# A STUDENT DORMITORY AS AN EDUCATIONAL SUPPORTING FACILITY: AN ENTERPRISE BUDGET ANALYSIS

**Dr. Etty Susilowati, MM**
Budi Luhur University
ettysslwt@gmail.com
**Dr. Sugiharto, M.Sc., M.Fin**
Budi Luhur University
ss_aei@yahoo.co.id
**Dr. Leonnard, MComm**
IPMI International Business School
Leonnard.ong@ipmi.ac.id
**Budi Srihartati**
Master student of Magister Management, Budi Luhur University

## Abstract
*The availability of student dormitories has become a major attraction for universities in Indonesia since many universities have provided this facility. In this study, we examine the potential of a student dormitory development at the Budi Luhur University, especially in terms of finance for student interests and education providers. Primary data were collected from 185 students and were analyzed by employing feasibility test of Net Present Value (NPV), Internal Rate of Return (IRR), Net Benefit Cost Ratio (Net B/C), Profitability Index (PI) and Pay Back Period (PP). Sensitivity analysis was also carried out both in terms of cost and income to anticipate the uncertainty that may occur. The findings indicated that the total investment required in the construction of the student dormitory was Rp 155,857,800 with an average revenue per annum of Rp 58,314,741,732. The results of the investment valuation analysis of net cash flows for 30 years indicated the NPV value of Rp 187,355,802,592, IRR of 21%, Net B/C of 10.57, PI of 2.20, and PBP 6.45 years. This proved that the investment in the student dormitory construction was considered feasible. Finally, from the sensitivity analysis of changes in occupancy rate, rental rates and operational costs, it was concluded that the investment in dormitory construction would be unfeasible when occupancy rates and rents were at the level of 80% down. Further managerial implications were discussed.*

## Keywords
student dormitory; investment; investment feasibility test; sensitivity analysis.

## JEL Classification
I22

## 1. Introduction
Students are young generation with a lot of potential who are expected to be able to utilize the quality of knowledge they have in society (Baharuddin & Makin, 2007). To gain the greatest benefit in the learning process, the students are trying to get the best university, according to their interest which is often not provided in their own cities. This resulted in some students must move to other cities to get a higher quality education. In addition to academic quality, immigrant students often also consider the availability of adequate and affordable logistics. Demographics of the students origin, distribution which spread throughout Indonesia and the concentration of university locations in certain cities in Indonesia requires the availability of adequate shelter for

students who do not live with their parents. Boekaerts (2002) stated that there are several factors that influence the success of students to achieve the optimal achievement, those are intelligence, personality, university environment, and living environment (family, boarding house or boarding house). In addition, the provision of physical facilities significantly affects the level of student satisfaction towards the university (Leonnard et al., 2014). Therefore, student dormitory is an alternative that can provide a sense of security and comfort for students who are not familiar with the surrounding environment.

Competition among public and private universities to get the best students nowadays is not only analyzed from academic achievement, but also considering the affordability of education and accommodation costs. In Jakarta, several universities have provided student dormitories for students, including University of Indonesia, Multimedia Nusantara University, Pelita Harapan University, Prasetya Mulya University, Bina Nusantara University, Bunda Mulia University, President Univesity etc. Student dormitories in addition to helping students in terms of residence can also be the main attraction of a university. In this study, we analyze the potential of student dormitory development at Budi Luhur University seen from the financial aspect. The results of this study are expected to be beneficial to the interests of students and education providers. Budi Luhur University is considered very prospective because currently has an active student number of 11.188 people, has 5 faculties consisting of undergraduate and postgraduate programs. Of the number of students is estimated about 61.70% comes from outside Jakarta and need a place to live during their education. In addition, Budi Luhur University has more than 3,200 m$^2$ of vacant land that has the potential to be developed as a student dormitory.

Previous studies have analyzed feasibility analysis (Mahyudin et al., 2014; Nikki et al., 2014; Winantara et al., 2014; Dikareva & Voytolovsky, 2016) and others have analyzed the feasibility of building public facilities (Smith et al., 2014; Juwitaningtyas et al., 2015; Figueiredo, Nunes & Brito, 2017) and housing (Prastiwi & Utomo, 2013; Maulina & Utomo, 2016; Munawaroh & Utomo, 2017) but feasibility analysis in the effort of providing educational facilities is still limited. Thus, this study contributes to the literature by providing a new perspective on the potential of providing student dormitory, not only from the aspects of educational quality, but also from the university's profitability as a provider of educational services.

