500-1000 sq. ft.) and (c) High Income Group (HIG) housing units with 3 bedrooms or more and covered area more than 90 sq. m. (>1000 sq. ft.). The prices taken were the transaction prices from the real estate agents/property dealers, private builders, resident welfare associations. Transaction based volume weights were used at the zone level and both transactions based and stock based weightings have been used.

4.3.4 Primary data on housing prices is being collected from real estate agents by commissioning the services of private consultancy/research organisations of national repute. In addition data on housing prices is also being collected from the housing finance companies and bank, which is based on housing loans contracted by these institutions. It is envisaged to develop a residential property price index for select cities and subsequently an all India composite index by suitably combining these city level indices to capture the relative temporal change in the prices of houses at different levels.

4.3.5 Limitations: NHB RESIDEX is a pioneering attempt by National Housing Bank to measure residential prices in India. NHB's data base, however, does not cover commercial properties. Another limitation is that though NHB RESIDEX is very broad based, it is available with half-yearly frequency with a time-lag. What RBI needs is a quick understanding about emerging trend on real estate prices and rent as it would provide valuable inputs for monetary policy formulation on a monthly/quarterly basis. In this context, NHB RESIDEX has limited utility.

4.4 Commercial Banks Property Price Index

4.4.1 Housing and related issues are an important subject for any economy. From the point of view of the financial sector, there are risk exposures for both lenders and borrowers. Banks as well as corporate having large exposure to real estate/housing may get affected by volatility in house prices. Further, real estate property prices are an important consideration for commercial banks as being useful inputs in their lending decisions. To mortgage lenders, the tracking of real estate prices is also important from the point of view of their portfolio management.

4.4.2 Some of the commercial banks in India are tracking real estate prices regularly by constructing property price indices. For the construction of the same, the approach followed is as follows: Cities are divided into different areas based on geographical and similar socio economic considerations. PIN codes are used in large cities for the division. Such areas are then clubbed into zones, most of the cities are having 5-6 zones based on the geographical proximity. Separate indices are prepared for areas, zones and then for city as a whole. Data are culled out from mortgage business data system of the bank and segregated on quarterly basis for various areas. Sample of 5 per cent entries are checked for the accuracy of the data.

4.4.3 From the commercial banks side, every loan disbursed is valued by in-house valuers. The prices of the flats/houses which have been appraised by the valuers during the particular quarter form the basket for that particular quarter are used as the price. Area-wise base period weights are derived from the total number of transactions done in the base period quarter. Such indices help to capture asset price trends in different areas. Property price indices are calculated for area, zone and city separately.

5. Proposed Approach and Recommendations

5.1 Property prices - residential and commercial - have a variety of important uses. For national income accountants, they are used for calculating both investment and consumption. The former is about building costs, while the latter is about service flows. For consumer price index construction, residential property prices are an input into the computation of the price of housing services for owner occupiers. For bankers, as well as their regulators and supervisors, these property prices are important in helping them to estimate the value of collateral backing loans; similarly for people trying to estimate the value of securities backed by pools of loans collateralized by property.

5.2 In particular, the real estate price index could potentially be the first available index to measure the performance of income producing real estate and would be the primary index that institutional investors may rely on for benchmarking the performance of real estate. It could be created to understand how the performance of real estate compares with other asset classes such as stocks and bonds and also to provide a better understanding of the risk and return for commercial real estate. The index may be used as a basis for developing diversification strategies such as the percentage allocation to real estate to minimise risk for a target portfolio return. Also, sub-indices such as for office, retail, industrial and apartment properties may be used to determine how to diversify by property type. Similarly, sub-indices by regions of the country may be used for geographic diversification.

5.3 Real estate property prices can be obtained from many sources. These include government registration authority, builders, real estate agents, individual buyers and sellers, housing societies, banks, housing finance companies and various other market participants. As real estate property is associated with a status value and has tendency of overpricing/underpricing, a survey based approach from individual buyers and sellers may depict an erroneous picture of the property movements. Similarly, data collected through a survey schedule from the real estate agents and

societies are fraught with practical difficulties. Builders on the other hand may not disclose property price information due to the intense competition across the sector. As mentioned earlier, registered prices of houses are grossly underestimated due to very high registration fees and stamp duty.

5.4 *Why banks data to be used*

5.4.1 It can be argued that at a basic level there is plenty of information on real estate prices and that the issue is the failure to capture it and to convert into a usable form for analytical purposes. This is so both at the national and sub national level. Users in individual states can be confronted either with a lack of relevant statistics or with different statistics for different time periods and with varying time-lags and based on different data sources or compilation methods. Thus there is an increasing user demand for relevant statistics on real estate prices.

5.4.2 There are two categories of data that might be used to construct house price indices; household surveys and administrative data on actual transactions. Although the former offers the potential advantage of considering the prices of an identical or at least comparable group of houses, the disadvantage of relying on estimated as opposed to actual prices has been felt to be so important that almost all house price indices rely on transactions data. Actual transactions have their own problems. Like all administrative data they have to be adjusted to fit statistical purposes.

5.4.3 Due to changes in banking laws and policies, banks are increasingly active in home financing. In acquiring mortgages on real estate, these institutions follow two main practices, viz., first, some of the banks maintain active and well-organized departments whose primary function is to compete actively for real estate loans. In areas lacking specialized real estate financial institutions, these banks become the source for residential and farm mortgage loans. Second, these banks themselves construct, maintain and track real estate property prices indices. Appraisal values could be effectively used to calculate the real estate price index based on appraisals. This is because the prices of real estate properties are not stated correctly by the

buyers. The appraisal values rather than transaction prices could be used to calculate the index. **Thus, the Group recommends sourcing the real estate property price data in the form of sale/resale directly from the scheduled banks (covering both commercial and urban cooperative banks), and housing finance companies like HDFC Realty and LIC Housing Finance, etc., from selected centres. Presumably, transaction level data are available in electronic form with these organisations.**

