Impact Of Economic And Life Style Factors On Real Estate Prices In India

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Abstract:

Real estate industry is one of the booming industries in India. The real estate prices are driven by many factors in the country. The industry is more amenable to the changing environment. In other words growth rate in real estate industry changes according to changing environment. In order to study the factors which are influencing real estate prices the present study is carried out. This study attempts to find out the impact of demographic, economic and lifestyle indicators of India on residential prices. Forecasting of real estate prices growth rate is also carried out in this study. The study finds that all the independent factors have influence on real estate prices but lifestyle indicator (number of new passenger car registrations) has independent and significant influence on real estate prices. From the study, it is also clear that there will be rise in real estate price in future.

Keywords: *Real Estate prices in India, Growth rate in real estate prices, Factors determining real estate prices.*

Introduction

The residential prices in India are fluctuating due to many factors. The investors in real estate markets are so keen in watching the price movements in order to invest efficiently without any risk. So there is a need to find out the factors which are having influence on real estate prices in different places. For the purpose of simplicity four places across India were chosen for the study. The independent factors may be economic, political, social and life style of the people. The study will help the investors by explaining the key factors which are having direct impact on the residential prices in India. This study also focuses in forecasting the real estate price growth rate for 4 quarters. The forecasting rate will also guide the investors in correct way for investing in near future periods.

Review of Literature

Raymond Y.C. Tse (1997) stated ARIMA model application to real-estate prices in Hong Kong and discussed the stationary in the time series data by unit root test. The estimated parameters are Office Property ARIMA(2,1,1) and Industrial Property ARIMA(2,1,1). The study says that psychological factors are to be considered in financial and futures markets. This paper shows the office and industrial property prices are fitted into the ARIMA equation.

Anthony Mills, David Harris and Martin Skitmore (2003) state the accuracy of housing forecasting in Australia. The study mentioned that this is the first attempt made in investing the accuracy of both the private as well as public sector forecasting. The study is similar to Stephan McNees at the Federal Reserve Bank in Boston, USA.

Tim Dixon (2005) studies the impact of ICT - information and communications technology on commercial real estate in the new economy. This was based on a qualitative assessment of existing frameworks and the study suggests that "socio-technical framework" is better to observe the ICT impact in real estate than other "deterministic" frameworks.

Lawrence Chin & Gang-Zhi Fan (2005) discussed the vibrant prices in the private housing market of Singapore using ARIMA modeling. The study also discussed some of the models like ARMA and GARCH. The study finds the subsistence of positive autocorrelation in housing price changes at the first lag. The study concludes that the private housing market in Singapore is described by the weak-form inefficiency. DeimantėZalieckaitė, Vytautas Snieška, Jovita Vasauskaitė, Rita Remeikienė (2007) studies the price fluctuations in the Lithuanian real estate market. Onur Oˉzsoy and Hasan S ahin (2008) studies the factors that are affecting the housing prices in Istanbul, Turkey. This study uses CART approach for the analysis. Chyi Lin Lee (2009) studies the housing price volatility in Australia. In order to study the price volatility this study uses EGARCH model.

Kim Hin David Ho & Faishal bin Ibrahim Muhammad (2010) states the DCGE model - dynamic computable general equilibrium model and the model explains the dynamic interaction system and impact analysis due to the macro-economy and macroeconomic policy. Based on ex post and ex ante model estimates it is found that suburban retail real estate is more liable to GDP growth policy.

Ali Heps¸en & Metin Vatansever (2011) described the trend forecasting in Dubai housing market. The study uses Dubai Residential Property Price Index (DRPPI) data for forecasting by using Box-Jenkins autoregressive integrated moving average method. The study uses ADF, PP, and KPSS tests for checking stationary in the series. The study finds that average monthly percentage increase in the Reidin.com. Jing Li and Yat-Hung Chiang (2012) examines the factors that behind China's real estate with the help of housing price and macro economic variables. Hassan Gholipour Fereidouni and Ebrahim Bazrafshan (2012) examine the determinants of returns on housing in Iran using GMM. Vijay Kumar Vishwakarma (2013) studied the forecasting of real estate business in the Canadian market. This study has compared three different ARIMA models like ARIMA, ARIMAX and ARIMAX-GARCH.