## 2. Methodology

### 2.1 Data Sources

This study employed primary and secondary data. The primary data were collected from 185 students of Budi Luhur University, while the secondary data were collected from books, journals and papers related to student dormitories, enterprise budget, and investment analysis. Data collection was carried out through direct interview by questionnaires with students and others systematically according to the research objectives.

### 2.2 Data analysis

Data analysis was carried out by evaluating the feasibility of investment through Net Present Value (NPV), Internal Rate of Return (IRR), Net Benefit Cost Ratio (Net B/C), Profitability Index (PI), Pay Back Period (PBP), and sensitivity analysis. NPV is the current equivalent value of the expected cash flows taking into account the cost of capital minus the initial cost of the project. An investment will be accepted if the NPV from the investment is positive. The formula for calculating NPV is as follows (Bosma et al., 2017):

$$NPV = \sum_{t=0}^{n}[(B_t - C_t)/(1+r)^t]$$

In which: $B_t$= benefits/year; $C_t$= cost/year; r = discount rate; n = project length; t= project year

IRR is the discount rate that causes the present value of the cash flow to equal the initial cost of the project. An investment is considered feasible if the IRR value is greater than the minimum interest rate of Attractive Rate of Return (MARR). The formula for calculating IRR is as follows (Munawaroh & Utomo, 2017):

$$IRR = i_l + \frac{(i_u - i_l)(NPV_l)}{(NPV_l - NPV_u)}$$

In which: $i_l$= Discount rate (+); $i_u$= discount rate (-); $NPV_l$ = NPV (+); $NPV_u$= NPV (-)

Net B/C is another type to measure the size of the project, where the present value of the benefit stream is divided by the present value of the cost. An investment is considered feasible if the net value of B/C is positive. PI is the cash flow NPV ratio to the investment value of the project. An investment is considered feasible if the value of PI is positive (Prastiwi & Utomo, 2013). The formula for calculating PI is as follows (Prastiwi & Utomo, 2013):

$$PI = \frac{\sum Present\ value\ of\ net\ cash}{\sum Present\ value\ of\ investation}$$

PP is a way to calculate the length of time it takes to generate a sufficient net cash flow to pay for the initial expenditure. An investment is considered feasible if the PP give a faster return time (Umar, 2001). The formula for calculating PP is as follows (Munawaroh & Utomo, 2017):

$$PP = \frac{I}{Ab}$$

In which: I = Investation value ; Ab = Net profit/year
All of the analyses were calculated by employing Ms. excel.

## 3. Result And Discussion
### 3.1 Enterprise Budget

Several assumptions employed in the enterprise budgeting of student dormitory are as follows: 1) the investment is planned for 30 years, according to the highest depreciation in the construction of middle class building, 2) total rooms to be built are 1,493 units, with a foundation of 8,000 m², total building area of 32,000 m², the other facilities (aisles, stairs, etc.) of 9,600 m², and room size of 15 m² each, 3) inflation rate is determined by average inflation of consumer price index from 2012 to 2016, 4) the discount rate employed is 18 %, and 5) the rental price assumed is able to compete with competitors around the university, especially with competitors who have come first, ie gateway apartment and boarding house. Unit price employs the reference of the cost of boarding house rent with monthly payment scheme (Table 1).

**Table 1  Standard for student dormitory rental price**

| Type of rooms | Facility | Rent |
|---|---|---|
| Single room | Bathroom inside | 1,100,000 |
| | Sharing kitchen | |
| | Electrity | |
| | Water | |
| Single room | Bed | 1,350,000 |
| | Wardrobe | |
| | Air Conditioner | |
| | TV | |
| | Desk and chair | |
| | Bathroom inside | |
| Double room | Bed | 1,750,000 |
| | Wardrobe | |
| | Air Conditioner | |
| | TV | |
| | Desk and chair | |
| | Bathroom inside | |

## 3.2 Investment cost

Investment costs are costs incurred at the beginning of the project. The initial investment cost for the construction of the student dormitory requires funds of Rp 155,857,800.00, - where the compliance for funds is assumed to be fulfilled by university. These initial investment costs consist of costs for land, buildings, interiors and furniture (Table 2).

