# Assessment of Investment Decision Models and their Application in Commercial Real Estate

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*Abstract:* Investment decision are dependent on various variable that differ from case to case, dynamic of region, financial capability of investor, risk and policies, which make the behavior of real estate dynamic through uncertainty and volatility. This makes the decision making for all the investors in commercial real estate difficult.

In this research, types of commercial real estates and their peculiarities, types of real estate investments, various variables associated with commercial real estate typologies (i.e. retail and offices) for investment decision making have been identified. various investment models present in commercial real estate investment decision making are identified and compared in terms of variable associated, cater to level of risk, assumption, type of decision, metrics and investment types. then, a matrix has been proposed in that suggest the best suitable investment decision model for commercial real estate typologies (i.e. retail and offices) to cater the uncertainty and volatility associated with them under different strategies of investment. this research will serve as a guide to investors, developers and builders. it will provide a prior knowledge to take a decision on investment in commercial properties of offices and retail.

*Index Terms* – **Real estate, Real estate investment, Investment decision models, Influence variables, Investment strategies.**

## I. INTRODUCTION

Investment is a commitment of resources made in the hope of realizing benefits that are expected to occur over a reasonably long period of time in future. The resources can be men, material, money etc. but at most of the times they can be expressed in terms of money to facilitate in taking an investment decision (David Sirota et.al., 2016). In Real estate investment funds are committed to preserve and increase capital and earn a profit. Real estate being most dynamic sector in India, investment analysis is must for the investors. Investors search for new and more profitable investment proposals, by investigating market considerations to predict the consequences of accepting the investment and make the economic analysis to determine the profit potential of each investment proposal. (Stephen E Hargitay et.al., 2011)

Investments decision are dependent on various variables that differs with the dynamic of region to region, financial capability of investor, cash flow estimates, project typology and regulatory authorities. These variable keep on change according to risks, market conditions, political policies, economical, sociological, geographical factors and physical parameters (Glenn p. 1994). Under such conditions it is possible, to apply risk analysis as a first measure to find out whether the project is financially feasible. For such variables there exist different types of investment decision models. Several classification criteria can be used for these mathematical models according to their structure. Establishment of models describes how decisions are made or give specific instructions on how to come to a decision. It screens the new project ideas and aids the identification of investment opportunities. (Francis P. et.al., 2018). In this thesis appraisal of investment models will be done and they will be analysed to find out best suited model different typologies of real estate for their unique variables.

## II. NEED OF THE STUDY

RERA bill passed in 2013, it modified the cash flow processes to safeguard the interests of customers and developers. In 2016 the demonetization hit the real estate economy, lead to the downfall of many of many investors and projects and in 2018 the downfall of economy which effected the 2nd major sector of economy i.e. real estate. Such situations have major impacts on investments, with changing market dynamics new risks and variables are evolved. There is a need of research on the investment models for current real estate market to explore best suited investment models according to typologies of real estate that can offer best decisions in current real estate dynamics.

## III. AIM

To appraise real estate investment decision models and analyze their applicability and suitability for commercial real estate.

## IV. OBJECTIVES

1. To explore different investment models prevalently used in real estate sector.
2. To identify the variables associated with commercial real estate typologies for making investment decision.
3. To enumerate different strategies for commercial developments like land, office and retail.
4. To propose the most favorable investment decision model on a case to case basis of each typology of commercial development.

## V. RESEARCH METHODOLOGY

Following research steps are followed, to meet the research aim and its objectives:-

**Step 1:** Appraising the investment decision models and
developing a comparison matrix on the basis of their peculiarities.

**Step 2:** Identifying investment decision making parameters.

**Step 3:** Identifying the investment strategies and developing their comparison matrix in terms of their characteristics, risk, volatility and liquidity in returns.

**Step 4:** Developing a matrix that suggest the most suitable investment decision model on case to case basis for commercial real estate typologies i.e. offices and retail.

## VI. LITERATURE REVIEW

### 6.1. Real Estate

Real estate is defined as land and all natural and human-made improvements permanently attached there to, including air and mineral rights (David Sirota et.al., 2016). In addition to the identification of real estate as the land and affixed building, multiple authors tried to give an overview of real estate sector. It is evident from the understanding of Indian real estate sector overview, The opportunities can be enhanced and impediments can be overcome by having the thorough knowledge of various financial channels available which enhances the viability of the projects in which they are invested (P.R., 2011). To own real estate is not only to possess the physical property but also to acquire certain legal rights to its continual peaceful use and redistribution. When we acquire real estate, we also acquire an accompanying bundle of rights in the property. These are the rights of use, possession,
control, enjoyment, exclusion, and disposition, including the right to pass the property on by means of a will (David Sirota et.al., 2016).

