



Financial and Market Decision-Making Tools for Housing Development

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Abstract: Most developers decide intuitively without scientific analysis tools when brainstorming ideas for housing development at the initiation phase. The situation of non-persistence and inconsistent purposes between the main participants in the process, and the specific peculiarities of the speculative housing market continue to be a concern. The paper aims to classify the decision-making tools for housing development at the initiation phase in Malaysia. This research implements the Delphi questionnaire survey method. Data collection involved 50 respondents among Malaysian housing developers. However, only 34 developers contributed to the study in the second round and eventually, 12 developers were left for the last round. Results confirm that the developers in Malaysia favor to make their development speculation decisions depending on modest financial and market past data exclamation and the simple use of numerical tools in generating a primary proposal. These shortcomings are principally attributed to time and economic constraints and the deficiency of financial expertise among the professional team of the developer organisations'.

Keywords: Decision-making tool, financial, housing development process, initiation phase, market

1. Introduction

Usually, the fundamental of idea development starts with the decision and desire of a developer to capitalise a housing construction project to fulfil a specific necessity (Ofori, 1990). The process suggests that developers act as the dominant party in the decision-making process of construction projects. The challenge is to come up with the most excellent decision in construction, while the obligation is shared by numerous information foundations in addition to experts, particularly in housing, in which the housing sector is close to the community objective (Mulliner, 2013). However, the difficulties typically related to non-perseveres and recount together to inconsistent purposes between the main participants in the process, and the complex peculiarities of the speculative housing market (Carmona, 2001). The conditions can create poor decision-making and may end up, resulting in a low-quality output of housing project (Ziara, 1999).

Monahan (2000) highlighted the idea that obtainable decision-making was an equally impartial accomplishment process. Furthermore, Triantaphyllou (2000) described decision-making as a process that involved the analysis of alternatives or tools in the evaluation principles which obligated advantage and worth in nature. According to Harris (2009), decision-making is the process of decreasing indecision alternatives. Information gathering activities are rigorously adopted and integrated into the decision-making process. Insufficient decisions are complete with unqualified inevitability as comprehensive information nearly altogether the tools are infrequently conceivable.

However, Tan (1996) specified that the results originated from a mixture of philosophies, perception model and ideas subjected to realism model, which reflected that decision-making was the contemplation of choosing a rational choice from the obtainable decision tools.

2. Literature Review

This paper covers financial and market decision tools to impartially and reasonably reveal the benefits and drawbacks of the proposed housing development, opportunities and intimidation as presented by the accounting statements and interest rates. In the most straightforward terms, the two criteria are to moderate findings which are necessary cost and expected profits. The appropriateness of the usage of financial decision tools for decision-making in housing development is to evaluate the project (Schmidt, 2011). If a project meets all the listed financial and market decision tools, a more thorough, detailed and nuanced analysis of the time value of money and the internal return can be carried out.

The initiation phase of housing development is critical to a project's accomplishment (Whole Building Design Guide, 2012). Decision-making during the initiation phase calls for the firm and sound philosophies and righteous judgments and presentation of systematic knowledge and know-how (Zainal & Rashid, 2013). Decision-makers in housing must be responsive to this phase because it is the process that formally identifies whether a new project is developed or an existing project should continue to the following phase (REHDA, 2010).

The housing development process has remained untaken in numerous dissimilar behaviours as a modest typical toward extra-complete and inclusive representations. The Chartered Institute of Building (CIOB) presented the development process equally a modest image (CIOB, 2002) whereas the Royal Institute of British Architects (RIBA) developed a development process by exactness complicated activities (RIBA, 2013). The researcher classified the overall development process in both international and Malaysia methods equally the commencement of decisive decision-making process in a housing development project, particularly stages of initiation phase (Zainal et al., 2017).

One of the most fundamental distinctions between the decision-making tools is primarily qualitative (market) as opposed to those which are primarily quantitative (financial). The distinction is sometimes misleading because some of the financial decision tools generate numerical results and some of the market decision tools are based on subjective, qualitative assumptions (Schmidt, 2011; Woodruff, 2013; Lin, 2000; Novak, 1996; Reh, 1997; Lake, 2011; Bilozor, Janowski, and Walacik, 2019; eHow, 1999; Achelis, 2011). Both tools compare investment gains according to the time scale. Furthermore, developers frequently have market senses when they first consider a site or development concept (Novak, 1996). They are consistently following trends, observing other developers and searching for new niches to fill the gap in the market as entrepreneurs (Zainal, 2019).