**Table 2 Projected investment cost of student dormitory**

| No | Investment types | Unit | Price/unit | Total |
|---|---|---|---|---|
| 1 | Land | 10,000 | 5,000,000 | 50,000,000 |
| 2 | Building | 32,000 | 3,000,000 | 96,000,000 |
| 3 | Building permit | 4 floors | 4,000,000 | 4,000,000 |
| 4 | Furniture dan interior | | | |
| | Number of unit x cost of furniture dan interior for single room | 597 | 6,000,000 | 3,583,200,000 |
| | Number of unit x cost of furniture and interior for double room | 896 | 7,000,000 | 6,270,600,000 |
| | Total | | | 155,857,800,000 |

## 3.3 Operational cost

Operational costs are routine expenses incurred annually at the project age. The operational costs of the student dormitory consist of fixed and variable costs. Fixed costs consist of salary of a head of dormitory, an admin staff, securities, and cleaning services (Table 3).

**Table 3 Projected fix cost of student dormitory**

| No | Type of costs | Unit | Price/unit | Total |
|---|---|---|---|---|
| 1 | Salary of head of dormitory | 1 | 3,350,000 | 3,350,000 |
| 2 | Salary of admin staff | 1 | 2,500,000 | 2,500,000 |
| 3 | Salary of security | 6 | 2,000,000 | 12,000,000 |

| 4 | Salary of cleaning service | 5 | 1,500,000 | 7,500,000 |
|---|---|---|---|---|
| | Total | | | 25,350,000 |

While variable costs consist of electricity, water, telephone and others (Table 4).

**Table 4 Projected variabel cost of student dormitory**

| No | Type of costs | Allocation | Price/unit | Total |
|---|---|---|---|---|
| 1 | Electricity and water | 1493 unit rooms | 100.000 | 149,300,000 |
| | | Service area | | 2,500,000 |
| 2 | Phone | | 500.000 | 500,000 |
| 3 | Others | T | | 10,000,000 |
| | Total | | | 162,300,000 |

## 3.4 Cash flow projection

The cash flow projection to build the student dormitory includes the flow of benefits or an overview of the incoming money and the flow of costs spent during the investment period after it is accounted for the inflation factor. The projected cash inflows of student dormitory investment are indicated in Table 5.

**Table 5 Projected cash flow of student dormitory**

| Year | Capital | Fix cost | Variable cost | Income | Cash flow | Cum. CF |
|---|---|---|---|---|---|---|
| 0 | 155,857,800,000 | | | | (155,857,800,000) | (155,857,800,000) |
| 1 | | 328,901,040 | 2,105,745,120 | 28,486,440,000 | 26,051,793,840 | (129,806,006,160) |
| 2 | | 328,901,040 | 2,105,745,120 | 28,486,440,000 | 26,051,793,840 | (103,754,212,320) |
| 3 | | 328,901,040 | 2,105,745,120 | 28,486,440,000 | 26,051,793,840 | (77,702,418,480) |
| 4 | | 328,901,040 | 2,105,745,120 | 34,183,728,000 | 31,749,081,840 | (45,953,336,640) |
| 5 | | 328,901,040 | 2,105,745,120 | 34,183,728,000 | 31,749,081,840 | (14,204,254,800) |
| 6 | | 328,901,040 | 2,105,745,120 | 34,183,728,000 | 31,749,081,840 | 17,544,827,040 |
| 7 | | 328,901,040 | 2,105,745,120 | 34,183,728,000 | 31,749,081,840 | 49,293,908,880 |
| 8 | | 328,901,040 | 2,105,745,120 | 41,020,473,600 | 38,585,827,440 | 87,879,736,320 |
| 9 | | 328,901,040 | 2,105,745,120 | 41,020,473,600 | 38,585,827,440 | 126,465,563,760 |
| 10 | 10,445,028,000 | 328,901,040 | 2,105,745,120 | 41,020,473,600 | 28,140,799,440 | 154,606,363,200 |
| 11 | | 328,901,040 | 2,105,745,120 | 41,020,473,600 | 38,585,827,440 | 193,192,190,640 |
| 12 | | 328,901,040 | 2,105,745,120 | 49,224,568,320 | 46,789,922,160 | 239,982,112,800 |
| 13 | | 328,901,040 | 2,105,745,120 | 49,224,568,320 | 46,789,922,160 | 286,772,034,960 |
| 14 | | 328,901,040 | 2,105,745,120 | 49,224,568,320 | 46,789,922,160 | 333,561,957,120 |
| 15 | | 328,901,040 | 2,105,745,120 | 49,224,568,320 | 46,789,922,160 | 380,351,879,280 |
| 16 | | 328,901,040 | 2,105,745,120 | 59,069,481,984 | 56,634,835,824 | 436,986,715,104 |
| 17 | | 328,901,040 | 2,105,745,120 | 59,069,481,984 | 56,634,835,824 | 493,621,550,928 |