### 6.2. Real Estate Investment

An investment is an asset or item that is purchased with the hope that it will generate income or appreciate in the future. In an economic sense, an investment is the purchase of goods that are not consumed today but are used in future to create wealth. In finance, an investment is a monetary asset purchased with the idea that the asset will provide income in the future appreciate and be sold at a higher price. (Stephen E Hargitay et.al., 2011) identified that as an economic activity, investment may be defined as follows, "Investment activity can be regarded as synonymous with decision making" (Stephen E Hargitay et.al., 2011). (David Sirota et.al., 2016) described a real estate investment as the commitment of funds by an individual with a view to preserving and increasing capital and earning a profit. Investors view consideration about real estate cash flow and asset values keeping in mind their own objectives and constraints, in making their investments.

### 6.3. Investment Decision Models

(Bispinck et.al., 2012) state that investment world is highly dependent on responsible decision making. In order to come to a rational and profound decision a decision analysis should be undertaken. (Edward Farragher, Arline Savage, 2008) states that the key to making a good real estate investment decision is to apply experience, good judgment, and creativity in a sophisticated decision-making process. The decision making process in not by assumptions but it is rather based on quantified evidences and analytical methods (Stephen E Hargitay et.al., 2011). An investment decision-making process includes the following stages: setting strategy, establishing return/risk goals, searching for investment opportunities, forecasting expected returns, evaluating forecast returns, assessing risk, adjusting for risk, decision-making, implementing accepted proposals, and auditing operating performance. (Sharanya Jayaraman, 2013) states that risks in a project is a factor to be considered in a project appraisal and enhancing the investment decision. It enhances decision making on marginal projects. Various major risks in an investment are political stability risk, skills and material shortage, market risk, cash flow risk and control risk. Under such conditions it is possible, to apply risk analysis as a first measure to find out whether the project is financially feasible. For such variables there exist different types of investment decision models. Several classification criteria can be used for these mathematical models according to their structure. Establishment of models describes how decisions are made or give specific instructions on how to come to a decision. It screens the new project ideas and aids the identification of investment opportunities. (Francis P. et.al., 2018) illustrates the concept of cash flow analysis and appraises its two commonly used methods in real estate as, discounting and non-discounting methods.

### 6.4. Multi Criteria Decision Making (MCDM) Model

It should also be emphasized that each parcel of real estate is unique and thus requires an individual evaluation that is relevant to its specific characteristics. Before investing in real estate, the investor must analyze the factors and their importance on the investment to achieve investment objectives. Multi Criteria Decision Analysis (i.e. MCDA, also known as MCDM, i.e. Multi Criteria Decision Making) is a study of methods and approaches that take multiple criteria into account when aiding (the) a decision maker to make decisions that matter (Otto Eemeli, 2012). MCDA is a method where the preferences of different alternatives are analyzed in relation to the objectives set by the decision maker. The process solves complex problems by first cutting the problem into smaller issues and studying them in their simpler forms. The multi criteria problem is usually focused too much on model creation and getting some numerical facts out of the model. MCDA offers methods that concern multiple conflicting and (not) incommensurable criteria, take decision makers preferences into account, observe the decision problem explicitly and structure and synthesize the information.

## VII. INVESTMENT DECISION MODEL ASSESSMENT

### 7.1. Methods of MCDM

Different Methods for Multi Criteria decision making of real estate investment are:

### 7.1.1. Weighted Sum Model (WSM)

As one of the simplest and most widely used discrete multi-criteria expert decision systems, the weighted sum model (WSM). WSM is most commonly used approach, best known and simplest multi criteria decision making model for evaluating a no. of alternatives in terms of number of decision criteria. WSM decomposes a decision problem into clearly defined decision factors and identifies their importance weights. Then, where possible, subjective expert judgments and objective information with regard to the factors are

combined using a weighted sum model to determine the overall value or the performance of the alternatives being considered. Weightage scores are given to each factor through survey and experts perception.

