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Sensitivity Analysis of Revenue Potential in The Evaluation of East Surabaya Hospital Investment

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ABSTRACT

As one of the largest cities in Indonesia, the City of Surabaya has an obligation to provide excellent health services for its residents. It goes without saying that Surabaya City Government is required to provide a General Hospital that can receive referrals from the government-owned Community Health Centers. For this reason, the Surabaya City Government built the East Surabaya Hospital which is located in Rungkut Sub-District. East Surabaya Hospital is a strategic project that requires investment feasibility analysis. The East Surabaya Hospital investment feasibility analysis was done by applying the Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PP) and Benefit Cost Ratio (BCR) parameters. After the feasibility analysis results were obtained, a sensitivity analysis was done on changes in management costs and the amount of health service levy rates for each Fees alternative. Based on the results of the investment feasibility analysis of 4 (four) Fees alternatives, there are 2 alternatives that can be concluded as worthy investments, which are alternative 1 and alternative 3. Meanwhile, alternative 2 and alternative 4 are not feasible since the NPV parameter shows negative values and the IRR value is lower than the MARR value. However, based on sensitivity analysis, alternatives 2 and 4 can be feasible if alternative 2's service rate is increased by 13.2%, and alternative 4's service rate is increased by 2.3%. The opposite applies in alternative 1 where the investment might become unfeasible if the service rate is reduced by more than 5.4% and alternative 3 might become unfeasible if the service rate is reduced by more than 2.5%.

Keywords: Hospital, Investment Feasibility Analysis, Sensitivity

1. Introduction

Surabaya City is the capital of East Java Province which is strategically located to support the development and growth of the city. As stipulated in the Decree of the Minister of Home Affairs Number 100.1.1-6117 of 2022 concerning the Provision and Updating of Codes, Data on Government Administration Areas, and Islands, Surabaya City has an area of 335.925 km^2. The north side of Surabaya City is bordered by the Java Sea and Madura Strait, while the south side of Surabaya City is surrounded by Sidoarjo Regency. The west side of Surabaya City is directly adjacent to Gresik Regency and the east side of Surabaya City is Madura Strait. Topographically, most of Surabaya City is a lowland area and there is a small part of Surabaya City that has a hilly contour with a relatively small slope level. Based on these conditions, Surabaya City is an ideal city as one of the trade and service epicentres in Java Island, especially East Java Province. Based on data from the Population and Civil Registration Office of Surabaya City, there are 3,009,286 residents who have a population identity as residents of Surabaya City. However, it is not only residents who have a residence identity as Surabaya City residents who need attention. There are a number of residents who live in Surabaya City either permanently or non-permanently outside of the 3,009,286 residents recorded. As such, this can be a fairly influential contributor in contributing to the population density of Surabaya City. The population density of

Surabaya City certainly causes various consequences of problems that are quite complex and require special attention for stakeholders in Surabaya City, especially for the Regional Government.

In spite of focusing on the issue of population density in terms of population and area, the distribution of population in Surabaya City is also a matter of considerable concern. Surabaya City is administratively divided into 31 sub-districts, not every area has an even distribution of population. In general, the area does have its own development potential and attractiveness that causes city residents to have a preference to live and move in the area. Therefore, the Regional Government makes efforts to stimulate the growth of economic and social activities in areas with relatively low population through the development of supporting infrastructure and the development of embryonic community-based business activities, which are expected to leverage the potential of the region. In contrast to areas with low population density, the Regional Government focuses on priority programmes related to the provision of education, health, environment, infrastructure, community empowerment, sanitation and clean water services in areas with high population density. This is intended to ensure environmental, social and economic quality, which is a basic service of the Regional Government to the community, especially in that area.

As has been described in relation to the development of the city which is quite varied, of course the impacts arising from the consequences of the development of Surabaya City are not only positive impacts, but there are also some consequences that have negative values. One of the negative impacts of the development of Surabaya City that is currently being faced is the emergence of densely populated settlement areas with inadequate infrastructure, environment and sanitation facilities. For this reason, the Local Government pays special attention in terms of ensuring the quality of life of the community, especially those in densely populated areas that are vulnerable to these problems. The realisation of a decent quality of life is a basic need for all parties (Nathanael & Indryani, 2023). Not only by individuals, but families, groups and even the general public also need a decent quality of life (Tenawaheng et al., 2021). In an effort to achieve a decent quality of life, one of the special concerns of the Regional Government is the improvement of public health services through promotive, preventive, curative and rehabilitative approaches that are carried out in a comprehensive, integrated, and sustainable manner (Djuhatmoko et al., 2019).

