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Factor Analysis of Tempe MSMEs Income Recovery in Malang City Post the COVID - 19 Pandemic Using Smart Interpretive Structural Modelling

Fatimah[1]; Diyah Sukanti Cahyaningsih[1]; Agus Zulkarnain Arief[2]
[1]*Department of Accounting, Faculty of Economic and Business University of Merdeka Malang*
[2]*Department of Architecture, Faculty of Engineering University of Merdeka Malang*

ABSTRACT
The Covid-19 pandemic has had an impact on the economic sector, especially on Micro, Small and Medium Enterprises (MSMEs). The aim of this research is to determine the variables that are the main supporters of the income of Tempe MSMEs in Malang City. During the COVID-19 period, the government had policies including Direct Cash Assistance (BLT), Pre-Employment Cards, tax relief and credit relaxation, these were aimed at maintaining people's purchasing power and running the economy smoothly. This research was carried out as a form of community service to provide insight into increasing the income of tempe entrepreneurs by related parties. The research uses a quantitative approach to determine the strongest drivers of income for Tempe MSMEs with the aim of providing recommendations for economic and food security in the post-COVID-19 period. The data analysis method used in the research is Smart Interpretive Structural Modeling (Smart-ISM). The data collection technique uses a questionnaire distributed to tempe business actors supported by documentation of activities and literacy studies. The results of this research show that the BLT, Pre-Employment Card and Tax Relief variables influence the availability of capital. So it can be said that government support is the biggest driver in maintaining stability and encouraging an increase in income for Tempe MSMEs. The recommendation from these results is to consider that in the post-COVID-19 period, economic conditions have not fully recovered, so stimulants from the government are still needed. Taking into account that tempeh products are among the basic food needs in Malang City, and soybean raw materials still depend on imports, to support economic and food security in the post-COVID-19 period and in the future there needs to be stimulants provided by the government, even though with a customized scheme.

Keywords:
Government Assistance; Capital; Income; Smart-ISM ; Technology; Labor.

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I. INTRODUCTION

Indonesia is a developing country that is rich in natural resource potential. The potential wealth of natural resources can be utilized for survival for the welfare of the Indonesian people. This is in accordance with the provisions of Article 33 in the 1945 Law which states that the earth, water and natural resources contained therein are controlled by the State and used as much as possible for the prosperity of the people. One of the abundant natural resources is agricultural products, but one of the agricultural products, namely soybeans, has not been able to meet domestic demand (Nainggolan, Klara Ulina, 2016) . The COVID-19 pandemic which has shaken health, social and economic life in Indonesia has had an impact on tempeh MSME entrepreneurs who depend on soybean supplies, most of which are imported.

MSMEs experiencing pressure during COVID-19 need attention. Bearing in mind, MSMEs are an integral part of Indonesian society in building the national economy which have a very important and strategic position, potential and role in achieving national development goals in particular, as well as playing a role in the process of equalizing and empowering people's economic growth which promotes income . The role of MSMEs can be seen in the very large contribution of MSMEs to the national economy (Darwin, 2018) . The government responded to pressure during this pandemic with various policies. First, the Government provides Direct Cash Assistance (BLT) for people in the pre-prosperous category. To overcome the impact of layoffs due to companies no longer being able to survive, the government launched the Pre-Employment Card program. Second, for taxpayers, especially MSMEs, the government provides tax incentives. Third, the policy of reducing credit interest and extending the installment period. Fourth, provide working capital assistance as a stimulus during critical times for MSMEs. Fifth, strengthening the role and synergy between Ministries/Institutions/BUMN and Regional Governments in supporting the business ecosystem to revive and maintain the performance of MSMEs (Islami et al., 2021). The COVID-19 pandemic has affected the

production, sales and financial problems of MSMEs, not all micro businesses have received income tax subsidies. even though the Government has allocated Rp. 123.46 trillion specifically for the recovery of MSMEs within the PEN framework since 2020, the majority of SMEs in Indonesia, especially during the COVID-19 pandemic, still have difficulty accessing funding. Interest rate subsidies and credit restructuring are alternatives to support MSMEs during the pandemic, and it is hoped that these policies will not be immediately abolished after the pandemic is declared over. Overall, government subsidies are still needed to support MSMEs in Indonesia to recover from the impact of the pandemic and increase their business capacity.

