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Drivers of Real Estate Market in the Post Demonetization Scenario in India

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Abstract
The real estate sector in India has grown with the increased need for new real estate units due to the reasons of growing population, increasing number of nuclear families and urbanization. The real estate sector in the last five years have been affected due to demonetizations and GST being introduced in India. Thereafter, the real estate sector has stabilized and is growing at a steady rate due to the several institutional reforms. The investments in real estate sectors have come from home buyers and also from institutional investors. The study aims to find out the effective drivers (factors) of real estate market in India post demonetization and GST scenario. The study incorporates both primary and secondary source of date but the mostly used primary data for analysis. Graphical data analysis and factor analysis with 'KMO and Bartlett's Test', 'Communalities', 'Total variance explained', 'Scree Plot', 'Factor Matrix', 'Rotated Factor Matrix' and 'Factor Transformation Matrix' are used for the study. The study infers that some of the selected factors are more effective on real estate demand than the rest other factors incorporated here.

1. Genesis of the Study

The volume of Indian real estate sector monetary term is expected to cross USD 1 trillion by 2030. It is currently contributing around 7 % of Indian Gross Domestic Product (DGP) and has very important role in economic development of India. It gives second highest employment to Indians after the agricultural areas. In demonetization the major goal of the Government was to remove black money from the circulation, ensure tax compliance and to eradicate counterfeit money being used in several illegal activities including terrorism. Demonetization would lead to increase money supply in the banking system which would lead to easier availability of funds in the banks for leaning to several including the real estate sector in India. In short run, demonetization would adversely affect the real estate sector since it involves large cash components. However, in the long run it would benefit the Indian real estate sector. It would also attract institutional investment in the real estate sector due to greater level of transparency. In this study, the impact of demonetization on various factors such as land prices, consumer buying behavior, real estate prices, builders' reducing prices, buyers' decisions and sellers' decisions to sell real estate properties. It also studies the impact of 'Real Estate Regulatory Act. (RERA)' and 'Benami Transaction Act. (BTA)' on buying of real estate properties. The comparative study is also done between impact of demonetization on residential real estate and commercial real estate for various factors such as buying and selling of properties.

2. Literature Review

The following section reviews multiple research studies conducted to measure effect of demonetization in the real estate demand in India. Various studies have also been incorporated where the demonetization act was implemented in foreign countries. **Ashwinder Raj Singh** stated that demonetization led to unsold inventory of flats and led to liquidity problems for the real estate sectors in India. **Jigar V Pandya and Dr. Vikram M Patel** concluded that Demonetization affected several sectors of Indian economy and especially those in which cash transaction were high such as the real estate sector. **Muthu Kumar V and Shashi Kumar M** have in their study on real estate in Bengaluru city that demonetarization led to slowing down of demand in all categories of real estate. **Dr. Jonardan Koner, Arnab Chabiri, Nikhil Agrawal, Rakhi Phophalia, Angel Roy** concluded in their study that many respondents were not clear as to whether demonetization would have a positive or negative impact on the real estate market. **Geethanjali Nataraj** stated that demonetization would have a multi-pronged impact on Indian economy in terms of higher deposits with banks increase in tax compliance and faster adaptation of digital technology and that it would have a positive impact on the real estate sector. **Narendra Verma and Toran Lal Verma** concluded in his study that demonetization would lead to reduction in black money real estate transaction. **Dr. Sonia and Sakshi Guridhar** concluded that in the short-term demonetization would lead to a negative impact on the real estate sector as it involved a significant amount of cash transactions. **Dr. Jayshree Rathod** stated that demonetization will bring down consumer spending. Consumers are also making purchases only if essential. **Dr. Sudesh Kumar and Mr. Sunandan Bumra** concluded that in the short-term demonetization would heavily affect the consumer market and agriculture sector in the medium and long-term demonetization would benefit both the government and banks. **Kali Charan and Vivek Khushwa** concluded that demonetization would lead to higher availability of money will the government which would spend great amount on infrastructure.

Many studies have looked into the concept of demonetization and its impact on several factors and real estate in particular with case studies. However, our research study covers the geographical area of Pune city in particular and the objective which has not been covered anywhere, thus justifying our study.

