TRANSPUBLIKA
Precise. Resilience. Felicitous.

Journal of Humanities, Social Sciences and Business
https://ojs.transpublika.com/index.php/JHSSB
Online ISSN 2810-0832

https://doi.org/10.55047/jhssb.v4i2.1580

Original Article

Feasibility Analysis of the Construction of the North Surabaya Hospital from the Financial Aspect

Lestyanto Wahyu[1*], Andi Patriadi[2], Sajiyo[3]

[1-3]Master of Civil Engineering Study Program, Faculty of Engineering, Universitas 17 Agustus 1945 Surabaya, Indonesia
Email: [1)] lestyantowahyu@gmail.com, [2)] andipatriadi@untag-sby.ac.id, [3)] sajiyo@untag-sby.ac.id

Received : 17 December - 2024
Accepted : 26 January - 2025
Published online : 28 January - 2025

Abstract

The purpose of this research is to analyze the investment feasibility of North Surabaya Hospital, Bulak District, Surabaya City with the parameters of Net Present Value, Internal Rate of Return, Benefit Cost Ratio (BCR) and Payback Period. This research focuses on the North Surabaya Hospital which was built by the Surabaya City Government Health Office with a budget allocation for the 2026 fiscal year. The research instruments used are interview guidelines and observation sheets, with data collection procedures through interviews with related parties in hospital construction, site observation, and documentation which includes primary and secondary data. Based on the investment analysis of North Surabaya Hospital and sensitivity evaluation of operational costs and potential income, the conclusions obtained are: Alternative 1 is feasible because it produces an NPV value of Rp. 211,014,227,005, IRR of 9.85%, BCR of 1.23 and PP of 7.69 years. Alternative 2 is not feasible because it generates NPV of IDR 28,416,192,984, IRR of 6.57%, BCR of 1.14 and PP of 8.34 years. Alternative 3 is not feasible because it generates NPV of IDR 66,444,241,124, IRR of 7.30%, BCR of 1.16 and PP of 8.20 years. Alternative 4 is feasible because it generates NPV of Rp. 166,294,504,181, IRR of 9.26%, BCR of 1.20 and PP of 7.70 years.

Keywords: Development Feasibility, Management Cost, Revenue, Hospital.

1. Introduction

Surabaya City is the capital city of East Java Province which has a strategic location to support the development and growth of the city. With an area of 335.925 km², Surabaya is inhabited by 3,017,382 people who are registered as city residents. In addition to the registered population, there are also people who live permanently or non-permanently in Surabaya, which contributes to population density. This density triggers various complex problems that require special attention from stakeholders, especially the local government. One of the negative impacts of Surabaya's growth is the emergence of densely populated settlements with inadequate infrastructure, environment and sanitation conditions. The Local Government focuses on improving the quality of life of the community, especially in densely populated areas. One of the priorities is to provide quality health services through a comprehensive, integrated, and sustainable promotive, preventive, curative, and rehabilitative approach. For this reason, the Surabaya City Government decided to build a class C hospital in a strategic area on the north side of the city, precisely in Bulak District. The North Surabaya Hospital is expected to complete the referral system for public health services from first-level health facilities before heading to class A and B hospitals (Dahliana et al., 2022).

In managing the finances of regional public hospitals, it is important to pay attention to the revenue, expenditure and financing components in investment activities. These three

Copyright: © 2024 by the authors.
This is an open access article distributed under the terms and conditions of the CC BY 4.0.

components have a major influence on the success of investment in hospitals. The expenditure component consists of operating expenditure and capital expenditure, while the revenue component comes from services, grants from the Central Government, and subsidies from the Regional Budget (APBD) (Djuhatmoko et al., 2019). The pattern of revenue in the Surabaya City APBD structure which tends to stagnate has an impact on limiting the allocation of priority expenditures, including health expenditure posts. Therefore, the Surabaya City Government encourages hospitals, as a sector that contributes to APBD revenue and as a community service sector, to optimize health service operations. Thus, over time, the subsidy burden from the APBD can be reduced and the hospital's contribution to APBD revenue can increase every year (W. H. Hidayat et al., 2022; Khairani et al., 2023). To achieve this goal, it is necessary to analyze investment activities in hospitals. This analysis aims to produce alternative business patterns that are efficient while still prioritizing quality, so that hospitals remain competitive with other private health facilities.

