



FINANCIAL FEASIBILITY OF FOOD PROCESSING INDUSTRY: LESSONS FROM TOFU INDUSTRY IN TRUNAN VILLAGE, MAGELANG

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Abstract

This study aims to examine the financial analysis of the Food Processing Industry in Tofu Industry Centers of Trunan Village in an effort to maintain the calculation of operational costs, profit and loss, and investment in minimizing investment losses. In particular, this study aims to calculate the Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PP), and Profitability Index (PI) in the Processed Food Industry in the Tofu Industry Centers of Trunan Village. The urgency of this research is to maintain the sustainability of the Tofu Industry Centers in Trunan Village, which is one of the leading MSME industry in Magelang City and in an effort to maintain food security. Based on the results of the analysis it was found that financially the MSME management in the Tofu Industry Centers centers Food Processing Industry in Trunan Village did not fulfill the feasibility aspect. Net Present Value (Rp 2,147,030,794), Internal Rate of Return shows 2%, Payback Period 2 Years 8 months, and Profitability Index 4.10.

Keywords: Feasibility Study, NPV, IRR, PP, PI

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INTRODUCTION

Trunan Village Tofu Industry Centers is considered the most productive tofu industry in Magelang City, Central Java (Magelang Ekspres, 2021). This Tofu Industry Centers produces tofu and tempeh. Most people in this village, work as tofu and tempeh makers. The large market demand for tofu and tempeh products is the main reason why this industry to survive for decades.

The potency of the food processing industry has quite a big impact on society. From an economic perspective, this industry become the source of income of the Trunan Village people for more than 2 decades (Achsa et al., 2022). This industry also attracts people from outside the village to work in Trunan Village, so that a lot of workers outside Trunan Village who rely on this industry for their living. Apart from that, the need for tofu and tempeh keeps on increasing, especially supported by the rapid growth in population.

The capability of Tofu Industry Centers to empower the community's economy can be strengthened by identifying the viability of the business. Identification of business continuity in the form of evaluation activities can help a business industry to survive, maximize business opportunities, and minimize existing risks (Haass & Guzman, 2020; Rode et al., 2022). Evaluation should be a continuous process through the business cycle. A good evaluation process will lead to

the right decisions for taking policies in business renewal (Thamhain, 2014).

Evaluation plays an important role in ensuring the longevity and sustainability of a business. It is an important mechanism that encourages organizations to be able to assess current business operations, identify gaps, and develop strategies to resolve existing problems. Evaluation is not a one-time event, but a continuous and systematic process to guide business owners and business managers in making the right decisions, and help adjust plans based on market conditions. The opinion by (Bryson, 2018) states that businesses that routinely evaluate their strategies and operations will be better prepared to face uncertainty and challenges because the business is always making improvements based on existing feedback and data.

Another important aspect is the role of evaluation in business sustainability in the financial aspect. Financial performance evaluation helps businesses to find out profits, cash flow, and control expenses. Regular financial reviews can encourage businesses to find cost-saving opportunities in a business, optimize resource allocation, and detect financial traps. A study by Ferri & Ricci, (2021) states that a business that routinely conducts financial evaluations can show higher levels of profitability and long-term success, compared to the opposite. The combination of operational assessments and providing a view

of the health of the business through financial evaluations can enable owners and managers to make holistic decisions on the further progress of the business.

Research related to financial analysis in the processing industry has been conducted in various contexts. These studies focus on cost structure analysis, profitability, cash flow, and the impact of investments on business sustainability. Previous research states that a company's financial performance has a significant impact on business sustainability (Bartolacci et al., 2020). The financial feasibility of a business can be detected by conducting a financial analysis, which may reveal that a tofu industry business is feasible to continue, and suggests improvements through the latest machine technology (Wibowo et al., 2022). Another study on the soybean industry showed financial analysis results indicating that the industry is feasible to run, and also stated that a company's financial analysis can encourage business efficiency (Rochaeni et al., 2022). These studies also focus on operational efficiency, technology utilization, and cost-saving strategies to enhance the competitiveness and financial sustainability of the food processing industry, including the tofu industry.

