

# FEASIBILITY STUDY ANALYSIS OF THE CONSTRUCTION OF HOSPITAL X IN BOGOR REGENCY

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## ABSTRACT

*The demand for hospitals continues to rise in line with the growing population, increased public awareness of healthcare, and improvements in health insurance systems (including BPJS). However, the increasing need for hospital beds is not always matched by the same level of investment in the healthcare sector, especially in the development of adequate advanced medical facilities. This study aims to assess the feasibility of investing in the construction of Hospital X in Bogor Regency by analyzing marketing and financial aspects.*

*The research employs a mixed-method approach that integrates both quantitative and qualitative methods. Data collection includes direct and participatory observations, interviews, document analysis, and secondary data assessment. The marketing aspect evaluates the hospital's catchment area and market potential, supported by macroeconomic indicators such as regional GDP and employment statistics. Meanwhile, the financial aspect is assessed using Payback Period, Net Present Value (NPV), and Internal Rate of Return (IRR).*

*The financial analysis reveals a Payback Period of 10 years, which is shorter than the project lifespan. The NPV is positive at IDR 22 billion using an 11% discount rate, while the IRR reaches 12.8% (1.6% above the 11% discount rate). In a leveraged scenario with up to 60% debt financing, the IRR on equity increases to 15.1%. Based on these findings, the proposed construction of Hospital X is deemed feasible, and investors may proceed with the development.*

**Keyword :** Hospital Feasibility Study, Marketing Aspect, Financial Aspect

## 1. Introduction

The continuous increase in population, Indonesia's improving economy, and the rising proportion of elderly individuals (aged 55 and above) are driving the growing demand for hospitals. This condition is further supported by the implementation of the National Health Insurance (JKN) under Ministry of Health Regulation No. 28 of 2014 through BPJS, which has significantly boosted hospital utilization.

The presence of BPJS allows broader access to hospital services across various social classes. Previously, many patients hesitated or postponed medical treatment due to high costs, but with government subsidies, particularly for low-income groups through the Premium Assistance Beneficiaries (PBI) program, more people can now afford hospitalization. Consequently, hospital patient volume surged between 2014 and 2019.

As hospitals are classified as advanced healthcare facilities, the growing number of patients has also led to an increased demand for healthcare services. This includes the need for more doctors, outpatient clinics, and inpatient beds to balance healthcare service demand with availability. In addition to increased capacity, service quality has also improved due to rising competition among hospitals.

The surge in demand for hospitals is evident from the rapid growth of the hospital industry, particularly in West Java. The expansion of hospital facilities in this region over the past five years highlights this trend. The number of hospitals in West Java increased from 275 in 2013 to 371 in 2019. The highest growth occurred between 2014 and 2015, when the number of hospitals rose from 290 to 310, reflecting an increase of over 6%. From 2013 to 2019, the average annual growth rate of hospitals was approximately 5.1%—significantly higher than the average population growth rate of 1.3% per year.

The increasing demand for hospitals is evident from the rapid growth of the healthcare industry. In West Java, the number of hospitals grew from 275 in 2013 to 371 in 2019, with the highest annual increase occurring between 2014 and 2015, when hospitals rose from 290 to 310 (over 6% growth). The average annual hospital growth rate from 2013 to 2019 was approximately 5.1%, significantly higher than the population growth rate of around 1.3% per year. In Bogor Regency, with a population of 5,427,070 (2020 Census), there are only 29 hospitals with a total of 3,379 beds—far below the WHO minimum standard of 1 hospital bed per 1,000 people, indicating a shortage of 2,049 beds.

The shortage of hospital beds in Bogor Regency, with a deficit of 2,049 beds, has encouraged investors to establish a new hospital. Cileungsi District, with its high population density and growing demographic trends, has been identified as a strategic location for hospital development. Since hospitals serve as public service providers, proximity to densely populated areas is an essential consideration.

The planned hospital, for study purposedly named Hospital X, aims to address the healthcare needs of residents in Cileungsi and surrounding areas. In addition to serving the general population, the hospital has the potential to cater to industrial workers, as the location is near a major industrial zone.

Cileungsi itself is one of the most densely populated districts in Bogor Regency, with a population of 292,160 people and a land area of 133.3 km<sup>2</sup>, resulting in a population density of 2,192 people/km<sup>2</sup>. The district is also a significant industrial hub. Currently, 147 medium and large-scale industries operate in Cileungsi, employing 47,014 workers (excluding their families). The presence of these industries further emphasizes the need for adequate healthcare facilities in the region.

Given this background, the study identifies a gap in hospital bed availability in West Java, particularly in Bogor Regency. The feasibility study aims to analyze the viability of constructing Hospital X based on marketing and financial management aspects.

This study adopts a management-based theoretical framework. At the grand theory level, it refers to Hospital Management principles. For middle theory, it applies Strategic Management concepts, while at the applied level, it employs Feasibility Study methodologies for hospital construction. According to George R. Terry in *Principles of Management*, management is defined as a process consisting of planning, organizing, executing, and monitoring activities, utilizing both science and art to achieve predetermined goals. Terry categorizes management into four fundamental functions: Planning, Organizing, Actuating, and Controlling (POAC).