| 18 | | 328,901,040 | 2,105,745,120 | 59,069,481,984 | 56,634,835,824 | 550,256,386,752 |
| 19 | | 328,901,040 | 2,105,745,120 | 59,069,481,984 | 56,634,835,824 | 606,891,222,576 |
| 20 | 10,445,028,000 | 328,901,040 | 2,105,745,120 | 70,883,378,381 | 58,003,704,221 | 664,894,926,797 |
| 21 | | 328,901,040 | 2,105,745,120 | 70,883,378,381 | 68,448,732,221 | 733,343,659,018 |
| 22 | | 328,901,040 | 2,105,745,120 | 70,883,378,381 | 68,448,732,221 | 801,792,391,238 |
| 23 | | 328,901,040 | 2,105,745,120 | 70,883,378,381 | 68,448,732,221 | 870,241,123,459 |
| 24 | | 328,901,040 | 2,105,745,120 | 85,060,054,057 | 82,625,407,897 | 952,866,531,356 |
| 25 | | 328,901,040 | 2,105,745,120 | 85,060,054,057 | 82,625,407,897 | 1,035,491,939,253 |
| 26 | | 328,901,040 | 2,105,745,120 | 85,060,054,057 | 82,625,407,897 | 1,118,117,347,150 |
| 27 | | 328,901,040 | 2,105,745,120 | 85,060,054,057 | 82,625,407,897 | 1,200,742,755,047 |
| 28 | | 328,901,040 | 2,105,745,120 | 102,072,064,868 | 99,637,418,708 | 1,300,380,173,755 |
| 29 | | 328,901,040 | 2,105,745,120 | 102,072,064,868 | 99,637,418,708 | 1,400,017,592,464 |
| 30 | 10,445,028,000 | 328,901,040 | 2,105,745,120 | 102,072,064,868 | 89,192,390,708 | 1,489,209,983,172 |
| Total | 187,192,884,000 | 9,867,031,200 | 63,172,353,600 | 1,749,442,251,972 | 1,489,209,983,172 | |

Net cash flow accumulated during the 30 year is Rp 1,490,983,667,972. Benefits gained from the construction of student dormitory are inflow obtained for 30 years that amounted to Rp 1,749,442,251,720. Outflow obtained for 30 years is Rp 185,419,200,000 which consists of fixed costs of Rp 9,867,031,200 and variable costs of Rp 63,172,353,600.

## 3.5 Assessment of investment feasibility

The analysis of investment criteria is derived from the the cash flow analysis for 30 years, by looking at the total income, and then deducting it with fixed and variable costs arising from the lease transactions. Cash flows are calculated based on 100 % occupancy rate, 100 % operational cost, 6 % inflation, 18 % discount rate, a 20 % increase in rent per four years, a 2 % operational increase per year, with single room rent for Rp 1,350,000 and double room for Rp 1,750,000. The room size is 15 m$^2$ with 4 floors and a total of 1,493 units as indicated in Table 6.

**Table 6  Value of investment feasibility**

| No | Criteria of investment feasibility | Value |
|----|-----------------------------------|-------|
| 1 | Net Cash flow | 1,490,983,667,172 |
| 2 | Total investment | 155,857,800,000 |
| 3 | Net Present Value (NPV) | 187,355,802,592 |
| 4 | Internal Rate of Return (IRR) | 21 % |
| 5 | Pay Back Period (PBP) | 6.45 |
| 6 | Net Benefit Cost Ratio (Net B/C) | 10.57 |
| 7 | Profitability Index (PI) | 2.20 |

Based on the table 6, the value of NPV is greater than 1. Similarly, the value of Net B/C and PI. The IRR calculation indicated an IRR of 21 %. The findings denote that the internal rate of return generated from boarding investment is greater in value

than the 18 % discount rate. The value of PBP is 6.45 years. Based on the assessment criteria of the payback period, this dormitory investment is acceptable because the amount of investment cost can be returned with a payback period of 6.45 years, with a 100% occupancy rate. From the overall findings, it can be summarized that the construction of student dormitory is feasible to be constructed.

