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Full Length Research Paper

**ECONOMIC ANALYSIS AND MARKETING STRATEGY IN
AGRICULTURAL SUPPLY CHAIN: A CASE STUDY ON W2K
ORGANIC FERTILIZER**

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ABSTRACT

The purpose of this study is to determine and analyze the effect of food inflation variables, distribution of staples and distribution of organic fertilizers on increasing food availability through market access as a moderating variable. The existence of food inflation affects the decrease in the availability of food in the market, where this is caused by the limited distribution of organic fertilizers which makes it difficult for farmers to produce food in large quantities, thus disrupting the distribution of food products, because the limited availability of food will increase prices and reduce market access to the public to buy food for their needs. From the results of existing research, it is concluded that partially the variables of food inflation, staple food distribution and organic fertilizer distribution affect the increase in food availability and also affect market access. Simultaneously, the variables of food inflation, staple food distribution and organic fertilizer distribution affect the variable of increasing food availability through market access as a moderating variable. The existence of food inflation affects the decrease in the availability of food in the market, which is caused by the limited distribution of organic fertilizer which makes it difficult for farmers to produce food in large quantities, thus disrupting the distribution of food products, because the limited availability of food will increase prices and reduce market access to the public to buy food for their needs.

Keywords: Food inflation, staple food, organic fertilizer, market access, foodstuffs

INTRODUCTION

At present in Indonesia, in particular, agricultural activities are still needed, where agricultural activities are needed to increase the adequacy of food availability, where food availability is a must in order to create food self-sufficiency comprehensively and evenly throughout Indonesia. The process of providing food must create a form of serious effort so that later the food needs of the community are available in sufficient and timely manner. Sufficient food needs will hoist food prices to prices that can reach the community, where the Government needs to implement a clear marketing strategy so that later food distribution can be evenly distributed, and the price strategy that will be applied does not burden the community as a whole. (Perey, Robert, 2018). The government is required to always improve the quality and quantity of food products, as well as increase food availability so that later existing food products can be easily obtained by the community, so that there are sufficient stocks for the community. Improving food quality is an important effort to ensure that food consumed by the general public meets food safety regulations and is healthy and safe. In implementing food quality, the government must establish strict controls for raw materials, production procedures, and finished goods. In addition, the government must also maintain food availability by maintaining the distribution of fertilizers on an ongoing basis, where the smooth distribution of fertilizers will have an impact on creating food availability at the farm level, and will create food availability in the market, which in turn will reduce prices and make goods cheap, and reduce food inflation. (Paes, Luis Alberto Bertolucci, 2019).

Economic factors, such as inflation, will have an impact on increasing food prices and decreasing people's purchasing power, because in addition to high food prices, people's income tends to remain fixed or not increase, where wages do not increase will have an impact on the lack of desired needs, because people only have income according to their ability to buy food products, so it will tend to harm producers and sellers of food in the market. The increase in food inflation will have an impact on the disruption of the agricultural supply chain caused by the high price of goods, where the price of these goods is actually the number of stocks of goods in the market is decreasing and even unable to suffice, which can be caused by the decline in farmers' production, the uneven distribution system of staples in various regions, as well as the fertilizer distribution system that is not evenly distributed in various regions, As well as a fertilizer distribution system that does not reach the community, which results in the availability of organic fertilizers becoming scarce, which should be subsidized by the Government, played by speculators in order to create personal gain, so that the availability of subsidized organic fertilizers becomes scarce and farmers cannot afford to buy organic fertilizers from agents or distributors because the price is expensive and exceeds the budget when farming, and the sales proceeds are insufficient to increase the demand for existing staples. (Qiao, Yuhui, 2018). Farmers will tend to produce food according to their needs and will not produce food beyond what the government should recommend due to limited access and distribution of fertilizers, where the difficulties of these