### **1.1 Identification of problems**

The analysis of hospital bed availability in Bogor Regency indicates a significant shortfall, necessitating additional inpatient facilities. This gap drives the plan for the establishment of a Class C hospital in Cileungsi District. In accordance with the research background, the following problem can be identified as follows:

1. How does the feasibility study evaluate the hospital development from a marketing management perspective?
2. How does the feasibility study assess the hospital development from a financial management perspective?
3. How does the feasibility study analyze the feasibility of hospital development from both perspectives simultaneously?

## 1.2 Research purposes

In relation to the background and problem formulation, the objectives of this hospital feasibility study are:

1. To identify and analyze the feasibility of Hospital X development from a marketing management perspective.
2. To identify and analyze the feasibility of Hospital X development from a financial management perspective.
3. To identify and analyze the feasibility of Hospital X development from both marketing and financial management perspectives simultaneously.

## 1.3 Research Scope

The study was conducted in the residential areas of Cileungsi and Jonggol in Bogor Regency, West Java, focusing on a feasibility study with an emphasis on two aspects: Marketing and Financial Aspects.

## 2. Literature Review

### 2.1 Marketing Aspect

The marketing aspect in a hospital feasibility study encompasses various demand and supply factors. Demand factors include demographics, population size, age distribution, gender, morbidity rates, and economic growth, which influence purchasing power. Meanwhile, supply factors consider elements affecting hospital bed availability, such as investment levels and investment projections.

Market potential for hospitals is calculated as an interaction between the demand and supply of hospital beds. Hospital beds serve as a key reference due to the hospital's primary function as a healthcare facility, particularly for inpatient services. This is also reflected in room capacity, which is used as a classification criterion for hospitals. Simply put, market potential can be expressed as follows:

$$\text{Market Potential} = \text{Demand} - \text{Supply} \quad (1)$$

Supply is calculated based on the total hospital bed capacity within the coverage area and can be projected using certain assumptions. Meanwhile, to determine the annual demand within the coverage area, a specific equation will be used, as outlined below:

$$\text{Demand} = \frac{\text{Inpatient} \times \text{ALOS}}{\text{BOR} \times 365} \quad (2)$$

### 2.2 Financial Aspect

One of the key financial assessment parameters is Net Present Value (NPV). According to Giatman (2006), NPV is a method used to calculate the net value of cash flows at present time. This calculation converts all cash flows into present value (P) and accumulates them, where the total P obtained represents the net value of all cash flows over the projected or planned period (Pujawan, 2003).

To compute NPV, data on estimated investment costs, operational costs, maintenance costs, and projected revenues or profits from the planned project are required (Afriyeni, 2012). The interest rate used to convert future cash flows into present value is referred to as the Minimum Attractive Rate of Return (MARR). The mathematical formula for calculating NPV can be expressed as follows:

$$NPV = CF_0 + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \dots \quad (3)$$

If the  $NPV > 0$ , the investment is considered feasible or profitable. Conversely, if  $NPV < 0$ , the investment is deemed unprofitable or less viable. In this study, the discount rate used is 11%, taking into account the long-term bond interest rate, which currently ranges between 4% - 5%, along with a risk premium of up to 6%.

Apart from NPV, another financial assessment parameter is the Internal Rate of Return (IRR). IRR is defined as the interest rate that equates the NPV to zero. Thus, to calculate IRR, the formula used is  $NPV = 0$ .

$$NPV = \sum_{i=0}^n \frac{CF_n}{(1+r)^n} = 0 \quad (4)$$

In this formula, IRR represents the interest rate (r) required to make the NPV equal to zero. The higher the IRR, the better the rate of return, positively impacting the feasibility of the investment from a financial management perspective. Ideally, the IRR should be higher than the discount rate used in the study.

The third financial assessment parameter is the Payback Period (PBP), which refers to the time required for the initial investment to be recovered or for revenues to break even with expenses after taxes are accounted for. According to Giatman (2006), the payback period is the timeframe within which the investment reaches a break-even point (BEP). If cash flow is measured annually, the PBP can be calculated using the following formula:

$$\text{Payback period} = n + \frac{(a-b)}{(b-c)} \times 1 \text{ year} \quad (5)$$

Component Explanation:

- n : The last year in which the cumulative cash flow has not yet covered the initial investment.
- a : The total initial investment value.
- b : The cumulative cash flow in year n.
- c : The cumulative cash flow in year (n + 1).

The investment is considered feasible if  $PBP \leq n$  (investment period).

Once the analysis is completed and thoroughly discussed, a final decision is made on whether the Hospital X construction project is feasible to proceed or not.

### 3. Research Methods

The research method used in this study is a mixed-method approach, combining quantitative and qualitative methods by collecting data, opinions, ideas, and perceptions through various strategies such as direct and participatory observation, interviews, document analysis, and secondary data sources.

As explained by Creswell (2010:5), mixed-method research integrates qualitative and quantitative approaches. Furthermore, Sugiyono (2011:18) states that the use of mixed methods aims to obtain more comprehensive, valid, reliable, and objective data.