3. Research Design

This study integrates both primary and secondary data but is mostly dependent on primary data. The primary data have been collected through the direct interview method by using a structured questionnaire with different aspects of residential and commercial real estate market with various timelines as required to achieve the objectives of the study. The study has used a 5-point Likert scale for measuring the different qualitative attributes required for the data collection. The format of a typical five-level Likert scale, used in this study is as follows:
1. Least Impact; 2. Somewhat impact; 3. Average impact; 4. Considerable impact and 5. High Impact.
The study incorporates factor analysis to obtain the significant factors from among the selected forty factors of demonetization, which impacted the real estate market in India, the most considering different angles of the factors like time period of six months, one year and more than a year, property type of new and resale, and also for residential and commercial properties. The components of factor analysis used for the study are 'KMO and Bartlett's Test', 'Communalities', 'Total Variance Explained', 'Scree Plot', 'Factor Matrix', 'Rotated Factor Matrix' and 'Factor Transformation Matrix'.
Factor Analysis is carried out on all the selected factors to obtain the most important factors which had the maximum impact on the real estate market in India. The study has incorporated forty factors which directly or indirectly impacted the real estate demand both in commercial and residential sectors. In this chapter, the study has considered different angles of the factors like time period (short, medium and long), property type (new and resale market) and the use of properties (residential and commercial).

4. Factor Analysis and Results Discussion

4.1. KMO and Bartlett's Test

'Kaiser-Meyer-Olkin (KMO)' and 'Bartlett's Test' are the measures of how suited your dataset is for Factor Analysis.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.791
Bartlett's Test of Sphericity	Approx. Chi-Square	2506.215
	df	780
	Sig	.000

Table 1: KMO and Bartlett's Test Result

Bartlett test of sphericity is significant and the Kaiser-Meyer-Olkin measure of sampling adequacy is greater than the acceptance level i.e. 0.6.

4.2. Communalities

Communality is the extent to which an item correlates with all other items. It shows how much of the variance in the variables has been accounted for by the extracted factors. Initial communalities are estimates of the variance in each variable accounted for by all components or factors. Higher communalities are better. If communalities for a particular variable are low (0.0-0.4) then that variable may struggle to load significantly on any factor.

Factors	Initial	Extraction
F1	1.000	.730
F2	1.000	.747
F3	1.000	.634
F4	1.000	.708
F5	1.000	.776
F6	1.000	.730
F7	1.000	.767
F8	1.000	.776
F9	1.000	.723
F10	1.000	.665
F11	1.000	.689

F12	1.000	.786
F13	1.000	.780
F14	1.000	.777
F15	1.000	.752
F16	1.000	.591
F17	1.000	.706
F18	1.000	.783
F19	1.000	.773
F20	1.000	.769
F21	1.000	.804
F22	1.000	.654
F23	1.000	.766
F24	1.000	.780
F25	1.000	.749
F26	1.000	.728
F27	1.000	.665
F28	1.000	.793
F29	1.000	.805
F30	1.000	.694
F31	1.000	.715
F32	1.000	.700
F33	1.000	.773
F34	1.000	.816
F35	1.000	.723
F36	1.000	.703
F37	1.000	.759
F38	1.000	.780
F39	1.000	.748
F40	1.000	.606

Table 2: Communalities Result

The table above incorporates the communality of the items and the factor F16 has the lowest communality.

4.3. Total variance explained

Eigen values reflect the number of extracted factors whose sum should be equal to the number of items which are subjected to factor analysis. The Eigen value table has been divided into three sub-sections, i.e. Initial Eigen Values, Extracted Sums of Squared Loadings and Rotation of Sums of Squared Loadings. For analysis and interpretation purpose we are only concerned with Extracted Sums of Squared Loadings.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.423	28.557	28.557	11.423	28.557	28.557	5.250	13.126	13.126
2	4.348	10.871	39.428	4.348	10.871	39.428	3.938	9.845	22.971
3	2.331	5.828	45.256	2.331	5.828	45.256	3.649	9.123	32.094
4	2.025	5.063	50.319	2.025	5.063	50.319	3.068	7.671	39.765
5	1.782	4.454	54.773	1.782	4.454	54.773	2.946	7.364	47.129
6	1.533	3.832	58.605	1.533	3.832	58.605	2.730	6.824	53.953
7	1.389	3.472	62.077	1.389	3.472	62.077	1.965	4.912	58.866

