

Feasibility Study of Housing Investment using YSQ Spreadsheet on Griya Tunggal, Jember Regency

Zahra Hanif Sholiha¹, Novi Puspitasari², Nurhayati³

¹Master degree in business Management, University of Jember, Faculty of Economic and Bussiness, Business Economic and Management, Kalimantan Street Jember, Indonesia

^{2,3}Lecturer University of Jember, Faculty of Economic and Bussiness, Business Economic and Management, Kalimantan Street Jember

Abstract:- The purpose of this study is to identify and analyze the financial aspect of housing investment on Griya Tunggal, Jember Regency. Capital budgeting will be used as assessment technique while YSQ Spreadsheet is used to assist in data processing. This study conducts to calculate Net Present Value (NPV), Internal Rate of Return (IRR), Profitability Index (PI) and Payback Period (PP). The calculation result shows that this investment is feasible with NPV Rp.315,468,959,- which the investment is acceptable because it produces a positive value. IRR also acceptable because the value of IRR is 25,89% which is more than the rate of return 7,25%. PI has 1,02 which that is acceptable investment because it generate P-value more than 1. The result of PP shows that the investment will have 10 years 9 months to recover the investment value with assumption the house will be rent within Rp.2,500,000, -/month, a monthly after the house is finished.

Keywords:- YSQ Spreadsheet, NPV, IRR, PI, PP, Feasibility Study, Housing Investment.

I. INTRODUCTION

The annual population growth rate in Indonesia has increased to 69,25% [1]. The increase in population affects the need for housing. The business environment in the property sector can create opportunities. The decree of the minister of public works and public housing of Republic Indonesia on the construction of simple unstructured housing requires the provision of roads, waste water management, water due to rain management, clean water management, and electricity supply. Housing development requires a design and plan to achieve the goal of optimizing for investment. Investment feasibility studies are significant in both the construction and engineering fields [2]. An investment feasibility study can be used as a basis for decision making in an investment project intended to generate a decent profit when development is carried out. An investment feasibility study is needed to evaluate a housing development project [3].

Houses and housing are described in UU No.1 of 2011 Chapter 1 Verses 7. A house is defined as a building that is suitable place to live with family, a reflection of the dignity and worth of its inhabitant, and an asset for its owner. SNI 03-1733-2004 concerning procedures for planning housing

and urban environments also explains further, namely that apart from having to meet the technical requirements for health and safety, the house must also provide comfort for its occupants, both thermal and psychological comfort according to the needs of the occupants [4].

Purnomo, et al., [5] explained that there are many aspects in conducting a business feasibility study, one of them is financial aspect. The financial aspect is a concept that discusses the time value of money assets invested. This means that the money we have today will have a different value in the next four years because the investment we make will earn interest so that the value of the investment will increase. Analysis of the value of money are discussed in three concepts, namely future value, present value, and annuity value. Purnomo, et al., [5] also mention capital budgeting is a common method that used to evaluate the investment of project.[6].

II. THEORY

2.1 Capital Budgeting

According to Ehrhardt, et al., [6] capital budgeting comes from two main syllables, capital and budget. Capital is defined as the long-term assets used in the production process and the budget is defined as the planned expenditure for the next period, and the capital budget is defined as the long-term asset investment plan.

In analyzing project investment, there are several techniques that can be used, namely:

1. Net Present Value (NPV),
2. Internal Rate of Return (IRR),
3. Profitability Index (PI), and
4. Payback Period

2.2 Net Present Value (NPV)

NPV is defined as the difference between the present value of cash inflows against the initial investment value. The greater the NPV value, the greater the project's contribution to profit to stakeholders. The projects will be accepted if the NPV value is positive ($NPV > 0$). However, if the NPV value is negative ($NPV < 0$) then the project is rejected, this is because there will be no profit to be gained from the investment project, but a loss. The formula used to calculate NPV is as follows [7].

$$NPV = CF_0 + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \dots + \frac{CF_N}{(1+r)^N} \quad (1)$$

$$\sum_{t=0}^N \frac{CF_t}{(1+r)^t} \quad (2)$$

Where :

CF_n = Cash Flow in year (n)
 r = Risk oppurtunity (%)

2.3 Internal Rate of Return (IRR)

IRR is the interest rate that gives the NPV of a project equal to the initial value/zero. Using trial and error, which is looking for several values so that is gives a positive and negative NPV, then IRR is searched using linier interpolation. A project investment is accepted if the IRR value is greater than the required rate of return. However, if the IRR value is less than the required rate of return, the project is rejected [7].

