

Theory of Land and Efficient Land Markets through Real Estate Exchange

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Abstract

Real Estate Exchange as to widen the scope of market, facilitate easy trading to avoid wide fluctuations in the market. The exchange would also enable price discovery through efficient allocation and distribution of resources. Real Estate exchange is the need of the hour. It would widen the scope of market, introduce greater liquidity, lead to price discovery, efficient allocation and distribution of resources while integrating the real sector with the economic growth and development. We propose an equity and debt participatory note instrument to be devised to distribute the legal and economic right over the real estate. An entire system of institutions and departments is further proposed in the article to enable the real estate exchange to operate and function. Digitalization of land records along with real time transaction recording is also proposed as one of the requisites for setting up an exchange. The exchange proposed aims to achieve allocation, distribution and information efficiency.

THERE IS AN important /urgent need for a Real Estate Exchange as to widen the scope of market, facilitate easy trading to avoid wide fluctuations in the market. The exchange would also enable price discovery through efficient allocation and distribution of resources.

Real estate is one of the most important vehicle of storage of wealth for any economy and its people. The distribution of income and wealth has been a matter of concern for most economies. However, engines of growth have created wide disparities between those who generate income and those who have wealth. Liquidity has been a serious concern for the investments

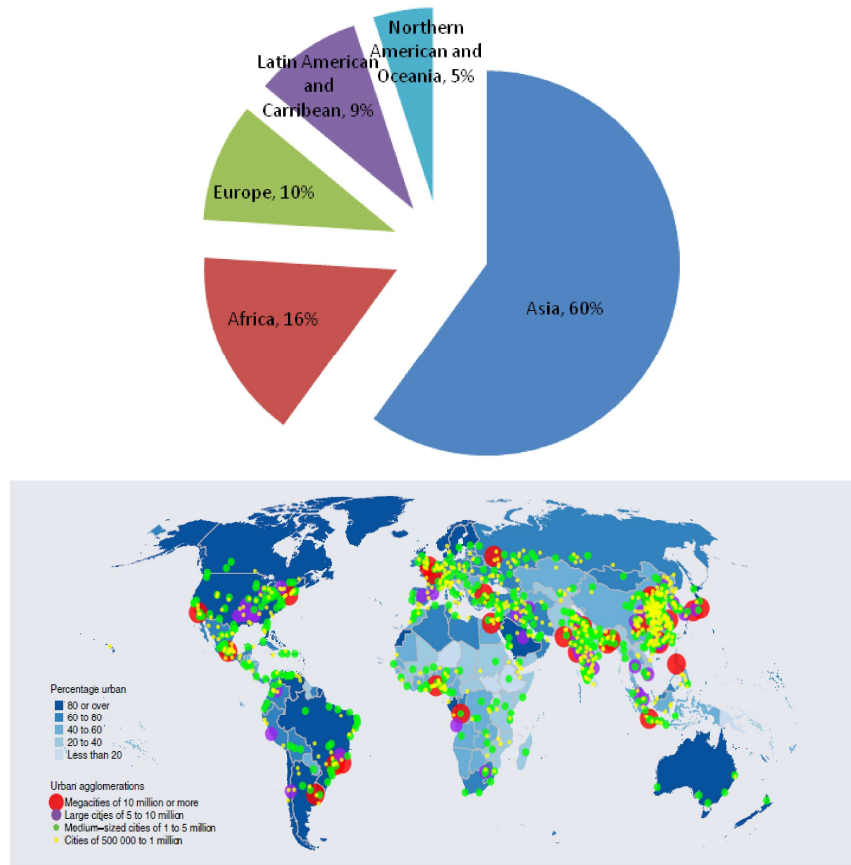
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Note : The designation employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontiers or boundaries.

Source: World Urbanisation Prospects, 2015, United Nations

Figure 1
World Population Distribution

In future the world urban population increase is expected to be highly concentrated in few countries. China, India and Nigeria would alone account for 37 per cent of the increase of nearly 2.5 billion people in the urban population by 2050. From 2014 to 2050, the urban areas are expected to grow by 404 million people in India, 292 million in China and 212 million in Nigeria. Other Countries like the Democratic Republic of Congo, Ethiopia, the United Republic of Tanzania, Bangladesh, Indonesia and Pakistan, and the United States of America, are estimated to contribute about 50 million each to the urban increase constituting 20 per cent of the total increase in urban population. Countries like Japan and Russian Federation would observe a decline of 12 million and 7 million respectively.