### 3.6 Sensitivity analysis

In this study, the sensitivity analysis to be tested is used to find out how sensitivity changes in occupancy rate, rental price, and operational cost. Changes are created gradually in percentage form until it is known that the criterion value is not feasible. The results of the sensitivity analysis of the occupancy rate indicate that the project is feasible to be applied at an occupancy rate of 90 % and 100 %, but at the time of occupancy rate down to 80 %, 70 %, 50 %, 25 % and 13 %, the project becomes not feasible anymore, because the investment criterion indicates an improper result, which is pointed from the IRR value which is lower than the reference discount rate (Table 7).

**Table 7 Sensitivity analysis of changes in occupancy rate**

| Investment criteria | | | | | | |
|---|---|---|---|---|---|---|
| Occupancy rate | Net cash flow | Total investment | NPV | IRR | PBP | PI | Net B/C |
| 100 % | 1,489,234,224,920 | 155,857,800,000 | 187,152,704,159 | 21 % | 6,45 | 10,56 | 2,20 |
| 90 % | 1,314,289,999,723 | 155,857,800,000 | 166,842,860,879 | 19 % | 7,05 | 9,43 | 2,07 |
| 80 % | 1,139,345,774,526 | 155,857,800,000 | 146,533,017,600 | 17 % | 7,81 | 8,31 | 1,94 |
| 70 % | 958,278,501,447 | 155,857,800,000 | 125,512,329,805 | 15 % | 8,70 | 7,15 | 1,81 |
| 50 % | 614,513,098,934 | 155,857,800,000 | 85,603,487,761 | 11 % | 11,99 | 4,94 | 1,55 |
| 25 % | 171,029,488,059 | 155,857,800,000 | 34,118,035,048 | 4 % | 21,38 | 2,10 | 1,22 |
| 13 % | (39,778,303,303) | 155,857,800,000 | 9,644,673,896 | -1 % | 31,00 | 0,74 | 1,06 |

While the result of the calculation of sensitivity analysis of the rental price, it is indicated that the higher the presentation of the rental price, the greater the profit and the investment is feasible to be applied. At the present level the rental price of 80 % down the investment is not feasible to be applied because the NPV and IRR will decrease further. In addition, when the rental price of 13 % net cash flow is negative Rp 39,996,983,585, - with an IRR of -1 % (Table 8).

**Table 8 Sensitivity analysis of changes in rental rates**

| Investment criteria | | | | | | |
|---|---|---|---|---|---|---|
| Rental price | Net cash flow | Total investment | NPV | IRR | PBP | PI | Net B/C |
| 200 % | 3,236,927,034,640 | 155,857,800,000 | 390,048,038,521 | 39 % | 3,86 | 21,77 | 3,50 |
| 150 % | 2,363,080,629,780 | 155,857,800,000 | 288,600,371,340 | 30 % | 4,72 | 16,16 | 2,85 |
| 100 % | 1,489,234,224,920 | 155,857,800,000 | 187,152,704,159 | 21 % | 6,45 | 10,56 | 2,20 |
| 90 % | 1,312,717,251,13 | 155,857,800,00 | 166,660,275,38 | 19 | 7,06 | 9,42 | 2,0 |

| | 8 | 0 | 8 | % | | | 7 |
|---|---|---|---|---|---|---|---|
| 80 % | 1,139,695,662,976 | 155,857,800,000 | 146,573,637,286 | 17 % | 7,81 | 8,31 | 1,94 |
| 50 % | 613,640,127,250 | 155,857,800,000 | 85,502,141,643 | 11 % | 12,00 | 4,94 | 1,55 |
| 20 % | 90,905,207,863 | 155,857,800,000 | 24,816,147,135 | 2 % | 24,78 | 1,58 | 1,16 |
| 13 % | (39,996,983,585) | 155,857,800,000 | 9,619,286,592 | -1 % | 31,00 | 0,74 | 1,06 |

Furthermore, from the calculation of the sensitivity analysis of the change in operational cost, it is indicated that the lower the operational cost of the presentation, the higher the NPV value will be, in this case indicates that this investment is feasible to be applied and not affected to operational cost of 13 % (the lowest percentage) and 200 % (the highest percentage) (Table 9).