This research uses all the tools discussed earlier (financial and market tools). Appropriate tools are listed in Table 1. The appropriateness of the usage of these decision tools for decision-making in housing development is to evaluate the project. If a project satisfies the entire listed decision tools, a more thorough and nuanced analysis of the time value of money and the internal return can be carried out. Accordingly, all these tools are compatible with the scope of this research.

Table 1 - Summary of decision tools

Author	Decision Tools
Schmidt (2011)	<ul style="list-style-type: none"> • Return on Investment (ROI) • Rate of Cost (ROC) • Payback Period • Discounted Cash Flow (DCF) • Internal Rate of Return (IRR) • Net Present Value (NPV)
Lin (2000)	<ul style="list-style-type: none"> • NPV
Novak (1996)	<ul style="list-style-type: none"> • Cost-benefit
Lake (2011)	<ul style="list-style-type: none"> • 4Ps analysis
Bilozor, Janowski, and Walacik (2019)	<ul style="list-style-type: none"> • Comparison method
eHow (1999)	<ul style="list-style-type: none"> • Parameter
Achelis (2011)	<ul style="list-style-type: none"> • Cumulative
Woodruff (2013)	<ul style="list-style-type: none"> • Payback Period

3. Methodology: Delphi Method

Delphi method in principle is a sequence of chronological questionnaires or ‘rounds’, scattered by the organised response, that aim to improve the best dependable agreement of judgment of a specialists cluster (Keast, 2009; Wisniewski, 2006). This technique is beneficial in the case of situations in which single results are essential to be appointed and joint in instruction to statement nonexistence of covenant or imperfect formal of information (Powell, 2003). As such, Delphi method is predominantly appreciated for its capability to arrange and organise group communication and perspective.

This method is used as the research technique in order to comprise the data collection style owing to its aptitude to discover the factors prompting the present practice of decision-making process in housing development projects and the information necessary for the dissimilar decision-making points. The Delphi method applies in which an agreement and position of a group of specialists are stretched after eliciting their sentiments on a defined issue, and it relies on the “informed, intuitive opinions of specialist” (Helmer, 1983). The research objectives can be accomplished by an amalgamation of expert, professional or specialist opinions and theoretical finding technique. In addition, the Delphi technique also creates a higher quality reaction in this research as systematic, questionnaire, expert opinions, iterative process, i.e. ‘rounds’, feedback (developer opinions mediated by the team) and anonymity of developers (Sharif, 2009).

The iterative process is implemented to maintain the first round core of Delphi (R1). The stage is contingent on the objectives of the research. There are totally interpretations and results since the questionnaire are produced keen on a list and drive is then clipped down in the second round of Delphi (R2). The second questionnaire form is agreed upon by a minor group of nominated respondents to recapitulate the objective response of research, plus assistance in validating the last finding. Figure 1 shows the process. Most responses were obtained from board of director (41%) in contrast were CEO (24%) that had 16 to 20 years as their experience in job project which indicate 35%. The lowest percentage is 1 to 5 years’ experience in job (18%).

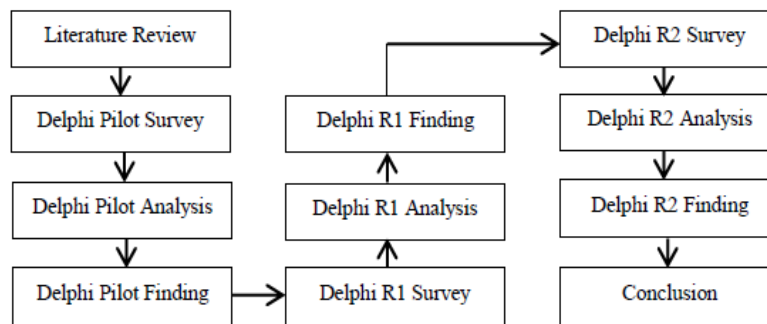


Fig. 1 - Process of research

4. Result

R1 Survey

A cumulative of 34 (*n*) replies out of 50 questionnaires was obtained from the R1 survey. Table 2 and Table 3 show the results in which accounted for a reply rate of 68 percentages. The financial decision tools comprise of eight tools separated into practical and theoretical concepts at the initiation phase. This is similar to market decision tools, which is also comprised of eight tools.