farmers will have an impact on the difficulties of the farmers in distributing food which results in increased inflation and raises prices significantly, resulting in disruption of the food supply chain from farmers due to excessive shortages of food supplies. (Rueda, Ximena, 2018).. The disruption of the food supply chain is also due to the disrupted distribution of staple foods due to the game of seculant, where staple supplies are held back from being distributed to the market, where they expect large profits by increasing the price of staples, where the unavailability of staples in the market will actually have an impact on increasing prices and generating inflation, so that it will result in disruption of the supply chain of staples to various regions which causes staples to be scarce and limited in number, and insufficient against existing supplies, as a result traders lose money and make it difficult for traders to make a profit, farmers find it difficult to get income to produce which makes people's lives, especially efforts to fulfill the needs of staples, become disrupted. (Feleke, Shiferaw, 2021). There are 38,770,000 farmers in Indonesia, of which 60 percent are affected by the reduction in production of staples, such as rice, corn, vegetables and other staples, where rising inflation, rising prices of staples, and disrupted distribution of staples as well as disrupted distribution of organic fertilizers have a major impact on farmers' production, where farmers in Indonesia are unable to create production on a large scale, and are unable to distribute staples massively, where fertilizer scarcity and reduced fertilizer supply hinder the production of fertilizers.

LITERATURE REVIEW

Food Inflation

Food inflation is a widespread and sustained increase in food prices that affects people's living standards. Many things can cause this, such as rising agricultural input costs, weather variations that impact crop yields, increased production costs, or distribution issues that limit the amount of food available. (Nattassha, Ruth, Simatupang, Togar M. and Handayati, 2019). As food inflation affects people's purchasing power, especially those with poor or fixed incomes, it can be a major problem. Rising food prices can reduce their purchasing power and make it harder for them to fulfill needs such as daily meals. (Perey, Robert, 2018). Governments and other economic institutions often use economic policies, such as price controls, farmer incentives and social assistance programs, to try to contain rising food prices. Comprehensive and data-driven strategies are often required for effective solutions, as food inflation can have major social and political consequences. (Paramita Sahoo, Prangya, 2018). Several reasons can cause food inflation, such as:

1. Increase in production costs, where producers may increase selling prices to cover the increased costs that customers have to bear if food production costs increase due to higher prices of energy, fertilizers, or raw materials.
2. Climatic factors, where seasonal variations or adverse weather can impact food availability and crop yields, which can lead to price changes.

3. Crude oil prices, where food prices may be affected by rising oil prices, which may also impact food production and transportation costs.
4. Distribution issues, where certain areas may experience price spikes due to logistical and infrastructure challenges in food distribution. (Paramita Sahoo, Prangya, 2018).

The indicator of food inflation is :

1. The consumer price index, which is a collection of goods and services that represent typical consumer spending, is included in the CPI. Certain food groups are often included in the CPI, and an increase in this index may be a sign of rising food prices.
2. Food price index (FPI), where certain countries have unique food price indexes. This provides a clearer picture of price changes in this category.
3. Key food prices, where a more direct picture of food price changes can be obtained by looking at the prices of a number of key food items, including meat, rice, wheat, maize, palm oil, and other products.
4. Food production index, where a picture of food availability can be obtained by monitoring agricultural productivity and food yields. Prices may come under pressure if production declines.
5. Consumer and farmer surveys, where information on the impact of food inflation can be further obtained by considering the opinions and perspectives of farmers and consumers on food availability and prices. (Caputo, Paola, 2020).

Distribution of Basic Materials

The term "distribution of essential goods" describes the multi-stage process of delivering essential products from producers to consumers through distribution networks. A complex supply chain consisting of various critical components, such as producers, distributors, wholesalers, retailers, and end consumers, is involved in the distribution of essential products. (Niwarthana, S. S and N. Dissanayake, Thibbotuwana and Rosario, 2023).. To ensure that essential goods are available and accessible to consumers, efficient and effective distribution of these goods is essential. Government regulations, trade laws, and transportation infrastructure are some examples of variables that may affect the distribution of essential goods in a country or region. (Barros, Murillo Vetroni, 2020). There are various stages involved in the dissemination of basic materials, namely:

1. Production, where farmers or producers are where the initial round of distribution of fundamental commodities begins. They are in charge of cultivating, producing, or manufacturing staple goods such as wheat, rice, vegetables, meat, and other foodstuffs.
2. Collection and management, where after production, raw materials are collected and

processed. Depending on the type of subject matter, this may require handling, processing or specific factory processing.

3. Wholesale and retail distribution, where after being collected and processed, staples are often sold wholesale. Wholesalers buy products in bulk from manufacturers or vendors and resell them to retailers in smaller quantities. The provision of stock to stores in different regions is facilitated by wholesale distribution.
4. Transportation or logistics, where logistics and transportation are essential for the efficient and smooth flow of commodities between stages as they go through the distribution process. This includes the use of cars, trains, ships, and other conveyances.
5. Stock management, where stock management is essential for maintaining inventory control and ensuring a steady supply of essential items at all levels of distribution. An effective stock management system helps prevent excess or insufficient inventory. (Nematollahi, Mohammadreza, Tajbakhsh, Alireza and Mosadegh Sedghy, 2021).