MSME income has a vital role in improving the welfare of society in Indonesia. MSMEs absorb labor in large numbers, including those who lack access to formal employment. With a stable income, MSMEs can provide a decent wage and support the daily life of their workers, thereby reducing the level of unemployment and poverty. In addition, MSME income allows business people to access health services, education, and other basic needs, which directly contribute to improving the quality of life. MSMEs also function as a driving engine of the local economy, which distributes income more evenly and encourages economic growth in various regions (Cahyaningati et al., 2024; Chandrarin et al., 2022; Zuhroh et al., 2019, 2023) . The existence of strong MSMEs with good income creates a more stable supply chain, strengthens the regional economy, and increases the purchasing power of the community. Thus, MSME income is not only important for the entrepreneurs themselves, but also has a wide impact on the well-being of society as a whole in Indonesia. Income is a crucial aspect for the survival and growth of Micro, Small, and Medium Enterprises (MSMES), including MSMEs in East Java. For MSMEs, revenue is not only a measure of financial success, but also the main source that allows them to finance daily operations, pay workers, buy raw materials, and develop their business. In the context of tempeh MSMEs, stable and increasing income allows producers to overcome fluctuations in the price of raw materials such as soybeans, which is the main component of production. In addition, good income allows them to invest in more efficient production technology, expand markets through more effective marketing strategies, and improve product quality to meet health and food safety standards. A healthy income is also important in the face of increasingly tight competition, both from local and international producers. In East Java, where tempeh is a very popular food product, the ability of MSMEs to generate stable income also contributes to local food security. Therefore, a solid income for tempe MSMEs not only helps them in maintaining and developing their business, but also plays an important role in the regional economy by providing jobs and supporting local economic growth.

One of the MSMEs in Malang City is the Malang Tempe Industrial Center which is the center of a home industry that produces tempeh. Initially, Sanan village only produced tempeh for side dishes, but now it has become the main tempeh processing industry in Malang City (Ningtyas & Wafiroh, 2022) . A village that has a dynamic and balanced living atmosphere between industry and the welfare of its residents. The development of tourist destinations has made Malang people create souvenir centers and one of them is the Malang tempeh chips souvenir center which is managed by the Sanan industrial center community. The Sanan tempeh chips business was initially run by Sanan residents in the 1970s, but at that time the community only sold tempeh on the market. However, even though people have created several creations that combine tempeh, it turns out that tempeh sells well on the market, both in the form of tempeh that is processed into side dishes and tempeh that has become a snack.

Smart Interpretative Structural Modeling (SISM) is an analytical tool for determining the factors that most influence something or driving power that can be used in research to encourage performance. This method begins with Interpretative Structural Modeling (ISM) software which was first introduced by Warfield in 1974, a method that helps decision making (Ahmad & Qahmash, 2021; Thakkar, 2021) . This tool helps management to find the determinant factors of a variable. In this research, this tool will be used to determine the strongest factors that influence income in order to help MSME entrepreneurs in making decisions. This tool is also used in research to support supply chain competitiveness in Tempe SMEs in Malang City.

II. MATERIAL AND METHODS

In a study, researchers need data analysis for data collection. Data analysis is the process of systematically searching and compiling data obtained from interviews, field notes, and documentation by organizing data into categories, describing it into units, synthesizing it, arranging it into patterns, choosing what is important and what is important. will be studied, and make conclusions so that they are easily understood by oneself and others (Chandrarin, 2017)

The data analysis technique in this qualitative research uses Smart Interpretive Structural Modeling because using this method you can easily move the description into more detailed sub-elements because ISM provides a clear description of the problem elements that have been determined. According to (Sianipar, 2012) ISM is a descriptive modeling technique which is a structuring tool for a direct relationship. Choosing this method was also because not many researchers had carried out analysis using the ISM method, so it made me interested in trying this method.