Table II
Percentage of Population Residing in Urban Areas in Select Cities

	India	Africa	Asia	Europe	Latin America and Caribbean	North America	Oceania	World
Annual Urban Population at Mid-year ('000)								
2000	288,365	278,770	1,392,740	516,827	396,276	249,504	22,013	2,856,131
2005	329,517	330,742	1,621,843	525,635	432,804	264,278	23,711	3,199,013
2010	372,902	394,940	1,864,836	537,982	467,642	279,949	25,924	3,571,272
2015*	419,939	471,602	2,113,137	547,066	502,793	294,834	27,853	3,957,285
Percentage of Population Living in Urban Areas								
2000	27.7	34.5	37.5	70.9	75.3	79.1	70.5	46.6
2005	29.2	36.3	41.1	71.7	76.9	80.0	70.5	49.1
2010	30.9	38.3	44.8	72.7	78.4	80.8	70.7	51.6
2014	32.4	40.0	47.5	73.4	79.5	81.5	70.8	53.6
2015	32.7	40.4	48.2	73.6	79.8	81.6	70.8	54.0
Average Annual Rate of Change of Urban Population								
2000-2005	2.67	3.42	3.05	0.34	1.76	1.15	1.49	2.27
2005-2010	2.47	3.55	2.79	0.46	1.55	1.15	1.78	2.20
2010-2015	2.38	3.55	2.50	0.33	1.45	1.04	1.44	2.05

*Projected

Source: World Urbanization Prospects: The 2014 Revision

Source: Handbook of Urban Statistics, 2016, Government of India, Ministry of Urban Development

Mega cities¹ are a home to 153 million people close to 7% of global population. Mega cities have grown from 10 in 1990 to 28 in 2014 and would grow to 41 in 2030. China alone has six megacities and 10 cities. India is projected to have seven megacities by 2030 with Ahmedabad, Bangalore, Chennai and Hyderabad joining the three present megacities which are Delhi, Mumbai and Kolkata. (see Figure 4)

To achieve sustainable development with the objective of shared prosperity and shared value the world would need devise market driven economic systems which are effective and efficient to determine the pace of development and allocations that provide access to services, such as health care and education, public transportation, as well as housing, electricity, water and sanitation for a densely settled population in a relatively economical manner.

There is a drastic change in the real estate market ever since privatization, globalisation has been initiated in India since 1991. Earlier the development of real estate stock was primarily for consumption at personal or business level but it acquired the status investment vehicle after 1991 in India. The

gigantic investment required and even made since 1991 is a witness to the development and increase in the existing stock through the length and breadth of the country.

There is a need for real estate exchange for facilitating easy sale and purchase of real estate inventory, free from fluctuations (booms and busts) and also raising funds through real estate exchange. India Census 2011 estimates that about 377 million (31.14% of India population) Indians live in urban areas which is likely to grow to 600 million (40%) by 2031 and 850 million (50%) by 2051. Urbanisation increased from 25.7% in 1991 to 27.82% in 2001 and to 31.14% in 2011. The number of statutory towns increased from 3,799 to 4,041 during 2001-2011. Census towns have increased from 1,362 to 3,892 during the same decade. Census 2011 provides that urban agglomeration (1 lakh population and above) stood at 298. Villages Increased from 638, 588 (2001) to 640,867 (2011) a 0.36% increase in the village numbers over the decade.

Urbanisation brings the need for basic services, infrastructure, jobs, land and affordable housing especially for the urban poor. Budget 2017-18 has given affordable housing the status of infrastructure development. The Government of India to meet the demand for rapid urbanisation has launched missions like Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Smart City Mission, Swachh Bharat Mission (SBM), and National Heritage City Development and Augmentation Yojana (HRIDAY). There has been continuous focus on affordable housing, financing, creation of smart cities, development of infrastructure to meet the growing needs of urbanization. The Government of India estimates a shortage of 60 million housing units with a requirement of 20 million in urban areas and 40 million in rural areas with a 70% requirement mainly from the affordable segment. Housing in Budget 2017-18 has been given infrastructure status and the National Housing Bank (NHB) will refinance individual housing loans of about Rs. 20,000 crore in 2017-18. NHB has estimated 130 billion USD or 8.5 trillion INR of investment in construction of affordable housing during the 12th Plan period of 2012-2017. The government of India with its schemes has laid emphasis on Housing for All by 2022. With the population estimated to be around 1.35 billion by 2022. The government has committed to invest about US\$ 61 billion by 2019 for affordable housing though there is an investment requirement of US\$ 1 trillion over the next five years. The ideal Public Private Partnership model has had limited scope and so far been unable to provide for the requirements of the urban and rural people. Private players in most spheres including development of real estate provide for greater core competencies in project development, planning, sales, marketing, financing and reducing time and cost overruns. Public sector in emerging economies like India have the advantage of public confidence but restricted innovativeness in space and architectural designs, approvals and high cost and time overruns. The major initiatives in India to meet the objective of providing affordable housing are National Urban Housing and Habitat Policy and Pradhan Mantri Awas Yojana (PMAY). The PMAY

structure or land parcel is expected to reap in the future. The determinants of the value of the real estate and the choice of model is yet very complex however there is consensus on the factors that influence the real estate values and markets at the macroeconomic level and microeconomic level.