5.5. Centre Selection: As per the latest information available with RBI, commercial banks' disbursement towards housing loans to top 30 centres in India constituted nearly 70 per cent of the total housing loans of all commercial banks. A list of these centres is presented in Annex 2. Final selection of the centres is based on the joint considerations of disbursement of housing loans by banks and also taking into account regional representation. **Therefore, as indicated in the terms of reference and considering the relative importance and geographical representations, the Group recommends collecting house price data at transaction level from top 13 centres: Greater Mumbai, Chennai, NCR Delhi, Bangalore, Hyderabad, Kolkata, Pune, Jaipur, Greater Chandigarh, Ahmedabad, Lucknow, Bhopal and Bhubaneswar. For monitoring overall asset price movement, selection of these centres fairly captures the regional dimension also.**

5.6. Survey Schedule: As the data are being sourced from the banks, a survey schedule is basically a return prescribed for the said purpose. The proposed return includes variables like type of property (including both real estate and commercial), address, type of transaction, valuation price of the property, purchase price of property and loan amount taken from the bank other than the information on certain characteristics of the borrower (viz. gender, employment, monthly income, etc.). With a view to capture some related indicators of financial stability, selected characteristics of the borrower are also included. A copy of the proposed return is presented in **Annex 3**.

5.7 House rent data: In order to compile a CPI which takes into account the consumption patterns of all segments of the population, CSO has taken steps to

collect price and rent data from all the States and UTs. All cities/Towns having population (2001 Population Census) more than 9 lakh and all State/UT capitals not covered therein were selected purposively. In all 310 towns from all categories of towns have been selected either on purposively or random basis from which 1114 price schedules (quotations) are canvassed every month. For each quotation six rented dwellings have also been selected for house rent data collection. For each town, total number of dwellings identified were distributed over different number of living rooms as per the state level percentage distribution of dwellings by number of living rooms, obtained from the NSS 58th Round Survey on Housing Conditions (July – December, 2002). Dwellings were also distributed to different segments of the population (poor, middle and affluent) keeping in view the local conditions in the town. Allocation of dwellings among three segments of the population was done judiciously i.e. lesser number of dwellings units were distributed to poor segment and other dwelling to middle and affluent classes. A total of 6684 dwellings have been selected from the 310 towns for house rent data collection at six monthly intervals. As regards to the base year of CPI(Urban), the TAC on SPCL in its 48th meeting held on 31st December, 2009 has decided that inflationary trends in the initial three to four months of 2010 might be examined for the base year selection as the year 2009 is not a normal year. The CPI (Urban) indices would be compiled at the State & UT level only not at city/town level. House Rent Indices, therefore, would be available only at State/UT level. **Considering the practical difficulty of collection of house rent data, the Group recommend using official data on house rent index of CPI(Urban) being released by CSO. For monitoring purpose, RBI needs to track both sale/resale price index as well as the rent index on a regular basis.**

5.8 Frequency of compilation: The Group recommends compiling real estate price index on quarterly intervals so as to capture the movement of these prices on a more frequent basis.

5.9 Proposed Real Estate Price Index Methodology: The Group recommends undertaking this exercise in stages. To begin with, two cities (say for Delhi and Mumbai) may be

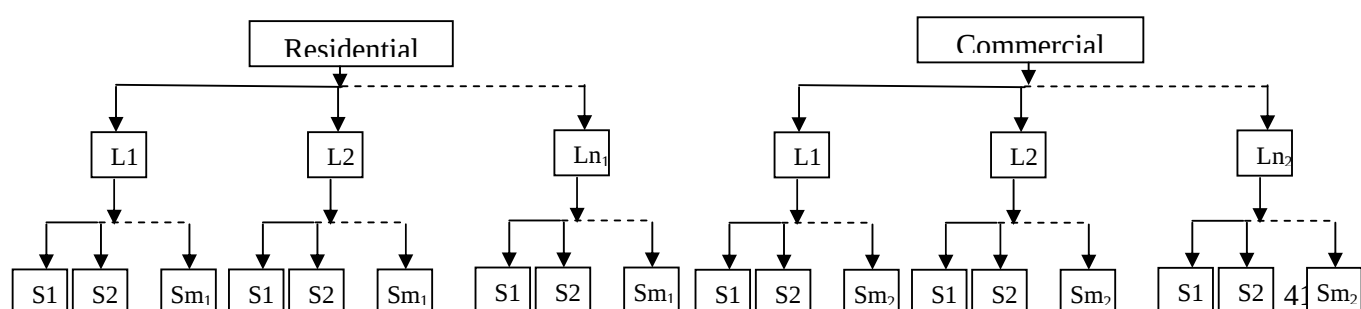
selected as pilot areas to test the applicability of the approach, which can be replicated later in other 11 cities once the method of collection is established.

5.9.1 Methodology

5.9.1.1 *Assumptions*: The following are assumed – (a) the composition/structure (property mix) of stock of real properties remains constant over a certain period of time, say five years; (b) that the unit values derived from the actual sales/transfer/exchanges of properties reports are representative of the sub-category where they belong; and (c) that the records of stock of properties with the commercial banks are adequate for property index construction purposes.

5.9.1.2 *Prices*: (a) Two types of real estate price indices will be constructed in each centre - (1) the residential property prices index, and (2) the commercial property prices index. Both indices will be built based on the two levels of stratification given in Table A4.1 of **Annex 4**. If further levels of stratification are required, these will be incorporated in the estimation. The unit level price (*say* per sq.ft price) will be derived based on which the index will be calculated.

5.9.1.3 *Index*: Price estimated for each stratum will be aggregated using the Laspeyre's index method with financial year 2009-10 as the base year. Within each center for each type, the data will be stratified based on size of the property and location. In each stratum median unit level price will be estimated first. A weighting diagram based on value of transaction in the base year will be used for the compilation of both types (commercial and residential) of indices in each center. As an alternative the total loan amount sanctioned can also be used for the weighting purpose. Methodology for the compilation of the index and an illustration of the methodology are summarized in **Annex 4**. A diagrammatic representation of location (L) and different size classes (S) is placed below:



5.10 The Group deliberated on relying only on the bank data because of possible problem of representation for the economy as a whole. The Group felt necessary to supplement the bank data through a survey conducted annually. This will also ensure robustness of the data available with the banking system. It is emphasized that in collection of the house price data, sampling frame becomes large. So the stratification criteria and weights are to be decided in an appropriate manner so that every stratum is well represented in the sample. In this context, the Group recommended selecting random sample from the available data from banks and follow the method of similar to post-enumeration check.