**Table 9 Sensitivity analysis of operational costs**

| Investment criteria | | | | | | | |
|---|---|---|---|---|---|---|---|
| Operational costs | Net cash flow | Total investment | NPV | IRR | PBP | PI | Net B/C |
| 200 % | 1,416,194,840,120 | 155,857,800,000 | 173,721,233,735 | 20 % | 6,91 | 10,09 | 2,11 |
| 150 % | 1,452,721,836,459 | 155,857,800,000 | 180,438,312,094 | 20 % | 6,67 | 10,32 | 2,16 |
| 100 % | 1,489,234,224,920 | 155,857,800,000 | 187,152,704,159 | 21 % | 6,45 | 10,56 | 2,20 |
| 90 % | 1,496,611,202,785 | 155,857,800,000 | 188,509,282,672 | 21 % | 6,41 | 10,60 | 2,21 |
| 80 % | 1,503,842,101,880 | 155,857,800,000 | 189,838,998,244 | 21 % | 6,37 | 10,65 | 2,22 |
| 50 % | 1,525,826,956,705 | 155,857,800,000 | 193,881,870,841 | 22 % | 6,25 | 10,79 | 2,24 |
| 20 % | 1,547,665,732,760, | 155,857,800,000 | 197,897,880,498 | 22 % | 6,14 | 10,93 | 2,27 |
| 13 % | 1,552,778,489,696 | 155,857,800,000 | 198,838,083,428 | 22 % | 6,11 | 10,96 | 2,28 |

Then the results of further data processing indicate that the investment will not be feasible at the 50 % occupancy rate for the rental price of 13 %, with a negative NPV value of RP -3,213,035,045. The results also indicate that the value of NPV negative at occupancy rate of 25 % to the rental price 25 % , occupancy rate of 25 % to rental price 13 %, occupancy rate 13 % to rental price 50 %, occupancy rate 13 % to rental price 25 %, and occupancy rate 13 % to rental price 13 % (Table 10).

**Table 10 Sensitivity analysis of occupancy rate and rental price to NPV**

| Occupancy rate | | | | | | | |
|---|---|---|---|---|---|---|---|
| Rental price | 100 % | 90 % | 80 % | 70 % | 50 % | 25 % | 13 % |
| 100 % | 186,811,139,238 | 166,521,605,801 | 146,232,072,365 | 125,232,405,259 | 85,363,472,056 | 33,929,504,796 | 9,480,617,005 |
| 90 | 166,521,60 | 148,263,05 | 130,004,50 | 111,106,90 | 75,228,86 | 28,943,43 | 6,941,886, |

| % | 5,801 | 6,693 | 7,585 | 9,258 | 0,260 | 8,270 | 595 |
|---|---|---|---|---|---|---|---|
| 80 % | 146,232,072,365 | 130,004,507,585 | 113,776,942,804 | 96,981,413,257 | 65,094,248,463 | 23,957,371,745 | 4,403,156,185 |
| 70 % | 125,232,405,259 | 111,106,909,258 | 96,981,413,257 | 82,361,524,896 | 54,604,925,254 | 18,796,792,892 | 1,775,570,211 |
| 50 % | 85,363,472,056 | 75,228,860,260 | 65,094,248,463 | 54,604,925,254 | 34,690,413,074 | 8,999,172,170 | (3,213,035,045) |
| 25 % | 33,929,504,796 | 28,943,438,270 | 23,957,371,745 | 18,796,792,892 | 8,999,172,170 | (3,640,506,471) | (9,648,716,634) |
| 13 % | 9,480,617,005 | 6,941,886,595 | 4,403,156,185 | 1,775,570,211 | (3,213,035,045) | (9,648,716,634) | (12,707,886,778) |

The calculation of sensitivity analysis of occupancy rate and operational cost to NPV also indicates that the investment is feasible to be applied. The NPV value is always positive on the change of occupancy rate to operational cost starting from 100 % to 13 % percentage (Table 11).