Research Methodology

This study is based on descriptive research design. For the purpose of the study the popular residential areas in India like

Adayar in Chennai, Koramangala in Bangalore, Sarvodaya Enclave in New Delhi and Bandra West in Mumbai are chosen. The time period taken for this study is ranges from 2009 to 2011. The real estate prices in Rs. per Square feet of these places starting from the 3nd quarter of the calendar year of 2009 (i.e., July-September 2009) to the 4th quarter of the calendar year of 2011(i.e., October-December 2011) are taken as dependent variable. The independent variables for this study are demographic, economic and life style indicators of India. Data for the dependent variable (real estate prices) are collected from magicbricks webpage and data for the independent variables are collected from euromonitor webpage. In order to find out the impact of the demographic, economic, and life style indicators of India on the real estate prices simple and multiple regression analysis is used. For forecasting the future real estate price growth rate ARMA model is used.

Variables

Dependent variables: This study includes Adayar average quarterly prices (Rs. per Square feet), Koramangala average quarterly prices (Rs. per Square feet), Sarvodaya Enclave average quarterly prices (Rs. per Square feet) and Bandra West average quarterly prices (Rs. per Square feet) as dependent variables.

Independent variables: Independent variables of the study are grouped under three heads namely demographic, economic and life style indicators of India. Demographic & economic indicators of India include variables like inflation, density of population, GDP measured at purchasing power parity, consumer expenditure and annual disposable income. Whereas lifestyle indicators of India includes internet usages and number of new passenger car registrations.

Present Trends In Real Estate Prices

Adayar average quarterly prices (Rs. per Square feet): Adayar is one of the popular residential areas situated in Chennai along the banks of the river Adayar and Chennai airport is approximately 5km away from Adayar and the Guindy railway station is considered to be the nearest railway station for Adayar. These features attract the people to settle over there.

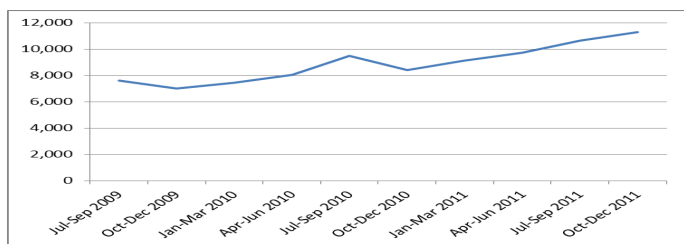**Chart 1: Real Estate price movement in Adayar**

Chart 1 reflects the fluctuating trend in the real estate prices in Adayar. In Oct-Dec 2009 average price falls by 7.5 percent and after that there is a slow growth in the trend. It has reached peak in Jul-Sep 2010 with growth rate of 17.7 percent. In the next quarter there is fall by 11.2 percent. After 2010 third quarter there is steady and continuous rise in real estate prices in adayar.

Koramangala average quarterly prices (Rs. per Square feet): Koramangala is said to be the popular residential area in Bangalore and it covers Jakasandra, Venkatapura and Madivala. Koramangala consists the famous education institutions namely St. John's Medical College, Jyoti Nivas College, St. John's Research Institute, etc.,

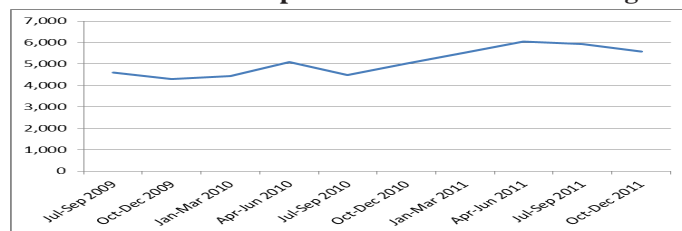**Chart 2: Real Estate price movement in Koramangala**

Chart 2 explains the decreasing trend by fall of 5.8 percent in the last quarter of calendar year of 2011. From 1st quarter to 2nd quarter of 2010 there is a steady peak of growth rate of 15.20 percent from 3 percent. But the 3rd quarter shows the deep fall of 12.06 percent from past. From this trend it is inferred that there is wide range of fluctuations in the trend of the real estate prices in Koramangala.