8	1.287	3.217	65.294	1.287	3.217	65.294	1.594	3.986	62.852
9	1.176	2.941	68.235	1.176	2.941	68.235	1.526	3.816	66.668
10	1.083	2.707	70.942	1.083	2.707	70.942	1.499	3.747	70.415
11	1.045	2.613	73.555	1.045	2.613	73.555	1.256	3.140	73.555
12	.891	2.226	75.781						
13	.868	2.169	77.950						
14	.771	1.928	79.878						
15	.737	1.842	81.721						
16	.701	1.752	83.472						
17	.620	1.549	85.022						
18	.579	1.448	86.470						
19	.515	1.288	87.758						
20	.475	1.188	88.946						
21	.427	1.067	90.013						
22	.392	.980	90.993						
23	.354	.886	91.879						
24	.349	.873	92.752						
25	.323	.807	93.558						
26	.286	.714	94.273						
27	.275	.687	94.959						
28	.240	.599	95.559						
29	.233	.584	96.143						
30	.228	.571	96.713						
31	.215	.536	97.250						
32	.181	.452	97.701						
33	.167	.417	98.119						
34	.150	.375	98.494						
35	.138	.345	98.839						
36	.127	.316	99.155						
37	.111	.277	99.432						
38	.095	.237	99.669						
39	.078	.195	99.864						
40	.054	.136	100.000						

Table 3: Total Variance Result

The table above displays the total variance at three stages. At the initial stage it shows the factors and their associated Eigen values, percentage of variance explained and cumulative percentage. In reference to the Eigen values, eleven factors to be extracted because they have Eigen values greater than 1. If eleven factors are extracted, then 73.56% of the variance would be explained.

4.4. Scree Plot

The scree plot is a graph of the Eigen values against all the factors. The graph is useful for determining the number of factors to be retained. The point of interest is where the curve starts to flatten.

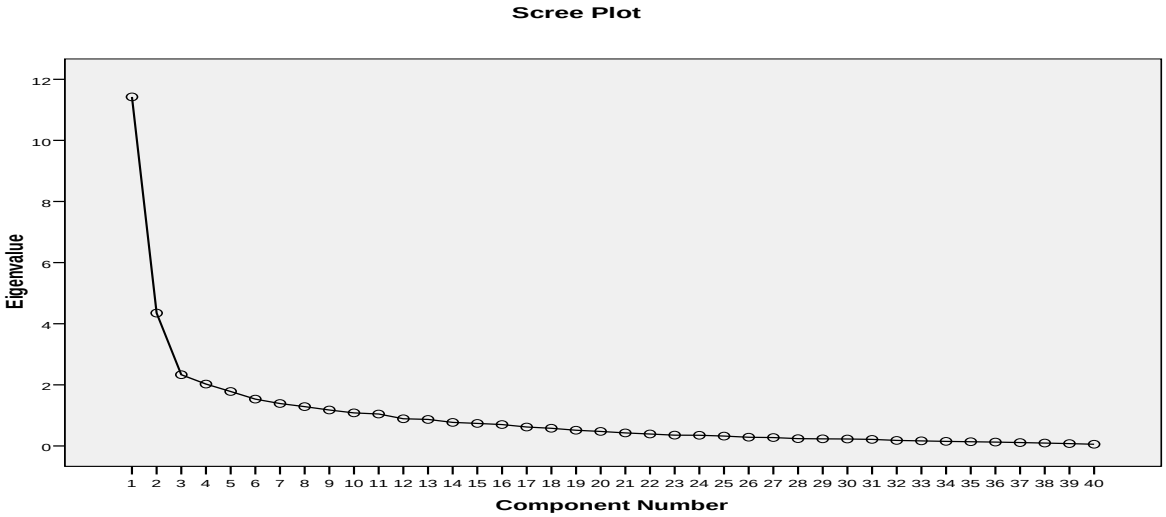

Figure 1: Scree Plot

The above scree plot graphically displays the eigen values for each factor and suggests that there are two predominant factors.