Based on research conducted by Agni (2022) related to the financial feasibility of investment in the Hospital Inpatient and Outpatient Service Development Plan, cash flow analysis takes into account all cost components, including investment costs, operational costs, and revenue derived from inpatient and outpatient service rates. The investment analysis was conducted using the discounted cash flow method with Payback Period (PP), Net Present Value (NPV), and Internal Rate of Return (IRR) parameters (Isya et al., 2021; Novalia et al., 2024). The results showed that the investment is feasible. This is reflected in the parameters used, namely the positive Net Present Value (NPV) value, the Internal Rate of Return (IRR) which is greater than required, and the Payback Period (PP) which is shorter than the life of the investment plan that has been determined (Abdurrabby et al., 2020; Giatman, 2011; Yan & Zhang, 2022). However, the research has not taken into account the components that have a significant influence on the success or failure of the investment process (Ani et al., 2024). Therefore, in addition to the investment feasibility analysis, it is necessary to conduct a sensitivity analysis to measure the effect of changes in cost components on investment feasibility (Prasetyo et al., 2023). This sensitivity analysis will evaluate how much influence certain variables have on the overall investment feasibility. These variables can be selected based on the level of global economic fluctuations, vulnerability to policy changes, or variables related to the business development innovations to be implemented.

In compiling the research as described above, several stages of implementation are needed so that the research preparation process has a systematic flow. The initial stage of the research begins with preparation, namely studying the theoretical basis and previous research as a reference and opening the researcher's insight (A. F. Hidayat et al., 2021). The next stage is data identification, where data is classified based on the method of acquisition: primary data is obtained through discussions with authorized agencies in the North Surabaya Hospital investment, including the planning, design, implementation, and procurement stages; secondary data is obtained from city planning and budgeting documents that have been published by Surabaya City Government agencies. After data identification, the next step was to collect data from internal Surabaya City Government agencies that handle planning, budgeting, and implementation of the North Surabaya Hospital development. The data obtained was categorized based on cost components: investment cost components, management cost components, and revenue projection components.

Research and analysis were conducted on each cost component so that a cash flow of investment could be prepared for each alternative scheme (Nathanael & Indryani, 2023; Tenawaheng et al., 2021). Setting health service tariffs in regional public hospitals that accommodate referral services for the National Health Insurance (JKN) must pay attention to

and be guided by the limits set by the Central Government policy. Therefore, alternative schemes for setting health service levy rates must also consider the possibility of tariff increases that may be implemented by the Central Government. After the financial cash flow is prepared for each alternative health service levy tariff scheme, the next step is to examine the feasibility of investment using the parameters of Payback Period (PP), Net Present Value (NPV), Internal Rate of Return (IRR), and Benefit Cost Ratio (BCR). From the feasibility analysis, a sensitivity analysis was conducted for two cost variables: the hospital management cost variable and the revenue cost variable derived from the health service retribution tariff. Sensitivity analysis was conducted by alternately increasing or decreasing the value of the two variables to determine the extent to which changes in the two cost components affect the feasibility of investment activities. Variables that are assumed to change can be more than one, but in the analysis, it is assumed that changes only occur alternately in one variable only, so that changes in variables do not occur simultaneously (Adiputra et al., 2019; Zainuri, 2021). To analyze changes in other variables, the analysis will be carried out separately. In the final stage of the research, conclusions are drawn based on the analysis conducted, and some alternative suggestions are formulated for the project owner in setting tariff policies and limiting management costs. An evaluation of the research conducted is also formulated to provide suggestions for future researchers in developing the research that has been carried out.

Currently, the North Surabaya Hospital located in Bulak Sub-district is still in the planning stage and will begin construction in 2027. The construction of North Surabaya Hospital is a strategic project for the Surabaya City Government. Therefore, the results of this study are expected to make a significant contribution to the sustainability of the hospital development investment. This study will reveal the level of investment feasibility based on several alternative tariff increases that may be applied. In addition to assessing the feasibility of the investment, this analysis will also illustrate the limitations of each cost component that can be applied, so that the investment remains feasible and generates the expected profit.

Based on the analysis concluded, this study will provide an overview of the limitations of management cost components and the amount of retribution tariff that can be changed, while still considering the investment feasibility standard for North Surabaya Hospital. This is certainly very useful in formulating service tariff policies and limiting hospital management costs for the project owner, namely the Surabaya City Government through the Surabaya City Health Office. Considering the above background, the purpose of this research is to analyze the investment feasibility of North Surabaya Hospital, Bulak Sub-district, Surabaya City with the parameters of Net Present Value (NPV), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR) and Payback Period (PP).

2. Methods

2.1. Research Subject

The subject of this research is North Surabaya Hospital. North Surabaya Hospital was built by the Surabaya City Government Health Office where the construction allocation was carried out through the 2026 budget year.

2.2. Object

As the formulation of the problems that have been determined, in this case the objects of research are:

a) Various kinds of costs that can affect the feasibility of investment, including investment costs, operational / management costs and income from health services at North Surabaya Hospital;
b) Sensitivity of factors affecting investment in North Surabaya Hospital, namely health service tariffs, operational costs.

2.3. Research Instruments

In the process of conducting research, it is necessary to use valid and reliable research instruments so as to produce the right data and information so as to lead to conclusions that describe the actual situation. The instruments used in this study are interview guidelines and observation sheets or observation guides as data collection instruments.