Interpretive Structural Modeling stages:

a. Identify Elements
   Elements of factors that are thought to influence the income of tempe chips entrepreneurs during the observation period are identified and listed. This data was obtained through structured interviews.
b. Contextual Relations
   A contextual relationship between factors is established, tailored to the objectives of the research model.
c. Structured Single Interaction Matrix (SSIM)
   This matrix represents the elements of the respondent's perception of the elements of the intended goal. The four symbols used to represent the type of relationship that exists between two elements of the two systems under consideration are:
   1) V: Relationship of factors in rows to factors in columns, not vice versa.
   2) A: The relationship of the factors in the column to the factors in the row, not vice versa.
   3) X: Interrelationship between factors in the row and factors in the column (can be vice versa).
   4) O: Indicates that the factors in the row and the factors in the column are not related.
d. Reachability Matrix (RM) Matrix
   An RM calculation is the result of an ISM application calculation which then converts the SSIM symbols into a binary matrix.
   The following conversion rules apply:
   1) If the relationship between the factor in the row and the factor in the column = V in SSIM, then the connection between the row and the column has a value of 1, and the connection between the column and the row has a value of 0.
   2) If the relationship between the factor in the row and the factor in the column = A in SSIM, then the connection between the row and the column has a value of 0, and the connection between the column and the row has a value of 1.
   3) If the relationship between the factor in the row and the factor in the column =
   4) If the relationship between the factor in the row and the factor in the column = O in SSIM, then the connection between the row and the column has a value of 0, and the connection between the column and the row has a value of 0.

   At this stage, it was compiled twice by the researcher. First, with variables that match the results of the literature review. Second, to validate the SISM results before making calculations, the variables most frequently mentioned by respondents in the 1st questionnaire were added as other variables that influence income.
e. Calculating SISM
f. Determine the quadrant of variables on the MICMAC Diagram to classify
   Quadrant I – Autonomous Variables
   Quadrant II – Dependent Variables
   Quadrant III – Linkage Variables
   Quadrant IV – Independent Variables
   Determining this quadrant aims to outline the weakest and strongest factors as determinants of income.
g. Preparation of diagrams, factors and relationship models to analyze income determinants.
h. Analyze the results supported by related literature.

III. RESULTS

Respondent Demographics

Based on the results of the questionnaire that has been distributed to respondents from Tempe MSME entrepreneurs in Malang City, information was obtained regarding the characteristics of the respondents which include gender, age, length of business, changes in income, capital, labor costs and working hours which will then be carried out descriptive analysis, namely by describing the data that has been processed in tabular form. The results of descriptive analysis regarding the characteristics of respondents are as follows:

1 Gender

From the results of the respondents, I calculated that the majority of Tempe MSME entrepreneurs were men, namely 57 percent of the respondents studied were male, while the rest were female respondents.

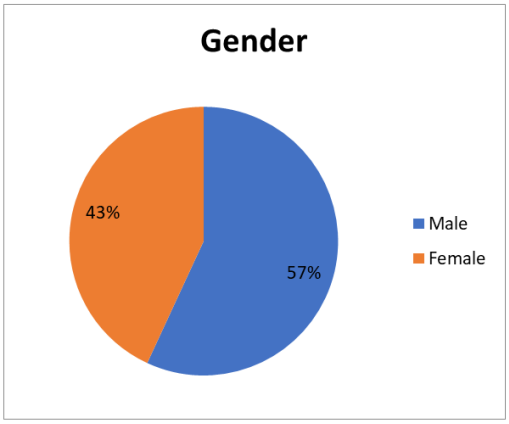


Figure 1. Gender Diagram of Tempe Entrepreneur Respondents

2 Age

The ages of respondents vary greatly from young to old, age is often a measure of a person's maturity in a business world like this, here are the results of the diagram.