2.4 Profitability Index (PI)

Accroding to Atmaja, et al, [8] , profitability index or PI is a comparison ratio between the present value of cash flow and investment. This method is also called ‘Benefit Cost Ratio’. An investment project is accepted if the PI value is greater than 1 (PI>1), and an investment project is rejected if the value is less than 1 (PI<1) because there is no profit, but a loss. Mathematically, the NPV, IRR, and PI values will be aligned where if the NPV value is positive, then the IRR value will always exceed the risk oppurtunity value and PI will always be greater than 1 [9]

$$PI = \frac{PV \text{ Cash Flow}}{\text{Initial Investment}} = \frac{\sum_{t=1}^N \frac{CF_t}{(1+r)^t}}{CF_0} \quad (3)$$

2.5 Payback Period (PP)

Payback periode is defined as the number of years needed to pay off/return the value of (initial investment). The shorter the period required, the better the investment project [7].

$$\text{Payback period} = \frac{\text{Nilai investasi}}{\text{Aliran kas bersih}} \times 1 \text{ tahun} \quad (4)$$

III. METODOLOGY

YSQ spreadsheet is used for data processing methodology. YSQ Spreadsheet is a worksheet designed as a tool to assist in analyzing investment feasibility using Microsoft Excel 2016 software. YSQ spreadsheet was created to analyze the feasibility of investing using capital budgeting by calcaulating financial parameter from data that has been obtained. The calculation was done using a formula in Mircrosoft Excel 2016 software. The feasibilty study of housing investment project uses a qualitative and quantitative approach with primary and secondary data as a comparison for similiar projects.

The analysis aspect of the feasibilty study that was reviewed included technical aspects and financial aspects. The technical aspect focuses on the location of the

investment and layout while the financial aspect will be oriented to the present value compared to the investment that will be made.

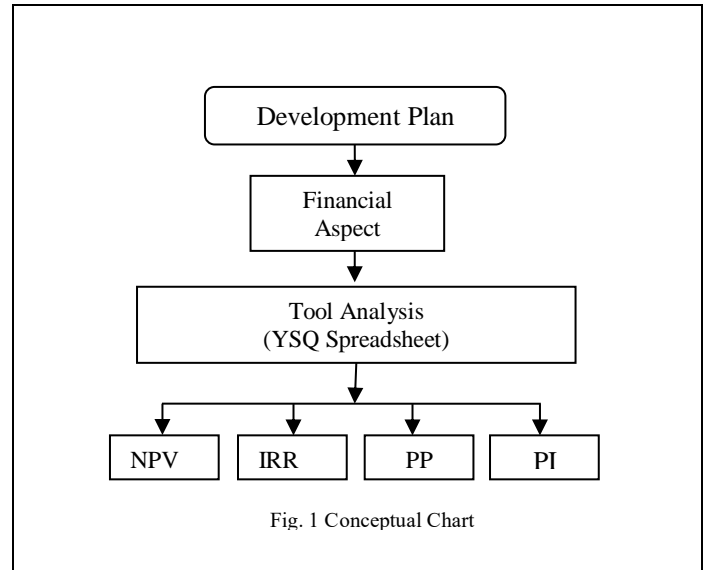


Fig. 1 Conceptual Chart

IV. RESULT AND DISCUSION

4.1 General Information of Location

This study was conducted on Griya Tunggul, Jalan Kaca Piring, Gebang Jember. In this location, 10 houses are planned to be built with 5 houses type A and 5 houses type B. Griya Tunggul will be built in land area of less than 200 m2. This residential building is located on a land that has an area of 1379, 2614 m2. The land area of each house unit is 90 m2. The building area of each residential unit is 42 m2.

4.2 YSQ Spreadsheet

The first page on this YSQ is the home page or the main menu which contains menu options that can be selected. There are eight menu options to choose from, ranging from an overview to the investment feasibility menu.