Organic Fertilizer Distribution

Organic fertilizer distribution is the process of moving fertilizer from the producer to the final consumer, which is generally the farmer. (Donner, Mechthild and de Vries, 2021).. The purpose of this distribution procedure is to support organic farming techniques and ensure the supply of high-quality organic fertilizer. (Asai, Masayasu, 2018).. To support environmentally friendly and sustainable agriculture, it is crucial to ensure that organic fertilizers are distributed effectively and comply with organic farming regulations. (Pato, 2020). The general procedure for distributing organic fertilizer is as follows:

1. Organic fertilizer products, where compost, green manure, agricultural waste, and other organic materials are some of the organic elements used by organic fertilizer manufacturers to make their products.
2. Distributors, where distributors are tasked with supplying organic fertilizer to various regions, either by distributing to wholesalers or selling directly to agricultural retailers.
3. Wholesalers and farm shops, where wholesalers buy organic fertilizer in bulk from distributors and resell it to retailers or farm shops.
4. Retailers and farmers, where farmers buy organic fertilizer from retailers in quantities that suit their needs.
5. Transportation and logistics, where in order to ensure that organic fertilizer reaches its destination undamaged; its transportation must be carried out with great care. (Velasco-Muñoz, Juan F., 2021).

Indicators of organic fertilizer distribution are:

1. Availability of organic fertilizer, where one important metric to consider is the availability of organic fertilizer in markets, local farm shops, or farm stores. This illustrates how easy it is for farmers to obtain organic fertilizer.
2. Distribution reach, i.e. How much farmland is supported by organic fertilizer, and how wide the geographical spread is.
3. The price of organic fertilizer, of which the price of organic fertilizer is one important indicator, is the cost of organic fertilizer. Farmers may be more receptive and accessible at a reasonable cost.
4. Promotion and marketing, i.e. effective marketing and promotion campaigns in increasing awareness and acceptance of organic fertilizers.
5. Logistics efficiency, where efficient logistics and transportation networks to ensure timely and cost-effective distribution of organic fertilizers. (Grabs, Janina and Carodenuto, 2021).

Market Access

The ability of a producer, distributor, or retailer to introduce goods or services to the market and make them accessible to customers is referred to as market access. (Hernandez-Aguilera, J. Nicolas, 2018). A successful company relies on having good market access because it makes goods and services visible to potential consumers and allows them to be purchased. (Wang, Hongyu, 2021). These elements together can provide good and long-term market access for a good or service. Good market access depends on awareness, adaptability, and sensitivity to changing consumer needs. (Türkten, 2023). Some of the elements that affect market access are as follows:

1. Effective distribution, where the availability of goods or services in various distribution channels that can be accessed by consumers. Efficient distribution ensures that goods can be accessed easily by customers.
2. Effective marketing, where marketing techniques are effective to increase consumer knowledge and awareness of goods and services. Promotions, advertising, and other marketing initiatives fall under this category.
3. Price by setting a price that matches the value of the goods or services as well as the capabilities and expectations of potential customers.
4. Product and service quality, which provides high quality goods and services that meet customer demands and expectations. Superior quality can make a product more attractive to consumers.
5. Product and service innovation, which is producing goods or services with a unique or innovative competitive advantage. Innovative products can stand out in the market.
6. Customer service, where by providing fast and high-quality client service. In addition to increasing customer satisfaction, providing the best service can help maintain or

grow market share. (Wiryawan, Fransisca Susanti & and Djatna, 2020).

The indicator of market access is:

1. The number of distribution channels is done by checking how many and what type of distribution channels are used to market the product. Having diverse distribution channels can make the product more accessible.
2. Outlet or store availability by tracking product or service availability among multiple retailers or sales channels.
3. Market share is done by calculating the percentage of the market controlled by a particular good or service compared to its competitors.
4. Customer service is carried out by performing customer service effectiveness and responsiveness in answering questions, managing complaints, and offering assistance to clients. (Fassio, Franco, 2022).