5.11 *Institutional set up:* Importance of real estate asset price monitoring in RBI is enormous. Besides monetary policy and financial stability angle, real estate price index of RBI being proposed here has the potential of a national-level price index. This new endeavour would undergo various stages of implementation which needs to resolve associated challenges. The proposed statistical system needs to be structured organisationally as a separate unit in the Statistics Department of RBI.

Annex 1

A1.1 Time dummy variable index method: A time dummy hedonic regression model is specified with the characteristics as independent variables and the natural log of the collected price as the dependent variable. Model specification for the time dummy method look like this:

$$\ln(p_{it}) = \alpha_t + \sum_{i=1}^k \beta_k z_{itk} + \delta_t D_t + \varepsilon_{itk} \quad (\text{A1.1})$$

For k set of observations and time period t and not all good appearing in all periods, p_{it} is the price of i^{th} observation in t^{th} time period expressed in natural logarithmic scale. α is the constant term, β_k is the regression coefficient or implicit hedonic price, z_k is the value of the characteristics, δ_t is the regression coefficient for time dummy, D_t is the time dummy variable with a value of 1 in period t and 0 otherwise and ε_{it} , error term.

A1.2 The quality-adjusted price index can be calculated directly by taking the exponential of the time-dummy coefficients of interest after estimating the regression coefficients. In other words, $\text{Index} = \exp(\delta_t)$, where δ_t is the regression coefficient of the time dummy when the hedonic functional form is semi-log. When we compare the relative price of a good, between period t and period $t-1$, for any given quality specification, represented by z , then this ratio is equal to the relative exponential of the time dummy variables. This is the simplest and most common approach. Many statistical agencies world-wide use this method to calculate price indexes.

A1.3 Whenever an item replacement takes place between the base and reference periods, quality change potentially occurs. The change in quality due to item replacement is taken care of by the associated characteristics, and the pure price change will be captured by the regression coefficient of the time dummy variable. The disadvantage of the time dummy variable index is that it is sensitive to specification bias and multi-collinearity. Multi-collinearity arises when the

independent variables are correlated, violating one of the basic assumptions of the multiple regression concept.

A1.4 Characteristics price index method: An alternative approach for a comparison between price of houses in period 't' and 't+1' is to estimate a hedonic regression for period 't+1', and insert the values of the characteristics of modal house in period 't' into the period 't+1' regression. This would generate predictions of the price of modal house existing in period 't', at period 't+1' shadow or implicit prices. This price can be compared with the price of the modal house in period 't' obtained from regression for period 't'.

Similarly another set of implicit prices could be generated by inserting the characteristics of modal house of period 't+1' into the period 't' regression coefficients. This price is then compared with the price of the same modal house in period 't+1' obtained from regression equation for period 't+1'.

The geometric mean of these two indexes gives us the desired characteristics price index. Let the regression equation for the period 't' be given as

$$\ln p_{it} = \beta_{0t} + \sum_{i=1}^k \beta_{it} x_{it} + \varepsilon_{it} \quad (A1.2)$$

where x_{it} = variable for characteristics i and β_0, β_i are the partial regression coefficients.

Substituting in regression equations of t and t+1, specification of modal house $\overline{X}_{it}$ in the period t, we have

$$\begin{aligned} \ln \overline{p}_{it} &= \beta_{0t} + \sum_{i=1}^k \beta_{it} \overline{X}_{it} + \varepsilon_{it} \quad \text{and} \\ \ln \overline{p}_{it+1} &= \beta_{0t+1} + \sum_{i=1}^k \beta_{it+1} \overline{X}_{it} + \varepsilon_{it+1} \end{aligned}$$

$$\text{The hedonic index specification in period t} = \overline{p}_{it+1} / \overline{p}_{it} \quad (A1.3)$$

Similarly, substituting average specification $\overline{X}_{it+1}$ in the period t+1 for variables in regression equations of 't' and 't+1', we have

$$\ln p'_{it} = \beta_{0t} + \sum_{i=1}^k \beta_{it} \overline{X_{it+1}} + \varepsilon_{it} \quad \text{and}$$

$$\ln p'_{it+1} = \beta_{0t+1} + \sum_{i=1}^k \beta_{it+1} \overline{X_{it+1}} + \varepsilon_{it}$$

The hedonic index specification in period t = $\frac{p'_{it+1}}{p'_{it}}$ (A1.4)

and the final hedonic index is the geometric mean of (A1.3) and (A1.4).

Geometric mean of (A1.3) and (A1.4) = $\sqrt{\left(\frac{p'_{it+1}}{p_{it}}\right) * \left(\frac{p'_{it+1}}{p'_{it}}\right)}$ (A1.5)

In other words, this is nothing but the valuation of the typical base period (t) house by the current period's implicit prices, obtained from the current period's hedonic function, and compared with the same valuation for the base period. This is analogous to the Laspeyres type price index. Similarly the alternative index is the comparison of typical current period's price with the hedonic function of the base period. The geometric mean of these two indexes would give the desired characteristics price index.

Annex 2

Top 30 centres arranged according to housing loan in 2008

1	MUMBAI
2	CHENNAI
3	DELHI
4	BANGALORE
5	HYDERABAD
6	KOLKATA
7	PUNE
8	JAIPUR
9	CHANDIGARH
10	THIRUVANANTHAPURAM
11	KOCHI
12	AHMEDABAD
13	LUCKNOW
14	BHUBANESWAR
15	COIMBATORE
16	INDORE
17	LUDHIANA
18	NAGPUR
19	MANGALORE
20	BHOPAL
21	VISAKHAPATNAM
22	KANPUR
23	NEW BOMBAY
24	THANE
25	MYSORE
26	GURGAON
27	VIJAYAWADA
28	VADODARA
29	JALANDHAR
30	SURAT

Annex 3

Return – Real Estate Asset Price Monitoring

I. Type of property

☐ Residential

☐ Commercial

II. Type of transaction

☐ Sale

☐ Resale

III. Address of property

[State City Location..... Pin.....]