Based on the description of the problems above, the Surabaya City Government must provide a specific orientation on the quality and quantity of basic community services that are needed, one of which are basic health services. To that end, in improving access to health services for residents of Surabaya City, the Surabaya City Government has facilitated with 63 (sixty three) Puskesmas that provide first level health services and 2 (two) RSUD that provide third level health services, namely RSUD Dr. M. Soewandhie located in Central Surabaya and RSUD Bhakti Dharma Husada located in West Surabaya.

Thus far, Surabaya City Government does not have a second level health care facility that can be facilitated by Class C and Class D Hospitals. In order for Surabaya City Government to guarantee more optimal basic health services to the residents of Surabaya City, it is necessary to arrange tiered referrals to health services in Surabaya City, one of which is by establishing a Class C General Hospital in Surabaya City which can receive referrals from Puskesmas. Based on several considerations both in terms of improving the quality of services and equitable access to health services, the City Government is carrying out the Construction of East Surabaya Hospital.

The construction of East Surabaya Hospital located in Rungkut, Surabaya City is one of the strategic projects of Surabaya City Government. Considering this matter, it is necessary to analyse the feasibility of investment in the construction of East Surabaya Hospital by taking into account the cost of hospital management and hospital service retribution rates that will be imposed based on the rules set by the Surabaya City Government.

Based on previous research conducted by by (Agni, 2022) regarding the financial feasibility of investment in the Hospital Inpatient and Outpatient Service Development Plan, the cash flow analysis has taken into account all cost components including investment costs, operational costs and revenue derived from inpatient and outpatient service rates. Based on the existing cost components, an investment analysis was carried out using the discounted cashflow method with Payback Period (PP), Net Present Value (NPV) and Internal rate of Return (IRR) parameters. From the results of the study, it can be concluded that the investment is feasible based on the parameters that have been determined. However, the research has not taken into account

components that have a high enough influence on the success or failure in the process of investment activities. Therefore, in addition to calculating the investment feasibility analysis, this research will also conduct an analysis related to components that affect investment feasibility. This analysis is known as sensitivity analysis, where the variables that have been determined will be analysed for their level of influence on the overall investment feasibility (Nathanael & Indryani, 2023).

The purpose of this research is to analyse the investment feasibility of East Surabaya Hospital, Rungkut District, Surabaya City with the parameters of Net Present Value (NPV), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR) and Payback Period (PP), as well as analysing the level of sensitivity of East Surabaya Hospital investment, Rungkut District, Surabaya City to the hospital income component.

2. Literature Review

In this research, investment evaluation analysis will be carried out through conventional methods using the Payback Period (PP) indicator, while the Discounted Cash Flow (DCF) method will use 3 (three) parameters, namely Net Present Value (NPV), Internal Rate of Return (lRR) and Benefit Cost Ratio (BCR). The following will describe the explanation of the calculation method that will be used.

2.1. Net Present Value (NPV)

Net Present Value (NPV) is investment over the life of the investment. Net Present Value (NPV) is a financial analysis used to determine the feasibility of an investment made by taking into account the present value of the net cash flow to be received over the life of the investment compared to the present value of the investment capital issued at this time with regard to a certain interest rate. The following Net Present Value (NPV) calculation formula can be used (Abdurrabby, 2019):

$$\mathbf{NPV} = \sum_{t=0}^{n} \left(\frac{(C)t}{(1+i)^t} \right) - \sum_{t=0}^{n} \left(\frac{(Co)t}{(1+i)^t} \right) \qquad (1)$$

The indicators of the NPV calculation are:

- NPV is positive (+) means it is good and acceptable.
- NPV is negative (-) means it is rejected.
- NPV is equal to zero (0) is neutral, can be accepted, can be rejected.