#### 3.1 Observation

This technique involves field observations of the hospital construction site, residential areas within the coverage area, and existing hospitals (potential competitors). The observation method used is participatory observation, where the observer actively engages in the observation process (Sugiyono, 2009:145).

#### 3.2 Interviews and Questionnaires

The interview method involves face-to-face discussions between the interviewer and respondents using an interview guide as an aid. Given the study's focus on marketing and financial aspects, interviews are primarily conducted with hospital owners/investors and the local community as the target market.

For owners/investors, interview questions aim to gather information regarding the development plan and initial data, such as the motivation for establishing the hospital, land area, investment value, and hospital profile. Meanwhile, for the general public, a questionnaire serves as a data collection tool. According to Sugiyono (2009:142), a questionnaire is a written set of questions designed for respondents. The questionnaire provides insights into previous hospitals used by respondents, along with their strengths and weaknesses from a patient's perspective, which serves as a reference for shaping the desired hospital profile.

The survey is conducted among residents living within a 0–5 km radius of the proposed hospital site. The survey data is analyzed using Microsoft Excel pivot tables.

### Respondent Selection Criteria:

Respondents are selected based on specific criteria, particularly those with experience in using hospitals, especially those within the study area:

1. Residents aged  $\geq 17$  years within the coverage area.
2. Respondents or their family members have used hospital services (either outpatient or inpatient care) within the last year.
3. Respondents who have used both outpatient and inpatient services select only one category, either outpatient or inpatient.

This sampling method primarily targets residents within the 5 km area. The final sample size consists of 43 respondents who have used outpatient services in the past year and 39 respondents who have used inpatient services.

According to Kerlinger and Lee (2000), in quantitative research, a larger sample size improves accuracy, reducing the likelihood of statistical errors. Although no exact minimum sample size is specified, Kerlinger & Lee (2000) recommend at least 30 samples to minimize the risk of an unrepresentative sample. This threshold meets the minimum requirement for data distribution to approximate normal distribution, as suggested by Guilford & Fruchter (1981).

### 3.3 Secondary Data Analysis

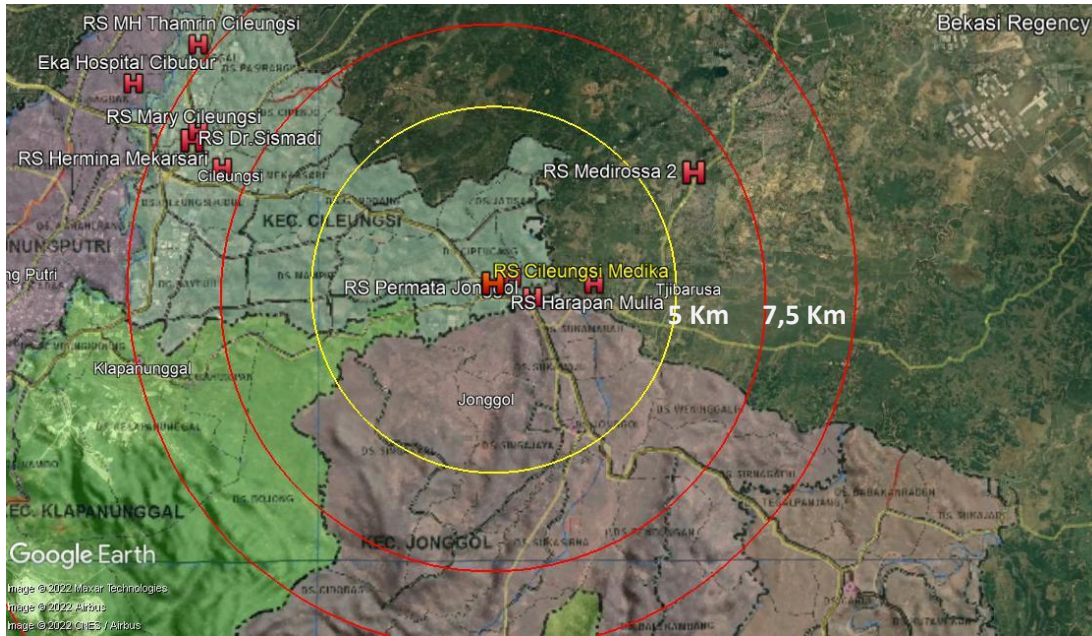
The document analysis method involves collecting data from various written sources and official government documents, such as those from BPS (Statistics Indonesia), the Bogor Regency Health Office, and the West Java Provincial Health Office. Secondary data is primarily used to provide a macro overview of Bogor Regency and the coverage area.

Several key documents used as information sources in this study include:

1. Bogor Regency in Figures (*Kabupaten Bogor Dalam Angka*).
2. Bogor Regency Health Profile (*Profil Kesehatan Kabupaten Bogor*).
3. Ministry of Health data on hospitals and their respective profiles within the coverage area. A complete list and details of hospitals can be accessed online at :  
[https://sirs.kemkes.go.id/fo/home/dashboard\\_rs?id=0](https://sirs.kemkes.go.id/fo/home/dashboard_rs?id=0)
4. Latest BPJS membership data, which can be accessed online at:  
<http://sismonev.djsn.go.id/kepesertaan/>
5. Financial data related to the hospital development plan, including:
  - Total investment.
  - Target patient numbers.
  - Revenue projections.
  - Cost estimations.
  - Profit and loss analysis.
  - Cash flow analysis.