### 7.1.2. Analytical Hierarchy Process (AHP)

The analytic hierarchy process model decomposes as a complex MCDM problem into a system of Hierarchies. The analytic hierarchy process is due to Saaty (1980) and is often referred to eponymously, as the Saaty method. It is popular and widely used. Since its introduction many different problems of multi attribute decision modeling has been successfully investigated with mathematical techniques of this approach. With this approach judgment factors that can be used for evaluating alternatives are arranged in the hierarchical structure. The alternative are ranked with the aid of the judgment matrices which are given to decision analyst. Since its theory based on hierarchical structure is very suitable for traditional decision framework commonly used in india.

### 7.1.3. ELECTRE Method

The elimination and choice translating reality (ELECTRE) method was first introduced by ROY, B. (1991). The basic concept of the ELECTRE method is to deal with "outranking relations" by using comparisons of pairs among alternatives under each criterion separately.

*Table 1: Comparison of Investment Decision Models*

| Variables | Qualification of Variables | ELECTRE | AHP | WSM |
|---|---|---|---|---|
| Number of evaluation elements | Limited number of criteria and sub criteria and a small number of alternatives | 1 | 0 | 0 |
| | Large number of criteria and sub criteria and a small number of alternatives | 0 | 1 | 0 |
| | Large number of criteria and sub criteria and a large number of alternatives | 0 | 0 | 1 |
| Typology of indicators | Quantitative | 1 | 1 | 1 |
| | Qualitative | 1 | 1 | 0 |
| Type of decision making | -- | Ranking/choice | Ranking/choice | Ranking/choice |
| Input level | Low | 0 | 0 | 0 |
| | Medium | 1 | 0 | 0 |
| | High | 0 | 1 | 1 |
| Decision problem solution | n categories of alternatives of equal score but different behavior | 1 | 0 | 0 |
| | Alternative with the higher global score | 0 | 1 | 1 |

### 7.2. Real Option Analysis

Miller and Park (2002) explain the ROA method as following; "The ROA method considers all future investment opportunities along the value chain, allowing a more flexible assessment of strategic projects." Real option analysis is derived from the financial sector where an option is a right but not an obligation to buy/sell an underlying stock. This option has a certain value, since it gives you a right which in turn limits your downside risk. This idea is converted to the real world by looking at an investment decision as having different options. "The ROA method considers all future investment opportunities along the value chain, allowing a more flexible assessment of strategic projects." ROA uses option trees in decision making. In this tree all current and future options are listed. This is much more extensive than the DCF method where only a go or no-go decision can be made. Option tree includes much more options than the go, no-go option of the DCF. Each option can result in obtaining new information on which it can become more or less favorable to go ahead with the investment. ROA is a highly flexible method because it includes all possible options. It also uses option trees to that give insight into the probabilities of different outcomes.

### 7.3. Investment Financial Models

### 7.3.1. Discounted Cash Flow (DCF)

(Sharanya Jayaraman, 2013) states Discounted cash flow (DCF) model as a method of valuing an asset using the concepts of the time value of money. The DCF model attempts to attach a value to a property based in cash flows. One of the most important factors in a property is the underlying cash flow. Generally speaking the discounted cash flow approach (DCF) model can value the cash flow over time and can estimate what value the property has currently (Bispinck et.al., 2012).

DCF model of investment decision is applied to the project decision making in two ways as:

### 7.3.1.1. Net Present Value

(Francis P. et.al., 2018) illustrates the Net Present Value method, a discount rate sometimes called the budget rate or target rate of interest, which is considered suitable from the investor's point of view, is adopted. This rate is then used to discount, that is, find present value of all monies flowing out, and all monies flowing in, as a result of the investment. The difference between the present value of monies flowing out (cash outflow) and the present value of monies flowing in (cash inflow) is the net present value (NPV). The discounting will produce three possible outcomes for the NPV, which may be positive, negative or zero. If the net present value of the investment is positive, it indicates that the investment will show a profit. A negative NPV implies that the yield on the investment is at a rate of return lower than the target rate, it indicates that the investment will be at loss. If the net present value is zero, the investment will neither show a profit nor a loss.

**7.3.1.2. Internal Rate of Return**

(David Douglas, 1977) states the Internal Rate of Return method as that rate of discount at which the present worth of future cash inflows is exactly equals to the present value of all expected cash outflows. IRR has the ability to take the time value of money into account. It is defined "as the rate of return which equates the present value of the cash outflows to the present value of the cash inflows" (Brown and Matysiak, 2000). The general decision rule to accept only those investment proposal with an IRR greater than, or equal to, a requires rate of return. The internal rate of return avoids the shortcoming of the NPV method by using only the rate of interest as the means of measurement. This method involves finding the one rate of interest at which the present value of the expenditure equals the present value of the benefits or receipts (that is, the rate at which net present value = zero). The rate of interest at which this happens is known as the internal rate of return (also called the DCF Rate) (Francis P. et.al., 2018).