2.4. Data Collection Procedure

According to Waruwu (2023), there are several kinds of research data collection methods, including Observation, Interview (directly or through intermediaries of other parties), Documentation, Questionnaire / questionnaire, Literature Study.

In this study, data collection was obtained from interviews with parties involved in the construction of the North Surabaya Hospital, then documented as data that could be used in the research implementation process later. The observation method is 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 categorized as follows:

2.4.1. Primary Data

a) Interview

Interviews related to Surabaya City Regional General Hospital financing which includes components that compose operational costs, service rates and revenues of both the Surabaya City Government Budget Team as planners and financial managers. The interview was conducted with the Head of Government and Human Development at the Regional Development Planning, Research and Development Agency.

b) Observation

- The planned location of the hospital is on Benteng Street, Kedung Cowek Village, Bulak District, Surabaya City.
- Surabaya City Regional General Hospital that has been operating as a comparison material, namely Dr. M. Soewandhie Hospital and Bhakti Dharma Husada Hospital.

2.4.2. Secondary Data

a) Regional Development Planning, Research and Development Agency of Surabaya City:
- Document of Regional Medium-Term Development Plan (RPJMD) of Surabaya City Year 2021-2026
- Initial Draft Document of Regional Government Work Plan (RKPD) of Surabaya City Year 2025

b) Surabaya City Regional Financial and Asset Management Agency:
- Hospital development budget allocation data
- Revenue realization data

c) Public Housing, Settlement Area and Land Office of Surabaya City:
- Detailed City Spatial Plan of the hospital construction location

d) Surabaya City Health Office:
- Detailed data on health service tariffs

- FS Document of Hospital Development
- Detailed data on hospital operational costs

2.5. Data Analysis Technique

Data analysis is the process of systematically searching and compiling data obtained from interviews, field observations, information documentation and literature studies, then sorting according to what the research will do. The purpose of this data analysis is to interpret the data so that it is easy to carry out further calculations in accordance with the predetermined theoretical basis, so that it can be used as a basis for preparing research conclusions.

3. Results and Discussion

3.1. Regional Financial Overview

Surabaya City as one of the provincial capitals has an important role in the development of the Indonesian economy. Surabaya City has a variety of potentials supported by adequate infrastructure. This is certainly very supportive of economic activity that can stimulate the development of the provincial economy and the national economy. As an indicator of the success of Surabaya City's economic development, the following aspects can be noted:

a) Economic Growth

The performance of the Surabaya City economic growth rate basically shows a fairly positive movement when viewed based on the economic growth rate per business field category. Based on BPS release data, the national and provincial economies in 2022 also experienced an increase and were released from the critical period that occurred in 2020. However, economic growth until the end of 2023 in Surabaya City, East Java Province and the National experienced a slight decline simultaneously.

b) Inflation Rate

Considering the inflation condition in East Java and the National, the condition of Surabaya City's inflation rate from year to year seems similar to the inflation rate in East Java and the National. Since 2021, the inflation rate of Surabaya City and East Java tends to be higher than the national inflation rate. However, in 2023, until December, Surabaya City's inflation rate managed to experience a fairly good movement of 3.03% (year-on-year). This figure is lower when compared to inflation in the same period in 2022 of 6.59% as can be presented in the following table.

Table 1. Economic Growth and Inflation Rate of Surabaya

Regional Finances	Year					
	2018	2019	2020	2021	2022	2023
Economic Growth	6,20	6,10	-4,85	4,29	6,51	5,70
Inflation Rate	3,03	2,71	1,33	2,71	6,59	3,03

Source: BPS East Java and BPS Surabaya, 2024

3.2. Project Investment Cost Data

The investment cost of the North Surabaya Hospital is data obtained from the Surabaya City Government Health Office Budget Work Plan (RKA) which is allocated through budgeting in 2025, but in practice, payment for hospital construction is carried out in 2026, due to adjustments to design changes that affect the start of work implementation. The following is a recapitulation of investment costs for the North Surabaya Hospital, Bulak Sub-district, presented in the table 2 below:

Table 2. Investment Costs of North Surabaya Hospital

Cost Type	Cost Details	
Construction Cost	Rp	498,800,000,000
Supervision Cost	Rp	7,499,999,999
Equipment Cost	Rp	177,764,979,768
Ambulance Cost	Rp	909,909,909
Information System Costs	Rp	1,515,800,000
Total Cost	Rp	684,974,889,676

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

Based on the description in table 2, the components that make up the investment costs of North Surabaya Hospital are construction costs, supervision costs, medical equipment procurement costs, vehicle procurement costs and hospital management information system costs. The component with the largest value in this investment is the cost of building the hospital, which is Rp. 498,800,000,000, which includes the cost of licensing, AMDAL, planning, construction work, architectural fees, utility installation costs, K3 costs and parking lot development costs.