As far as the author's research is concerned, there has been no comprehensive research related to financial evaluation studies. Whereas, the business evaluation process need careful identification and

calculations. Through the evaluation process, the food processing industry, particularly the Trunan Village Tofu Industry Centers, can be developed in a better direction. Efforts to identify and evaluate financial conditions are an important feature in maintaining business continuity, hence this research is essential to carry out. This study was conducted to close the gap in financial evaluation methods which have not been carried out comprehensively and to answer the research question, what is the financial viability of tofu industry in Trunan village?

THEORETICAL BASIS

Basically, business or enterprise is a form of investment. Investment is an effort to encourage economic improvement. Investment is an attempt to invest capital in a project that will later be carried out (Colquitt et al., 2021). The main benefits of investment are encouraging employment opportunities, increased output, and the economy. Specific capital investment for investment can be seen from how much investment capital is allocated for land, equipment, buildings, and labor (Krisnawan et al., 2015). The entire investment is expected to provide sustainable profits and benefits for investors. Investment also plays a vital role in driving innovation and technological development. When companies invest in research and development, they not only increase their competitiveness but also create new products that can meet market needs. Thus, investment focuses not only on

short-term profits but also on sustainable long-term growth for the economy. In addition, the right investment can strengthen infrastructure, which in turn supports the growth of other sectors in the economy.

In investing, finance is the main aspect. Finance is the key support in implementing investment in businesses/projects. Financial investment in the form of capital can be in the form of land, equipment, buildings, and labor, all of which require good financial planning. If there is no good financial management, investment will not be optimal, and will allow the emergence of financial risks that worsen a business. The financial aspect of investment functions as a tool to measure the feasibility of a project. There are several criteria that can be used to evaluate whether a business project can be implemented or not, or whether the business is feasible to run. Several investment criteria can be applied to the financial aspect to provide information regarding the profits and benefits of the investment generated in a business/project. Some of the investment criteria are profitability index, internal rate of return, payback period, and net present value. Each criterion has a description to see the potential, risk, and benefits of the investment made. For example, Net Present Value (NPV) is one of the criteria to evaluate a project whether it can provide net profit, after taking into account the various costs of the project.

The role of financial aspects in driving business development is reflected in the proper management of financial investments. So that it can produce good business stability in the long term. Like a business that invests in technology for business production efficiency. The purpose of this is to increase greater opportunities, and long-term profits. Technology does require large initial capital, but with proper financial planning, a business will project that the technology can provide significant returns.

Based on previous literature, investment-criteria-based analysis such as NPV, IRR, BCR, BEP, and PP reveals that a housing project is feasible to run with a return on investment value over a certain period and can provide profits (Rori et al., 2020; Tiwa et al., 2016). Production efficiency and project feasibility can be recognized using the R/C Ratio, NPV, IRR, Net B/C, and PP (Khafsah et al., 2018; Ramadhan & Soepriyono, 2019). Other research using investment criteria such as BEP, NPV, IRR, PP, and PI can demonstrate different performances in terms of investment feasibility (Priyo, 2016; Suandi & Chayati, 2018).

RESEARCH METHODS

The research was conducted at the Tofu Industry Centers in Trunan Village, Magelang City, covering all tofu and tempeh entrepreneurs in Trunan Village. The research was conducted in 2023 and targeted the entrepreneurs of the tofu and tempeh food

processing industry. The questionnaire is used as a data collection technique filled out by entrepreneurs, related to financial aspects.

The data analysis technique uses four investment criteria including profitability index, internal rate of return, payback period, and net present value.

The profitability index is a calculation method aimed at assessing the feasibility level of a project by comparing the present value of the cash flow value with the investment value of the project (Gurau, 2012). This index calculation applies the following formula:

$$P = \frac{\text{Cash in flow}}{\text{Cash out flow}} \dots \dots \dots (1)$$

Based on this calculation, the feasibility of investing with *profitability index*, that is, if the PI value is > 1 then it is worth running. If the PI value < 1 then it is not feasible to run.