Table 2 - R1 Finding for financial decision tools

Stage/ Financial Decision Tools	A	B	C	D	E	F
1	0	0	0	0	0	13
2	0	0	0	0	21	5
3	12	23	17	6	6	0
4	8	0	8	6	0	0
5	0	0	1	0	0	13
6	0	0	0	0	0	28
7	13	0	9	0	0	0
8	1	11	0	22	0	0

Table 6 - R2 finding for financial decision tools

Stage/Financial Decision Tools	μ (n=12)	Acceptance Level
Development exploration and assessment		
1. Payback period method	4.8333	Accept
2. Interest rate analysis	4.3333	Accept
3. Profitability index (PI)	4.8333	Accept
4. Interest and loan analysis (Rate of Cost (ROC) & Return on Investment (ROI))	4.0000	Accept
Development evaluation		
1. Profitability index (PI)	4.9167	Accept
2. Interest and loan analysis (Rate of Cost (ROC) & Return on Investment (ROI))	4.1667	Accept
Pre-feasibility study		
1. Profitability period method (PI)	4.7500	Accept
2. Payback period method	4.7500	Accept
3. Interest rate analysis	4.5000	Accept
4. Internal Rate Revenue (IRR)	3.6667	Accept
Preliminary investigation		
1. Interest and loan analysis (Rate of Cost (ROC) & Return on Investment (ROI))	4.5000	Accept
2. Interest rate analysis	4.4167	Accept
3. Profitability Index (PI)	4.7500	Accept
Development schedule		
1. Account Method	5.0000	Accept
2. Profitability Index (PI)	4.5833	Accept
Feasibility study		
1. Net Present Value (NPV)	5.0000	Accept
2. Discounted Cash Flow	4.8333	Accept
3. Internal Rate of Return (IRR)	4.6667	Accept
4. Account Method	4.8333	Accept

Table 7 - R2 finding for market decision tools

Stage/Market Decision Tools	μ (n=12)	Acceptance Level
Development exploration and assessment		
1. Potential analysis	4.8333	Accept
2. 4Ps (product, price, promotion and place) analysis	5.0000	Accept
3. Economy analysis	5.0000	Accept
4. Cost-benefit analysis	4.9167	Accept
Development evaluation		
1. Potential analysis	4.7500	Accept
2. Comparison analysis	5.0000	Accept
3. Economy analysis	4.9167	Accept
4. Cost-benefit analysis	4.9167	Accept
Pre-feasibility study		
1. Economy analysis	5.0000	Accept
2. Trend analysis	5.0000	Accept
3. 4Ps (product, price, promotion and place) analysis	5.0000	Accept
Preliminary investigation		
1. Comparison analysis	4.9167	Accept
2. Trend analysis	4.9167	Accept
3. 4Ps (product, price, promotion and place) analysis	4.5833	Accept
4. Economy analysis	4.5833	Accept
5. Cost-benefit analysis	4.5833	Accept
Development schedule		
1. Parameter analysis	4.5000	Accept
2. Cumulative analysis	4.1667	Accept
3. Cost-benefit analysis	4.9167	Accept

Feasibility study		
1. Cost-benefit analysis	5.0000	Accept
2. Economy analysis	5.0000	Accept

The decision-making process consists of a variety of consideration tools to be used in the edict in order to understand the most constructive / best judgment. Financial and market tools involve in the decision-making process. Every stage contributes to the amalgamation of quantitative (financial) and qualitative (market) tools. Appendix A and B show the result of the decision-making tools employed at the initiation phase of the decision-making process in housing development based on findings by Zainal & Rashid (2013). The following is a list of financial and market methods utilised at each of the initiation phase stages by ranking-based R2 findings.