**7.3.2. Stochastic Investment Model**

There are uncertainties in DCF analysis process due to poor or imperfect information about the input figures of the analysis. If one is not certain about the input figures, then the resulting outputs are exposed to uncertainty. Most of the analysis in real estate is based on the market value of the property in question. The market value is largely stochastic in nature. The market value fluctuates based on a lot of factors, like the equity of the property, the current market situation, the intended and current use of the property, the valuation method, the financing used to buy the property, the initial investment, income produced by the property, etc. There are more sophisticated techniques available to test the variation of outcomes of the DCF model caused by the uncertainty in the input figures and therefore affecting the future cash flows of the property. Most of them look to assign probabilities to the input values of the DCF. After receiving a multitude of outcomes, the results can used to make an investment decision. if an investor is able to assign probabilities for the input figures ranges of output results can be determined. Among these technique, most commonly use technique is Monte Carlo Simulation (MCS). The basic concept of MCS is to repeat a certain process multiple times with fluctuating input figures. In the case of a real estate investment the process is a direct capitalization or a DFC analysis where the calculation is repeated with given parameters. Instead of giving single inputs as the calculation parameters, one assigns probability distributions or value ranges as input parameters for each input figure. MCS then randomly selects the input values from these assigned ranges or probability distributions and carries out the process. The process is repeated until the desired amount of results is reached. As a result, there will be a multitude of possible outcomes that can be analyzed using statistical tools (e.g. mean, range, standard deviation). The results can also be presented as a discrete distribution or a continuous distribution.

**7.3.3. Direct Capitalization**

The direct capitalization is based on the premise that value of an income - producing asset is a function of future benefits and income derived from that asset. Income capitalization involves capitalizing a 'normalized' single - year net income estimated by an appropriate market based yield. The first step is to estimate rent revenues, or put more generally, (gross) operating income for the first year. Then the operating expenses for the first year are estimated. Subtracting the operating expenses from the operating income leads to the Net Operating Income (NOI) for year 1. In order to find the value of the property, the NOI must be divided by a capitalization rate. This capitalization rate is derived from the market by identifying several comparable properties that have been sold in the recent past and obtain both their sales price and NOI. Dividing the price for which the comparable property was sold with its NOI leads to a capitalization rate that can be used for the subject property. This approach is best utilized with stable revenue producing assets, whereby there is little volatility in the net annual income. Valuing real estate property that an investor intends to acquire can help an investor determine whether to acquire the property or discontinue the investment plan.

**7.3.4. Payback Period**

The payback period is a non discounting technique of investment decision making. The payback period calculates in which year the expenses are covered. This measure is mostly used in situation where the project should repay itself within the first 5-7 years. For example it was often used by IT firms which have to cope with rapidly changing technology. After a few years the new investment would then be outdated, thus it would need to have a short payback period. A clear advantage of payback is that it is easy to understand and calculate. It is often used as a supplementary screening technique, especially in the case of mutually exclusive projects where IRR is unable to select the most appropriate. An obvious disadvantage of the payback approach is that it ignores the time value of money and ignores cash flows beyond the payback period. To overcome the issue of ignoring the time value of money it is possible to use modified payback, whereby we determine the number of periods required not to recover the actual level of cash flows, but the present value of cash flows.