DiPasquale and Wheaton (1992) found the link between the markets for assets and property that occurs at two junctions. First, the rent levels determined in the property market are central in determining the demand for real assets. Investment in physical and financial assets is done to seek current and future income stream. Changes in the rents or revenues derived from the real estate asset immediately affect the demand for the assets in the capital market. The second link as per DiPasquale and Wheaton (1992) between the two markets occurs through the construction sector. Construction in any economy increases the supply of the asset and given the demand is static there is likely to be a decrease in the prices of the asset market and there is likely to be a fall in the rents of the property.

Real estate with geographic fundamentals determine the value-in-use of land, and financial variables help translate a future flow of explicit or implicit rents into a current price which make way for investment or speculation. Urban and land economists like Ely, typically focus on the value-in-use of real estate, which reflects different geographic advantages. The other set of Financial economists have used financial variables such as interest rates, down-payment requirements, and mortgage approval rates to determine the present value of a future explicit or implicit cash flows (Poterba, 1984, Himmelberg, Mayer and Sinai, 2005, Glaeser 2013).

Glaeser (2013) found the American markets to be speculator of the real estate. Given the history of the American real estate markets he enumerated six lessons learnt from the boom and bust cycle of the real estate in America. The first lesson he enumerates is that the capitalist market are speculators of real estate. Real Estate is particularly a democratic asset which attracts the mighty. The second lesson is that the boom and bust cycles in the real estate market have a significant social cost primarily through ensuing financial chaos. The third lesson is that the high prices paid during the boom and the low prices paid during the bust are typically compatible with reasonable models of housing valuation and defensible beliefs about future price growth. The fourth major lesson is that while low interest rates have been less important in generating price booms, under-priced default options can often help explain high prices. The fifth lesson is that the dominant mistake that investors make is to underestimate the impact that elastic long-run supply of land, structures and crops will have on future land values. The sixth lesson is that uncertainty continues to persist in its own unique manner in each boom and bust cycle.

As per PWC (2016) the global stock of institutional grade real estate will expand more than 55% from US \$ 29 trillion in 2012 to US \$ 45.3 trillion in 2020 to US\$ 63 trillion in 2030. They found that real estate as an investment asset would grow highest in emerging markets. As per their six predictions

would complement measures that aim at reducing the risk of bubbles as the movement would be directly surveyed, monitored and have the possibility of control. It would also minimize distortion that are created due to special treatment of housing and homeownership. It would strengthen the supply and demand interaction to mitigate the impact of supply or demand shocks.

II. Development of a Real Estate Exchange

Real estate markets are characterized by heterogeneity, consisting of geographical and sectoral submarkets that lack central trading market asserted Hilbers, Lei and Zacho (2001). A Real Estate exchange is an attempt to provide for this central trading market that would take care of the asset bubbles and fluctuations in the real estate market that greatly impact economic wealth of any country. The exchange would initiate process of integrating the housing prices to the real economic and financial wealth of the economy by introducing transparency, efficiency and accountability in the real estate market trade.

Presently the Model Property registration documents that register the land parcel to an individual, Hindu Undivided Family, partnership firm, company or trust or any other body incorporated are Agreement to Sell ; Exchange Deed ; Gift Deed; Lease Deed; Power of Attorney ; Sale Deed ; Simple Mortgage Deed and Will. These documents do not lead to principal interest and subordinate interest transfers in fractional forms with divisive capabilities over several individuals or to a group of unknown investors.

We propose that assets registered on the exchanges as land parcels or real estate can be distributed as real estate participatory notes which would carry the market value of the real estate estimated by the principal interest holders and vetted by the approved valuers. The Real Estate Participatory Notes can be distributed as the Equity Security certificates and Debt Security certificates. Equity Real Estate Participatory Notes would give the holder the ownership rights to the real estate property. In case of limited life ownership as in case of leasehold land or real estate then Limited Life Equity Real Estate Participatory Notes may be issued. Debt Real Estate Participatory Notes would give the holder the right to receive rents/interest from the real estate property. The use of the property would be defined by its legal status and voting power of the equity real estate participatory note holders. The Debt Real Estate Participatory Notes and Equity Participatory Notes can be traded in the exchanges like any debt or equity securities. They can carry special covenant that may restrict the right to change the economic use of the specified space of the property for which the notes have been created. These notes can be created for a specified space, floor, apartment, building and even land. One would need to develop the economic value estimates and have it approved/ vetted by valuers that would then be divided into these specified participatory notes. Foreign participation in these notes may guided by the law of the land and similarly corporate or individual ownership be guided by the existing philosophies and law of the land.

conversion price index would customise the standard land parcels of a region to the specific attributes of individually registered land parcels.