This financial projection data is obtained from investment modeling conducted by planning consultants.

**4. RESULT & DISCUSSION**



**Fig – 1 Map of the Proposed Hospital X Development Location**

**4.2 Marketing Aspect Analysis**

**4.2.1 Market Potential**

The Inpatient Morbidity Rate (IMR) represents the percentage of the population requiring inpatient services within a given year. This rate has shown a consistent increase due to factors such as higher purchasing power, growing health awareness, advancements in medical technology, an aging population, and expanded health insurance coverage.

The Average Length of Stay (ALOS) is calculated at 3.80 days. As medical treatments continue to advance, ALOS is projected to gradually decrease by 0.50% per year. By 2032, ALOS is expected to be approximately 3.6 days.

**Table – 1 Bed Demand Projection in the Coverage Area**

No	Year	Population in Coverage Area	Projected Inpatient Cases (#)	ALOS (Days)	BOR (%)	Bed Demand (#)
0	2022	431,432	31,731	3.8	75%	440
1	2023	440,767	32,742	3.8	75%	452
2	2024	450,162	33,774	3.8	75%	464
3	2025	459,612	34,828	3.7	75%	476
4	2026	469,116	35,903	3.7	75%	488
5	2027	478,672	37,001	3.7	75%	501
6	2028	488,227	38,117	3.7	75%	513
7	2029	497,778	39,251	3.7	75%	526
8	2030	507,320	40,404	3.7	75%	539
9	2031	516,852	41,575	3.6	75%	552
10	2032	526,368	42,763	3.6	75%	565

### Current and Projected Bed Capacity in the Coverage Area

The coverage area includes three hospitals: RSUD Cileungsi, RS Harapan Mulia, and RS Permata Jonggol, with a total capacity of 439 hospital beds. The assumption for bed capacity expansion is that every three years, a new hospital with 100 beds will be built. Additional beds may come from either expansions in existing hospitals or the establishment of new hospitals. The market potential is calculated as follows:

**Table – 2 Projection of Hospital Bed Market Potential in the Coverage Area**

No	Year	Projected Bed Supply (#)	Projected Bed Demand (#)	Projected Market Potential (#)
0	2022	439	440	<b>-1</b>
1	2023	439	452	<b>-13</b>
2	2024	539	464	75
3	2025	539	476	63
4	2026	539	488	51
5	2027	639	501	138
6	2028	639	513	126
7	2029	639	526	113
8	2030	739	539	200
9	2031	739	552	187
10	2032	739	565	174
<b>Average</b>				<b>101</b>

### Market Outlook and Investment Feasibility

In 2022, the supply – demand balance is almost neutral, with a slight undersupply of 1 to 13 beds until 2023. The historical trend suggests that bed demand increases by 12 to 13 beds per year. However, starting in 2024, with the addition of 100 beds every three years, an oversupply of 75 beds is expected.

The current undersupply of hospital beds presents a favorable investment opportunity for the construction of a new hospital. The healthcare service market in the coverage area remains promising, especially due to the lack of hospital facilities in the eastern and southern regions.

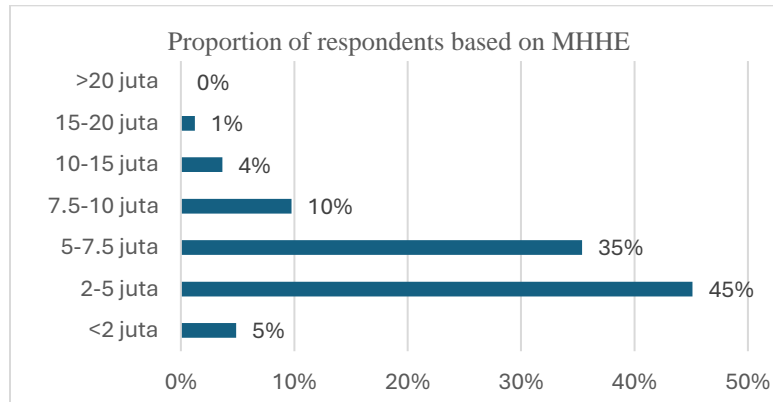
#### 4.2.1 Customer / Patient Perspective

Psychographics in marketing involves segmenting consumers into different groups based on lifestyle and personality variables.

Traditionally, geographic and demographic variables have been the primary factors in market segmentation. However, psychographic factors (such as social class, personality, and lifestyle) should also be considered, as they differentiate individuals within the same geographic or demographic group. Psychographic segmentation divides the market into social classes, personal characteristics, and lifestyle groups.

Hospital consumers have a monthly household expenditure (MHHE) between IDR 2 – 5 million, indicating that the majority belong to the lower-middle to middle-income class. Their education level is generally low, influencing their healthcare decision-making process. These patients prioritize receiving treatment over the hospital's brand name, meaning the hospital label is not a determining factor in their choice.