Sarvodaya Enclave average quarterly prices (Rs. per Square feet): Sarvodaya Enclave is considered to be one of the finest residential places in New Delhi. It has mixture of Schools, Colleges, Banks, Religious places, etc., people likes this place because of these favoured sign.

Chart 3: Real Estate price movement in Sarvodaya Enclave
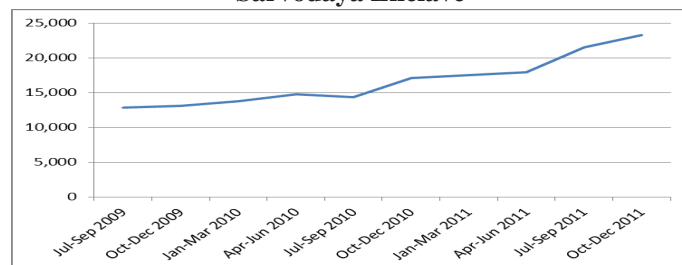

Chart 3 indicates steady rise in the trend of Sarvodaya Enclave average quarterly prices. From 3rd quarter of calendar year of 2009 to 2nd quarter of calendar of 2010 reflects slow increase but from Jul-Sept 2010 to Oct-Dec 2010 there is incredible growth of 19.7 percent from fall of 3.1percent in Jul-Sept 2010. After that the trend shows the positive growth.

Bandra West average quarterly prices (Rs. per Square feet): Bandra (pronounced Baah-ndra) is the popular place in Mumbai and from 20th century, west-side called as Bandra West and in the past this place has no popular on restaurants but in the present stage Bandra West is getting so popularity on restaurants in the quality aspects.

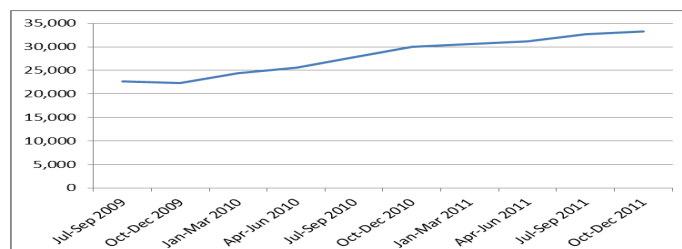**Chart 4: Real Estate price movement in Bandra West**

Chart 4 shows decreasing trend in the last quarter of 2009 by 1.2 percent and from Jan-Mar 2010 there is a positive growth in the Bandra West average quarterly prices. In Jan-Mar 2011 and Apr-Jun 2011 there is no much deference in the growth of average quarterly price and it has only 1.9 percent and 1.8 percent respectively.

Present Trends in Demographic, Economic and Life Style Indicators

Inflation: Inflation is said to be the level of price raise of goods in India. In the 2010 there is a huge rise in inflation to 12.1 percent from 10.8 percent in 2009. The inflation is at controllable level in the year 2011 at 9.2 percent.

Density of population: Density of population can be measured as the population in a country per unit area. The density of population in India is 394.9, 401 and 407 during the period 2009, 2010 and 2011 respectively. the density of population (persons per sq km) are 394.9, 401 and 407 respectively, This shows that there is no much difference in the growth rate (1.5 percent only) in density of population during last three years. GDP measured at purchasing power parity: GDP measured at purchasing power parity means value of goods and services produced in the year which are valued at the price prevails in United States. In India there is a high growth in 2009 of 12.6 percent when compared to the growth of 9.1 percent in 2010 and 10.1 percent in 2011.