Improved Food Availability

Increasing food availability is a major obstacle to achieving global food security (Meza-Sepúlveda, Diana C., 2021). Communities, commercial sectors, governments, and international organizations can take various actions and make efforts in this regard (Watnakornbuncha, Daruche, 2021). To meet the growing demand around the world, a combination of these strategies, along with local and international commitments, can help increase food availability sustainably. (Chikwava, Brian Kaunda, 2022). Some of the tactics to increase food availability are as follows:

1. Increased agricultural productivity, which increases agricultural productivity by using better plant species, effective farming techniques, and contemporary agricultural technologies.
2. Technological innovation by applying technical breakthroughs in agriculture, disease and climate resistance, and the creation of resistant plant species in sustainable agriculture and data-driven agriculture.
3. Increase the availability of seeds and fertilizers, which ensures farmers have access to sufficient fertilizers and high-quality seeds, and provide subsidies where necessary.
4. Agricultural diversification by encouraging crop diversification to reduce risks and increase the availability of different types of food.
5. Efficient food management by reducing post-harvest losses and food waste by implementing an effective food supply chain management system.
6. Adaptation to climate change is done by implementing climate change adaptation measures so that agriculture can adjust to variations in rainfall, temperature, and erratic weather patterns. (Krishnan, Ramesh, 2020).

Indicators of increased food availability are:

1. Food production is an increase in the amount of food produced, including livestock and crops gathered.
2. Agricultural productivity higher agricultural productivity per hectare or business unit, which is a measure of production efficiency.
3. Seed and fertilizer availability, where sufficient fertilizer and high-quality seeds must be available to sustain agriculture.
4. Diversify food production by increasing animal and plant diversity to improve food security and nutrition.
5. Increased local food availability, such as increased production of protein-rich foods, such as plant and animal products, to meet dietary needs for protein (Zucchella, Antonella and Previtali, 2018).

CONCEPTUAL FRAMEWORK

The results of thinking from the research conceptual framework can be seen in Figure 1 below:

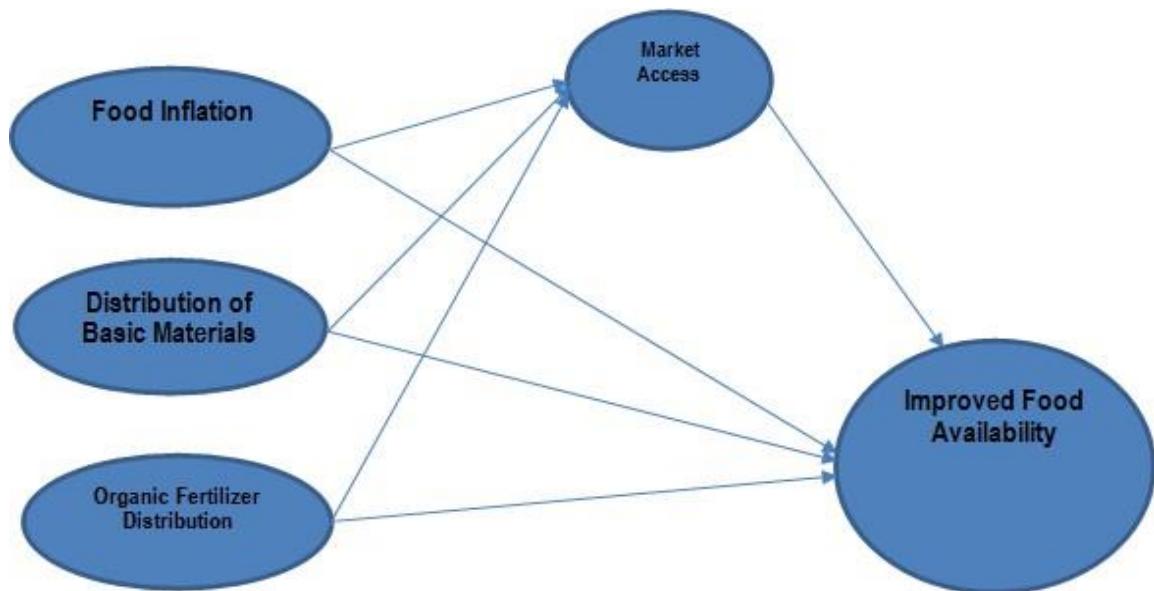


Figure 1: Conceptual Framework

Hypothesis

1. Food inflation has an effect on increasing food availability
2. Distribution of staple foods has an effect on increasing food availability
3. Distribution of organic fertilizer has an effect on increasing food availability

4. Food inflation affects market access
5. Staple distribution affects market access
6. Organic fertilizer distribution affects market access
7. Market access has an effect on increasing food availability.
8. Market access moderates the positive relationship between food inflation and increased food availability.
9. Market access moderates the positive relationship between the distribution of staple foods and increasing food availability.
10. Market access moderates the positive relationship between organic fertilizer distribution and increased food availability.