IV. Characteristics of the transaction

1. Floor space area (sq. ft.): _____

2. Date (dd/mm/yyyy) of disbursement of first loan

--	--	--	--	--	--	--	--

3. Purchase Price (incl. land, but excl. registration fee, stamp duty, brokerage fee, etc.)

[Rs. lakhs] _____

4. Valuation Price of the Property [Rs. Lakhs] _____
(as valued by the lender)

V. Characteristics of borrower

1. Gender of borrower: Male ☐ Female ☐

2. Whether the borrower is:

☐ Self-employed/Business-person ☐ Other Employed ☐ Others

3. Monthly income (Rs.) of the borrower _____

VI. Other financial information

1. Loan amount taken (Rs. lakh) _____

2. Maturity period (Contractual) _____

Annex 4

Methodology for Compilation

Table A4.1 : Classification and Stratification

Classification	Level 1 Stratification	Level 2 Stratification	Remarks
A. Residential	By location	By size	Appraised values
	Based on Administrative Classification	Small, Medium and Large	
B. Commercial	By location	By size	Appraised values
	Based on Administrative Classification	Small, Medium and Large	

The methodology can be summarized in the following three steps:

Step 1: For each type, compute price relatives (PR) of the average (median) unit level prices for each of the strata at the most detailed level i.e for each location $i=1,2, \dots, n$ and each size category $j=1,2 \dots m$, this is given by:

$$PR_{ij} = (\text{current median price}_{ij} / \text{base median price}_{ij}) \times 100 \quad (1)$$

Step 2: Price index for each location (i) in any centre is the weighted average of the price relatives of the size categories $j=1,2 \dots m$:

$$\text{Index}_i = \sum_j (PR_{ij} \times W_{ij}) / \sum_j W_{ij} \text{ for } i=1,2 \dots n \quad (2)$$

The weight (W_{ij}) is computed from the value of transactions (loan amount sanctioned) in each strata in the base year of the particular type of property in every center.

Step 3: The aggregate price index for a particular centre for residential/commercial property is the weighted average of the indices for the different locations as estimated in Step 2 . Thus the index will be

$$\text{Index} = \sum_i (\text{Index}_i \times W_i) / \sum_i W_i \quad (3)$$

The weight (W_i) is computed from the value of transactions (loan amount sanctioned) in each location in the base year of the particular type of property in every center.

Illustration of Methodology

Let us consider the case of residential properties in Mumbai. Here the stratification can be made according to six administrative zones *say* Zone 1 to Zone 6; and three size categories based on floor space area, *say* Small (Less than 500 Sq.ft), Medium (500-1000 Sq.ft) and Large (More than 1000 Sq.ft). Thus here we have 18 stratum in total (Six stratum in first level of stratification and three in second making $6 \times 3 = 18$ stratum).

Let the quarter for which the index to be compiled is Q1 of 2010 (t_1); and the base year is 2009(t_B). In the first step the unit value prices (per square feet prices) for the individual cases are obtained dividing the prices by the area (Sq.ft). The median is obtained next for 18 stratum separately in t_B and t_1 . The price relatives is then calculated for each of the 18 strata by using the equation (1). Subsequently following Step 2 and Step 3 the Residential index for Mumbai for Q1:2010 can be calculated. A numerical example is given in Table A3.2 using assumed values.

Table A4.2 Illustration for the Steps Involved

	Z1			Z2			....		
	S	M	L	S	M	L	S	M	L
2009 (t _B) Median	1000	1500	2000	1500	2000	2500	....	....	....
Q1:10(t ₁) Median	1500	3000	4000	1500	3000	5000	....	....	....
PR=t ₁ /t _B *100	150	200	200	100	150	200	....	....	....
Weights	0.50	0.25	0.25	0.60	0.20	0.20	....	....	....
Zone Index	150*0.5+200*0.25+200*0.25 = 175			100*0.6+150*0.2+200*0.2 = 130			....		
Weights	0.30			0.20			...		
Residential Index Mumbai for Q1:10	175*0.3+130*0.2+150*0.1+200*0.1+150*0.2+100*0.1=138.5								

Annex 5

Property markets in some of the key emerging market Asian Economies

Housing has a critical role of anchoring the economic growth expectations in most of the island countries of the south-east Asian economies like Singapore, Malaysia, Taiwan, Thailand, and Indonesia. In a recent paper brought out by the ECB (*“Wealth Effects in Emerging Market Economies”* by Tuomas A. Peltonen, Ricardo M. Sousa and Isabel S. Vansteenkiste, Working Paper Series No 1000, January 2009), the importance of housing, stock market, and money wealth effects on consumption has been brought out very clearly in respect of the emerging market economies. Using quarterly data of fourteen such countries for the period 1990:1-2008:2, it has been observed that : (i) wealth effects are statistically significant and relatively large in magnitude; (ii) housing wealth effects tend to be smaller for Asian emerging markets while stock market wealth effects are, in general, smaller for Latin American countries; (iii) housing wealth effects have increased for Asian countries in recent years; and (iv) consumption reacts stronger to negative than to positive shocks in housing and financial wealth. There is a large body of literature that studies the effect of asset price fluctuations on private consumption and authors have used different econometric techniques and databases to address the issue. More recently, interest in the topic has regained ground against the background of the current financial turmoil which has led to concerns by numerous academics, central banks and governments about the potential macroeconomic implications of a downturn in house and equity prices.