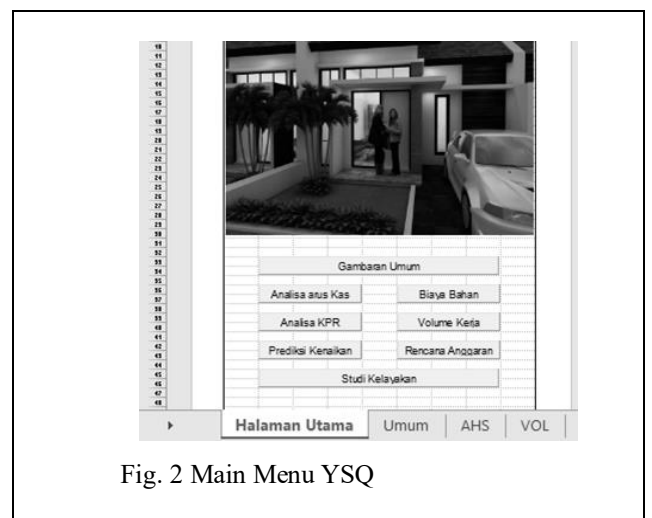


Fig. 2 Main Menu YSQ

YSQ Spreadsheet containing several worksheet which has each different focus for calculation, namely:

1. Main Menu
2. General Information
3. Material / Unit Price Analysis
4. Volume
5. Operational Budgeting Planning
6. Credit
7. Cash Flow
8. Investment and growth prediction
9. Financial aspect analysis

4.3 Financial Aspect

Cash flow is the financial movement of a project in the form of income and expenses from various project assets. Projects for investment are expected to generate greater cash flow than before investing. In the Griya Tunggul housing investment project, the analysis of the financial aspects of cash flow uses Net Present Value, Internal Rate of Return, Profitability Index, and Payback Period methods.

4.3.1 Net Present Value

Formula (1) and (2) are used for manual calculation, while on YQS Spreadsheet the formula should be converted into excel calculation function, therefore the formula is:

$$NPV = NPV(rate, value 1, value 2, ... value n) \tag{5}$$

Where :

- rate = bank discounted interest rate for 1 year
- value1 = investment cost
- value2 – n = cashflow on year 2 – year n

Based on NPV calculation on YSQ Spreadsheet, the value of NPV is Rp.315,468,959, -. According to criteria on point 2.2 Net Present Value (NPV)the result of PV is accepted because the value of NPV has positive value.

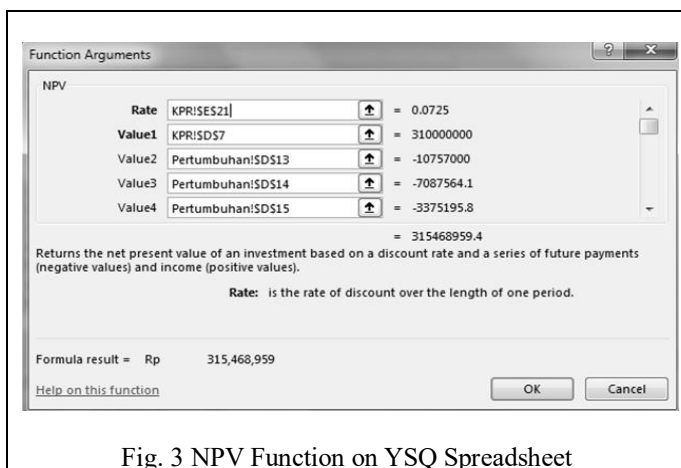


Fig. 3 NPV Function on YSQ Spreadsheet

4.3.2 Internal Rate of Return (IRR)

On YQS Spreadsheet the formula of IRR should be converted into excel calculation function, therefore the formula is:

$$IRR = IRR(value, [guess]) \tag{6}$$

IRR is the interest rate that the price is looking for. The value used is the result of the calculation between the value that must be issued by the customer and the NPV value in the year-n. Guess is an approximate result that is close to the IRR value. The IRR assessment criteria can be accepted if the IRR value is greater than the specified rate of return. Based on the IRR calculation on YSQ, the value is 25.98%, then the investment can be accepted because it produces an IRR value greater than the Bank's interest rate value of 7.25%.