Krisnawan et al. (2015) stated the level of feasibility of a project can be reflected in how much return value the level of investment will offer. Internal Rate of Return (IRR) is the level discount rate (DR) that produces an NPV equal to zero (Russell & Rickard, 2012). The unit size resulting from this estimation result is in percent. A business/project is considered feasible when the IRR percentage is greater than the figure *minimum attractive rate of return* (MARR). Basically, calculating the IRR level is conducted by using an interpolation method between a lower discount rate and a higher discount rate. The formula generated

by using the interpolation method for IRR is as follows:

$$IRR = i + \frac{NPV_1}{NPV_1 - NPV_2} x (i_1 - i_2) \dots \dots \dots (2)$$

Description:

IRR : Internal Rate of Return

i_1 : First Interest Level

i_2 : Second Interest Level

NPV₁ : First NPV

NPV₂ : Second NPV

The payback period is the return period for capital spent in all investment projects by calculating the profits obtained and deducting the initial capital (Stamalevi, 2015).

$$PP = \text{Investment Value} - \text{Cash in flow} \dots (3)$$

In calculating the payback period, the difference between the investment value and income until the investment value is exhausted/reaches a positive value (Nurfitriani & Suryawati, 2018). In this analysis stage, it is concluded that the shorter the return period for investment capital, the less risk will be, and vice versa.

Net present value is obtained by calculating the difference between the cash inflow and cash outflow in a projection period. NPV will be positive or feasible if the income from a project is greater than the investment/capital value (Mamun & Hasanuzzaman, 2019). The formula is obtained, as follows:

$$NPV = \left(\frac{NCF_t}{(1+i)^t} \right) \dots \dots \dots (4)$$

NPV : Net present value

NCF_t : Net cash flow (net income)

I : Discount rate

t : Year

RESEARCH RESULTS AND DISCUSSION

Specific research discusses the feasibility of a business/enterprise based on four investment criteria with several established assumptions. In detail, the investment criteria analysis from a financial aspect is discussed in the following sections.

a. Financial Aspect Assumptions

In performing financial aspects analysis, several assumptions are employed, these assumptions are delivered, as follows:

- a) The food processing industry in question is the Tofu Industry Centers of Trunan village in Magelang City.
- b) 25 business actors at the Trunan Village Tofu Industry Centers become the objects of this research.
- c) The assumption of the inflation rate in this research is 7 percent per year, aligned with the average inflation rate in Magelang City.
- d) The assumption of the deposit interest rate employed in this research is 10.25 percent per year.
- e) The depreciation method used in this research is the straight-line method, this method assumes that the depreciation expense for each period is the same.
- f) The wage of employees at the Trunan Village Tofu Industry Centers was recorded as Rp. 1,125,000/person/month.

b. Capital and Investment

The investment cost allocated for 25 tofu business industries in Trunan Village is IDR. 210,577,440.00 per year. Most of the investment costs for the Trunan Village Tofu Industry Centers are assigned to production equipment such as frying pans, stoves, sieves, sieves, stoves, and molds. Some relatively expensive equipment are oxygen cylinders, water pumps, and scales. Details of investment costs for the Trunan Village tofu business industry are as follows:

Table 1. Investment Costs for Trunan Village Tofu Industry Centers

No	Nama of Business	Investment
1	Cahaya Tidar	32.000.000
2	Kripik Tahu Larasta	32.000.000
3	Kripik Tahu Yuka	70.975.000
4	Tahu Anugerah Abadi	12.455.000
5	Tahu Beti	3.250.000
6	Tahu Bu Asminah	8.080.000
7	Tahu Bu Jami	11.900.000
8	Tahu Bu Kustianti	9.000.000
9	Tahu Bu Salimah	9.020.000
10	Tahu Bulat Pak D	20.440.000
11	Tahu Canda Makmur	8.210.000
12	Condong Raos	13.600.000
13	Tahu Fajar Rezeki	27.500.000
14	Tahu Mas Adi	16.550.000
15	Tahu Mba Ana	24.500.000
16	Tahu Oldnies	32.290.000
17	Tahu Pak Fuad	18.855.000
18	Pabrik Tahu Seno	3.950.000
19	Tahu Pong Pak Dadan	25.720.000
20	Tahu Rizqi	10.528.000
21	bu Waitri	12.610.000

22	Tahu Sayur Pak Suhatmoko	7.440.000
23	Tahu Suswanto	7.140.000
24	Tahu Sayur Pak Yanto	12.440.000
25	Selera Hati	8.250.000
Average		17.548.120
Per Year		210.577.440

Source: Primary Data, processed

c. Operational Cost Estimation

The operational costs of the Trunan Village Tofu Industry Centers are defined as the costs

used to run the Trunan Village tofu business industry from production to sales. Operational cost turnover at the Trunan Village Tofu Industry Centers is calculated in one year. Operational costs allocated for one year are totaled as IDR. 2,312,015,119. Most of them are apportioned for labor and raw material costs. Details of operational costs for the Trunan Village Tofu Industry Centers are detailed as follows:

Table 2. Operational Costs of Trunan Village Tofu Industry Centers

No	Description	Amount	Unit	Cost	per Month	Cost Per Year
1	Operating cost	1	package	181.417.927	181.417.927	2.177.015.119
2	Personal Costs					
	a. Employee's Wages	10	people	1.125.000	11.250.000	135.000.000
Total Operational Costs Per Year						2.312.015.119

Source: Primary Data, processed

d. Profit/Lost Estimation

In the first year of its establishment, the Tofu Industry Centers at Trunan Village succeeded in making a profit of Rp. 683,097,633. Assuming an increase in tofu prices of 5 percent per year, the profits of this business will continue to increase. The following is a profit and loss estimation for the Tofu Industry Centers at the Trunan Village for ten years.

end of the business, while cash out is attained from taxes and investments. In detail, the estimated cash flow for the Tofu Industry Centers at the Trunan Village is presented in the following table:

e. Cash Flow Estimation

First-year cash flow estimation for the Tofu Industry Centers at the Trunan Village Tofu Industry Centers demonstrated a positive rate. Cash in is obtained from profits and non-depreciated additional investments at the

Table 3. Estimated Profit and Loss of Trunan Village Tofu Industry Centers

No	Description	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1	Total Revenue	2.281.728.000	2.395.814.400	2.515.605.120	2.641.385.376	2.773.454.645	2.912.127.377	3.057.733.746	3.210.620.433	3.371.151.455	3.539.709.028
	Total A	2.281.728.000	2.395.814.400	2.515.605.120	2.641.385.376	2.773.454.645	2.912.127.377	3.057.733.746	3.210.620.433	3.371.151.455	3.539.709.028
2	Total of Operational Cost:										
	Operational Cost	1.488.847.322	1.593.066.634	1.704.581.299	1.823.901.990	1.951.575.129	2.088.185.388	2.234.358.365	2.390.763.451	2.558.116.892	2.737.185.075
	Depreciation	33.883.308	30.118.496	26.353.684	22.588.872	18.824.060	15.059.248	11.294.436	7.529.624	3.764.812	-
	Total B	1.522.730.630	1.623.185.130	1.730.934.983	1.846.490.862	1.970.399.189	2.103.244.636	2.245.652.801	2.398.293.075	2.561.881.704	2.737.185.075
3	E B I T	758.997.370	772.629.270	784.670.137	794.894.514	803.055.456	808.882.741	812.080.945	812.327.358	809.269.750	802.523.953
4	Tax 10 %	75.899.737	77.262.927	78.467.014	79.489.451	80.305.546	80.888.274	81.208.094	81.232.736	80.926.975	80.252.395
5	After Tax Revenue	683.097.633	695.366.343	706.203.123	715.405.063	722.749.910	727.994.467	730.872.850	731.094.623	728.342.775	722.271.557
6	Interest										
7	Net Profit/Loss	683.097.633	695.366.343	706.203.123	715.405.063	722.749.910	727.994.467	730.872.850	731.094.623	728.342.775	722.271.557

Source: Primary Data, processed

Table 4. Cash Flow Estimation for Tofu Industry Centers, Trunan Village

Year	Inflow		Outflow		Depreciation	Proceed
	Profits	Non Depreciated Investment	Investment	Tax		
0	-		1.661.495.442	-		(1.661.495.442)
1	683.097.633			34.154.882	3.764.812	652.707.563
2	695.366.343			34.768.317	3.764.812	664.362.837
3	706.203.123			35.310.156	3.764.812	674.657.779
4	715.405.063			35.770.253	3.764.812	683.399.622
5	722.749.910			36.137.496	3.764.812	690.377.227
6	727.994.467			36.399.723	3.764.812	695.359.555
7	730.872.850			36.543.643	3.764.812	698.094.020
8	731.094.623			36.554.731	3.764.812	698.304.703
9	728.342.775			36.417.139	3.764.812	695.690.449
10	722.271.557	1.623.847.322		36.113.578	3.764.812	2.313.770.113

Source: Primary Data, processed

f. Financial Aspect Feasibility

Several indicators employed to determine the level of project feasibility are the Payback Period (PP), Net Present Value (NPV), Profitability Index (PI), and Internal Rate of Return (IRR). Based on the results of the analysis, the feasibility indicator values for the Trunan Village Tofu Industry Centers centers are revealed as follows:

Table 5. Investment Criteria for Trunan Village Tofu Industry Centers

Feasibility Criteria	Value for Feasibility
NPV	Rp 2.147.030.794
IRR	40%
PI	4,10
Payback Period	2 years 8 months

Source: Primary Data, processed

Payback Period (PP) is one of the common methods used in evaluating

investments, which measures how long it takes to return the entire initial investment. In the case of Trunan Village, the analysis results show that the Payback Period is 2 years and 8 months. This means that the invested capital will be returned within that period. Based on financial management theory, the shorter the payback period, the better the investment, because the invested capital can be returned faster and can be used for other investments or more strategic business needs.

Net Present Value (NPV) is an investment assessment method that considers the value of time and space. Meanwhile, the Net Present Value (NPV) at the Trunan Village Tofu Industry centers, is recorded as Rp. 2,147,030,794, thus the Trunan Village Tofu Industry Centers was declared feasible since the NPV value showed a positive number. Based on these results, the investment is feasible and will provide a net profit after

calculating all cash flows discounted to the present value. In financial theory, a positive NPV indicates that a project is profitable, because the future value of the cash flow is greater than the initial investment. In existing literature, NPV is often considered the most comprehensive investment assessment method because it considers all cash flows obtained from the project, as well as discount factors that also reflect the risk and opportunity costs of the investment made. Based on (Ehrhardt, 2016) states that NPV can provide an accurate picture of the added value generated from a project compared to other investment methods, because it reflects the net contribution of the project.

Profitability Index (PI) is the ratio between the present value and future cash flows and initial investment. Based on the results of the analysis, a value of 4.10 is obtained for the Profitability Index (PI) of Trunan Village Tofu Industry Centers, because the Profitability Index (PI) value is greater than 1, the investment in Trunan Village Tofu Industry Centers is declared feasible. Based on financial theory, a high PI indicates a profitable project and can be a priority when compared to other projects with lower PIs. PI is often used in making decisions in the allocation of company capital. Especially if the company has limited capital and must choose several different projects. (Berk & DeMarzo, 2020) said that PI has become an indicator that functions in budget constraint conditions

because this calculation allows investors to choose which project provides the best return on initial investment.

Internal Rate of Return (IRR) is the discount rate that makes the present value of future cash flows equal to the initial investment. The Internal Rate of Return (IRR) shows a value of 47 percent. Then, since the IRR value is greater than the current deposit interest rate, the investment in the Trunan Village Tofu Industry Centers is declared feasible. In financial theory, IRR can be a benchmark for assessing the attractiveness of an investment. If the IRR is greater than the cost of capital or the prevailing interest rate, then the investment is considered profitable. (Damodaran, 2014) states that IRR is the most frequently used indicator in investment assessment. This refers to the ease of understanding and can provide a direct picture of the project's return.

CONCLUSIONS AND SUGGESTIONS

Based on the results of the Payback Period, NPV, PI, and IRR analysis, it can be concluded that The Trunan Village Tofu Industry Centers is a feasible and profitable investment project. This project is expected to provide a return on investment in a relatively short time and generate added value for investors. The use of comprehensive evaluation methods such as NPV, PI, and IRR provides a more complete picture of the potential benefits and risks of this project, allowing stakeholders to make more informed

decisions. The results of this analysis are supported by various previous studies that show that these evaluation methods are effective in determining project and investment feasibility. Yet, the potencies of the Trunan Village Tofu Industry Centers have not been enhanced. Therefore, efforts are needed to develop the Trunan Village Tofu Industry Centers, such as, first, promoting potential investment opportunities for the Trunan Village Tofu Industry Centers intensively so that unexploited potential can be optimized. Second, to overcome capital problems, a partnership pattern can be employed, so that capital problems for raw materials and land rental can be settled. Third, increase awareness and assist business actors in managing the production and marketing of good tofu products.

The implications of the analysis results and recommendations for the development of the Trunan Village Tofu Industry Centers include various interrelated aspects, from increasing investment, sustainable partnership models, to positive impacts on the local economy. These efforts are not only aimed at increasing individual profits, but also at creating added value for the community and the surrounding environment, thus making the Trunan Village Tofu Industry Centers a sustainable and competitive business model.

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