Under the Real Estate Actual Transaction Price Reporting System, a system that makes it mandatory for the real estate agents brokering a deal to report the actual transaction price to the local government within 60 days following the actual transaction implemented in countries like Korea. This would enable local/state government to recognise the market price of the real estate under exchange.

Earliest works of Richardo³ (1822) and Thunen⁴ (1826) models were based on agricultural land and rents they should command. Rosen (1979) and Roback, (1982) work indicate higher valuation for land and real estate where one receives higher wages or other amenities. Alonso (1964); Muth (1964) and Mills (1967) indicate that higher price of housing can also be observed where commuting cost are low. Poterba (1984) determined the price of a real estate in terms of the present value of future rents or the net flow of utility from living in a particular house. This would typically give rise to Gordon's Model (1959) where Capitalisation Rate is given by

$$P_t = \frac{x_t}{\rho + m + \tau - \alpha}$$

where, P_t = Price of the land or Real Estate
 x_t = Current State of Demand (rent of land)
 ρ = Discount Rate
 m = Maintenance Cost (A fixed percentage of the Real Estate Cost)
 τ = Property Tax
 α = Rate of growth of Demand

The model has been extended for incorporating financing arrangements that introduce mortgage payments with different discount factors and endogenous defaults. Uncertainties and growth estimation of the changes in demand have also been incorporated by different scholars.

The valuation of a real estate may then be given by

$$\text{Value of Real estate} = (\text{Value of Land} + \text{Value of Building}) * CF$$

where, CF= Correction Factor that acts as an index of the development of the area surrounding the real estate estimated by its distance from social, economic, public and financial infrastructure.

Several Models and valuation methods have been in use for the development of the market price of the real estate.

The real reason why a real estate exchange can be established is because the what is of value in the real estate is the real property interest which is transferable even though the asset is immovable. The value of the real estate is in the interest and not the physical land and building.

Methods of determining the market value, Agarwal (2004) are

- i. Market Approach/ Sale Comparison Approach
- ii. Income Approach/ Income Capitalisation Approach
- iii. Cost Approach
- iv. Capitalised Earning Approach
- v. Excess Earning Method
- vi. Cash Flow Method
- vii. Tangible Assets (Balance Sheet) Method
- viii. Cost to Creator Approach (Leapfrog Start-up)
- ix. Rule of Thumb Methods
- x. Value of Specific Intangible Assets
- xi. Price Earning Model
- xii. Net Asset Value Model
- xiii. Current Market Price Model
- xiv. Entity DCF Model
- xv. Economic Profit Model

A property to be listed should attempt to receive the certificate from the valuer to the valuation of its market value before participatory notes are created. The legal dimension whether the property is free of any lein, economic interest, property interest and meets the regulatory requirements (fire, other statutory requirement) would then be onus of the valuer.

Chin and Chau (2002) identified that decisions of purchase for residential properties is both an investment and consumption decision. They identify that housing market besides being a consumption item also manifests characteristics such as durability, hetrogeniety and spatial fixity. They identified the works of Rosen (1974) for hedonic pricing model that determines the value of an asset based on inherent characteristics where the house prices are relative and can be determined by regression analysis that can estimate their differential implicit attributes. Hedonic model based on the utility and satisfaction concepts has its early beginning traced from the work of Triplett (1986), Batik (1987), Colwell and Dilmore (1999), Lancaster (1966) and Rosen (1974). Lancaster Model was found by Chin and Chau (2002) to be more suitable for consumer goods and Rosen Model more suitable for durable goods. They further study the Hedonic model and its application to the housing sector with special focus on specific attributes like location, structural and neighbourhood.

Table III gives the list of Attributes identified by Chin and Chau (2002) as factors in hedonic models impacting the housing prices. Question mark indicates that it varies from place to place on empirical estimation.