METHODS

The research method described is to use a quantitative descriptive method approach using the *structural equation model* (SEM) method, where the results of data processing with the SEM method are carried out with the PLS application. According to (Pradipta, Indry Aristianto and Tresia, 2021) quantitative descriptive method with SEM method is a method used in developing and testing conceptual models that combine variable relationships.

The population in this study were farmers who produced foodstuffs amounting to 38,770,000 farmers, where the sampling method was carried out using the *accidental sampling method*, which according to (Pradipta, Indry Aristianto and Tresia, 2021) the sampling method using *accidental sampling* is a method carried out by the sampling process at the research site. The sampling can use the Slovin formula, where the calculation results are as follows:

$$n = N / (1 + N e^2) = 38,770,000 / (1 + 38,770,000 \times 0.05^2) = 399.99 = 400 \text{ farmers producing foodstuffs}$$

So the number of samples in this study were 400 farmers who produced food. The data analysis carried out in this study is by conducting descriptive analysis, *convergent validity analysis*, AVE analysis, R Square test and hypothesis testing.

RESULTS AND DISCUSSION

RESULTS

Descriptive Analysis

Food Inflation Variable

Table 1: Descriptive Analysis of Food Inflation Variables

| Question | Respondent Answer Score | | | | | | | | | |
|----------|-------------------------|-------|-------|-------|-------|-------|--------|------|---------|---|
| | SS (5) | | S (4) | | N (3) | | TS (2) | | STS (1) | |
| | F | % | F | % | F | % | F | % | F | % |
| Q1 | 147 | 36,75 | 155 | 38,75 | 84 | 21 | 13 | 3,25 | - | - |
| Q2 | 145 | 36,25 | 160 | 40 | 87 | 21,75 | 7 | 1,75 | - | - |
| Q3 | 142 | 35,5 | 158 | 39,5 | 82 | 20,5 | 17 | 4,25 | - | - |
| Q4 | 144 | 36 | 161 | 40,25 | 84 | 21 | 10 | 2,5 | - | - |
| Q5 | 145 | 36,25 | 162 | 40,5 | 86 | 21,5 | 7 | 1,75 | - | - |

Source: Processed with Primary Data, 2023

From Table 1 above, the distribution of existing data and answered by respondents for question 1 is agreed as many as 155 respondents (38.75%), for question 2 the most respondents answered agreed as many as 160 respondents (40%), for question 3 many respondents answered agreed as many as 158 respondents (39.5%), for question 4 respondents who answered agreed as many as 161 respondents (40.25%) and for question 5 respondents who answered agreed as many as 162 respondents (40.5%).

Variable Distribution of Basic Materials

Table 2: Descriptive Analysis of Basic Material Distribution Variables

| Question | Respondent Answer Score | | | | | | | | | |
|----------|-------------------------|-------|-------|-------|-------|------|--------|------|---------|---|
| | SS (5) | | S (4) | | N (3) | | TS (2) | | STS (1) | |
| | F | % | F | % | F | % | F | % | F | % |
| Q1 | 142 | 35,5 | 158 | 39,5 | 82 | 20,5 | 17 | 4,25 | - | - |
| Q2 | 146 | 36,5 | 157 | 39,25 | 88 | 22 | 8 | 2 | - | - |
| Q3 | 145 | 36,25 | 162 | 40,5 | 86 | 21,5 | 7 | 1,75 | - | - |
| Q4 | 147 | 36,75 | 155 | 38,75 | 84 | 21 | 13 | 3,25 | - | - |
| Q5 | 144 | 36 | 161 | 40,25 | 84 | 21 | 10 | 2,5 | - | - |

Source: Processed with Primary Data, 2023

From Table 2 above, the distribution of existing data and answered by respondents for question 1 is agreed as many as 158 respondents (39.5%), for question 2 the most respondents answered agreed as many as 157 respondents (39.25%), for question 3 many respondents answered agreed as many as 162 respondents (40.5%), for question 4 respondents who answered agreed as many as 155 respondents (38.75%) and for question 5 respondents who answered agreed as many as

161 respondents (40.25%).