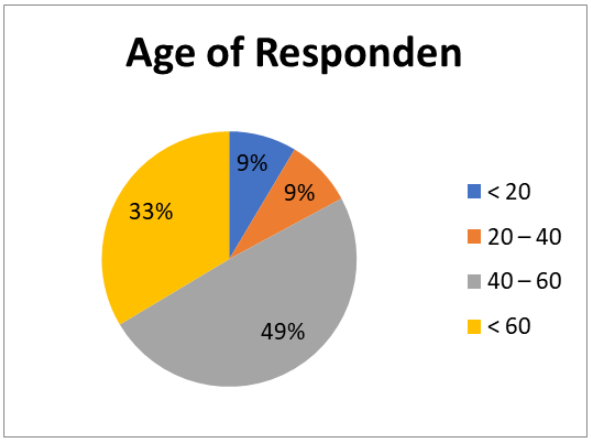


Figure 2. Age Diagram of Tempe Entrepreneur Respondents

3 Business Period

Every Tempe MSME business certainly has a different business period, some are 20, 30, 40 or even 50 years. Whether the length of business affects income, below I will describe the results of the questionnaire which was filled in by several respondents.

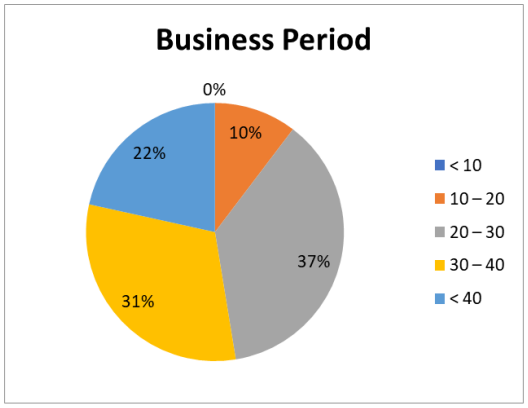


Figure 3. Business Period Diagram for Tempe Entrepreneurs

Smart Interpretive Structural Modeling Analysis

1 Structural Self-Interaction Matrix (SSIM)

At this stage, contextual relationships were obtained by distributing questionnaires involving several respondents from the Sanan Tempe Chips Industry, Malang City. For the development of the Structural Self-Interaction Matrix (SSIM) to analyze the relationships between variables, there are four standard symbols used to describe the relationships between the variables. these variables, such as:

V : Rows affect columns.

A : Rows are affected by columns.

X : Rows and columns influence each other.

O: Rows and columns are not related to each other.

Based on these contextual relationships, SSIM is formed as in the following table:

Table 1. Structural Self-Interaction Matrix (SSIM)

	Capital (X1)	Labor (X2)	Resources (X3)	Technology (X4)	Government Assistance (BLT and Pre-Work Card) (X5)	Government Assistance: Tax Relief (X6)	Government Assistance : Credit Relaxation (X7)	Income (Y)
Capital (X1)		V	V	V	A	A	A	V
Labor (X2)			O	A	A	A	A	V
Resources (X3)				A	A	A	A	V
Technology (X4)					A	A	A	V
Government Assistance (BLT and Pre-Work Card) (X5)						O	O	V
Government Assistance: Tax Relief (X6)							O	V
Government Assistance : Credit Relaxation (X7)								V
Income (Y)								

Source: Calculate ISM-http://smartism.sgetm.com/

2 Reachability Matrix

The next stage is to convert the SSIM into a binary matrix, or also called the Reachability Matrix . The symbols V, A, X, and O are replaced with binary numbers 1 and 0 for each contextual relationship between income variables. Convert SSIM to binary numbers, following these rules:

a. If the row relationship affects the column in SISM (V), then the relationship in the reachability matrix is 1 and the column effect on the row is 0.

b. If the row relationship is influenced by the column in SISM (A), then the relationship in the reachability matrix is 0 and the column is influenced by the row is 0.

c. If the row and bottom relationships influence each other in SISM (X) then the relationship in the reachability matrix is 1.

d. If the row and column relationships are not related to each other in SISM (O) then the reachability

matrix relationship is 0.
By following these rules, the reachability matrix for the income variable can be seen as shown in the following table. After that, start calculating the driver power and dependency, which is the number of binary numbers 1 in each variable, based on the row and column descriptions.