The middle-income group (MHHE ~IDR 5 million) accounts for approximately 50% of respondents with expenses exceeding IDR 5 million. This group has more complex decision-making patterns, as they possess higher purchasing power and more healthcare options. However, with the BPJS program, healthcare options have expanded for the lower-middle class, as government regulations require hospitals to allocate a portion of their beds for BPJS patients.



**Fig – 2** Respondents based on economic Monthly Household Expenditure (MHHE)

According to Siagian (2006), higher education levels correlate with an increased desire for knowledge and skill enhancement. In this context, "skill" refers to the ability to choose an appropriate hospital when healthcare services are needed. Patients with lower education levels have limited ability to compare hospitals and make informed healthcare decisions.

The marketing aspect analysis aims to determine market size, demand growth, and market share of the relevant product. The results of the analysis are outlined based on the following factors:

1. Last hospital used
2. Strengths and weaknesses of competitor hospitals
3. Monthly Household Health Expenditure (MHHE)
4. Gender
5. Age group
6. Medical care financing sources
7. Residential location

For outpatient services, the community equally prefers RS Permata Jonggol and RSUD Cileungsi. Meanwhile, for inpatient services, the majority of respondents favor RS Permata Jonggol, with RSUD Cileungsi as the second choice.

Regarding monthly household health expenditure (MHHE), hospital users in the coverage area primarily belong to the middle and lower-middle economic class. The age group most frequently using hospital facilities ranges from 31–40 years old, followed by those aged 41–50 years. The majority of payments are made through BPJS, including BPJS PPU, which is covered by employers.

Survey results indicate that outpatient service users at RS Permata Jonggol slightly exceed previous usage levels, suggesting that some patients currently using other hospitals may switch to RS Permata Jonggol in the future. In contrast, RSUD Cileungsi has experienced a decline in outpatient usage.



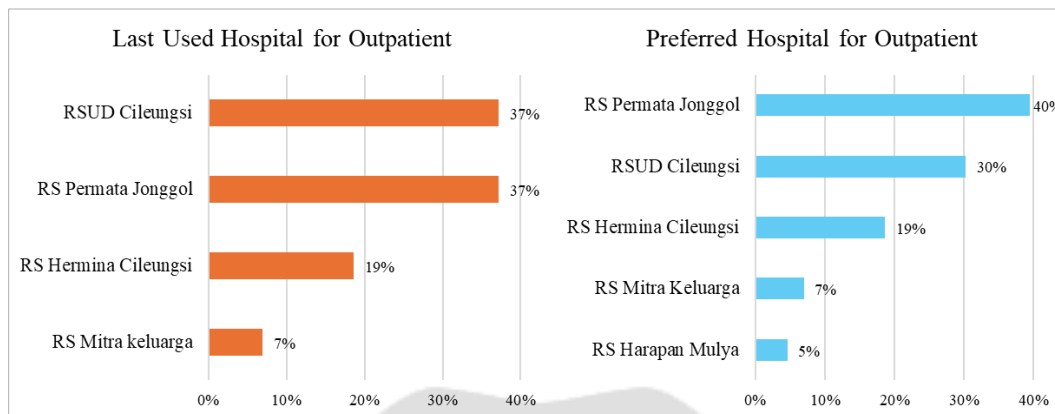


Fig – 3 Preferred and Last Used Hospitals for Outpatient Services

For inpatient services, survey results differ slightly. The number of patients choosing RS Permata Jonggol for inpatient care has slightly decreased compared to previous users, while another option, RS Mitra Keluarga Cibubur, has emerged as a new preference.

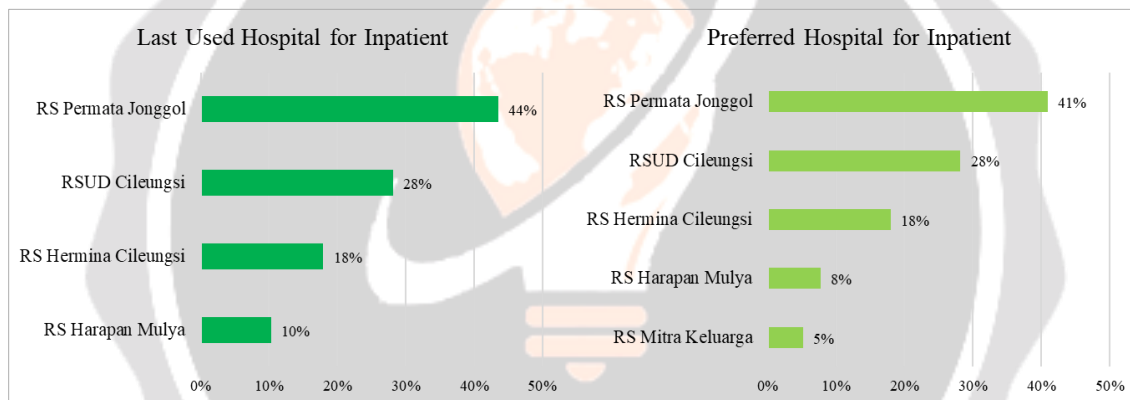


Fig – 4 Preferred and Last Used Hospitals for Inpatient Services

## 4.2 Financial Analysis

### 4.2.1 Hospital Profile

The hospital profile meets the minimum requirements outlined in Minister of Health Regulation No. 24 of 2016 regarding Technical Requirements for Hospital Buildings and Infrastructure. For a Class C general hospital, it is recommended to have a minimum building area of 60 m<sup>2</sup> per hospital bed (TT), while Class B hospitals require 80 m<sup>2</sup> per hospital bed.