**Table 11 Sensitivity analysis of occupancy rate and operational cost to NPV**

| Operational costs | Occupancy rate | | | | | | |
|---|---|---|---|---|---|---|---|
| | 100 % | 90 % | 80 % | 70 % | 50 % | 25 % | 13 % |
| 100 % | 187,027,466,042 | 166,717,622,763 | 146,407,779,483 | 125,387,091,689 | 85,478,249,645 | 33,992,796,931 | 9,519,435,779 |
| 90 % | 188,370,613,085 | 168,060,769,805 | 147,750,926,526 | 126,730,238,731 | 86,821,396,687 | 35,335,943,974 | 10,862,582,822 |
| 80 % | 189,713,760,127 | 169,403,916,848 | 149,094,073,568 | 128,073,385,774 | 88,164,543,730 | 36,679,091,016 | 12,205,729,864 |
| 70 % | 191,103,917,316 | 170,794,074,037 | 150,484,230,757 | 129,463,542,963 | 89,554,700,918 | 38,069,248,205 | 13,595,887,053 |
| 50 % | 193,743,201,254 | 173,433,357,975 | 153,123,514,695 | 132,102,826,901 | 92,193,984,857 | 40,708,532,143 | 16,235,170,991 |
| 25 % | 197,148,079,007 | 176,838,235,727 | 156,528,392,448 | 135,507,704,653 | 95,598,862,609 | 44,113,409,896 | 19,640,048,744 |
| 13 % | 198,766,571,193 | 178,456,727,913 | 158,146,884,634 | 137,126,196,840 | 97,217,354,795 | 45,731,902,082 | 21,258,540,930 |

Finally, the results of the sensitivity analysis of changes in rental rates and operational costs to NPV indicate that as the rental prices rise, NPV will begin to rise as operational costs fall, conversely as the rental prices fall and the operational costs rise, NPV will decline. Investment will become unfeasible when the rental prices decrease by 13 % against the operational cost up to 200 % generating NPV with negative value Rp. -3,925,466,115, - (Table 12).

**Table 12 Sensitivity analysis of rental prices and operational costs to NPV**

| Operational costs | Rental prices | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 200 % | 150 % | 100 % | 90 % | 80 % | 50 % | 20 % | 13 % |
| 200 % | 376,884,095,376 | 275,334,878,979 | 173,785,662,581 | 153,272,720,869 | 133,165,976,002 | 72,033,347,751 | 11,286,606,501 | (3,925,466,115) |
| 150 % | 383,599,830,588 | 282,050,614,191 | 180,501,397,793 | 159,988,456,081 | 139,881,711,234 | 78,749,082,962 | 18,002,341,713 | 2,790,269,097 |
| 100 % | 390,315,565,800 | 288,766,349,403 | 187,217,133,005 | 166,704,191,293 | 146,597,446,446 | 85,464,818,174 | 24,718,076,925 | 9,506,004,309 |
| 90 % | 391,672,144,313 | 290,122,927,915 | 188,573,711,518 | 168,060,769,805 | 147,954,024,959 | 86,821,396,687 | 26,074,655,438 | 10,862,582,822 |
| 80 % | 393,001,859,885 | 291,452,643,487 | 189,903,427,090 | 169,390,485,377 | 149,283,740,531 | 88,151,112,259 | 27,404,371,010 | 12,192,298,394 |
| 50 % | 397,044,732,483 | 295,495,516,085 | 193,946,299,687 | 173,433,357,975 | 153,326,613,128 | 92,193,984,857 | 31,447,243,608 | 16,235,170,991 |
| 20 % | 401,062,085,286 | 299,512,868,889 | 197,963,652,491 | 177,450,710,779 | 157,343,965,932 | 96,211,337,661 | 35,464,596,411 | 20,252,523,795 |
| 13 % | 402,068,102,421 | 300,518,886,023 | 198,969,669,626 | 178,456,727,913 | 158,349,983,067 | 97,217,354,795 | 36,470,613,546 | 21,258,540,930 |

## 4. Conclusion and Recommendation

Construction of student dormitory as a supporting educational facility is feasible to be applied in terms of financial, student interests and educational providers. The total investment required is Rp. 155,857,800,000. The student dormitory is projected to generate an average income per year of Rp 58,314,741,732 and the average cost per year is Rp 2,434,646,160. The average net cash flow per year is Rp 49,699,455,572 and the net cash flow generated during 30 years is Rp.1,490,983,667,172. The result of investment assessment of the student dormitory in the net cash flow for 30 years obtained NPV value of Rp.187,355,802,592, IRR of 21 %, Net B/C of 10.57, PI of 2.20, and PBP 6.45 years. This proves that the investment development of the student dormitory is feasible because it will be profitable in the long term for 30 years.