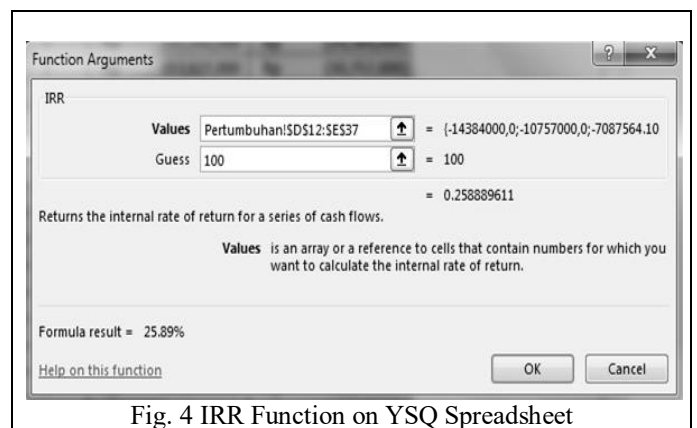


Fig. 4 IRR Function on YSQ Spreadsheet

4.3.3 Profitability Index (PI)

Profitability Index (PI) can be used in giving recommendations whether a project is accepted or not. PI is an investment appraisal method that calculates the ratio between the percentage value of revenue and the present value of the investment.

$$PI = NPV/CFo \tag{7}$$

Where :

CFo = Initial Cash Flow

Based on the calculation results, the PI is 1.02, so the investment is acceptable because the PI value is greater than 1 (1.02 > 1).

4.3.4 Payback Period (PP)

The formula used to calculate PP is according to formula (4). Based on the calculation of the YSQ Spreadsheet on this study, the PP value is 10 years 9 months assuming a monthly house rental price of Rp.2,500,000, -. The PP value will be faster if the rental price higher.

4.4 Study Barriers

Cell data that can be changed or calculated results are protected to avoid calculation errors due to inappropriate formula changes. If in the future there will be a change in the formula or addition of materials, then this protection must be opened first before making adjustments. Adjustments are not only in this worksheet, but also must consider changes to formulas in related worksheets such as volume worksheets and budget plans. Therefore, appropriate

preparation and higher time investment to create or modify YSQ Spreadsheet is needed.

V. CONCLUSION

Based on calculation on YSQ Spreadsheet for Housing Investment on Griya Tunggul, Jember Regency can be seen on

Table 1.

Table 1 Result Summary

	Results	Criteria	Notes
NPV	Rp 315,468,959	Positive (+)	Investment can be accepted due to NPV results is positive.
IRR	25.89%	More than	Investment can be accepted due to IRR results is higher than bank interest rate.
		7.25%	
PI	1.02	More than	Investment can be accepted due to PI results is more than 1.
		1	
PP	10	Rental assumption	With rental assumption, the cost of initial investment can be return on 10 Year and 9 Month.
	Year		
	9		
	Month	Rp 2,500,000	

According to the summary and result of financial aspect using YSQ Spreadsheet, can be concluded that housing investment on Griya Tunggul, Jember Regency is feasible and acceptable.

ACKNOWLEDGMENT

The author would like to express special thanks of gratitude to the author parents and brother as well as the author supervisor who gave a lot of support and discussion to completing this study within the limited time frame.

REFERENCES

- [1]. Indonesia Badan Standard Nasional Tata cara perencanaan lingkungan perumahan di perkotaan [Book]. - Jakarta : SNI, 2004.
- [2]. Kementrian-PUPR Kebijakan dan Strategi Nasional Perumahan dan Permukiman (KSNPP). - Jakarta : [s.n.], May 13, 2002.
- [3]. Yaser A. A., A.A. Sulaiman and Khalid A.S. Theory and Practice In Capital Budgeting: Evidence From Kuwait [Journal]. - [s.l.] : The journal of Applied Business Research, 2016. - Vol. Vol. 32 No. 4.
- [4]. RI DPR UU No.1 Tahun 2011 - Perumahan dan Kawasan Permukiman [Book]. - Jakarta : DPR RI, 2011.
- [5]. Purnomo R.A., Riawan and Sugiarto L.A. Studi Kelayakann Bisnis [Book]. - Ponorogo : Unmuh Ponorogo Press, 2017.
- [6]. Ehrhardt M. C. and Brigham E. F. Financial Management [Book]. - Ohio : Joe Sabatino, 2011.
- [7]. Kasmir and Jakfar Studi Kelayakan Bisnis Edisi Revisi [Book]. - [s.l.] : Premadia, 2003.
- [8]. Atmaja and L. Setia Teori dan Praktik Manajemen Keuangan [Book]. - Yogyakarta : Andi, 2008.
- [9]. Soedarsono, Pramodya and Wibowo K Feasibility Study and Investment Analysis Of Mix use Sentraland Semarang [Conference] // Proceedings of International Conference: Problem Solution and development of Coastal and Delta Areas. - Semarang : [s.n.], 2017. - Vols. N/A. No.C-68.