Property markets have certain distinctive features that distinguish real estates from the other asset class namely (i) Supply of property is intensively local and inelastic with varying degrees depending on a host of factors like availability of land, basic amenities, key infrastructural facilities, length of planning and construction phases as also regulatory and availability of housing finance at affordable rates. (ii) Delivery of the new stock can take quite a long time owing to the. (iii) Rents could be sticky because of the use of long-term rental contracts. (iv) Market prices lack transparency and most transactions occur through bilateral negotiations. (v) Liquidity is

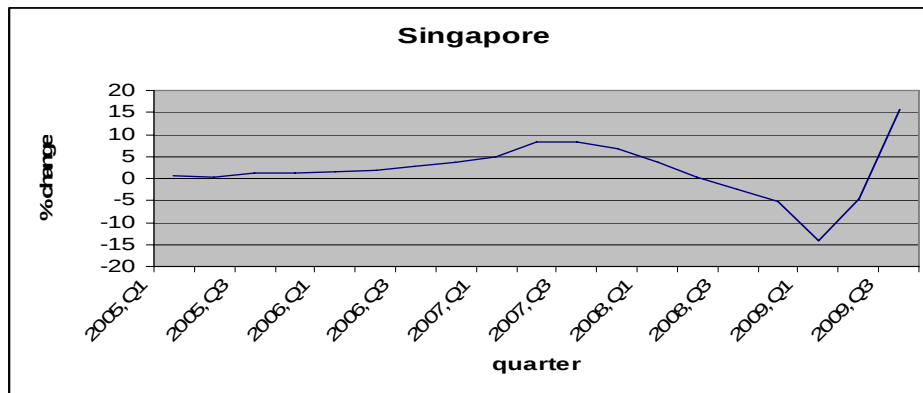
constrained because of transaction costs. (vi) Borrowers rely heavily on external finance. Another feature that is increasingly being revealed is that an inevitable cyclical behaviour in housing prices backed by behavioural aspects could become disruptive and broad-based through huge swings in the residential house prices, particularly so in a developed market condition without having concomitant governance and regulatory structure.

Some of the emerging market economies in Asia, have become systemically important because of reasons rooted in the Asian crisis episode. Current status on the housing price scenarios in some of these key emerging market economies with a side-by side comparable picture drawn from the developed economies would highlight the attendant issues and importance attached with the housing prices. Everywhere there is a precipitous feeling about runaway asset bubble formation of another kind, particularly in the countries where there exist developed kind of market structure because of world-wide loose and accommodative macroeconomic policy stances, both on the fiscal and monetary fronts. Trying to stabilize asset prices is problematic for a variety of reasons, not the least of which is that it is nearly impossible to know for sure whether a given change in asset values result from fundamental factors or not. A convergent view that emerged in the past among the mainstream monetary policy makers is that they need not respond to changes in asset prices, except that they signal changes in expected inflation. However, it could be necessary to respond to the toxic side effects of asset price bubbles for financial stability purpose. Nominal monetary shocks try to create real effects on activity primarily because certain prices and wages do not adjust pro rata so that the initial effects of monetary shocks is likely to be much more on flexible asset prices. Theoretically, therefore, this combination of flexible asset prices and sticky goods/labour prices could lead to overshooting in asset prices. It could depend on the size of monetary shocks and the local structure of the asset market like say that of real estate market. Due to unprecedented size of monetary as well as fiscal stimulus arranged across the world economies to arrest deflationary impact of the sub-prime led housing bubble busting, flexible asset markets have probably buoyed

upwards, particularly in the well organized markets for equities and housing. All these have made the central banks poring over asset price movements with a hitherto unprecedented gusto so as to understand the nature of recovery and sustainability of such price movements.

A5.1 Among the Asian leaders in the housing sector, **Singapore** has a success story to narrate so far as asset price and bubble-bust impact on growth is concerned; it seems to be coming out relatively unscathed second time in the recent reckoning since the Asian Financial Crisis, confirming thereby an efficient regime of governance and market regulatory structure. The country is also expressing its thankfulness to a series of well-timed and well-thought-through domestic measures, and very effective stimulus packages in China, India and Indonesia. When the year 2009 began, Singapore economy was forecasted to shrink by up to 8 per cent, which turned out to be close to – 2 per cent, a 6 percentage point improvement. Singapore's natural peer group, the developed economies however, continue to suffer recession and high unemployment. On the other hand recessionary spell across the developed economies is set for, as it were, a heightened "normal" level of unemployment, with the United States hitting a 10.2 per cent, Britain 7.9 per cent, France 8.3 per cent and **Ireland** 12.5 per cent. Ireland's case, of course has become a telling one; with the property prices down by 18 per cent, GDP has shrunk by 13.6 per cent from its peak! The year 2009 for Singapore was almost poised to trudge the grim Irish path, but thank to its Asian stature and prudent saving behavior, it could augur the lamp bearer of emerging Asian markets backed by China and India. House prices in Singapore recovered very fast as portrayed in the following chart.

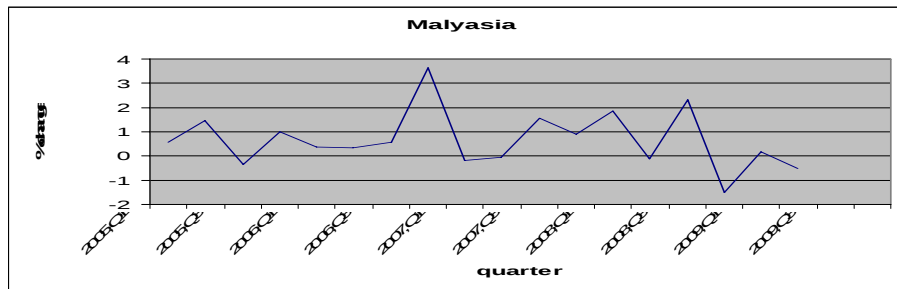
Quarterly House Price Movements



After weathering the crisis rather successfully, its policymakers are now looking forward to the growth and inflation perspective. Singapore housing market is quite nuanced so that it helps in assessing exactly the quantitative implications of current asset price changes for future inflation. Inflationary pass through effect of surge in asset prices seems to have a calibrated impact in Singapore in the next six months due to increased spending via increased wealth as well as confidence effects. (Sources: *Bloomberg, Reuters*)

A5.2 Malaysian property market is not expected to have any property bubble in the immediate run. Price of properties nationwide declined 9.8 per cent year - to- date due to the global economic crisis, but gained 1.40 per cent year-on-year, due to renewed interest emerging in the second quarter of 2009. Property prices are envisaged to face an upsurge assuming the presence of cheap finance, attractive promotions offered by the realtors and favorable regulations to continue. Sales demand for residential properties are expected to remain buoyant as investors continue to deem it as one of the more liquid hedging asset. As per the following chart, property prices are quite benign and yet to take an upward price rise.