3.3. Management Cost Data

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

Table 3. Management costs of North Surabaya Hospital

Cost Type	Cost Details	
Maintenance Cost	Rp	1,605,608,626
Medical Operating Expenses	Rp	6,706,186,388
Office Operating Costs	Rp	24,634,114,556
Employee Honorarium Costs	Rp	88,601,306,097
Equipment and Machinery Costs	Rp	6,043,848,021
Depreciation Costs	Rp	17,776,497,977
Medical Equipment Costs	Rp	58,871,886,578
Total Cost	Rp	204,239,448,243

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

The component with the largest value in North Surabaya Hospital expenditure is medical personnel salary expenditure, which amounted to Rp. 88,601,306,097. This component is the core component of the North Surabaya Hospital service. The component details in table 3 are the projected expenditure costs incurred in the first year of investment.

3.4. Revenue Data

Based on Government Regulation Number 47 of 2021 concerning the Implementation of the Hospital Sector, for local government hospitals, the number of inpatient beds for standard class inpatient services is 60% (sixty percent) of the total number of beds in the hospital. Standard class inpatient services are intended for patients who come from health insurance recipients (PBI) in accordance with the provisions of applicable laws and regulations. Based on these provisions and taking into account the projected patient visits from health insurance beneficiaries, it is necessary to consider the disaggregation of revenue from the National Health Insurance (JKN) and the general tariff as presented in Table 4 below.

Table 4. Projected Revenue of North Surabaya Hospital

Cost Details	Total	
General Emergency Room	Rp	1,440,000,000
BPJS Emergency Room	Rp	22,500,000,000
General Doctor Visit Services	Rp	147,600,000
BPJS Doctor Visit Services	Rp	2,706,000,000
General Surgery	Rp	4,078,080,000
BPJS Surgery	Rp	54,374,400,000
Medical Support Services	Rp	16,785,120,000
General Inpatient Care	Rp	1,116,000,000
BPJS Inpatient Care	Rp	24,552,000,000
General Outpatient Care	Rp	12,927,600,000
BPJS Outpatient Care	Rp	56,322,000,000
Parking	Rp	234,000,000
Room Rental	Rp	21,600,000
Medical Resume	Rp	9,000,000
Education and Research	Rp	120,000,000
Total	Rp	197,333,400,000

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

The source of revenue with the largest value in the overall revenue of North Surabaya Hospital is revenue sourced from BPJS services, namely Rp. 160,454,400,000. The component is a core service in the North Surabaya Hospital service. The component details in table 4 are projections of hospital revenue in the first year of service operation.

3.5. Data Processing and Research Conditions

In conducting an investment evaluation, it is necessary to prepare a cash flow projection for North Surabaya Hospital first. Cash flow projections are compiled from costs associated during investment activities. In evaluating the North Surabaya Hospital investment, the calculation of cash flow projections uses the following provisions:

1) Hospital investment life plan for 10 (ten) years;
2) Visit Rate and Health Levies Increase are simulated into several alternatives as follows:
   a. Alternative 1, Number of Visits increases by 6% per year, Service Levies increases by 8% per year except parking which increases by 4% per year;
   b. Alternative 2, Number of Visits increases by 6% per year, General Service Retribution increases by 8% per year, BPJS Service Retribution increases by 6% per year and parking increases by 4% per year;
   c. Alternative 3, Total Visitation increases 10% per year except Inpatient increases 12% until 97% full bed capacity at 10 years of plan life, General Service Levies increases 10% per 2 years except BPJS and parking increases 10% per year;
   d. Alternative 4, Total Visits increase by 6% per year, General Service Levies increase by 8% per year, BPJS Service Levies increase by 6% per year and parking increases by 4% per year, plus subsidies gradually decrease by 5% per year.
3) The subsidy provided by the Surabaya City APBD for hospital service operations is expected to decrease annually by 5%;
4) The interest rate refers to the Bank Indonesia interest rate in January 2024 which is 6%;
5) The inflation rate uses the highest inflation value from 2018 to 2023, which is 3.03%. Data in 2022 of 6.59% is ignored due to anomalies due to covid-19. Meanwhile, inflation in the plan life year is calculated using forecasts from inflation data from 2018 to 2023 with the following results:

Table 5. Projected Inflation over the 10 Year Plan Life

Year of	0	1	2	3	4	5	6	7	8	9	10
Year	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Inflation (%)	3.28	3.35	3.42	3.49	3.57	3.64	3.71	3.78	3.85	3.93	4.00

Source: Author's Processed Data (2024)

Based on the cost component data that has been compiled thoroughly, a cash flow projection can then be prepared for the investment life of 10 (ten) years for each alternative service levy scheme planned, so that the cash flow can be accumulated annually into a net cash flow. In preparing the cash flow, the calculation of cash inflow is obtained from health service charges and subsidies provided through the APBD, while the cash outflow is obtained from the components of hospital management costs. The details of the cash flow can be presented in the table and diagram as follows:

1) Alternative Tariff 1

Based on the calculation of cash flow compiled in alternative tariff 1, the net cash flow still shows a negative value in year 7, while in year 8 the net cash flow starts to show a positive value. At the end of the investment year, the net cash flow reaches a value of Rp. 720,017,665,526. The following cash flow details are presented in Table 6 and the net cash flow diagram of alternative tariff 1 is presented in Figure 1.