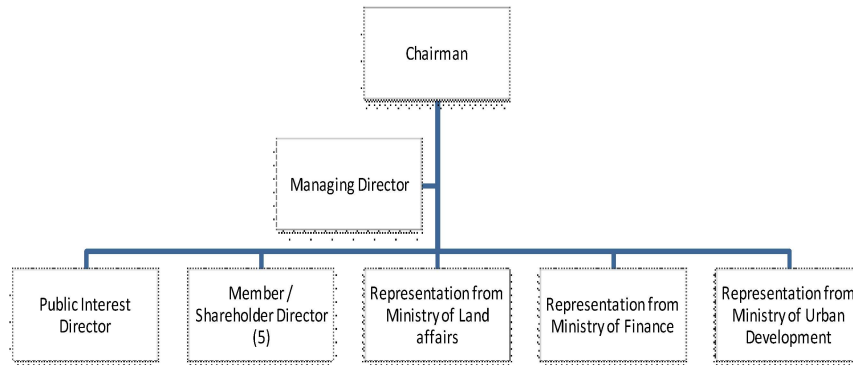


Figure 5

Organisational Structure for Real Estate Exchange (REE)

4.2 Real Estate Clearing and Settlement Corporation (RECSC)

National level Real Estate Equity or Debt Participatory Notes Clearing Corporation Limited, RECSC, would be wholly owned subsidiary of REE, responsible for clearing and settlement of all trades executed on REE and deposit and collateral management and risk management functions. The Settlement cycle in case of REE would not be the same as the securities exchange. They would have to follow a minimum margin submission which would 10% of the total contract value of the exchange which would be forfeited if the buyer is unable to service his obligation within the defined time frame. RECSC would also be linked up with bank for any specific contracts that would seek loans from the bank to transfer the real estate title in favour of the buyer and issue them a real estate registration card.

4.3 Real Estate Registration Card

A real estate registration card would be chip based smart card that would give a unique registration number to the real estate transacted while containing the information about the real estate specifics and the ownership title along with any specific interest or overriding rules.

4.4 Real Estate Index Service and Products Ltd. (REISPL)

REISPL would be a subsidiary company of REE that would monitor real estate prices and create necessary Indices and indexes related service for trade and evaluation. It would also play a significant role in introducing product related to real estate markets on the exchange.

4.5 Real Estate and Land Exchange Act

The government would need to bring a bill in their parliaments to pass the Real Estate and Land Exchange Act (RELEA) permitting exchanges to create participatory notes that would enable securitisation process of the existing real estates on freehold and leasehold basis and on land deals. In case of leasehold properties the law of the land would guide the transactional value of the participatory notes at the end of the lease term which is in case