2.2. Internal Rate of Return (lRR)

Internal Rate of Return (IRR) is a method to measure the rate of return. Unlike the evaluation of the Net Present Value (NPV) and Benefit Cost Ratio (BCR) methods which use interest rates as a factor in calculating investment feasibility, the IRR method aims to obtain the interest rate when the NPV is equal to zero (Yusup, 2018). This method can be used to determine how strong the cash flow is in returning the capital and the amount of obligations that must be fulfilled. The strength of cash flow in returning capital is what is called the Internal Rate of Return (IRR) (Giatman, 2006).The IRR calculation formula is as follows (Yan & Zhang, 2022):

$$\text{NPV}=\sum \frac{B_t}{(1+r)^n} - \sum \frac{C_t}{(1+r)^n} = 0 \qquad (2)$$

Based on the formula above, where IRR = r, the benchmark that can be used to assess the feasibility of investment from the IRR calculation is the MARR (Marginal Average Revenue Return) value, where the investment can be accepted if the IRR value exceeds the MARR value. The formula for determining MARR is as follows (Hidayat et al., 2021):

$$MAAR = (1+i)(1+f) - 1 \qquad (3)$$

2.3. Benefit Cost Ratio (BCR)

Benefit Cost Ratio (BCR) is a method that is often used in the initial evaluation stage of investment planning or as an additional analysis in order to validate the results of evaluations that have been carried out by other methods. In addition, this method is very good for evaluating government projects that have a direct impact on many people, both positive and negative impacts. The BCR calculation formula is as follows (Khairani et al., 2023):

$$BCR = \frac{Benefit}{Cost} \quad atau \quad \frac{\sum Benefit}{\sum Cost} \qquad (4)$$

Based on the BCR method, the decision criteria used are as follows:

- BCR ≥ 1, then the investment project is feasible.
- BCR < 1, then the investment project is not feasible.

The BCR method emphasises the value of the comparison between the aspects of benefits that will be obtained with the aspects of costs and losses that will be borne (cost) with the investment.

2.4. Payback Period (PP)

Payback Period (PP) basically aims to determine how long the investment period will be returned when the break even point (BEP) condition occurs. Based on the results of the payback period (PP) calculation, it can be assessed whether an investment is feasible or not by paying attention to the resulting payback period (PP) value. If the payback period (PP) value is smaller than the investment life, then the investment is declared feasible to run. The opposite applies, that if the payback period (PP) value is greater than the investment life, then the investment is declared not feasible to run. To calculate the payback period (PP) value, the existing cash flow situation can be examined first and the following equation is used follows (Khairani et al., 2023):

$$PBP = n + \frac{a-b}{c-b} \; x \; 1 \; tahun$$

In which:
n : The last year in which the cash flow still does not cover the initial investment
a : Total initial investment
b : Cumulative amount of cash flow in year n
c : Cumulative amount of cash flow in year (n+1)

3. Methodology

3.1. Research Subject

The subject of this research is East Surabaya Hospital which is located at Jl. Medokan Asri Tengah, Medokan Ayu Village, Rungkut District, Surabaya. East Surabaya Hospital was built by the Surabaya City Government Health Office where the construction allocation was carried out through multi-year budgeting which was carried out in fiscal year 2023 and fiscal year 2024.

3.2. Object

The object of the research is various kinds of costs that can affect the feasibility of investment, including investment costs, operational / management costs and income from health services at East Surabaya Hospital.

3.3. Data Collection Procedure

In this research, data collection was obtained from interviews with parties involved in the construction of the East Surabaya Hospital, then documented as data that could be used in the research implementation process later. The observation method was also carried out in data collection with the aim of obtaining an overview of the implementation of the activities carried out. Based on its type, the data collected in this study can be categorised as follows.

3.3.1. Primary Data

1) Primary Data Interview

There are two interviews in this research as a primary data. The first is interview about the funding of Surabaya City General Hospital which includes the components that make up operational costs, service Fees and revenues both Surabaya City Government Budget Team as planners and financial managers, and the second is interviews with the budget user authority, which is the Health Office related to investment costs incurred.