Table 6. Projected Cash Flow of Alternative 1

Year of	Inflow (Rp)	Outflow (Rp)	Cashflow (Rp)	Net Cashflow (Rp)
0		684,974,889,676	-684,974,889,676	-684,974,889,676
1	197,333,400,000	204,239,448,243	-6,906,048,243	-691,880,937,919
2	224,941,680,000	211,227,705,204	13,713,974,796	-678,166,963,124
3	256,413,460,320	218,607,578,769	37,805,881,551	-640,361,081,573
4	292,289,479,574	226,403,125,028	65,886,354,547	-574,474,727,026
5	333,186,165,797	234,640,123,523	98,546,042,275	-475,928,684,751
6	379,806,231,655	243,346,210,666	136,460,020,989	-339,468,663,762
7	432,950,752,864	252,551,024,430	180,399,728,434	-159,068,935,329
8	493,532,937,458	262,286,361,320	231,246,576,138	72,177,640,809
9	562,593,822,594	272,586,346,729	290,007,475,865	362,185,116,674
10	641,320,168,760	283,487,619,907	357,832,548,853	720,017,665,526

Source: Author's Processed Data (2024)

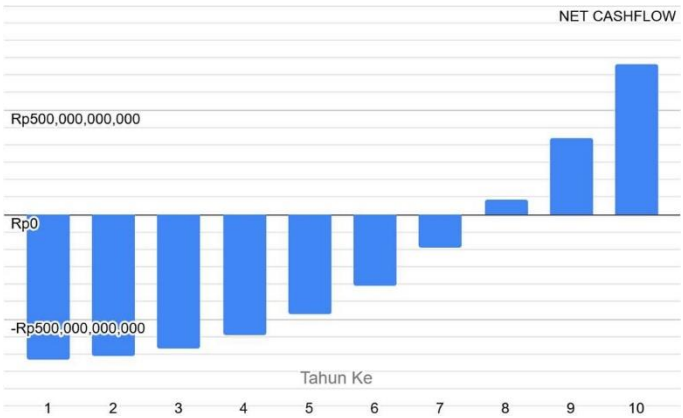

Figure 1. Net Cashflow Diagram Alternative 1

Source: Author's Processed Data (2024)

2) Alternative Tariff 2

Based on the calculation of cash flow compiled in alternative tariff 2, the net cash flow still shows a negative value in year 8, while in year 9 the net cash flow starts to show a positive value. At the end of the investment year, the net cash flow reaches a value of Rp. 433,035,338,838. The following cash flow details are presented in Table 7 and the net cash flow diagram of alternative tariff 2 is presented in Figure 2.

Table 7. Projected Cash Flow of Alternative 2

Year of	Inflow (Rp)	Outflow (Rp)	Cashflow (Rp)	Net Cashflow (Rp)
0		684,974,889,676	-684,974,889,676	-684,974,889,676
1	197,333,400,000	204,239,448,243	-6,906,048,243	-691,880,937,919
2	221,732,592,000	211,227,705,204	10,504,886,796	-681,376,051,124
3	249,160,921,440	218,607,578,769	30,553,342,671	-650,822,708,453
4	279,996,105,264	226,403,125,028	53,592,980,236	-597,229,728,216
5	314,663,181,498	234,640,123,523	80,023,057,975	-517,206,670,241
6	353,640,467,457	243,346,210,666	110,294,256,791	-406,912,413,450
7	397,466,272,132	252,551,024,430	144,915,247,701	-261,997,165,748
8	446,746,458,730	262,286,361,320	184,460,097,409	-77,537,068,339
9	502,162,965,667	272,586,346,729	229,576,618,938	152,039,550,599
10	564,483,408,146	283,487,619,907	280,995,788,239	433,035,338,838

Source: Author's Processed Data (2024)

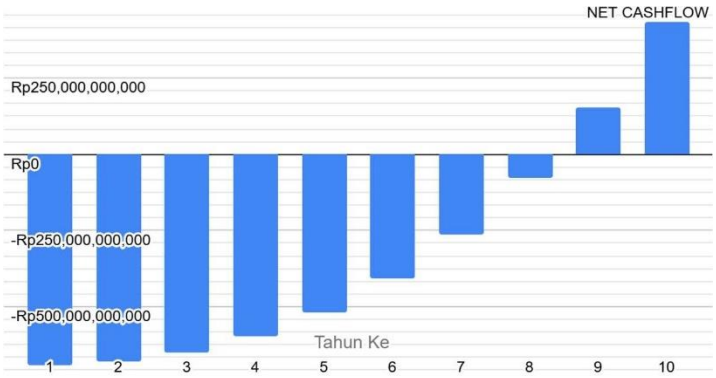

Figure 2. Net Cashflow Diagram Alternative 2

Source: Author's Processed Data (2024)