Financial Decision Tools

- Development exploration and assessment stage
 1. Payback Method
 2. PI
 3. Interest Rate Analysis
 4. ROC & ROI
- Development evaluation stage
 1. PI
 2. ROC & ROI
- Pre-feasibility study stage
 1. PI
 2. Payback Method
 3. Interest Rate Analysis
 4. IRR
- Preliminary investigation stage
 1. PI
 2. ROC & ROI
 3. Interest Rate Analysis
- Development schedule
 1. Account Method
 2. PI
- Feasibility study
 1. NPV
 2. DCF
 3. Account Method
 4. IRR

Market Decision Tools

- Development exploration and assessment stage
 1. 4Ps
 2. Economy Analysis
 3. Cost-benefit Analysis
 4. Potential Analysis
- Development evaluation stage
 1. Comparison Analysis
 2. Economy Analysis
 3. Cost-benefit Analysis
 4. Potential Analysis
- Pre-feasibility study stage
 1. Economy Analysis
 2. Trend Analysis
 3. 4Ps Analysis
- Preliminary investigation stage
 1. Comparison analysis
 2. Trend Analysis
 3. 4Ps Analysis
 4. Economy Analysis

5. Cost-benefit Analysis
 - Development schedule
 1. Cost-benefit Analysis
 2. Parameter Analysis
 3. Cumulative Analysis
 - Feasibility study
 1. Cost-benefit Analysis
 2. Economy Analysis

5. Discussion and Conclusion

It is a common practice for developers to use decision-making tools to analyse all information obtained. Developer forecast is derived from the extrapolation of trends combined with considerations for established forthcoming events plus built-in experience and Zainal (2013) also supported this characteristic. Financial and market decision-making tools are analytical instruments that support and complete the decision-making process.

All housing developers employ Payback Method, PI, ROC and ROI at the stage of exploring and assessing development. Throughout the early stages of the initiation phase, the decision-makers prefer to use four simple tools, which are appealing metric as their interpretations are easily understood. In the development evaluation stage, housing developers tend to use an easy and straightforward method. There are only two financial tools at this stage, namely PI and ROC and ROI. All the tools are useful as far as capital budgeting technique is concerned. Decision-makers refer to these tools when it comes to grading housing projects into investment return in gross value. The decision to continue the project is based on positive gross development values. When a company makes a capital investment, it expects to recover the initial cash committed and some additional cash in the future. This is similar recover with finding from Novak (1996); Whole Building Design Guide (2012) and Bilozor, Janowski & Walacik (2019).

Developers consider PI, Payback Method, ROC and ROI and IRR at the stage of a pre-feasibility study. Decision-makers at this stage are aware and refer to the level of debt services so that the result or valuation is more accurate and reflects the current market. Apart from Lake (2011); Bilozor, Janowski, and Walacik (2019); eHow (1999); Achelis (2011) the effect on the market value of outstanding debt and preferred stock, the number of historical interest rates on a corporation's debt and the dividend rates on its preferred stock issues are relatively insignificant. Housing developers agree that ROC and ROI and Interest Rate Analysis assist in analysing all information and variables gathered at the preliminary investigation stage. They use the three tools to measure the return on investment. Moreover, the value from analyses is regarded as profits. The tools are uncomplicated and suitable to implement, especially at the site. Moreover, the developer must avoid using all analyses on the basis of experience judgment as reiterated.

The accounting method is the only financial tool that developers use at development schedule stage. The rationale is that this stage presents a summarised review and checklist of results from the preceding stages. Practically, developers develop a model of straightforward mathematics, and computer simulation, and then decision-makers place all information in order for accounting analysis. Eventually, developers prefer to use cash flow with added NPV, discounted cash flow and IRR. At this stage, same idea with Wisniewski (2006), decision-makers measure the total value of the investment. All the information is gathered from each stage before it is analysed with these three financial tools to avoid missing information. The problem with approaches used by most developers to measure financial performance is that they measure too many variables, in addition to limited measures which are useful data in managing performance in organisations.

All housing developers employ various market analysis tools. Developers indicate that they use potential analysis and 4Ps at the stage of exploring and assessing development. There are only two tools utilised as the decision-making process emphasises mostly on developing and shaping the idea of a housing development. This stage contributes to simple market analysis. The rationale is that a decision-maker would prefer to have a decision in "gross" presentation to make it effortlessly understood. At the same time, the analysis illustrates decisions for the sake of long term return to the developer in value gained. The same situation occurs again at evaluating development stage that developers also use potential analysis and 4Ps along with the economic analysis as. As compared to Ofori (1990) and Triantaphyllou (2000), the stage of exploring and assessing the development, the methodology is generally focused on analysing demand and supply on a big scenario picture. Analysis at this stage aims at exploiting market growth by tailoring marketing, housing development and development strategies to satisfy customer demands and overcome market barriers as expected.