2) Observation

The location of the observation is both in the location of the Hospital plan, which is on Tambak Wedi Tengah Timur I Street, Medokan Ayu Village, Rungkut Subdistrict, Surabaya City and Regional Public Hospitals in Surabaya City that have been operating as a comparison material, namely Dr. M. Soewandhie Hospital and Bhakti Dharma Husada Hospital.

3.3.2. Secondary Data

The secondary data sources for this research include several government agencies in Surabaya City. First, the Badan Perencanaan Pembangunan Daerah, Penelitian dan Pengembangan provided the Regional Medium-Term Development Plan Document for 2021-2026 and the Preliminary Draft of the Local Government Work Plan Document for 2025. The Badan Pengelolaan Keuangan dan Aset Daerah contributed data on hospital development budget allocations and revenue realization. Additionally, the Dinas Perumahan Rakyat, Kawasan Permukiman dan Pertanahan supplied the Detailed City Spatial Plan for the hospital construction site. Lastly, the Dinas Kesehatan provided detailed health service tariff data, the FS Document for Hospital Construction, and comprehensive data on hospital operating costs.

3.4. Data Analysis

Data analysis is the process of systematically searching and compiling data obtained from interviews, field observations, information documentation and literature studies, then sorting it according to what the researcher will do.

3.5. Investment Evaluation Analysis

From the results of primary and secondary data collection related to investment feasibility factors for East Surabaya Hospital, a sensitivity analysis is then carried out so that changes in factors that are most influential in success or failure during the implementation of East Surabaya Hospital investment can be identified. Sensitivity analysis takes into account the effect of changes in each factor reviewed on the performance of investment receipts determined by the indicator Net Present Value (NPV), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR) dan Payback Period (PP).

4. Results and Discussion

4.1. Project Investment Cost Data

The investment cost of East Surabaya Hospital is secondary data obtained from the Surabaya City Government Health Office Budget Work Plan which is allocated through multi-year budgeting in 2023 and 2024, but in practice, payment for hospital construction was made in 2014, due to adjustments to design changes that affected the start of work implementation. The following details of investment costs for the East Surabaya Hospital, Rungkut Sub-district, are presented in the table below:

Table 3. East Surabaya Hospital Investment Cost

No.	Investment Cost Details	Total Cost (Rp.)
1	Pre-construction Cost	
	- Licensing and fees for AMDAL	604.850.100
	- Planning costs	1.501.100.000
2	Construction Cost - Structural, architectural, infrastructure and utilities costs - OHS costs - Parking lot construction costs	302.144.400.000
3	Supervision fee (construction management)	4.749.980.000
4	Management information system costs	1.515.800.000
5	Medical device procurement costs	126.663.197.089
6	Vehicle procurement costs	6.750.000.000
Total investment cost (IDR)		**443.929.327.189**

Source: Dinas Kesehatan of Surabaya, Processed by the Author (2024)

Based on the description in Table 3, the components that make up the investment cost of East Surabaya Hospital are pre-construction costs, construction costs, supervision costs, hospital management information system costs, medical equipment procurement costs and vehicle procurement costs. The component with the largest value in this investment is the cost of building the hospital, which is Rp. 302,144,400,000, where the value includes the cost of construction work, architectural fees, utility installation costs, K3 costs and parking lot development costs.

4.2. Expenditure Cost Data

Expenditure costs at East Surabaya Hospital are secondary data obtained from Dinas Kesehatan Surabaya based on the Budget Work Plan (RKA) of the RSUD that has been operating and then processed so as to obtain a detailed value of expenditure cost data for 1 (one) year is as follows:

Table 4. East Surabaya Hospital Investment Cost

No.	Details of Expenses	Total Cost (Rp.)
1	Medical personnel salary expenditure	83.944.761.788
2	- Medical operational expenditure - Inpatient - Outpatient - Laboratory - Pharmacy, etc.	60.049.509.863
3	Non-medical staff salary expenditure - Directors and staff - Administrative & technical officers	32.721.196.875
4	Hospital support operational expenditure	8.284.390.795
5	Waste operational expenditure	807.646.089
6	Vehicle maintenance expenditure	2.137.401.849
7	Utility maintenance expenditure	4.037.044.366
8	Medical equipment maintenance expenditure	5.512.512.367
9	Building maintenance expenditure	2.160.680.214