*Table 2: Comparison Matrix of Financial Investment Models*

| Investment Decision Models | Variable | Assumption | Uncertainty Level | Time Value of Money | Volatility of Investment | Type of Decision | Model Metrics | Investment Type |
|---|---|---|---|---|---|---|---|---|
| **Discounted Cash Flow (DCF)** | Cash Inflows | Deterministic | Low-Medium/Unsophisticated Property | Considers Time Value of Money | Accurate when there is low volatility | Go or No go Decision | Internal Rate of Return (IRR) | Long Term Investment |
| | Cash Outflows | | | | | | | |
| | Inflation/Depreciation | | | | | | Net Present Value (NPV) | |
| | Expected Growth | | | | | | Discount Rate | |
| **Payback Period** | Cash Inflows | Deterministic | Low | No | Accurate when there is low volatility | Go or No go Decision | -- | Short Term Investment |
| | Cash Outflows | | | | | | | |
| **Stochastic DCF** | Cash Inflows | Probabilistic | High-Medium | Considers Time Value of Money | Medium | Go or No go Decision | Monte Carlo Simulation | Long Term Investment |
| | Cash Outflows | | | | | | DCF | |
| | Equity Risk Premium | | | | | | Survey | |
| | Loan to Value (LTV) | | | | | | Mean, Range, Standard Deviation | |
| | Growth Rate | | | | | | | |
| **Direct Capitalization (DC)** | Net Operating Income (NOI) | Deterministic | Low | No (NOI of first year only) | Properties with stable income flows/low volatility | Go or No go Decision | Cap Rate | For Income producing Building |
| | Value of Property | | | | | | | |
| | Capitalization Rate | | | | | | | |
| **Real Option Analysis (ROA)** | -- | -- | High | -- | High Volatility | Option to postpone Decision | Decision Tree | Long Term Investment |
| | | | | | | When to purchase | | |
| | | | | | | When to sell | | |
| | | | | | | When to increase Investment | | |

## VIII. COMMERCIAL REAL ESTATE INVESTMENT STRATEGIES

Investors can invest in commercial real estate hard asset through three strategies. These strategies depend on the financial status of investor, market condition, end use, tendency of investor to cater risk, profitability etc. These strategies are as follows:

1. Land phase/ Pre-launch Investment
2. Operational Property Investment
3. Distressed Property Investment

### 8.1. Land phase/ Pre-launch Investment

This strategy involves investment in property from scratch. This strategy involves buy Land, Pay to Build a New Property, Find Tenants, and Sell It Upon Stabilization. Cash out flows involves land cost, construction cost along with operation and maintenance cost.

### 8.2. Operational Property Investment

This strategy involves acquiring a property with a low occupancy rate, make significant renovations to improve it, and aims to sell or rent the property for a significantly higher price.

### 8.3. Distressed Property Investment

Strategy characterized by targeting underperforming and/or under managed properties or properties that are temporary depressed and then using high degrees of leverage (borrowed funds) to acquire the property, hold it for a short period of time and then sell it at an expected profit of at least 20%.

*Table 3: Matrix describes the peculiarities of different strategies.*

| | Strategy-1 Land Phase/Pre Launch | Strategy-2 Operational Property | Strategy-3 Distressed |
|---|---|---|---|
| Risk | Low to average | Average to high | High |
| Real Estate Type | New construction from scratch | Existing properties often with the need for refurbishments | Problem properties |
| Characteristics | Long duration cash flows | Generally cash flowing but with the opportunity to increase cash flows through an improvement plan. | Less central or located in emerging economics, cash flows through residual value. |
| Liquidity | Low | Low | Low |
| Volatility in Returns | Low | Moderate to high | High |

## IX. INVESTMENT DECISION MODEL MATRIX

Investment decision model matrix is made for commercial real estate investment for retail and office type of properties. For the strategies discussed in table 3, volatility and uncertainties of different real estate types are measured. Based on uncertainties and volatility of each investment type, the investment decision model is discussed.

Office properties are categorized into two types i.e. General IT and Built to suite. General IT further categorised in Grade A, B, C. Volatility and uncertainty of all the strategies are measured. On the basis of which Valuation model , decision model and financial model are suggested to best suit. Similarly, retail properties are categorised into two types i.e. Malls/High streets and Shop cum Office (SCO). Volatility and uncertainty of all the strategies are measured. On the basis of which Valuation model , decision model and financial model are suggested to best suit.