Quarterly House Price Movements

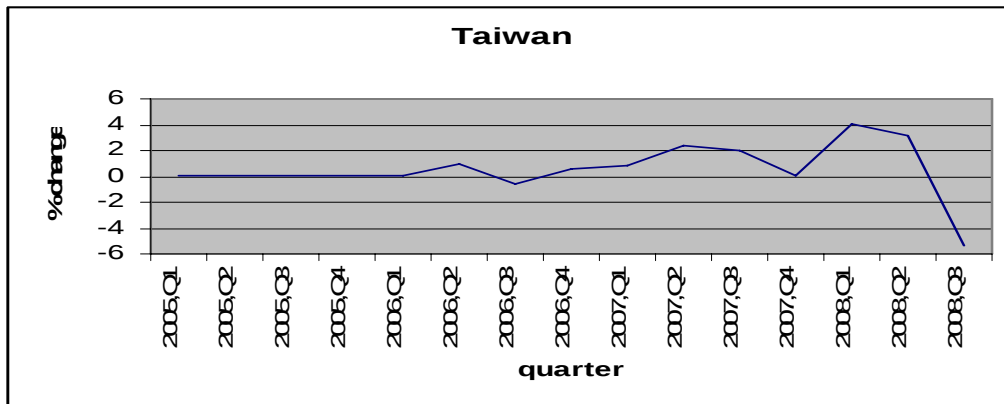


Surveys covering the key property players to assess the future trends in housing demand and trend in the prices. Recent such survey revealed that none of them are slowing down their pace of project developments. The responses are that (i) Property developers have taken advantage of the current discounted valuations to replenish land banks and were not holding back new launches. (ii) Take-up rates of residential properties have remained strong between 80 to 90 per cent in the last quarter. (iii) It is estimated that residential property sales will remain buoyant in the first half of 2010. The growth driver in 2010 will be, among others, the favorable regulations, continuous government support, thriving property market taking its cue from an improved economy and the ability to attract FDI flow. (iii) On the retail/shopping complex and office front, oversupply position is expected to continue. Many corporations and businesses are holding back expansion/relocation plans until the financial crisis is over. (iv) The downside risks are envisaged as the re-introduction of the Real Property Gains Tax (RPGT), possible pullback in sales due to withdrawal of cheap credit, unanticipated rise in raw material prices thus raising average selling prices and delaying the process of launching and approvals. Re-introduction of the RPGT is anyway to regulate the secondary sales market. On the flip side it may discourage foreign investment in commercial properties. The tax was introduced too soon as the economy was still on the verge of recovery; it was felt need to curb any prospective beginning of next asset bubble. (vi) Average rental yield for offices and commercial properties was on a downtrend in 2009, with rentals for offices falling 1.9 per cent year-on-year, and 1.35 per cent, year-to-date, within the Klang Valley. (Source: MIDF Research-Bernama). There are real estate investment trusts (REITS), which help deal in investment in real estate market. However they are not envisaged to be star performers. Any recovery in the property market,

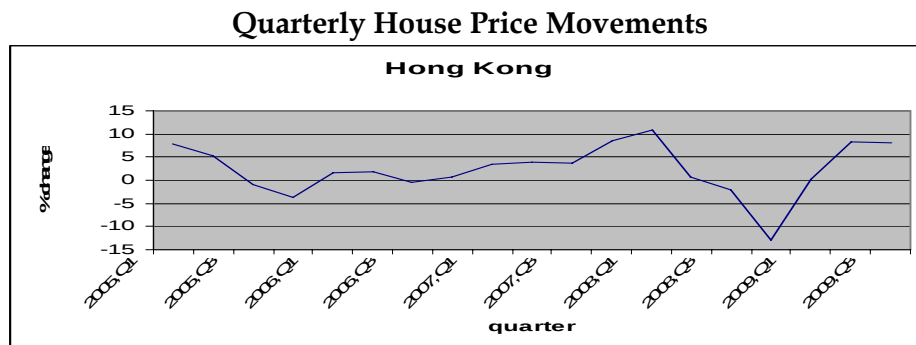
coupled with an exemption from RPGT and stamp duty will see rising interest in REITs; it currently yield an average return of between 8-9 per cent.

A5.3 Taiwan monetary authority tracks property-price inflation very closely assisted by matching expectation surveys. As per the responses obtained from the 141 Taiwanese companies surveyed during November 12 to December 7, 2009, about 41 per cent expect the island's property market to improve in the first quarter of 2010, twice as many forecasting a decline. This survey is arranged by the Interior Ministry's Architecture and Building Research Institute with the Real Estate Research Centre at the National Chengchi University producing the survey. Home prices are under "huge pressure" to decline because of oversupply, according to the government. The current message is that people need to be careful while being optimistic about the property market as about 12-15% residential units are vacant. This caution is to preempt any speculative overdrive that may kill the nascent growth prospect that drives the economy in a short to medium term. At present, the Taiwan's real estate market is bolstered by record-low interest rates against the backdrop of some very early signs of the economy emerging from a recession. The island's GDP shrank the least in a year in the three months ended September 2009 and expected to expand 4.39 per cent next year. The central bank has left borrowing costs unchanged at their past four quarterly meetings to help pull the economy out of recession. Taiwan has enjoyed four years of rising house prices. Prices rose by 8.86 per cent across Taiwan in the year to end-Q1 2008, according to the Sinyi House Price Index. Residential property in Taipei city increased in price by 7.06 per cent over the year.