The calculation of 1 bed per 70 m<sup>2</sup> used in this study should adequately meet the capacity and facility requirements for Hospital X as a Class C hospital.

Tabel – 3 Planned Hospital Profile

Item	Description
Name	Hospital X
Type	General Hospital; Type C
Bed Capacity	128 beds (108 inpatient beds + 4 isolation beds + 16 other care beds)

<b>Item</b>	<b>Description</b>
Target Market Share	Up to 18% market share for outpatient services.Up to 18% market share for inpatient services (65% BOR achieved by year 5).
Land Area	10,000 m <sup>2</sup>
Building Size	8,400 m <sup>2</sup> (Ratio 1:70 m <sup>2</sup> )
Number of Levels	4 levels + semi-basement
Parking Capacity	100 cars and 120 motorcycles

The building size serves as the basis for construction cost estimation. The hospital is also expected to have a parking area accommodating up to 100 cars and 120 motorcycles. The minimum standard of one parking space per two hospital beds has been met.

#### 4.2.2 Investment Cost (Capital)

In general, the investment cost of a hospital can be divided into several categories, including land, building, equipment (medical and non-medical), and other expenses:

**Tabel – 4 Investment Cost for Hospital X**

<b>Component</b>	<b>Amount (IDR 000,000)</b>
<b>Land</b>	20,000,000,000
<b>Building</b>	85,120,000,000
<b>Equipment</b>	30,482,125,000
<b>DED and Licensing</b>	3,979,200,000
<b>Pre-Operational &amp; Contingency</b>	3,972,440,000
<b>Total</b>	143,553,765,000

#### 4.2.3 Profit and Loss Projection

Profit serves as the most fundamental financial performance measure for any business. When revenues exceed operational costs, the business generates a profit. Conversely, if expenses surpass revenue, the business incurs a loss.

The revenue remaining after deducting all operational expenses results in EBITDA (Earnings Before Interest, Tax, Depreciation, and Amortization). In the initial year, the EBITDA is projected to be negative at minus IDR 6.53 billion. Over time, as hospital operations improve, EBITDA is expected to grow steadily. Hospital X is projected to achieve a positive NPAT (Net Profit After Tax) or Break-even NPAT in its fifth year of operation.

Next, EBIT (Earnings Before Interest and Tax) is calculated by subtracting depreciation and amortization from EBITDA. Based on the projections, EBIT is expected to turn positive in the fourth year, continuing its positive trend throughout the holding period. A positive EBIT signifies that the hospital will have sufficient funds to meet its financial obligations.

For this study, it is assumed that 40% of equipment and building investments will be funded through own equity, while 60% will be financed through loans. As a result, the hospital will incur interest expenses, which are accounted for in the profit and loss projection.

Any profitable business is subject to taxation. The corporate tax rate applied in this study is 25% on taxable income throughout the projection period. Based on the accumulated profit calculations, starting from the eighth year, the hospital is expected to begin paying corporate taxes at 25% of IDR 13.03 billion.

The following table presents the profit and loss projection for Hospital X.

**Tabel – 5 Profit and Loss Projection of Hospital X**

Tahun	1	2	3	4	5	6	7	8	9	10
Unit	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)
<b><i>Earning Before Interest, Tax, Depreciation and Amortization</i></b>										
Revenue	20,589	50,138	71,148	89,254	102,701	114,873	124,329	136,467	144,286	155,317
Expense	27,116	46,749	61,427	73,823	82,675	90,337	96,600	104,496	110,186	117,736
EBITDA	-6,527	3,389	9,720	15,431	20,025	24,536	27,729	31,971	34,100	37,582
<b><i>Earning Before Interest and Tax</i></b>										
Depreciation	4,355	4,355	4,355	4,355	4,355	4,355	4,355	1,742	1,742	1,742
Amortization	4,654	4,654	4,654	4,654	4,654	4,654	4,654	4,654	4,654	4,654
EBIT	-15,535	-5,619	712	6,423	11,017	15,527	18,720	25,575	27,704	31,186
<b><i>Taxable Income</i></b>										
Interest	8,708	8,376	7,437	6,400	5,254	3,987	2,588	1,041	0	0
Taxable income	-24,243	-13,996	-6,726	22	5,763	11,540	16,133	24,534	27,704	31,186
Tax	0	0	0	0	0	0	0	3,257	6,926	7,796
Interest and Tax	8,708	8,376	7,437	6,400	5,254	3,987	2,588	4,298	6,926	7,796
<b><i>Net Profit After Tax</i></b>										
EBIT	-15,535	-5,619	712	6,423	11,017	15,527	18,720	25,575	27,704	31,186
Interest and Tax	8,708	8,376	7,437	6,400	5,254	3,987	2,588	4,298	6,926	7,796
NPAT	-24,243	-13,996	-6,726	22	5,763	11,540	16,133	21,277	20,778	23,389