4.5. Factor Matrix

This factor structure matrix table contains the un-rotated factor loadings, which are the correlations between the variable and the factor. Because these are correlations, possible values range from -1 to +1. The factor pattern matrix contains the coefficients for the linear combination of the variables. The columns under this heading are the un-rotated factors that have been extracted.

	Factors										
	1	2	3	4	5	6	7	8	9	10	11
F30	.751										
F13	.722									-.361	
F27	.705	-.316									
F29	.702										
F36	.697										
F37	.693		-.331								
F17	.690										
F31	.679										
F12	.669		.340					-.329			
F33	.663		-.434								
F34	.644			-.378							
F35	.639	-.350									
F15	.635						.340				
F32	.630	-.320									
F28	.630						-.325				
F10	.621										
F14	.615	-.329	.338								
F19	.588		-.301			-.300					
F24	.584		-.366								
F25	.555				-.396		-.317				
F11	.543					.466					

F7	.515		-.458		-.405						
F18	.494			.424	.378						
F40	.490			.377							
F8	.464				-.378						
F4	.463		-.462								
F3	.444										
F5	.417		.315			.398		-.402			
F1		.734									
F23		.680					-.351				
F38	.304	.639			.368						
F6	.382	.627									
F21		.556			.431						-.373
F22	.316	.547	.337								
F39		.546							.343		
F26		.529		-.422							
F9		.526					.492				
F2			.302	.486		.322	.368				
F20	.335		-.403						-.457		
F16	.401										.472

11 Factors extracted

Table 4: Factor Matrix

The solution above includes several complex variables. Factor 1 comprises twenty eight items with factor loading 0.42 to 0.75. Factor 2 comprises nine items with factor loading 0.53 to 0.73. Factor 3 comprises two items with factor loading -0.43 to 0.3. Factor 4 comprises five items with factor loading 0.43 to 0.79. Factor 5 comprises four items with factor loading 0.48 to 0.79. Factor 6 comprises four items with factor loading 0.52 to 0.75. Factor 7 comprises two items with factor loading 0.62 to 0.82. Factor 8 comprises three items with factor loading 0.42 to 0.76. Factor 9 comprises one item with factor loading 0.75. Factor 10 comprises one item with factor loading 0.81. Factor 11 comprises one item with factor loading 0.53

4.6. Rotated Factor Matrix

The rotated factor matrix, sometimes referred to as the loadings, is the key output of principal component/factor analysis. It contains estimates of the correlations between each of the variables and the estimated components. This table contains the rotated factor loadings (factor pattern matrix), which represent both how the variables are weighted for each factor but also the correlation between the variables and the factor with possible values range from -1 to +1.

	Factor										
	1	2	3	4	5	6	7	8	9	10	11
F34	.848										
F17	.711										
F36	.665										
F32	.662										
F30	.657		.373								
F14	.548			.300							-.460
F37	.537	.318			.372		.364				
F28	.511		.372	.319		.390					
F39		.729									-.322
F1		.728									
F23		.711				.332					
F22		.652									

F26		.581							-.512		
F9		.573								.478	
F11			.752								
F29			.700								
F13	.338		.683								
F31	.478		.529								
F15	.412		.430	.339						.303	-.326
F18				.796			.311				
F35	.364			.618							
F10				.577							
F12	.390		.388	.435							
F27	.421		.328	.430	.324						
F4					.778						
F24					.739	.305					
F7					.728						
F33	.380		.428		.481						
F25						.747					
F8						.653	.306		.374		
F40				.312		.606					
F6		.475				.523					
F20							.821				
F19				.402			.617				
F21		.358						.761			
F38		.553						.565			
F16			.339					-.423			
F5									.748		
F2										.810	
F3			.301	.353							.534

Table 5: Rotated Factor Matrix

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
A Rotation converged in 23 iterations.