Pre-feasibility study stage utilises the same tools as the preceding stage, i.e. economy analysis, trend analysis and 4Ps (Mulliner, 2013). All housing developers use these market tools to assess current housing market in depth. The scope of the analysis must include demand and supply of houses, a pattern of demand, a pattern of construction resource, pros and cons of developing a housing project, past and future market of housing, capital cost, level and debt service and consumer behaviour. Developers usually use comparison analysis, trend analysis, economic analysis and 4Ps at the preliminary investigation stage. The tools work out the list of result analyses in stages before turning it into

reality. Besides, these tools allow decision-makers to review the data, as well as information, can be gathered systematically at sites and the surrounding.

For practical purposes, developers utilise parameter analysis and cumulative analysis, which is similar to sensitivity analysis at the development schedule stage. Both tools support decision-making for development by testing the results beforehand. Another benefit of these analyses is to support decision-makers develop more credible, understandable, compelling and persuasive recommendations. Compared to the feasibility study stage, developers incorporate cost-benefit analysis and economic analysis to make an accurate decision as to whether or not to proceed with a project. Although this stage requires in-depth financial analysis, however, subjective analysis is still required. Cost-benefit analysis and economy analysis can enable decision-makers to appraise the decisions accurately at the final stage of the initiation phase as related to Haris (2009) and Woodruff (2013).

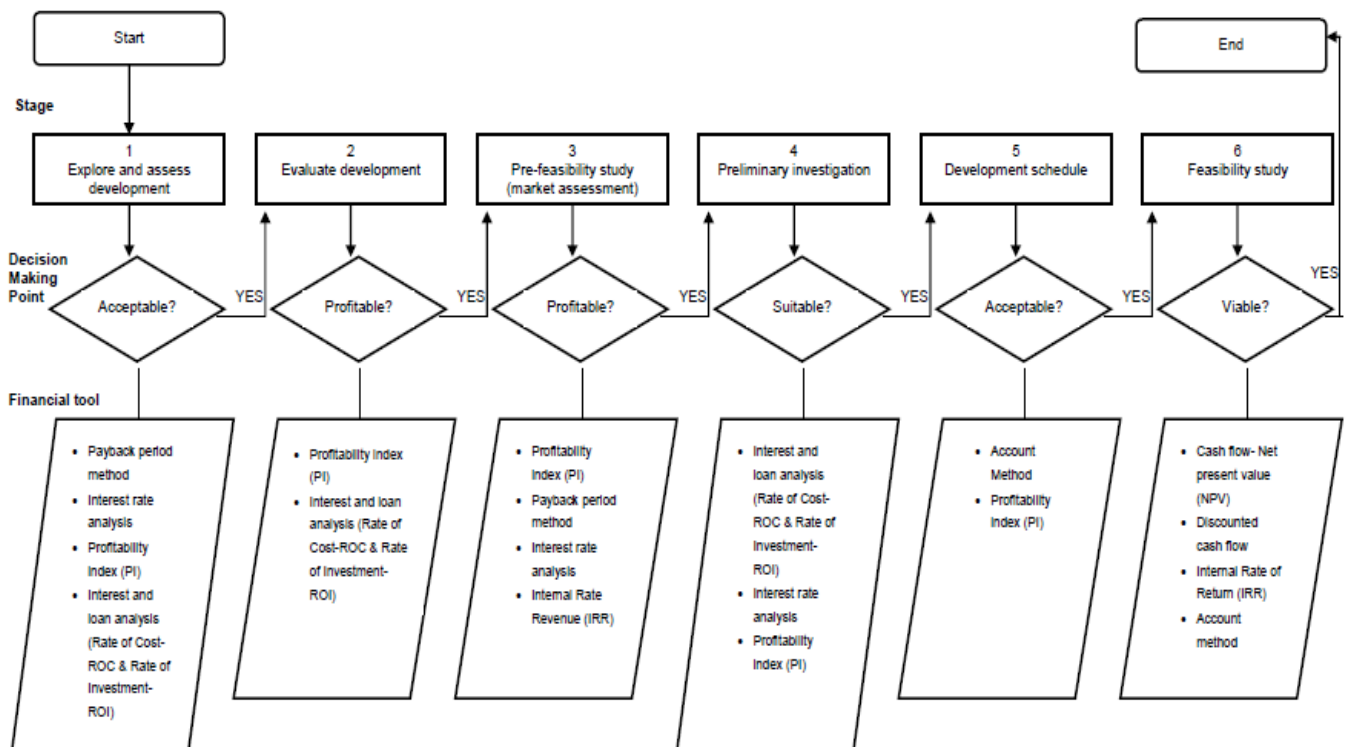
Housing developers predict the development of housing through the use of financial and market decision-making tools to extrapolate trends coupled with allocations for known forthcoming events plus built-in experience. All housing developers consider that ROC, ROI and Interest Rate Analysis help them analysing all information and variables obtained. Besides, they frequently employed DCF, NPV and IRR to facilitate the calculation of return on investment. Developers also indicate that they mostly utilize market decision tools such as Potential Analysis and 4Ps Comparison Analysis, Trend Analysis and Economic Analysis. There are many types of information which act as crucial resources when deciding on a housing development project. Those are economic, environment, physical, social and risk factors. Those are requisite information included when employing decision-making tools.