#### 4.2.4 Cash Flow Projection

According to Sutrisno (2009:16), “Profitability is a company's ability to generate profit by utilizing its available capital.” Profitability is a crucial financial metric when conducting a feasibility study. A business cannot sustain itself in the long term if it does not generate profit. Even a profitable business may still face financial difficulties if it fails to generate adequate cash flow to meet its operational needs over time. Cash flow analysis is conducted to examine this aspect by identifying the amount of cash flow generated at each stage of the projection period.

The cash flow analysis is based on the Net Profit After Tax (NPAT). NPAT is then summed with non-cash components, such as depreciation of buildings and equipment (both medical and non-medical) and any working capital contributions from investors. The resulting sum from this calculation is referred to as Cash Flow from Operations (CFFO). CFFO is projected to become positive in the third year, which aligns with the profit and loss projection, where Hospital X is expected to reach its break-even NPAT (BE NPAT) in the fifth year.

As the name suggests, CFFO pertains to operational cash flow. However, investors must also account for capital cash flow, which includes investment costs such as land acquisition, physical construction, and the purchase of medical and non-medical equipment. The combination of CFFO and capital cash flow results in Free Cash Flow to Firm (FCFF), which represents the net cash inflow to the hospital each year.

For construction-related investment expenses, cash outflow occurs in year 0, with the first operational year starting in year 1. Meanwhile, equipment purchases involve both initial acquisitions and periodic replacements of outdated equipment. This results in additional cash outflows in year 8. Consequently, in year 8, FCFF is projected to decline compared to previous years due to reinvestment in medical equipment.

The following table presents the free cash flow projection for Hospital X.

**Tabel – 6 Cashflow Projection of Hospital X**

Tahun	0	1	2	3	4	5	6	7	8	9	10	
Unit	Asumsi	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	(Rp juta)	
Net profit after tax		0	-24,243	-13,996	-6,726	22	5,763	11,540	16,133	21,277	20,778	23,389
Depreciation			4,355	4,355	4,355	4,355	4,355	4,355	4,355	1,742	1,742	1,742
Amortization			4,654	4,654	4,654	4,654	4,654	4,654	4,654	4,654	4,654	4,654
Working capital												
Cash flow from operations		0	-15,235	-4,987	2,283	9,031	14,771	20,548	25,141	27,673	27,174	29,785
After tax interest cost			6,531	6,282	5,578	4,800	3,940	2,991	1,941	781	0	0
Building		93,072	0	0	0	0	0	0	0	0	0	0
Equipment purchase		30,482	0	0	0	0	0	0	0	12,197	0	0
Land		20,000	0	0	0	0	0	0	0	0	0	0
Terminal value												263,088
Free cash flow to firm		-143,554	-8,704	1,295	7,861	13,831	18,712	23,539	27,082	16,257	27,174	292,874
Borrowing		86,132	0	0	0	0	0	0	0	0	0	0
Loan principal repayment			0	8,940	9,879	10,916	12,063	13,329	14,729	16,275	0	0
After tax interest cost			6,531	6,282	5,578	4,800	3,940	2,991	1,941	781	0	0
Free cash flow to equity		-57,422	-15,235	-13,928	-7,597	-1,886	2,709	7,219	10,412	-799	27,174	292,874

For the purpose of this study, the holding period is assumed to be 10 years. At the end of this period, hospital operations are considered to be terminated, and the hospital is assumed to be sold to determine the terminal value, resulting in a cash inflow.

There are two methods used to determine the sale value:

1. Scrape Value Method
2. Capitalization Value Method

The reversion value (terminal value) is used to estimate the sale price of Hospital X after 10 years. The calculation is based on either the Scrape Value or Perpetuity Value of Hospital X, selecting the higher and more reasonable value for the hospital business. The terminal value calculation is presented in the following table:

**Tabel – 7 Reversion Value Calculation**

Description	Unit	Assumption	Amount (IDR million)
Annual Land Value Increase	%	5.00%	-
Land Value at Year 10	IDR/ Rp million	-	32,578
Residual Building Value	IDR/ Rp million	-	46,536
Residual Equipment Value	IDR/ Rp million	-	6,970
<b>Scrape Value at Year 10</b>	IDR/ Rp million	-	<b>86,083</b>
<i>Rate of return</i>		<b>12.00%</b>	
Operational Cash Flow (CFFO)	IDR/ Rp million	-	31,571
<b>Perpetuity Value at Year 10</b>	IDR/ Rp million	-	<b>263,088</b>

#### 4.2.5 Analisis Pengembalian

The payback period analysis table indicates that in year 0, the Free Cash Flow to Firm (FCFF) is negative IDR 143.55 billion, which originates from the initial hospital construction investment. This value turns positive at IDR 276.37 billion in year 10.