Consumer expenditure: Consumer expenditure means amount spent by people to buy consumer goods. The growth rate in consumer spending is 25.98 percent in the year 2010 which is considered to be one of the highest levels when compared to growth rate of 4.33 percent in 2009 and 15.7 percent in 2011. Annual disposable income: Annual disposable income = Income – Tax paid, and which is available for spending and savings activities. In India the growth rate of annual disposable income in 2009 is just 2.06 percent but after that in 2010 there is a tremendous increase in the growth by 26.65 percent. In 2011 the growth rate comes to 13.98 percent.

Internet usages: Internet usages in India are growing year by year with incredible growth rate. In 2009 there is a growth rate of 18.5 percent only but after that two following subsequent years has the growth of 22 percent and which is considered to be the steady trend in the internet usages.

Number of new passenger car registrations: Number of new passenger car registrations means total number of new passenger cars which are registered in a year. In India in 2009 the growth rate is only 4.77 percent but year 2010 has the growth rate of 11.33 percent and this is considered to be increasing trend and in 2011 the growth rate is only 6.3 percent.

Impact of Demographic & Economic Indicators of India on Real Estate Prices

To study the impact each economic indicator on real estate prices at Adayar, Koramangala, Sarvodaya Enclave and Bandra West simple regression is applied. The equation is
Average quarterly prices = α + β independent variable

Table 1: Impact of Demographic & Economic indicators of India on real estate average quarterly prices

Independent variables	Inflation			Density of population			GDP measured at purchasing power parity		
Dependent variables	R	R Square	Coefficients (t)	R	R Square	Coefficients (t)	R	R Square	Coefficients (t)
Adayar	.641	.411	-.641 (- 2.361)**	.834	.695	.834 (4.268)*	.842	.708	.842 (4.406)*
Koramangala	.768	.590	-.768 (-3.394)*	.870	.758	.870 (5.001)*	.887	.787	.887 (5.435)*
Sarvodaya	.695	.482	-.695 (-2.731)**	.832	.692	.832 (4.240)*	.844	.713	.844 (4.459)*
Bandra West	.608	.370	-.608 (-2.167)	.918	.843	.918 (6.564)*	.919	.844	.919 (6.588)*

*significant at 1% level **significant at 5% level

Table 1 shows R the correlation and R square the degree of determination, β the co-efficient and the t- value with level of significance. From the T values it is clear that all the variables have significant impact on real estate prices of all four places except inflation on Bandra West. Impact of Inflation on prices in Adayar shows the standardised coefficient of -.641and which is considered to be the significant impact. Influence of Density of population and GDP measured at purchasing power parity on real prices in Adayar shows the standardised coefficient of .834 and .842 respectively. Influence of Inflation on Koramanga real estate price has significant effect with standardised coefficient of -.768. The standardised coefficient for impact of Density of population on Koramangala price is .870. This means when Density of population increases by 100 percent the Koramangala quarterly average price increases by 87 percent.

Table 2: Impact of Demographic & Economic indicators of India on real estate prices

Independent variables	Consumer expenditure			Annual disposable income		
Dependent variables	R	R Square	Coefficients (T Value)	R	R Square	Coefficients (T Value)
Adayar	.818	.670	.818 (4.029)*	.808	.653	.808 (3.881)*
Koramangala	.844	.712	.844 (4.452)*	.828	.685	.828 (4.173)*
Sarvodaya	.811	.658	.811 (3.919)*	.798	.636	.798 (3.739)*
Bandra West	.912	.832	.912 (6.292)*	.906	.821	.906 (6.062)*

*significant at 1% level **significant at 5% level

Table 2 shows all the independent variables such as consumer expenditure and annual disposable income have significant influence on the real estate price in Adayar, Koramangala, Sarvodaya and Bandra West. The single * indicates that the independent variables have significant influence at 99 percent level of confidence. The R square value indicates the degree of determination. The R square value for the influence of consumer expenditure on Bandra west price is 0.832. This means that 83 percent of variance in Bandra price can be determined by consumer expenditure of India.