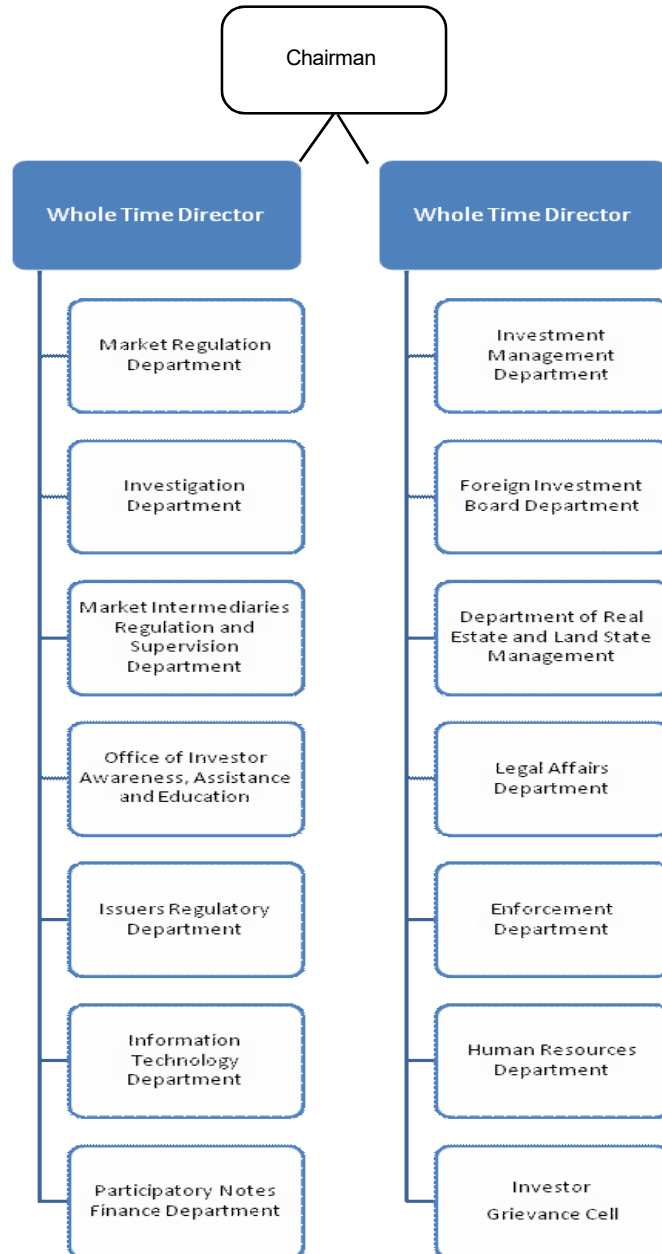


Figure 6
Organisational Structure of RLEB

provides for the supply side dynamics in real estate market. At any given point of time real estate is given or fixed and tends to be affected by construction lags. Real estate supply refers quantity of real estate space available at different prices. Supply side economics of real estate can view over the long run, short run and in terms of new construction. The long run aggregate supply curve indicates the relationship between the long run prices or rents and the total available real estate and land. Short run aggregate supply curve refers to the market's total stock at a given point in time. Short run supply curve is price inelastic. New constructions have an important role to play in the supply of real estate as they add to the already existing stock of real estate. Redevelopment projects have a further capacity to enhance the supply of real estate. PWC (2016) estimated that by 2025, over 60% of all construction activity will take place in emerging markets, up from just 35% in 2005. China, US, India, Indonesia, Russia, Canada and Mexico will account for 72% of expected construction activity. Global construction costs are on a rise by 2.9% in 2016 from 2015⁸.

VI. Benefits to a Country with Real Estate Exchange

The biggest benefit of the exchange would be price discovery of the land and real estate which would enable countries estimate their economic wealth and indicators of the economic wealth. It would help in unearthing black money or money laundering in land deals which remain outside the ambit of regulator bodies as the transaction are secretly done on which no registration or other statutory charges and payment are not made. The electronic platforms would provide information about the notes and real estate space available for buy or rent or development. Government, Individuals and others can accure spaces from the exchange. They can further sell land or real estate over the exchange with special schemes that may focus on industries, groups of specific interest like army personnel, central government employees, state government employees and others. The sale may be enabled if for higher value real estates with unique identification numbers along with Income Tax Record Number (PAN Card in India). This would help government easily access information about how the transaction for payment is routed and who the property belongs to in the centralised record system base. Restriction on resale of specified scheme plot can be administered through the exchange. It would also facilitate governments in assessing and collecting the right amount of capital gains or wealth tax in terms of tax wherever applicable.

Real Estate developers would be able to raise funds and seek liquidity from the market for the projects undertaken by them. Listing of the real estate would also enable the real and other owner to seek access to financial facilities like mortgages based loans as are available for shares. This step will also enable easy sale of locked investment in stock in hand for Real Estate developers. Financial Institutions and banks can also subscribe to Debt Participatory Notes which on non-repayments could be restructured into equity participatory notes available for exchange. The present Over the

growth phase, plateau phase, crisis phase and transition phase. He described 20 fundamental core drivers affecting the real estate cycle. Primary drivers of real estate sector are central bank policies, access to capital, job growth, commodity prices, demographic shifts, Consumer confidence/spending, labour force productivity, supply/demand ratios, infrastructure investment, economic growth. The secondary driver according to Lee (2011) were international trade, state/local regulations, population migration, small business performance, consumer credit/savings, business start up, advancements in technology, competitors/industry factors, Household formation/characteristics, Household income/network.

Real estate markets are highly cyclical. Macroeconomic aggregates like GDP growth rates, employment, consumer demand, savings, bank lending, inflation and interest rates impact the real estate markets. With real estate market the relationship between economic growth and development and real estate prices would be evident. Technical indicators of real estate participatory notes would easily indicate the onset of a boom or bust phase which can be stabilised with government actions in the market. Overall, the real estate sector would be more integrated with economic growth and development of an economic through a real estate exchange.

Notes

- 1 Mega cities with 10 million or more inhabitants. Megacities of 10 million or more Large cities are with 5 to 10 million inhabitants. Medium-sized cities are with 1 to 5 million inhabitants.
- 2 No short selling opportunities and high risk level make it impossible to make large profits
- 3 Defined rent is that portion of the produce of the earth which is paid to the landlord for the original and indestructible powers of the soil
- 4 Preindustrialisation Model for Land rent given by the formula he formula in which Land Rent $(R) = Y(p-c) - YFm$, $R = Y(p-c) - YFm$, where R = land rent; Y = yield per unit of land; c = production expenses per unit of commodity; p = market price per unit of commodity; F = freight rate (per agricultural unit, per mile); m = distance to market.
- 5 A real property interest is the right of ownership, control, use or occupation of the land and buildings (IVS 2011). This can be of three types- Superior Interest, Subordinate Interest and right to use land and building
- 6 Total amount of space leased during a particular period
- 7 Change in market occupied stock
- 8 Turner and Townsend, International Construction Survey, 2016

Chau, K. W. and F.F. Ng, (1998), "The effects of improvement in public transportation capacity on residential price gradient in Hong Kong", *Journal of Property Valuation and Investment*, Vol. 16, No 4, pp. 397-410

Chau, K. W., V.C.M. Ma and D.C.W. Ho, (2001), "The pricing of "luckiness" in the apartment market", *Journal of Real Estate Literature*, Vol. 9, No. 1, pp. 31-40.