3) Alternative Tariff 3

Based on the calculation of cash flow compiled in alternative tariff 3, the net cash flow still shows a negative value in year 9, while in year 10 the net cash flow starts to show a positive value. At the end of the investment year, the net cash flow reached a value of Rp. 493,823,616,193. The following cash flow details are presented in Table 8 and the net cash flow diagram of alternative tariff 3 is presented in Figure 3.

Table 8. Projected Cash Flow of Alternative 3

Year of	Inflow (Rp)	Outflow (Rp)	Cashflow (Rp)	Net Cashflow (Rp)
0		684,974,889,676	-684,974,889,676	-684,974,889,676
1	197,333,400,000	204,239,448,243	-6,906,048,243	-691,880,937,919
2	220,778,808,000	211,227,705,204	9,551,102,796	-682,329,835,124
3	251,067,329,760	218,607,578,769	32,459,750,991	-649,870,084,133
4	280,879,695,955	226,403,125,028	54,476,570,927	-595,393,513,205
5	319,589,787,648	234,640,123,523	84,949,664,126	-510,443,849,079

Year of	Inflow (Rp)	Outflow (Rp)	Cashflow (Rp)	Net Cashflow (Rp)
6	357,515,175,560	243,346,210,666	114,168,964,894	-396,274,884,185
7	407,016,786,393	252,551,024,430	154,465,761,963	-241,809,122,222
8	455,285,182,528	262,286,361,320	192,998,821,208	-48,810,301,014
9	518,623,469,614	272,586,346,729	246,037,122,885	197,226,821,871
10	580,084,414,229	283,487,619,907	296,596,794,322	493,823,616,193

Source: Author's Processed Data (2024)

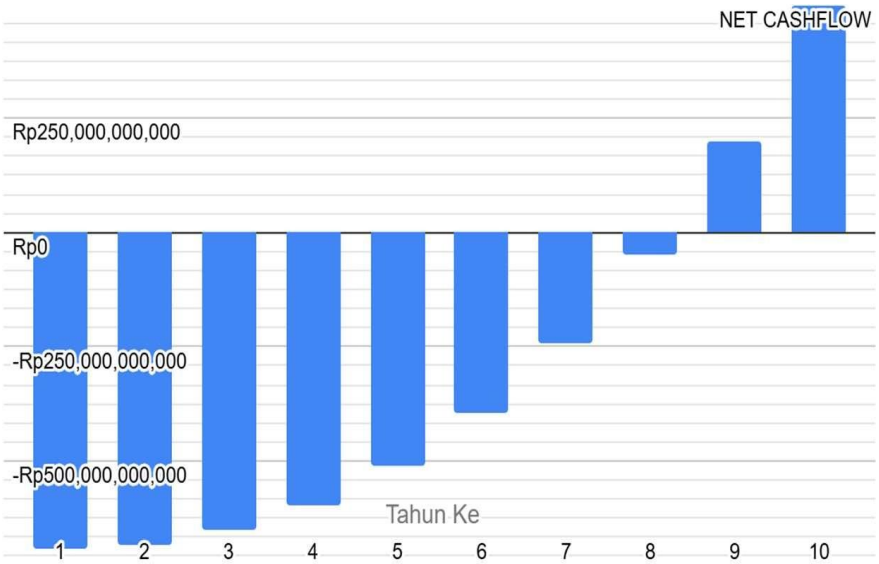

Figure 3. Net Cashflow Diagram Alternative 3
Source: Author's Processed Data (2024)

4) Alternative Tariff 4

With an additional subsidy of Rp. 16,500,000,000 in year 1 and gradually decreasing by 5% in the following years, based on the cash flow calculation prepared in alternative tariff 4, the net cash flow still shows a negative value in year 7, while in year 8 the net cash flow starts to show a positive value. At the end of the investment year, the net cash flow reaches a value of Rp. 626,240,426,244. The following cash flow details are presented in Table 9 and the net cash flow diagram of alternative tariff 3 is presented in Figure 4.