*Table 4: Investment Decision Model Matrix of Office Real Estate*

| Investment Type | Investment Options | Strategy | Volatility | Uncertainty | Investment Decision | | | |
|---|---|---|---|---|---|---|---|---|
| Land | -- | -- | -- | -- | **Return Forecasting Model** | | **Valuation Model** | |
| | | | | | Time Series Analysis | | Direct Comparison | |
| Office | General IT | S-1 (Land phase/pre launch) | -- | -- | **Valuation Model** | | **Decision Model** | **Financial Model** |
| | | | High (Grade A) | High | Direct Comparison (land valuation is done by using this model) | | Analytical Hierarchy Process/Weighted Sum Model | Stochastic DCF |
| | | | Medium (Grade B) | Medium-High | | | | Stochastic DCF |
| | | | Low (Grade C) | Low | | | | DCF/Payback Period |
| | | S-2 (Operational property) | -- | -- | **Valuation Model** | | **Decision Model** | **Financial Model** |
| | | | High (Grade A) | Medium | Direct Capitalization (For valuation of income producing buildings) | | Analytical Hierarchy Process/Weighted Sum Model | Stochastic DCF |
| | | | Medium (Grade B) | Medium | | | | Stochastic DCF |
| | | | Low (Grade C) | Low | | | | DCF/Payback Period |
| | | S-3 (Distressed) | -- | -- | **Return Forecasting Model** | **Valuation Model** | **Decision Model** | **Financial Model** |
| | | | High | High | Time Series Analysis, Econometric/ regression analysis | Direct Comparison (In case of non income producing) / Direct Capitalisation (In case on income producing) | Real Option Analysis | Stochastic DCF |
| | | | Medium-Low | High | | | | |
| | Built to Suit (BTS) | S-1 (Land phase/pre launch)/S-2 (Operational property) | High | Medium | **Valuation Model** | | **Decision Model** | **Financial Model** |
| | | | | | Direct Comparison (land valuation is done by using this model)/Direct Capitalization (For valuation of income producing buildings)/ | | Analytical Hierarchy Process/Weighted Sum Model | DCF Model |
| | | S-3 (Distressed) | High | High | **Return Forecasting** | **Valuation Model** | **Decision Model** | **Financial Model** |

| | | | | |
|---|---|---|---|---|
| | | | **Model** | | | |
| | | | Time Series Analysis, Econometric/ regression analysis | Direct Comparison (In case of non income producing) / Direct Capitalisation (In case on income producing) | Real Option Analysis | Stochastic DCF |

*Table 5: Investment Decision Model Matrix of Retail Real Estate*

| Investment Type | Investment Options | Strategy | Volatility | Uncertainty | Investment Decision | | | |
|---|---|---|---|---|---|---|---|---|
| Land | -- | -- | -- | -- | **Return Forecasting Model** | **Valuation Model** | | |
| | | | | | Time Series Analysis | Direct Comparison | | |
| Retail | Malls/High Street | S-1 (Land phase/pre launch) | Medium | High | **Valuation Model** | **Decision Model** | | **Financial Model** |
| | | | | | Direct Comparison (land valuation is done by using this model) | Builder/Developer; PAN India Retail Investor | Analytical Hierarchy Process/Weighted Sum Model | Stochastic DCF |
| | | S-2 (Operational property) | Medium | Medium | **Valuation Model** | **Decision Model** | | **Financial Model** |
| | | | | | Direct Capitalization (For valuation of income producing buildings) | Builder/Developer; PAN India Retail Investor | Analytical Hierarchy Process/Weighted Sum Model | DCF Model |
| | | S-3 (Distressed) | High | High | **Return Forecasting Model** | **Valuation Model** | **Decision Model** | **Financial Model** |
| | | | | | Time Series Analysis, Econometric/ regression analysis | Direct Comparison (In case of non income producing) / Direct Capitalisation (In case on income producing) | Real Option Analysis | Stochastic DCF |
| | Shop cum Office | S-1 (Land phase/pre launch) | Medium | Medium | **Valuation Model** | **Decision Model** | | **Financial Model** |
| | | | | | Direct Comparison | Builder/Developer; Retail Investor | Analytical Hierarchy Process/Weighted Sum Model | Stochastic DCF |
| | | S-2 (Operational property) | Medium | Low | **Valuation Model** | **Decision Model** | | **Financial Model** |
| | | | | | Direct Capitalization | Builder/Developer; Retail Investor | Analytical Hierarchy Process/Weighted Sum Model | DCF Model |
| | | S-3 (Distressed) | High | High | **Return Forecasting Model** | **Valuation Model** | **Decision Model** | **Financial Model** |
| | | | | | Time Series Analysis, Econometric/ regression analysis | Direct Comparison (In case of non income producing) / | Real Option Analysis | Stochastic DCF |

| | | | | | | Direct Capitalisation (In case on income producing) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

## X. CONCLUSION AND INFERENCES

Various investment models present in commercial real estate investment decision making are compared in terms of variable associated, cater to level of risk, assumption, type of decision, metrics and investment types. The result of this research can help investors or managers make more informed decisions and better plan their investments in CRE. Multi criteria decision making models not only consider financial returns of investments but also other factors that impact the decision. Applying the wholesome impact of influence factors, peculiarities of real estate typology and specification of investment decision model, a matrix has been proposed that will give the most suitable model to predict the success of CRE investments and will be very helpful to investors and managers.

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