Impact of Lifestyle Indicators of India on Real Estate Prices

The life style factors taken for the study are internet users and number of passenger car registration. The dependent variables are real estate price in Adayar, Koramangala, Sarvodaya Enclave and Bandra West. To find out the influence of each variable on real estate price simple correlation is performed. The results of the analysis are given in the table 3. The equation for the model is Dependent variable = α + β (dependent variable).

Table 3: Impact of Lifestyle indicators of India on real estate pricesrices

Independent variables	Internet usages			Number of new passenger car registrations		
Dependent variables	R	R Square	Coefficients (t)	R	R Square	Coefficients (t)
Adayar	.842	.709	.842 (4.411)*	.802	.644	.802 (3.800)*
Koramangala	.888	.788	.888 (5.451)*	.819	.670	.819 (4.033)*
Sarvodaya	.845	.714	.845 (4.466)*	.790	.624	.790 (3.644)*
Bandra West	.919	.844	.919 (6.585)*	.902	.815	.902 (5.927)*

*significant at 1% level **significant at 5% level

Table 3 indicates that the lifestyle indicators have significant impact on average quarterly prices at 1 percent significant level. The R value also explains that there is a great correlation between the lifestyle indicators and the average quarterly prices. Model fitness also seems to be perfect in this case. The R square values for internet users are more than R square values for number of new passenger car registration. This means that influence internet usages is more on real estate prices.

Relationship Among Independent Variables
In this section all the independent variables are tested for the collinearity. In order to find out the collinearity among independent variables correlation is performed. The results of the correlation is given below

Table 4: Correlation among Independent variables

		Inflation	Population	GDP	Consumer expenditure	Annual Income	Internet usages	Car registrations
Inflation	Correlation	1						
	Sig.							
Population	Correlation	-.630	1					
	Sig.	.051						
GDP	Correlation	-.679*	.998**	1				
	Sig.	.031	.000					
Consumer expenditure	Correlation	-.564	.997**	.989**	1			
	Sig.	.090	.000	.000				
Annual Income	Correlation	-.527	.992**	.982**	.999**	1		
	Sig.	.118	.000	.000	.000			
Internet usages	Correlation	-.681*	.998**	1.000*	.989**	.981**	1	
	Sig.	.030	.000	.000	.000	.000		
Car registrations	Correlation	-.508	.989**	.977**	.998**	1.000**	.977**	1
	Sig.	.134	.000	.000	.000	.000	.000	

* Correlation is significant at the 0.05 level (2-tailed) ** Correlation is significant at the 0.01 level (2-tailed).

Table 4 explains relationship among independent variables such as economic and life style variables. The significant values are less than 0.05 for many cases which means there is significant relationship among independent variables. GDP has 1 percent significant relationship with Population and 5 percent relationship with Inflation. Consumer expenditure has 1 percent significant relationship with Population and GDP. Annual Income has 1 percent significant relationship with Population, GDP and Consumer expenditure. Internet usage has 1 percent significant relationship with Inflation and 5 percent significant relationship with rest variables. Car registration has 1 percent significant relationship with all the variables except Inflation. The table infers that population, Consumer expenditure, Annual Income and Car registrations have not related with the Inflation.

Factors Determining Real Estate Average Quarterly Prices
Multiple regression is performed by using all the demographic, economic and the lifestyle indicators of India as independent variables and real estate prices as dependent variable. This will indicate independent impact of each variable on dependent variable. The equation of this model is Average quarterly prices = α + β1 inflation + β2 density of population + β3 GDP measured at purchasing power parity + β4 consumer expenditure + β5 annual disposable income + β6 internet usages + β7 number of new passenger car registrations.