Quarterly House Price Movements



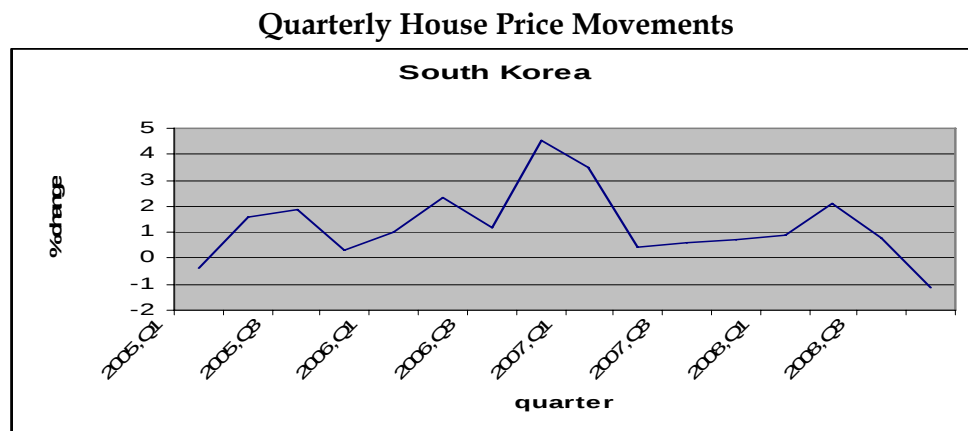
A5.4 Hong Kong property market is trying to ease a shortage in land supply and homes that fuelled price increases of up to 30 per cent this year, sparking a public outcry over housing costs and prompting the central bank to warn the city may face “sharp corrections” in asset prices should fund flows reverse.



Things have become little edgy particularly after Dubai episode. Developers feel that the government, one of the largest suppliers of building sites, should offer more land. Low mortgage costs, near-zero interest rates on savings deposits and buying by mainland Chinese pushed up existing home prices by 28 per cent this year as of December 13, 2009, according to the Centa-City Leading Index, a weekly measure developed by Centaline Property Agency Ltd and the City University of Hong Kong. HK home transactions almost tripled in November from a year earlier figures from the land registry show, marking the eighth straight monthly gain. Hong Kong developers have 50,000 units on hand to sell, based on estimates of their land bank,

sites under constructions and homes that were built, compared with 73,000 units in September 2007. The Hang Seng Property index, which tracks the city's biggest developers, has risen 61 per cent this year, making it the best-performing component in the benchmark.

A5.5 In South Korea, the Seoul house price index inched up in 2009, rising 3.6 per cent (2.8 per cent in real terms) from April to October 2009. Nationally, the house price index rose 2.1% (1.3% in real terms) over the same period, according to data from Koomin Bank. However the government moved swiftly to tighten loan conditions, to forestall a perceived housing bubble. In July, it reduced loan-to-value ratios from 60% to 50% for the purchase of properties in Seoul and other urban areas. It also instructed banks to scrutinize borrowers' income when granting loans. In Korea, every time residential property prices rise sharply, the government intervenes. For instance in 2006, when the index rose 18.9 per cent (16.4 per cent in real terms) in Seoul, capital gains taxes for properties in "speculative areas" were hiked.

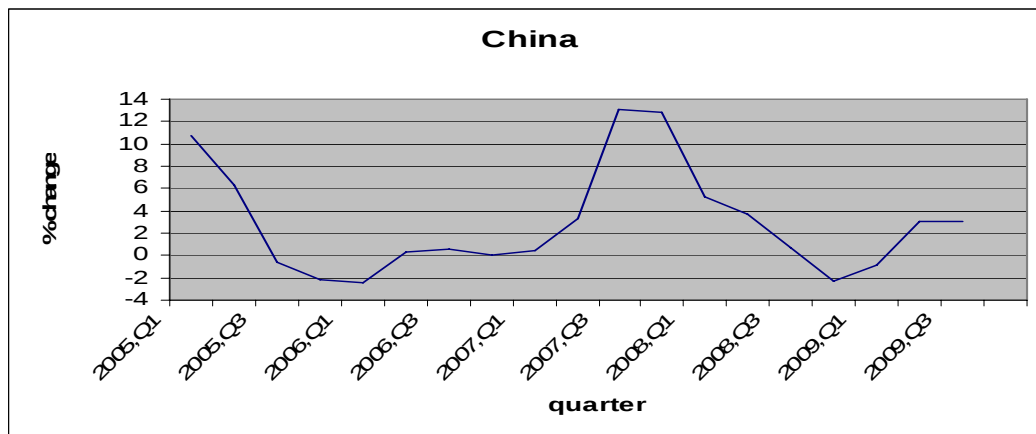


House price rises slowed in 2007 to 5.4 per cent in Seoul (1.75 per cent in real terms) and 3.1 per cent nationally (0.6 per cent in real terms). In 2008, house price rises were a mere 5 per cent for Seoul (0.86 per cent after inflation) and 3.1 per cent nationally (-1.5 per cent after inflation). The quick recovery of house prices in 2009 may be attributed to government spending and tax breaks to households; increased financial

system liquidity; and optimism that the economy is set to improve. Foreigners can buy freely in South Korea, except for acquisition of land located in development-restricted zones.

A5.6 In China, housing sales and property prices in China rose in the first half of 2009 backed by direct government intervention, House prices in 70 major cities rose by 2% (3.2% in real terms) in August 2009 from a year earlier, the third month of house price increases, according to data from the National Bureau of Statistics of China (NBSC).

Quarterly House Price Movements



Prompted by a fear of a forming property bubble in China, government officials implemented several measures to deflate the bubble in 2007, which led to a slowdown in house price growth in the first half of 2008. With the global financial crisis, house prices eventually dropped in the second half of 2008. To encourage purchase of houses and help the residential property sector to recover, fiscal measures, which includes tax cuts and additional spending for the real estate sector, were introduced by the government. Buyers and developers took advantage of the relaxed lending conditions and lower interest rates. With the revival of the real estate sector, residential property prices are expected to sustain its growth for the rest of 2009 and 2010, according to Colliers International.

A5.7 US housing market fiasco: Present worries and alert messages in connection with asset price movements owe a lot to the financial mess triggered by the US sub-prime crisis that led to the Great Recession that now heavily stalks the world economy growth. Moreover, uncertainties loom large about the downside risk associated with the unwinding of the concerted stimulus packages and equally accommodative loose monetary policy, which otherwise run the risk of tripping either towards fresh bubble formation in the asset prices or stirring up the inflation dragon in absence of sustained growth impetus which are yet to come up in the form of private sector activities and investment intentions.