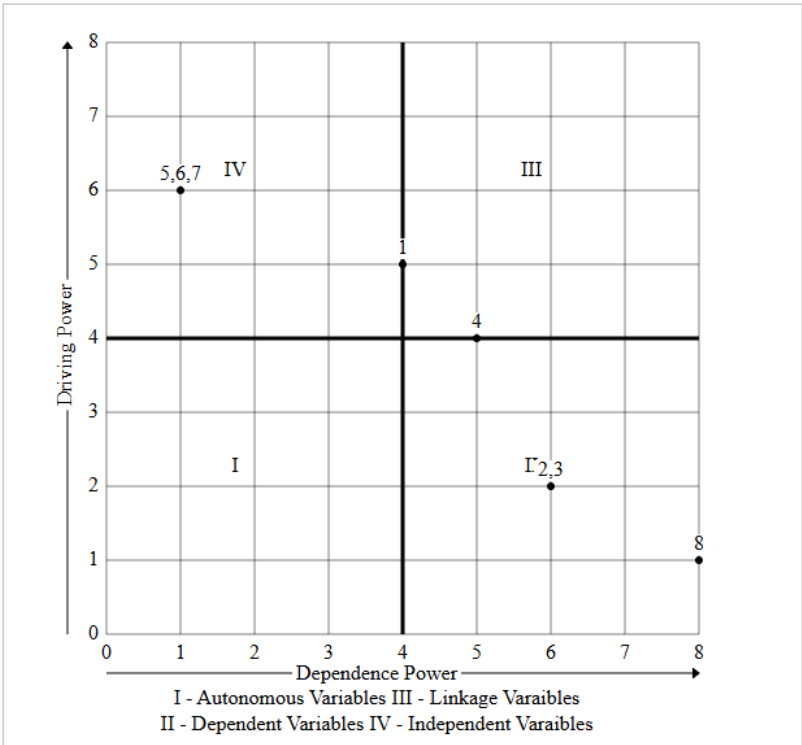
Table 2 Reachability Matrix

Variables	2	3	4	5	6	7	8	Driving Power
Capital (X1)	1	1	1	1	0	0	0	1	5
Labor (X2)	0	1	0	0	0	0	0	1	2
Resources (X3)	0	0	1	0	0	0	0	1	2
Technology (X4)	0	1	1	1	0	0	0	1	4
Government Assistance (BLT and Pre-Work Card) (X5)	1	1	1	1	1	0	0	1	6
Government Assistance: Tax Relief (X6)	1	1	1	1	0	1	0	1	6
Government Assistance : Credit Relaxation (X7)	1	1	1	1	0	0	1	1	6
Income (Y)	0	0	0	0	0	0	0	1	1
Dependence Power	4	6	6	5	1	1	1	8	

Source : Calculate ISM-http://smartism.sgetm.com/

In the table above, it can be seen that among the variables above, the driving power is Capital and Government Assistance, including BLT Pre-Employment Cards, Tax Relief and Credit Relaxation.

3 Interpretation of System Objects with Graphics (Quadrants)



Source : Calculate ISM-http://smartism.sgetm.com/
Figure 4. Results of System Object Interpretation using ISM on Tempe Entrepreneur Responses

In the picture above, it can be seen that the driving power is capital. Then other driving prowers also focused on numbers 5, 6 and 7, namely Government Assistance, including BLT Pre-Employment Cards, Tax Relief and Credit Relaxation. Government assistance has a very high impact because it is included in quadrant IV, namely Independent Variables. Government assistance plays an extraordinary role during the COVID-19 pandemic like

this. Independent variables are influencing variables, why is it still at level IV because government assistance really influences the income of many MSMEs who receive assistance from the government (Islami et al., 2021) . Then in the Variable Lingkage it can be seen that the dominant technology means that this technology is a supporting intermediary. Then the Dependent Variable is at 2 and 3, namely Capital and Labor. Meanwhile, the Autonomous Variable is number 8 or income which is the highest order.