Table 9. Projected Cash Flow of Alternative 4

Year of	Inflow (Rp)	Outflow (Rp)	Cashflow (Rp)	Net Cashflow (Rp)
0		684,974,889,676	-684,974,889,676	-684,974,889,676
1	213,833,400,000	204,239,448,243	9,593,951,757	-675,380,937,919
2	236,453,808,000	211,227,705,204	25,226,102,796	-650,154,835,124
3	265,958,579,760	218,607,578,769	47,351,000,991	-602,803,834,133
4	295,026,383,455	226,403,125,028	68,623,258,427	-534,180,575,705
5	333,029,140,773	234,640,123,523	98,389,017,251	-435,791,558,454
6	370,282,561,029	243,346,210,666	126,936,350,363	-308,855,208,091
7	419,145,802,589	252,551,024,430	166,594,778,158	-142,260,429,933
8	466,807,747,914	262,286,361,320	204,521,386,594	62,260,956,661
9	529,569,906,731	272,586,346,729	256,983,560,002	319,244,516,662
10	590,483,529,490	283,487,619,907	306,995,909,582	626,240,426,244

Source: Author's Processed Data (2024)

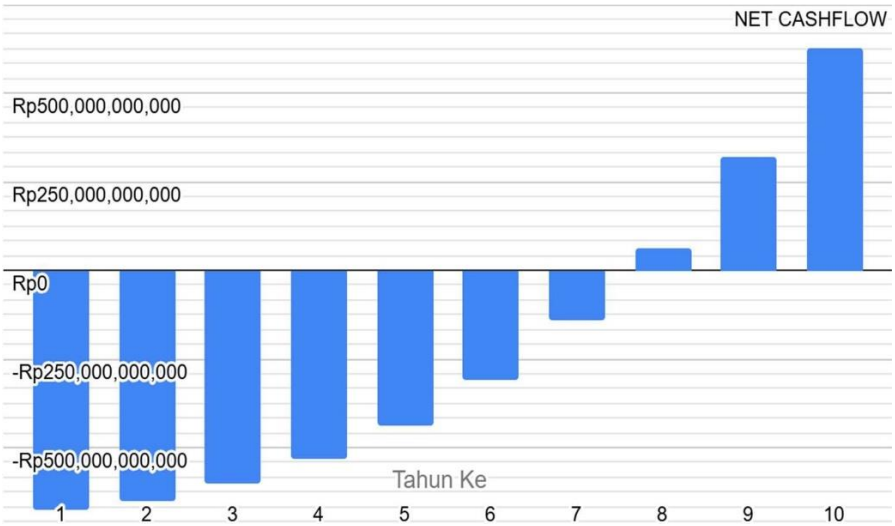

Figure 4. Net Cashflow Diagram Alternative 4
Source: Author's Processed Data (2024)

Based on the presentation of the cashflow table and net cashflow diagram of the 4 (four) tariff alternatives as previously described, it certainly illustrates the condition of investment performance on each tariff alternative. However, to find out more accurately the investment performance, further analysis needs to be done by taking into account the investment feasibility parameters that have been determined. Investment evaluation of North Surabaya Hospital needs to be carried out to determine the feasibility of investment during the life of the investment plan. In this research, investment evaluation is analyzed 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 North Surabaya Hospital investment evaluation on predetermined parameters are presented in the following table:

Table 10. Investment Evaluation Results of North Surabaya Hospital

Service Alternative	NPV (Rp)	IRR (%)	BCR	PP (Year)	Conclusion
Alternative 1	211,014,227,005	9.85	1.23	7.69	Feasible
Alternative 2	28,416,192,984	6.57	1.14	8.34	Not Feasible
Alternative 3	66,444,241,124	7.30	1.16	8.20	Not Feasible
Alternative 4	166,294,504,181	9.26	1.20	7.70	Feasible

Source: Author's Processed Data (2024)

4. Conclusion

Based on the data analysis results related to the investment in the North Surabaya Hospital in this study, along with the investment evaluation and sensitivity analysis of management costs and potential revenues of the East Surabaya Hospital against the parameters of Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PP), and Benefit-Cost Ratio (BCR), the following conclusions were drawn:

Alternative Scheme 1 results in an NPV of IDR 211,014,227,005, an IRR of 9.85%, a BCR of 1.23, and a PP of 7.69 years, making the investment feasible. Alternative Scheme 2 produces an NPV of IDR 28,416,192,984, an IRR of 6.57%, a BCR of 1.14, and a PP of 8.34 years, indicating that the investment is not feasible due to an IRR lower than the Minimum Attractive

Rate of Return (MARR) of 9.21%. Alternative Scheme 3 results in an NPV of IDR 66,444,241,124, an IRR of 7.30%, a BCR of 1.16, and a PP of 8.20 years, making the investment unfeasible due to an IRR lower than the MARR of 9.21%. Lastly, Alternative Scheme 4 produces an NPV of IDR 166,294,504,181, an IRR of 9.26%, a BCR of 1.20, and a PP of 7.70 years, making the investment feasible.