The above rotated solution includes several complex variables. Factor 1 comprises eight items with factor loading 0.51 to 0.85. Factor 2 comprises six items with factor loading 0.57 to 0.73. Factor 3 comprises five items with factor loading 0.43 to 0.75. Factor 4 comprises five items with factor loading 0.43 to 0.79. Factor 5 comprises four items with factor loading 0.48 to 0.79. Factor 6 comprises four items with factor loading 0.52 to 0.75. Factor 7 comprises two items with factor loading 0.62 to 0.82. Factor 8 comprises three items with factor loading 0.42 to 0.76. Factor 9 comprises one item with factor loading 0.75. Factor 10 comprises one item with factor loading 0.81. Factor 11 comprises one item with factor loading 0.53.

4.7. Factor Transformation Matrix

Factors	1	2	3	4	5	6	7	8	9	10	11
1	.600	.217	.462	.364	.337	.293	.193	.036	.084	.043	-.012
2	-.178	.835	-.190	-.206	-.044	.241	.131	.310	-.082	.086	.065
3	.220	.022	-.030	.079	-.650	.412	-.441	-.094	.274	.243	-.120
4	-.488	-.228	-.169	.450	.183	.339	.235	.169	.344	.351	.075
5	-.144	.139	.294	.544	-.350	-.488	-.105	.434	-.131	-.017	-.021
6	-.241	.084	.570	-.331	.169	-.152	-.309	-.078	.258	.391	.357
7	.243	.010	-.095	-.208	-.141	-.414	.465	.021	.271	.529	-.357
8	.030	-.341	.188	-.226	-.066	.293	.057	.382	-.644	.372	-.062

9	-.051	.092	-.128	.052	.471	-.066	-.544	.118	-.019	.143	-.642
10	.318	.055	-.473	.234	.153	-.216	-.235	-.093	-.238	.407	.511
11	-.281	.219	.160	.245	-.086	.028	.136	-.708	-.405	.225	-.209

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Table 6: Factor Transformation Matrix

The table above shows the items (variables) in the rotated factor space.

5. Conclusion

According to the outcome of the rotated factor matrix, the following eight factors have similarities and can be replaced by one factor; here we call it Extracted Factor 1(EF1). The eight factors are: i) F34 (How demonetization has impacted on seller's decision to sell a commercial resale property within a year?); ii) F17 (How demonetization has impacted on seller's decision to sell a residential resale property within a year?); iii) F36 (How is the impact of demonetization on demand for commercial real estate within a year?); iv) F32 (How demonetization has impacted on seller's decision to sell a commercial resale property immediately (6 months)?); v) F30 (How demonetization has impacted on buyer's decision to buy a commercial resale property within a year?) vi) F14 (How demonetization has impacted on seller's decision to sell a residential new property immediately (6 months)?); vii) F37 (How is the impact of demonetization on demand for commercial real estate more than a year?) viii) F28 (How demonetization has impacted on buyer's decision to buy a commercial resale property immediately (6 months)?). Therefore, it can be interpreted that Extracted Factor 1 (EF1) as the underlying trait measured by F34, F17, F36, F32, F30, F14, F37, F28, as these variables load highly on it.

Similarly, the following six factors have similarities and can be replaced by one factor; here we call it Extracted Factor 2 (EF2). The six factors are: F39 (How has demonetization impacted the financial institutions, funding for commercial property loans?); F1 (How is the impact of demonetization on land prices?); F23 (How is the impact of demonetization on overall commercial real estate prices?); F22 (How has demonetization impacted the financial institutions, funding for residential home loans?); F26 (As an impact of demonetization, how likely will builders reduce the prices of their commercial properties?); F9 (As an impact of demonetization, how likely will builders reduce the prices of their residential properties?); Therefore, it can be interpreted that Extracted Factor 2(EF2) as the underlying trait measured by F39, F1, F23, F22, F26, F9, as these variables load highly on it.

Similarly, the following six factors have similarities and can be replaced by one factor; here we call it Extracted Factor 3(EF3). The six factors are: F11 (How demonetization has impacted on buyer's decision to buy a residential resale property immediately (6 months)?); F29 (How demonetization has impacted on buyer's decision to buy a commercial new property within a year?); F13 How demonetization has impacted on buyer's decision to buy a residential resale property within a year?; F31 (How demonetization has impacted on seller's decision to sell a commercial new property immediately (6 months)?); F15 (How demonetization has impacted on seller's decision to sell a residential resale property immediately (6 months)?)Therefore, it can be interpreted that Extracted Factor 3 (EF3) as the underlying trait measured by F11, F29, F13, F31, F15, as these variables load highly on it.