10	Other expenditure - Licensing expenses (PBB, accreditation) - Training costs	 109.789.636 876.644.508
Total cost of expenditure (Rp)		**200.641.578.350**

Source: Dinas Kesehatan Kota Surabaya, Processed by the Author(2024)

The components with the largest amount of expenditure in East Surabaya Hospital are medical personnel salary expenditure of Rp. 83,944,761,788 and medical operational expenditure of Rp. 60,049,509,863. Both of these are core components of East Surabaya Hospital services. The component details in table 4.4 are the projected expenditure costs incurred in the first year of investment.

4.3. Income Source Data

Based on the Government Regulation No. 47 of 2021 regarding the Implementation of the Hospital Sector and taking into account the projected patient visits from health insurance recipients, it is necessary to consider sorting out the revenue from the National Health Insurance and the general costs.

Table 5. Hospital Revenue Projections

No.	Revenue Description	Total (Rp)
Health Service Revenue		
1	Emergency Room for the national insurance member	3.992.901.952
2	General Emergency Room	1.108.800.000
3	Doctor Visite Services	628.320.000
4	Surgery for the insurance member	11.673.772.488
5	General Surgery	5.011.521.274
6	Layanan Penunjang Medis - Laboratory - Radiology - Blood Bank - Haemodialysis - Pharmacy	 11.310.062.400 16.012.926.720 2.359.375.200 2.065.585.560 20.454.408.000
7	Hospitalisation for the national insurance member	12.965.662.918
8	General Hospitalisation	10.608.269.660
9	Outpatient for the national insurance member	52.944.845.654
10	General outpatient	14.311.879.875
Other Income		
1	Room Rent	21.600.000
2	Education, Training, and Research	120.000.000
3	Medical Resume	9.000.000

4	Parking fee	281.543.500
Total (Rp)		**165.880.475.203**

Source: Dinas Kesehatan Surabaya City, Processed by the Author (2024)

The revenue source with the largest amount in the overall revenue of East Surabaya Hospital is revenue sourced from outpatient and inpatient services, followed by revenue from the medical support service sector. Both components are the essential services in East Surabaya Hospital's services. The component details in table 5 are projections of hospital revenue in the first year of service operation.

4.4. Research Findings

Investment evaluation of East Surabaya Hospital needs to be carried out to determine the feasibility of investment over the life of the plan. In this study, investment evaluation is analysed using several parameters. From the calculation results of each parameter, an analysis will then be carried out on the investment feasibility of each alternative that has been determined. The results of the East Surabaya Hospital investment evaluation against the predetermined parameters are presented in the following table:

Table 6. East Surabaya Hospital investment evaluation results

Alternative Service Fee	NPV (Rp.)	IRR (%)	BCR	PP (Year)	Conclusion
Alternatif 1	401,311,611,822	15.759%	1.32	6.66	Feasible
Alternatif 2	- 64,863,131,469	3.769%	1.05	9.01	Not Feasible
Alternatif 3	324,928,532,197	14.250%	1.28	6.91	Feasible
Alternatif 4	212,682,371,942	11.766%	1.21	7.31	Not Feasible

Source: Author's Processed Data (2024)

Based on the investment evaluation results presented in table 6, it can be concluded that:

1. Alternative scheme 1 produces an NPV value of IDR 401,311,611,822, IRR of 15.759%, BCR of 1.32 and PP of 6.66 years, so the investment is appropriate;
2. Alternative scheme 2 resulted in an NPV value of Rp. 64,863,131,469, IRR of 3.769%, BCR of 1.05 and PP of 9.01 years, so the investment is not feasible to implement because the NPV value reaches a minus value and the IRR value is smaller than the MARR value;
3. Alternative scheme 3 produces an NPV value of Rp. 324,928,532,197, IRR of 14.250%, BCR of 1.28 and PP of 6.9 years, so the investment is feasible;
4. Alternative scheme 4 produces an NPV value of Rp. 212,682,371,942, IRR of 11.766%, BCR of 1.21 and PP of 7.31 years, so the investment is not feasible to implement, because the IRR value is smaller than the MARR value.