Chau, K. W., F.F. Ng and E.C.T. Hung, (2001), "Developer's good will as significant influence on apartment unit prices", *Appraisal Journal*, Vol. 69, pp. 26-34.

Chau, KW and H.M. Lam, (2001), "Speculation and property Prices - Empirical evidence from historical price trends in Hong Kong. In: the Asian Real Estate Society (AsRES)", 6th Annual

Chin Tung-Leong and K W Chau, (2003), "A Critical Review of Literature on Hedonic Price Model", *International journal of Housing Science and Application*", Vol. 27, No.2, pp. 145-165.

Chui LHT and KW Chau, (2005), "An Empirical Study of the Relationship between Economic Growth", *Real Estate Prices and Real Estate Investments in Hong Kong, Surveying and Built Environment*, Vol 16 No. 2, pp. 19-32

Clapp, J. M. and C. Giaccotto, (1998), "Residential hedonic models: A rational expectations approach to age effects", *Journal of Urban Economics*, Vol. 44, pp. 415-437.

Clark, D. E. and W.E. Herrin, (2000), "The Impact of public school attributes on home sale price in California", *Growth and Change*, Vol. 31, pp. 385-407.

Clauretie, T. M. and H.R. Neill, (2000), "Year-round school schedules and residential property values", *Journal of Real Estate Finance and Economics*, Vol. 20, No. 3, pp. 311-322.

Colwell, P. F. and G. Dilmore, (1999), "Who was first? An examination of an early hedonic study", *Land Economics*, Vol. 75, No. 4, pp. 620-626.

Correll, M. R., J.H. Lillydahl and L.D. Singell, (1978), "The effects of greenbelts on residential property values: Some findings on the political economy of open space", *Land Economics*, Vol. 54, No. 2, pp. 206-217.

Coulson, NE and M.S. Kim, (2000), "Residential investment, non-residential investment and GDP", *Real Estate Economics*, Vol. 28 No. 2, pp. 233-247.

Daniels, C. B., (1975), "The Influence of racial segregation on housing prices", *Journal of Urban Economics*, Vol. 2, pp. 105-122.

Darling, A. H., (1973), "Measuring benefits generated by urban water parks", *Land Economics*, Vol. 49, pp. 22-34.

DeLong, JB and L.H. Summers, (1991), "Equipment investment and economic growth", *Quarterly Journal of Economics*, Vol. 106, pp. 445-502.

DeLong, JB and LH Summers, (1992), "Equipment Investment and economic growth: How strong is the nexus?" *Brookings Papers on Economic Activity* No. 2, pp.157-211.

DeLong, JB, (1992), "Productivity growth and machinery investment: A long-run look, 1870-1980", *Economic History Review*, Vol. 52, pp. 307-324.

Gordon, Myron J., (1959), "Dividends, earnings, and stock prices"; *The Review of Economics and Statistics*, pp. 99-105.

Green, RK, (1997), "Follow the leader: How changes in residential and non-residential investment predict changes in GDP", *Real Estate Economics*, Vol. 25 No. 2, pp. 253-270

Halvorsen, R. and H.O. Pollakowski, (1981), "Choice of functional form for hedonic price equations", *Journal of Urban Economics*, Vol. 10, pp. 37-49.

Haurin, D. R. and D. Brasington, (1996), "School quality and real house prices: Inter- and intrametropolitan effects", *Journal of Housing Economics*, Vol. 5, pp. 351-368.

Hayes, K. J. and L.L. Taylor, (1996), "Neighbourhood school characteristics: What signals quality to homebuyers?", *Economic Review*, Federal Reserve Bank of Dallas, Fourth Quarter

Himmelberg, Charles, Christopher Mayer, and Todd Sinai, (2005), "Assessing high house prices: Bubbles, fundamentals, and misperceptions", National Bureau of Economic Research, WP No. 11643

Hongyu Liu, Yun W. Park and Zheng Siqu, (2002), "The Interaction between Housing Investment and Economic Growth in China", *International Real Estate Review*, Vol. 5, No. 1, pp. 40 - 60

Hsueh, L. M., (2000), "The relationship between housing price, tenure choice and saving behavior in Taiwan", *International Real Estate Review*, Vol. 3, No. 1, pp. 11-33.