4 Identify Key Elements by Structure or Level

From the final Reachability matrix , a structural model begins to be constructed which forms a network containing points (nodes) and hot lines. If there is a relationship between columns and rows, then the arrow direction will be drawn from the column variable to the row. This network image is often also called a digraph , which is an abbreviation for directed graph . Next, these nodes will be replaced with variable statements, so that an Interpretive Structural Modeling (ISM) network model is formed.

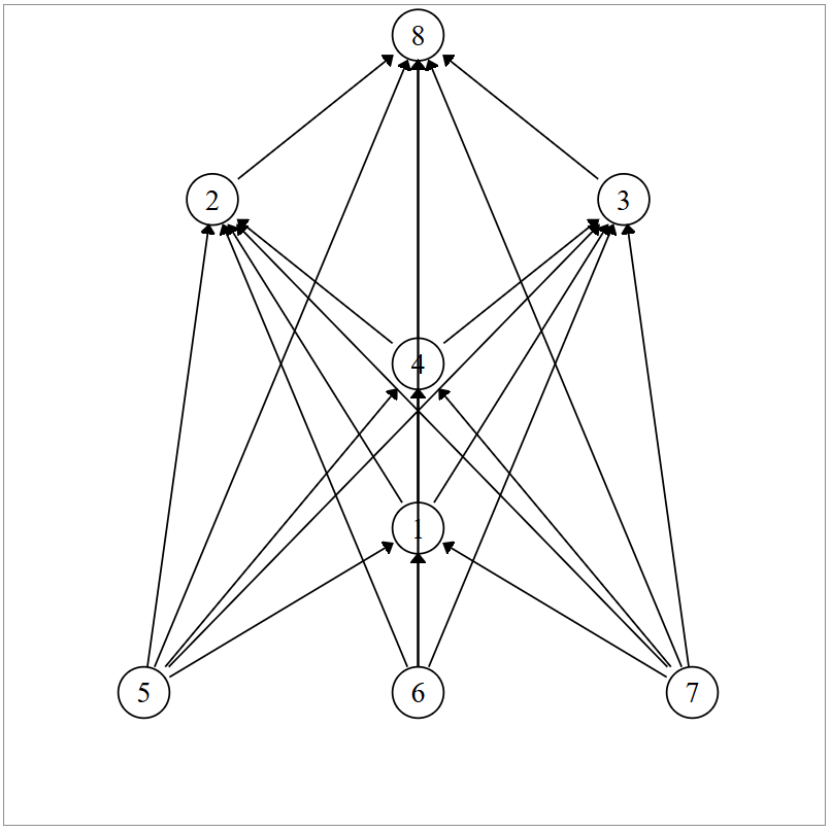


Figure 5. Results of Identification of Key Elements of Tempe Entrepreneur Respondents

From the picture above it can be seen that numbers 5, 6, and 7, namely Government Assistance, really encourage capital, labor, resources and technology which can be seen in numbers 1, 2, 3, and 4 then these 4 factors support or encourage the income factor in tempeh business in Malang City.

In the image above the level results of the digraph image are:

a. Level 1: Revenue (Is a key or priority level).
b. Level 2: Manpower and Resources.
c. Level 3: Technology.
d. Level 4: Capital.
e. Level 5: Government Assistance.