Table 5: Factors affecting real estate price

Independent variables			Inflation	Number of new passenger car registrations
Dependent variables	R	R Square	Coefficients (t)	Coefficients (t)
Adayar	.847	.717	-	.642 (2.754)**
Koramangala	.915	.838	-.475 (-2.690)**	.578 (3.270)*
Sarvodaya	.860	.740	-	.589 (2.636)**
Bandra West	.919	.845	-	.800 (4.629)*

*significant at 1% level **significant at 5% level

When multiple regression is performed independent effect of each independent variable on dependent can be estimated. Table 5 shows real estate prices are determined by new passenger car registrations in India. The car registration is having influence on real estate prices in all four places such as Adayar, Kormangala, Sarvodaya and Bandra West. The real estate prices in Kormangala are influenced not only by car registration but also by inflation rate prevailing in India. . R represents the entire model correlation and R square represents the degree of determination. In this case, all the four models have the significant R and R square values. This indicates that inflation and car registration India have significant influence on real estate prices.

Forecasting of Real Estate Prices Growth Rate
Real estate prices are forecasted by using ARMA model. For forecasting Koramangala and Bandra West real estate price, ARMA (1,1) model is used and for Adayar and Bandra West forecasting, ARMA (1,2) model is used. ARMA models are carried after satisfying with unit root test result. The model is chosen by taking variables which are having significant influence. In this study attempt has been made to predict the growth rate in real estate prices rather than the actual real estate prices. The forecasted growth rate in real estate prices in four different places are given in the table 5.

Table 5: Forecasted Real estate prices growth rate

	Adayar	Koramangala	Sarvodaya Enclave	Bandra West
Jul-Sep 2012	6.470146	4.738632	8.713569	4.12873
Oct-Dec 2012	5.739194	4.738633	8.718283	4.12873
Jan-Mar 2013	6.279702	4.738633	8.715966	4.12873
Apr-Jun 2013	5.880019	4.738633	8.717104	4.12873
Jul-Sep 2013	6.175568	4.738633	8.716545	4.12873

Table 5 explains the future growth of real estate prices in four selected places in India. The growth rate in real estate prices in Adayar is varying from 5.7 percent to 6.4 percent. The growth rate in Koramangala, Sarvodaya Enclave and Bandra are not varying very much. The growth rate in real estate prices are around 4.7 percent, 8.7 percent and 4.1 percent in Koramangala, Sarvodaya Enclave and Bandra West respectively.

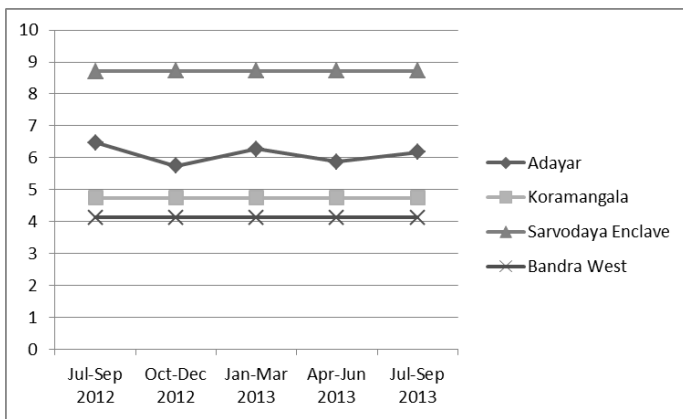**Chart 5: Forecasted Real estate prices growth rate**

Chart 5 shows the pictorial representation of forecasted growth rate of real estate prices. The Chart shows future growth rate in real estate prices Adayar are varying from year to year wheras growth rate in Koramangala, Sarvodaya Enclave and Bandra West remains same. Sarvodaya Enclave has highest growth rate in near future.

Conclusion

The simple regression analysis reveals that the all the independent variables including demographic, economic and lifestyle indicators in India have the significant impact on the real estate prices in all four cities. The correlation analysis shows that there is a significant relationship among independent variables. Therefore multiple regression is performed. The multiple regression analysis indicates that number of new passenger car registrations in India drives the real estate prices of India. The price in Koramangala in Bangalore is influenced not only by car registration but also by inflation. This means that real estate prices moves according to changes happening in the lifestyle. The forecasted real estae prices shows that the growth rate in real estate prices in Adayar are varying from year to year wheras growth rate in Koramangala, Sarvodaya Enclave and Bandra West remains same. Sarvodaya Enclave has highest growth rate.

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