Beyond the terminal value, operational cash flow in year 10 reaches IDR 29.78 billion, indicating that the positive figure in year 10 is not solely due to the terminal value addition.

Based on industry benchmarks, the expected payback period for a new hospital typically ranges from 6 to 11 years. Since the payback period for this project is achieved within 10 years, the hospital investment plan is considered financially viable from a payback period perspective.

**Tabel – 8 Return Analysis Breakdown**

Year		0	1	2	3	4	5	6	7	8	9	10
Unit	Assumption	(IDR mil)	(IDR mil)	(IDR mil)	(IDR mil)	(IDR mil)	(IDR mil)	(IDR mil)	(IDR mil)	(IDR mil)	(IDR mil)	(IDR mil)
<b>Break-even Analysis</b>												
NPAT		0	-24,243	-13,996	-6,726	22	5,763	11,540	16,133	21,277	20,778	23,389
Break-even occurs	Year 4											
<b>Payback Period</b>												
Accumulated FCFF		-143,554	-152,257	-150,963	-143,102	-129,271	-110,560	-87,021	-59,939	-43,682	-16,508	276,366
Pay Back Period	< 10 years											
<b>Net Present Value</b>												
Bank of Indonesia rate	5.00%											
Discount rate	100.00%											
Discount factor		1.00	0.90	0.81	0.73	0.66	0.59	0.53	0.48	0.43	0.39	0.35
Free cash flow to firm		-143,554	-8,704	1,295	7,861	13,831	18,712	23,539	27,082	16,257	27,174	292,874
Discounted cash flow		-143,554	-7,841	1,051	5,748	9,111	11,105	12,585	13,044	7,054	10,623	103,146
Net Present Value	22,071											
<b>Internal Rate of Return</b>												
Free cash flow to firm		-143,554	-8,704	1,295	7,861	13,831	18,712	23,539	27,082	16,257	27,174	292,874
IRR - FCFF	12.8%											
Free cash flow to equity		-57,422	-15,235	-13,928	-7,597	-1,886	2,709	7,219	10,412	-799	27,174	292,874
IRR - FCFE	15.1%											

Given the risks associated with the hospital business, an additional risk premium of 6.0% per year is considered sufficient as risk compensation. As a result, the discount rate used is 11.0%.

The table indicates that the NPV (Net Present Value) of Hospital X is IDR 22.07 billion. A positive NPV signifies that the present value of all future cash inflows exceeds total cash outflows. Based on the previously established parameters, from an NPV perspective, the hospital development plan is deemed feasible to proceed.

The Project IRR (Internal Rate of Return) is 12.8%, approximately 1.8% above the 11% discount rate. Meanwhile, the Equity IRR reaches 15.1%. These results indicate a satisfactory IRR, confirming that Hospital X is financially viable based on the IRR perspective.

The IRR on equity (IRR from FCFE) is 15.1%, reflecting the return on self-invested capital. This figure is higher than the firm/project IRR (IRR from FCFF) due to the leverage effect from loans or external funding sources (such as banks, investors, or financial institutions). Leverage increases the rate of return as it is calculated based on a smaller initial self-invested capital.

With additional external investors or loans, the business risk is shared with external investors, thereby reducing the overall risk borne by the initial investors.

## 5. CONCLUSION

The marketing aspect is assessed based on competition levels, market potential, and demographics. All parameters within the marketing aspect show positive results, supporting the development plan of Hospital X. It can be concluded that the construction plan for Hospital X is feasible to proceed from a marketing management perspective.

The financial aspect evaluation is primarily based on Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period (PBP). The results indicate that the NPV is positive (IDR 21.6 billion), the IRR is positive (12.8%), and the payback period is under 10 years. These parameters clearly demonstrate that the financial aspect also supports the hospital development plan. Based on these assessments, it is concluded that from a financial management perspective, the construction of Hospital X is feasible to proceed.

This study aims to enhance understanding and knowledge regarding the feasibility study of hospital development from both marketing and financial management aspects, particularly for Class C general hospitals with a capacity of 100 to 200 beds. In high-cost areas where labor wages are relatively high and non-BPJS hospital service rates have a larger gap compared to INA-CBGs standard rates, financial projections are heavily influenced by the target market. The higher the proportion of BPJS patients, the lower or longer the return on investment. With a target market of 50% BPJS patients, as presented in this study, the return remains favorable.

The findings of this study can serve as a reference for future feasibility studies on hospital development, especially in Bogor Regency and surrounding areas. Additionally, this article can be beneficial for hospital planners and potential investors in evaluating and making informed decisions. Investors typically focus on marketing and financial aspects, as these are the key factors influencing profitability and return on investment.

Although competition remains relatively low, it is advisable for investors to seek professional hospital management to ensure efficient operations. Hospital management is a complex organization that requires the integration of various expertise and resources. Furthermore, hospital organizations often maintain a top-down structure, heavily dependent on the leadership figures in top management. Experienced top management plays a crucial role in ensuring that operational management and technical issues are effectively addressed.

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