For most Americans, **the US housing market** collapsed about four years ago. The worst affected were New York City and south Florida, where the financial crisis and recession shuttered construction projects in what were among the hottest US real estate markets. Manhattan rents fell as much as 7 per cent in the year ended December 15 as the recession helped some tenants move up to larger apartments for less. Rents for studio apartments dropped 7 per cent to an average of \$2247 a month, the Real Estate Group of New York said on Tuesday. One bedroom apartments fell 5.6 per cent to \$3262. Both the figures are building with doormen. The biggest difference between this year and last year is the amount of inventory. Rent in Manhattan is falling as unemployment climbs; joblessness is now at 10 per cent (seasonally adjusted). The city lost 25000 finance related jobs in the year till November 2009, including 700 in the month itself! Buildings' rents without doormen declined somewhat at a lower pace, namely 3.8 per cent to \$1921 for studio apartment and less than one per cent to \$2636 for one-bedroom.

In a recent summing up of the state of affairs in the US economy, the first decade of the new millennium shows zero gains for US homeowners as "housing prices adjusted for inflation"; they are roughly back to where they were at the beginning of the decade (Paul Krugman). And for those who bought in the decade's middle years – when all the serious people ridiculed the warnings that housing prices made no sense, that we are in the middle of a gigantic bubble, the story is now sordid when

the disaster struck. Historically cyclical house prices is just trying to trough its lowest ever nadir across the globe; the more it buoyed up, the more it has gone down to keep the mean reversion tendency so inherent in asset prices dynamics. Almost a quarter of all mortgages in America are underwater, with owners owing more than their houses are worth.

A5.8 Housing condition in the **United Kingdom** has registered an unexpectedly buoyant demand and a chronic lack of housing for sale were the key drivers of the housing market in 2009. The Y-o-Y fall in house prices in England and Wales eased to 1.9 per cent in December, the smallest annual drop since May 2008, according to the property data company Hometrack. The monthly pace of house price rises suffered a seasonal slowdown to 0.1 per cent in December from November's 0.2 per cent and Hometrack forecast prices would drop a further 1 per cent in 2010 as a whole. According to mortgage lenders Halifax and Nationwide report, prices have already risen by around 2 per cent in the year to November. Estate agents surveyed by Hometrack reported a 41 per cent increase in registrations from prospective home buyers in 2009, while the supply of property rose by just 7 per cent. A probable rise in unemployment and growing concern about tax rises and spending cuts after an election due by June were likely to limit demand. Against the backdrop of low sales volumes, equity –rich households could continue to put upward pressure on prices in localized markets in 2010. (Source – Reuters).

Annex 6

House Price Data Availability for the Developed Economies

Historically speaking, real estate prices playing a critical role behind financial crises has been recognized as far as back as the South Sea bubble. Time series data on housing, particularly the property prices, are available for the advanced economies and mostly so in respect of the United States, where variety of housing data are available in greater. The same is not the case for emerging market economies. Keeping track of the macroeconomic impact of asset price fluctuations in emerging

markets is assuming an important dimension as these economies are becoming a key engine of growth in the world economy and may play an important role in the resolution of global imbalances. Since an increasingly large number of emerging market economies is becoming financially developed, their access to financial assets and the possibility to extract equity from them has also risen, hence, increasing the potential macroeconomic impact of domestic asset price movements. Measuring wealth effects for emerging markets and assessing implications of asset prices is only of recent origin (Annex 5).

There is a large body of literature that studies the effect of asset price fluctuations on private consumption, mostly relating to the developed countries like the US, Canada or OECD countries where residential property plays a crucial role of investment consumption by the households. More recently, interest in the topic has regained ground against the background of the current financial turmoil which has led to concerns by numerous academics, central banks and governments about the potential macroeconomic implications of a downturn in house and equity prices. Major developed countries' house price indices are indicated in the following Table. House price indices exist for many of these countries for last two decades or so.

Definition and source for house prices

Country	HPI	Source
US	Nationwide single family house price index. Weighted, repeat-sales index . Releases quarterly.	OFHEO
Japan	Average mansion price per household- capital area; Nationwide urban land price index as a proxy for HPI	JREI
Germany	Index for total Germany, total resales	Bundesbank
Greece	Releases quarterly indices of prices of dwellings by region for urban areas.	The Bank of Greece
France	Publishes in their quarterly press releases. Indices are for apartments and houses by region.	FNAIM
Italy	Releases a semi-annual housing report with the average price of residential buildings for the 13 urban areas.	Nomisma Spa / Banca D'Italia
UK	Mix-adjusted house price index released on quarterly/monthly basis	Nationwide
Canada	Multiple listing series, average price in Canadian dollars	MoF
Australia	(i) Index of a weighted average of 8 capital cities. (ii) Weighted average median house price	(i) ABS, (ii) REIA
Denmark	Index of one-family house sold	Statistics Denmark
Austria	Quarterly indices are based on the price per square metre for new and used condominiums and single family homes	Oesterreichische National Bank (Austria)
Spain	Precio medio del m2 de la vivienda,	Banco de Espana
Finland	Housing prices in metropolitan area.	Bank of Finland
Ireland	Second hand houses	Irish Department of Environment
Korea	Nationwide house price index	Kookmin Bank,
Netherlands	Existing dwellings	Nederlandsche Bank
Norway	Nationwide index for dwellings	Statistics Norway
New Zealand	Quotable value index for dwellings (new and existing)	Reserve Bank
Sweden	One and two dwelling buildings	Statistics Sweden
Switzerland	Single-family home	Swiss National Bank

OFHEO: Office of Federal Housing Enterprise Oversight, - an agency within the US Department of Housing and Urban Development. On July 30, 2008 OFHEO became part of the new Federal Housing Finance Agency (FHFA). The index is now termed the FHFA HPI. **JREI:** Japan Real Estate Institute.