5. ISM Results

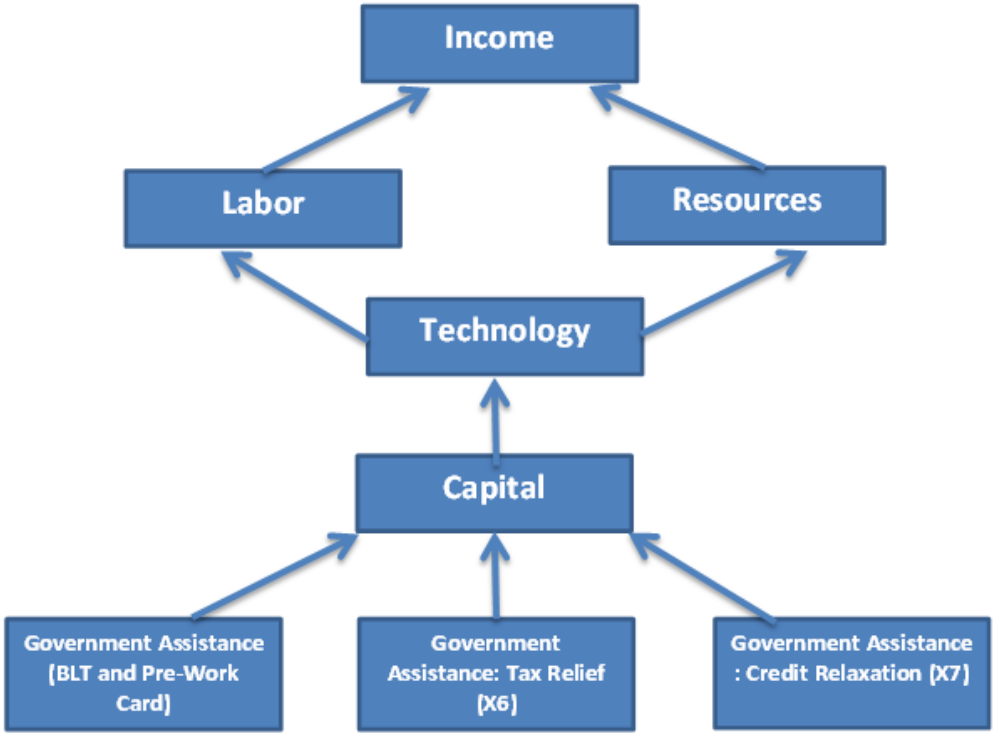


Figure 6. Final SISM Results for Tempe Entrepreneur Respondents

It can be seen from Figure 5 above that government assistance, including pre-employment card BLT, tax relief and credit relaxation, encourages capital in production, then capital encourages technology which affects labor and resources and which ultimately will affect the income of a business. Here it can also be seen that the driving power is not in income but in government assistance and capital.

IV. DISCUSSION AND CONCLUSION

Based on the data presentation and discussion that has been presented previously, the conclusion that researchers can draw is that based on government assistance, BLT and Pre-Employment Cards greatly influence income, especially on production factors for tempe entrepreneurs, because with this assistance, tempe entrepreneurs can shop again to buy raw materials, for example . Not only for tempe entrepreneurs, this government assistance is also very useful for consumers or buyers because it can increase purchasing power. Then there is also government assistance in the form of credit relaxation which is very helpful for tempe entrepreneurs considering that for tempe entrepreneurs who have credit, payments can be postponed and the interest will be lighter. Apart from these two forms of assistance, there is also government assistance in the form of tax relief which is very helpful for tempe entrepreneurs, namely by providing tax incentives with the national economic recovery program against the impact of the COVID-19 pandemic.

The three factors that are the main drivers (government assistance) are the impetus for capital creation. Then, with adequate capital in the tempe business, tempe entrepreneurs can make good use of technology. Furthermore, the good use of technology can encourage the availability of labor and resources for tempe entrepreneurs. Then these factors will encourage income from the tempe business.

Based on the research I have carried out on community service activities, it is very clear that there is government assistance, whether from pre-employment cards, tax relief or credit relaxation. However, this government assistance is not provided continuously because this assistance only helps tempe entrepreneurs during the pandemic. With this assistance, the respondents must provide a basis for starting to organize their independence. And do not depend continuously on the government. One of the independence things that tempe entrepreneurs can do is manage their finances better. This assistance can also be well absorbed by the community, so efforts are being made by the government to maintain and improve data collection and distribution of aid.

In this study, some respondents still misperceived what was explained by the researcher when filling out the questionnaire, so that the questionnaire was not filled in completely. Future researchers may be able to obtain a higher response rate, by explaining each question in language that is easy to understand..

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