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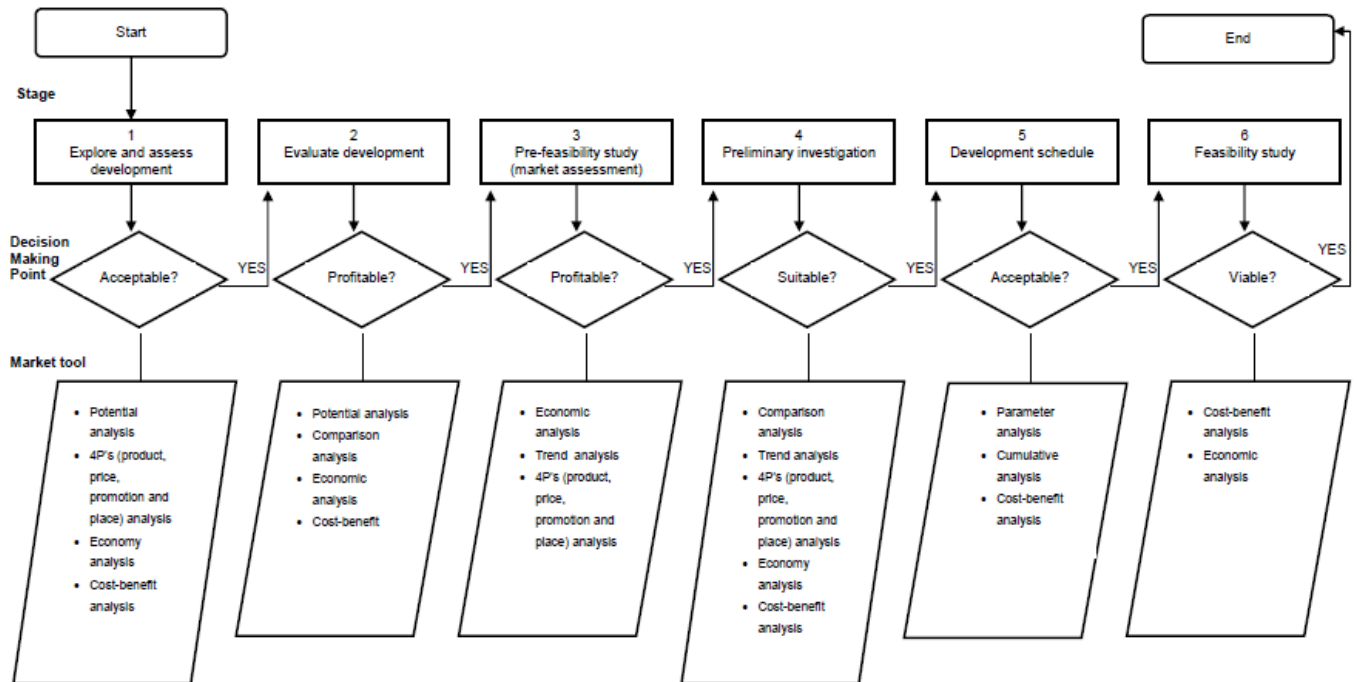
Appendix A

Financial decision tools used at the initiation phase process for housing development



Appendix B

Market decision tools used at the initiation phase process for housing development



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