4.5. Sensitivity Analysis of Health Service Retribution Rates

Sensitivity analysis on Health service retribution rate is presented in the following table:

Table 7. Sensitivity Analysis of Retribution Rates

Changes	Investment Parameters				Conclusion
	NPV	IRR	PP	BCR	
Alternative 1 (Decrease)					
0.051	284,300,455,238	13.11%	7.19	1.26	Feasible
0.052	282,006,118,835	13.06%	7.20	1.26	Feasible
0.053	279,711,782,431	13.01%	7.21	1.26	Feasible

Table 7. Sensitivity Analysis of Retribution Rates

Changes	Investment Parameters				Conclusion
	NPV	IRR	PP	BCR	
0.054	277,417,446,028	12.95%	7.22	1.26	Not Feasible
0.055	275,123,109,624	12.90%	7.23	1.25	Not Feasible
0.056	272,828,773,220	12.85%	7.24	1.25	Not Feasible
0.057	270,534,436,817	12.79%	7.25	1.25	Not Feasible
0.058	268,240,100,413	12.74%	7.26	1.25	Not Feasible
0.059	265,945,764,010	12.68%	7.27	1.25	Not Feasible
0.060	263,651,427,606	12.63%	7.28	1.25	Not Feasible
Alternative 2 (Increase)					
0.129	226,495,546,270	12.84%	6.79	1.21	Not Feasible
0.130	228,372,889,351	12.89%	6.78	1.21	Not Feasible
0.131	230,250,232,431	12.95%	6.76	1.21	Not Feasible
0.132	232,127,575,512	13.00%	6.75	1.21	Feasible
0.133	234,004,918,593	13.05%	6.74	1.21	Feasible
0.134	235,882,261,673	13.10%	6.72	1.21	Feasible
0.135	237,759,604,754	13.16%	6.71	1.21	Feasible
0.136	239,636,947,835	13.21%	6.70	1.21	Feasible
0.137	241,514,290,915	13.26%	6.69	1.21	Feasible
0.138	243,391,633,996	13.31%	6.67	1.22	Feasible
Alternative 3 (Decrease)					
0.020	280,569,465,718	13.20%	7.12	1.25	Feasible
0.021	278,351,512,394	13.15%	7.13	1.25	Feasible
0.022	276,133,559,070	13.10%	7.14	1.25	Feasible
0.023	273,915,605,746	13.05%	7.15	1.25	Feasible
0.024	271,697,652,422	12.99%	7.16	1.25	Feasible
0.025	269,479,699,098	12.94%	7.17	1.25	Not Feasible
0.026	267,261,745,774	12.89%	7.18	1.25	Not Feasible
0.027	265,043,792,450	12.83%	7.19	1.25	Not Feasible
0.028	262,825,839,126	12.78%	7.20	1.24	Not Feasible
0.029	260,607,885,802	12.73%	7.21	1.24	Not Feasible
Alternative 4 (Increase)					
0.021	256,902,222,380	12.88%	7.09	1.24	Not Feasible
0.022	259,007,929,544	12.93%	7.08	1.24	Not Feasible
0.023	261,113,636,707	12.99%	7.07	1.24	Feasible

Table 7. Sensitivity Analysis of Retribution Rates

Changes	Investment Parameters				Conclusion
	NPV	IRR	PP	BCR	
0.024	263,219,343,871	13.04%	7.06	1.24	Feasible
0.025	265,325,051,035	13.09%	7.05	1.24	Feasible
0.026	267,430,758,199	13.14%	7.04	1.24	Feasible
0.027	269,536,465,362	13.19%	7.03	1.24	Feasible
0.028	271,642,172,526	13.25%	7.02	1.24	Feasible
0.029	273,747,879,690	13.30%	7.01	1.25	Feasible
0.030	275,853,586,853	13.35%	7.00	1.25	Feasible

Source: Author's Processed Data (2024)

Based on the table above, the following conclusions can be drawn:

1. Alternative Fees 1 is declared Not Feasible and quite sensitive if there is a decrease in hospital service rates above 5.4%;
2. Alternative Fees 2 is declared Feasible and quite sensitive if there is an increase in hospital service rates of at least 13.2%;
3. Alternative Fees 3 is declared Not Feasible and quite sensitive if there is a decrease in hospital service rates above 2.5%;
4. Alternative Fees 4 is declared Feasible and quite sensitive if there is an increase in hospital service rates of at least 2.3%.