The Extracted Factor Four (EF4) has similarities as those of the following five factors which are: F18 (How is the impact of demonetization on demand for residential real estate within 6 months?); F35 (How is the impact of demonetization on demand for commercial real estate within 6 months?); F10 (How demonetization has impacted on buyer's decision to buy a residential new property immediately (6 months)?); F12 (How demonetization has impacted on buyer's decision to buy a residential new property within a year?); F27 (How demonetization has impacted on buyer's decision to buy a commercial new property immediately (6 months)?). Therefore, it can be interpreted Extracted Factor 4(EF4) as the underlying trait measured by F18, F35, F10, F12, F27, as these factors load highly on it.

The Extracted Factor five (EF5) has similarities as those of following four factors which are: F4 (If you were to be a builder, how has demonetization impacted housing demand for primary market?); F24 (How is the impact of demonetization on primary commercial real estate market?); F7 (How is the impact of demonetization on primary residential real estate market?); F33 (How demonetization has impacted on seller's decision to sell a commercial new property within a year?).Therefore, it can be interpreted Extracted Factor 5 (EF5) as the underlying trait measured by F4, F24, F7, F33, as these factors load highly on it.

Similarly, the following four factors are having the similarities and can be replaced by one factor; here we call it Extracted Factor 6 (EF6). The four factors are: F25 (How is the impact of demonetization on secondary resale commercial real-estate industry?); F8 (How is the impact of demonetization on the secondary residential real-estate industry?) F40 (What is overall impact of Demonetization on Real Estate sector in India?); F6 (How is the impact of demonetization on overall residential real estate prices?). Therefore, it can be interpreted that Extracted Factor 6 as the underlying trait measured by F25, F8, 40, F6, as these factors load highly on it.

Similarly, the following two factors are having the similarities and can be replaced by one factor; here we call it Extracted Factor 7(EF7). The two factors are: F20 (How is the impact of demonetization on demand for residential real estate more than a year?); F19 (How is the impact of demonetization on demand for residential real estate within a

year?); Therefore, it can be interpreted that Extracted Factor 7 (EF7) as the underlying trait measured by F20, F19, as these factors load highly on it.

The Extracted Factor Eight (EF8) has similarities as those of following three factors which are: F21 (How have the Government policies like Real Estate Regulatory Act (RERA) and Benami Transaction Act impacted on the trend for buying new residential homes?) F38 (How have the Government policies like Real Estate Regulatory Act (RERA) and Benami Transaction Act impacted on the trend for buying new commercial properties?); F16 (How demonetization has impacted on seller's decision to sell a residential new property within a year?). Therefore, it can be interpreted that Extracted Factor 8 (EF8) as the underlying trait measured by F21, F38, F16, as these factors load highly on it.

The Extracted Factor Nine (EF9) has similarity as those of following one factor which is: F5 (If you were to be a builder how demonetization has impacted housing demand for secondary (resale) market?). Therefore, it can be interpreted Extracted Factor Nine (EF9) as the underlying trait measured by F5, as this factor loads highly on it.

Similarly, the following one factor is having the similarity and can be replaced by one factor; here we call it Extracted Factor 10(EF10). The factor is: F2 (How does the demonetization impacted on the prediction for better future of real-estate market in the upcoming years?). Therefore, it can be interpreted that Extracted Factor 10(EF10) as the underlying trait measured by F2, as this factor loads highly on it.

The Extracted Factor Eleven (EF11) has similarity as those of following one factor which is: F3 (If you were to be a builder, how do you forecast, demonetization impacting consumer buying behaviour?). Therefore, it can be interpreted that Extracted Factor Eleven (EF11) as the underlying trait measured by F3, as this factor loads highly on it. Therefore, the factor analysis suggests that the selected 40 factors can be replaced by the above mentioned eleven Extracted Factors.

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