From the sensitivity analysis of the change of occupancy rate, the rental price and the operational cost are summarized that the investment of student dormitory will be unfeasible when the occupancy rate and the rental price are at the level of 80 % down, on the contrary with the result of the sensitivity analysis of the change in operational cost it indicate that the NVP will get higher. Taken together the occupancy rate and the rental price decreased by 50 %, 25 % and 13 % will cause the investment to be unfeasible in the long run. The operational costs will increase and NPV will fall when the rental prices decrease. The investment will also become unfeasible when the rental prices decrease by 13 % against the operational costs increase to 200 % cause NVP is negative of Rp. -3,925,466,115.

This study is expected to become one of the reference for the further studies, because there are still limited studies about financial feasibility analysis of student dormitory needs. Moreover, this study is expected to be able to include the economic aspect of student dormitory potential with BOT (Build Operate Transfer) system, operation management (using operator service), and Mudharabah.

## References

Baharuddin, Makin, M. (2007). *Pendidikan humanistik: Konsep, teori dan aplikasi praktis dalam dunia pendidikan*. Yogyakarta: AR Ruzz Media.

Boekaerts, M. (2002). *Motivation to learn*. Brussel: IAE-IBE UNESCO.

Bosma, R. H., Lacambra, L., Landstra, Y., Perini, C., Poulie, J., Schwaner, M. J., & Yin, Y. (2017), The financial feasibility of producing fish and vegetables through aquaponics, *Aquacultural Engineering*, 78, 146-154.

Dikareva, V., & Voytolovskiy, N. (2016), The efficiency and financial feasibility of the underground infrastructure construction assessment methods, *Procedia Engineering* 165(2016), 1197-1202.

Figueiredo, R., Nunes, P., & Brito, M.C. (2017), The feasibility of solar parking lots for electric vehicles, *Energy* 140(1), 1182-1197

Juwitaningtyas, T., Ushada, M., & Purwadi, D. (2015), Financial feasibility analysis for moss greening material panel in Yogyakarta, *Agriculture and Agricultural Science Procedia* 3(2015), 159-162.

Leonnard, Daryanto, H.K.S., Sukandar, D., & Yusuf, E.Z. (2014), The loyalty model of private university student, *International Research Journal of Business Studies* 7(1), 55-68.

Mahyuddin, I., Mahreda, E.S., Mustika, R., & Febrianty, I. (2014), Analisis kelayakan dan sensitivitas harga input pada usaha budidaya ikan lele dalam kolam terpal di Kota Banjarbaru Provinsi Kalimantan Selatan, *EnviroScienteae* 10(2014), 9-17.

Maulina, Z. P., & Utomo, C. (2015), Study Kelayakan Investasi Apartemen Gunawangsa Merr Surabaya, *Jurnal Teknik ITS*, *4*(2), D91-D94.

Munawaroh, A., & Utomo, C. (2017), Analisa Investasi The Akavia Indekost Residences Ngaliyan-Semarang, *Jurnal Teknik ITS*, *6*(1), 68-72.

Poetri, N. A., Basith, A., & Wijaya, N. H. (2014), Analisis kelayakan pengembangan usaha peternakan sapi perah kunak (studi kasus usaha ternak kavling 176, Desa Pamijahan Kab. Bogor), *Jurnal Manajemen & Organisasi* 5(2), 122-138.

Prastiwi, A., & Utomo, C. (2013). Analisa Investasi Perumahan Green Semanggi Mangrove Surabaya, *Jurnal Teknik ITS*, *2*(2), D191-D196.

Smith, M. T., Goebel, J. S., & Blignaut, J. N. (2014), The financial and economic feasibility of rural household biodigesters for poor communities in South Africa, *Waste Management* 34(2), 352-362.

Umar, Husein. (2001), Studi Kelayakan Bisnis, Gramedia Pustaka Utama. Jakarta.

Winantara, I. M. Y., Bakar, A., & Puspitaningsih, R. (2014), Analisis kelayakan usaha kopi luwak di Bali, *Jurnal Teknik Industri Itenas* 3(2), 118-129.