Huh, S. and S.J. Kwak, (1997), "The choice of functional form and variables in the hedonic price model in Seoul", *Urban Studies*, Vol. 34, No. 7, pp. 989-998.

IBA, MHB, SPA (2009), "Handbook on Policy, Standards and Procedures for Real Estate Valuation by Banks and HFIs in India", India Bankers Association (IBA), National Housing Bank (NHB), School of Planning and Architecture (SPA), 2009

Jaitley, Arun, (2017), "Budget Speech 2017-18", Government of India, Ministry of Finance, Governemnt of India, Delhi

Jud, G. D. and J.M. Watts, (1981), "Schools and housing value", *Land Economics*, Vol. 57, No. 3, pp. 459-470.

Kain, J. F. and J.M. Quigley, (1970), "Measuring the value of housing quality", *Journal of the American Statistical Association*, Vol. 65, pp. 532-548.

Ketkar, K., (1992), "Hazardous waste sites and property values in the state of New Jersey", *Applied Economics*, Vol. 24, pp. 647-659.

Kim, Kyunghwan, Sock Yong Phang and Susan Wachter, (2012), "Supply Elasticity of Housing", *International Encyclopedia of Housing and Home*. pp.66-74.

Kohlhase, J. E., (1991), "The impact of toxic waste sites on housing values", *Journal of Urban Economics*, Vol. 30, pp. 1-26.

KPMG, (2016), "Urban Real Estate", KPMG August 2016, pp. 1-40.

Lancaster, K. J., (1966), "A new approach to consumer theory", *Journal of Political Economy*, Vol. 74, pp. 132-157.

Orford, S., (1988), "Valuing location in an urban housing market", in the Proceedings of the 3rd International Conference on GeoComputation, United Kingdom, University of Bristol.

Palmquist, R. B., (1992), "Valuing localized externalities", *Journal of Urban Economics*, Vol. 31, pp. 59-68.

Plattner, R. H. and T.J. Campbell, (1978), "A study of the effect of water view on site value", *Appraisal Journal*, Vol. 46, pp. 20-25.

PWC, (2016), "Real Estate 2020, Building the Future", PWC

Rasmussen, D. W. and T.W. Zuehlke, (1990), "On the choice of functional form for hedonic price functions", *Applied Economics*, Vol. 22, pp. 431-438.

Renaud, B., (1990), "Housing affordability and housing finance: an international perspective", in: Hyundai Research Institute, Proceedings of (the) International Housing Conference on Korean Housing Policies, Seoul.

Ricardo, David, (1822), "On protection to agriculture", J. Murray Publication

Richardson, H. W., J. Vipond, and R.A. Furbey, (1974), "Determinants of urban house prices", *Urban Studies*, Vol. 11, pp. 189-199.

Ridker, R. G. and J.A. Henning, (1967), "The determinants of residential property values with special reference to air pollution", *The Review of Economics and Statistics*, Vol. 49, pp. 246-257.

Roback, Jennifer, (1982), "Wages, rents, and the quality of life." *The Journal of Political Economy*, Vol. 90, No. 6, pp. 1257-1278.

Rodriguez, M. and C.F. Sirmans, (1994), "Quantifying the value of a view in single-family housing markets", *Appraisal Journal*, Vol. 62, pp. 600-603.

Rosen, S., (1974), "Hedonic prices and implicit markets: Product differentiation in pure competition", *Journal of Political Economy*, Vol. 82, No. 1, pp. 35-55.

Rosen, Sherwin, (1979), "Wage-Based Indexes of Urban Quality of Life in current issues in Urban Economics", edited by P. Mieszkowski and M. Straszheim, Johns Hopkins University Press.

Sirpal, R., (1994), "Empirical modeling of the relative impacts of various sizes of shopping centres on the value of surrounding residential properties", *Journal of Real Estate Research*, Vol. 9, No. 4, pp. 487-505.

So, H. M., R.Y.C. Tse and S. Ganesan, (1996), "Estimating the influence of transport on house prices: Evidence from Hong Kong", *Journal of Property Valuation & Investment*, Vol. 15, No. 1, pp. 40-47.

Straszheim, M. R., (1975), "An Econometric Analysis of the Urban Housing Market", National Bureau of Economic Research, New York.

Thaler, Richard, (1978), "A note on the value of crime control: Evidence from the property market", *Journal of Urban Economics*, Vol. 5, pp. 137-145

Tomkins, J., N. Topham, J. Twomey, and R. Ward, (1998), "Noise versus access: The impact of an airport in an urban property market", *Urban Studies*, Vol. 35, No. 2, pp. 243-258.

Triplett, J. E., (1986), "The economic interpretation of hedonic methods", *Survey of Current Business*, Vol. 66, pp. 36-40.