The following graph illustrate the sensitivity of NPV and IRR values to changes in the amount of service fee costs:

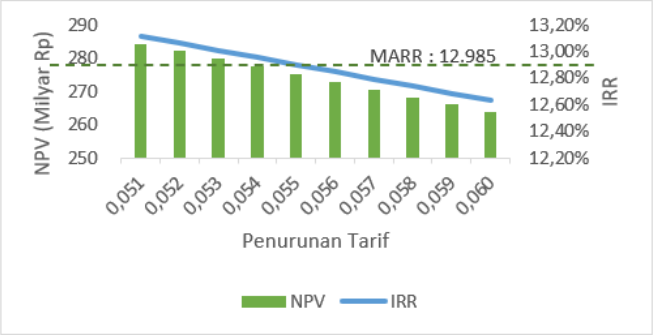

Figure 1. Sensitivity graph of hospital service charge rate to NPV and IRR in Alternative 1 scheme
Source: Author's Processed Data, 2024

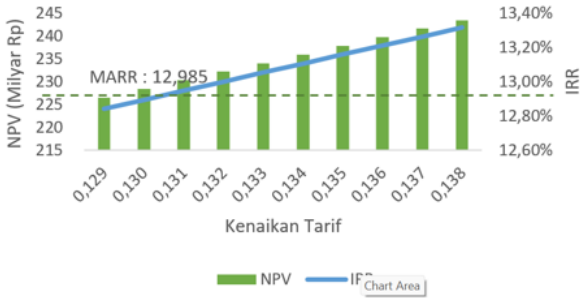

Figure 2. Sensitivity graph of hospital service charge rate to NPV and IRR in Alternative 2 scheme
Source: Author's Processed Data, 2024

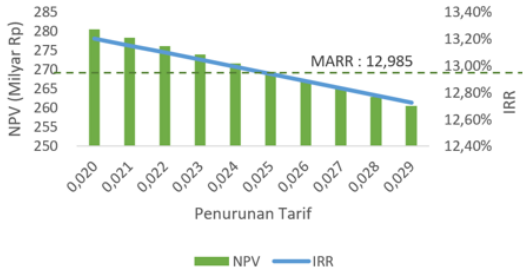

Figure 3. Sensitivity Graph of Hospital Service Retribution Rate on NPV and IRR in Alternative 3 Scheme

Source: Author's Processed Data, 2024

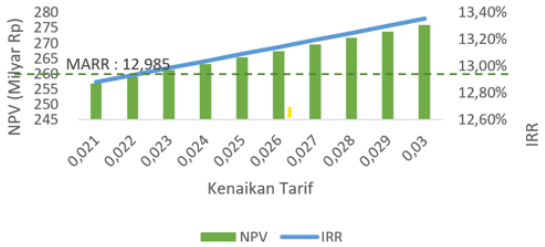

Figure 4. Sensitivity Graph of Hospital Service Retribution Rate on NPV and IRR in Alternative 4 scheme

Source: Author's Processed Data, 2024

5. Conclusion

The investment evaluation and sensitivity analysis of the potential income of East Surabaya Hospital, considering parameters such as Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PP), and Benefit-Cost Ratio (BCR), led to several conclusions regarding the feasibility of different alternatives. Alternative 1 is feasible to implement under the current conditions but is highly sensitive to service fee reductions; a decrease of more than 5.4% would render it not feasible. On the other hand, Alternative 2 is not feasible at present but shows potential if there is an increase in service fees by at least 13.2%, making the investment viable.

Alternative 3, like Alternative 1, is currently feasible but is sensitive to a smaller reduction in service fees of up to 2.5%; any reduction beyond this point would make it unfeasible. Meanwhile, Alternative 4 is not feasible under the current conditions but could become feasible with a modest increase in service fees by 2.3%. This sensitivity analysis highlights the importance of maintaining or adjusting service fees to ensure the feasibility of these investment alternatives for East Surabaya Hospital

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