5. References

Abdurrabby, J., Zaenal, Z. Z., & Wijaksana, I. K. (2020). Analisis Sensitivitas Net Present Value (NPV) terhadap Perubahan Parameter Harga Jual dan Biaya Produksi pada Penambangan Tras di CV. An-Nakhl Desa Cupang Kecamatan Gempol Kabupaten Cirebon Provinsi Jawa Barat. *Prosiding Teknik Pertambangan*, *6*(2), 659–664.

Adiputra, I., Giriantari, I. A., & Kumara, I. N. S. (2019). Kajian Penggunaan Incinerator Untuk Mengelola Limbah Medis Padat di Denpasar. *Majalah Ilmiah Teknologi Elektro*, *18*(3), 369–376.

Agni, M. K. (2022). Analisis Investasi Studi Kelayakan Rencana Pengembangan Layanan Rawat Inap Dan Rawat Jalan Rumah Sakit. *Jurnal Formil (Forum Ilmiah) Kesmas Respati*, *7*(3). https://doi.org/10.35842/formil.v7i3.448

Ani, A. A., Hertati, L., & Asharie, A. (2024). Pelatihan Studi Kelayakan Bisnis Usaha Fotocopy Hafis Program MBKM Mahasiswa UIGM. *Journal Of Sustainable Community Service*, *2*(4), 192–206. https://doi.org/10.55047/jscs.v2i4.597

Dahliana, A., Santosa, W. N., & Rasyidah, U. M. (2022). Analisis Kelayakan Pengembangan Unit Hemodialisis di Rumah Sakit X di Surabaya. *Keluwih: Jurnal Kesehatan Dan Kedokteran (June)*, *3*(2), 93–99.

Djuhatmoko, N., Purwanto, W., & Tjahjono, A. (2019). *Analisis Investasi Pengadaan Alat Radioterapi (Linear Accelerator) Dengan Metoda Net Present Value, Payback Period Dan Internal Rate Of Return Di Rumah Sakit Umum Pusat Dr. Sardjito Yogyakarta*. STIE Widya Wiwaha.

Giatman, M. (2011). *Ekonomi teknik*.

Hidayat, A. F., Kurniawan, H., & Widyasari, R. (2021). Analisis Kelayakan Finansial Agroindustri Kerupuk Kulit Menggunakan Mesin Peniris di Kecamatan Selong, Kabupaten Lombok Timur. *Agroteknika*, *4*(1), 11–19.

Hidayat, W. H., Toyfur, M. F., & Agustian, M. (2022). Studi Kelayakan Pembangunan Dan Pengelolaan Gedung Parkir Di Rumah Sakit Umum Daerah Dr. Hm Rabain Kabupaten Muara Enim. *Cived*, *9*(1), 58–65.

Isya, M., Sugiarto, S., & Harja, J. (2021). Sensitivitas Kelayakan Ekonomi Pada Rencana Pembangunan Jembatan Lawe Alas–Pedesi Kabupaten Aceh Tenggara Provinsi Aceh. *Teras Jurnal: Jurnal Teknik Sipil*, *11*(1), 140–148.

Khairani, D. U., Andreas, A., & Arini, R. N. (2023). Analisis Kelayakan Investasi Pengembangan Bisnis Konstruksi Dengan Pendekatan Life Cycle Construction. *Jurnal ARTESIS*, *3*(1), 28–36.

Nathanael, R. A., & Indryani, R. (2023). Analisis Sensitivitas Kelayakan Finansial The Bay Apartment Bandar Lampung. *Jurnal Teknik ITS*, *12*(1), C21–C28.

Novalia, K. D., Muhammadun, H., & Marleno, R. (2024). Financial Feasibility Analysis of Transjatim Corridor I Luxury Sidoarjo-Surabaya-Gresik Route. *International Journal on Advanced Technology, Engineering, and Information System*, *3*(4), 422–431. https://doi.org/10.55047/ijateis.v3i4.1272

Prasetyo, B. A., Muhammadun, H., & Nugroho, L. D. (2023). Comparison of Feasibility Analysis of Investment with Gravity System and Pumping System in the IKK Ibu Water Supply, West Halmahera Regency. *International Journal On Advanced Technology, Engineering, And Information System*, *2*(4), 321–333.

Tenawaheng, P. P. R., Utomo, C., & Wiguna, I. P. A. (2021). Analisis sensitivitas investasi apartemen begawan. *Jurnal Teknik ITS*, *10*(1), D25–D30.

Waruwu, M. (2023). Pendekatan penelitian pendidikan: metode penelitian kualitatif, metode penelitian kuantitatif dan metode penelitian kombinasi (Mixed Method). *Jurnal Pendidikan Tambusai*, *7*(1), 2896–2910.

Yan, R., & Zhang, Y. (2022). The Introduction of NPV and IRR. *2022 7th International Conference on Financial Innovation and Economic Development (ICFIED 2022)*, 1472–1476.

Zainuri, Z. (2021). *Ekonomi Teknik*. CV. Jasa Surya.