Organic Fertilizer Distribution Variables

| Question | Respondent Answer Score | | | | | | | | | |
|----------|-------------------------|-------|-------|-------|-------|------|--------|------|---------|---|
| | SS (5) | | S (4) | | N (3) | | TS (2) | | STS (1) | |
| | F | % | F | % | F | % | F | % | F | % |
| Q1 | 145 | 36,25 | 162 | 40,5 | 86 | 21,5 | 7 | 1,75 | - | - |
| Q2 | 147 | 36,75 | 155 | 38,75 | 84 | 21 | 13 | 3,25 | - | - |
| Q3 | 144 | 36 | 161 | 40,25 | 84 | 21 | 10 | 2,5 | - | - |
| Q4 | 146 | 36,5 | 157 | 39,25 | 88 | 22 | 8 | 2 | - | - |
| Q5 | 142 | 35,5 | 158 | 39,5 | 82 | 20,5 | 17 | 4,25 | - | - |

Table 3: Descriptive Analysis of Organic Fertilizer Distribution Variables

Source: Processed with Primary Data, 2023

From Table 3 above, the distribution of existing data and answered by respondents for question 1 is agree as many as 162 respondents (40.5%), for question 2 the most respondents answered agree as many as 155 respondents (38.75%), for question 3 many respondents answered agree as many as 161 respondents (40.25%), for question 4 respondents who answered agree as many as 157 respondents (39.25%) and for question 5 respondents who answered agree as many as 158 respondents (39.5%).

Market Access Variable

Table 4: Descriptive Analysis of Market Access Variables

| Question | Respondent Answer Score | | | | | | | | | |
|----------|-------------------------|-------|-------|-------|-------|-------|--------|------|---------|---|
| | SS (5) | | S (4) | | N (3) | | TS (2) | | STS (1) | |
| | F | % | F | % | F | % | F | % | F | % |
| Q1 | 143 | 35,75 | 153 | 38,25 | 85 | 21,25 | 18 | 4,5 | - | - |
| Q2 | 144 | 36 | 161 | 40,25 | 84 | 21 | 10 | 2,5 | - | - |
| Q3 | 146 | 36,5 | 157 | 39,25 | 88 | 22 | 8 | 2 | - | - |
| Q4 | 145 | 36,25 | 162 | 40,5 | 86 | 21,5 | 7 | 1,75 | - | - |

Source: Processed with Primary Data, 2023

From Table 4 above, the distribution of existing data and answered by respondents for question 1 is agreed as many as 153 respondents (38.25%), for question 2 the most respondents answered agreed as many as 161 respondents (40.25%), for question 3 many respondents answered agreed as many as 157 respondents (39.25%), for question 4 respondents who answered agreed as many as 162 respondents (40.5%).

Variable Improvement of Food Availability

Table 5: Descriptive Analysis of Variables for Increasing Food Availability

| Question | Respondent Answer Score | | | | | | | | | |
|----------|-------------------------|-------|-------|-------|-------|-------|--------|------|---------|---|
| | SS (5) | | S (4) | | N (3) | | TS (2) | | STS (1) | |
| | F | % | F | % | F | % | F | % | F | % |
| Q1 | 146 | 36,5 | 157 | 39,25 | 88 | 22 | 8 | 2 | - | - |
| Q2 | 145 | 36,25 | 162 | 40,5 | 86 | 21,5 | 7 | 1,75 | - | - |
| Q3 | 142 | 35,5 | 158 | 39,5 | 82 | 20,5 | 17 | 4,25 | - | - |
| Q4 | 147 | 36,75 | 155 | 38,75 | 84 | 21 | 13 | 3,25 | - | - |
| Q5 | 143 | 35,75 | 153 | 38,25 | 85 | 21,25 | 18 | 4,5 | - | - |

Source: Processed with Primary Data, 2023

From Table 5 above, the distribution of existing data and answered by respondents for question 1 is agreed as many as 157 respondents (39.25%), for question 2 the most respondents answered agreed as many as 162 respondents (40.5%), for question 3 many respondents answered agreed as many as 158 respondents (39.5%), for question 4 respondents who answered agreed as many as 155 respondents (38.75%) and for question 5 respondents who answered agreed as many as 153 respondents (38.25%).

The real output results of the SEM test can be seen from the following *Bootstrapping* diagram:

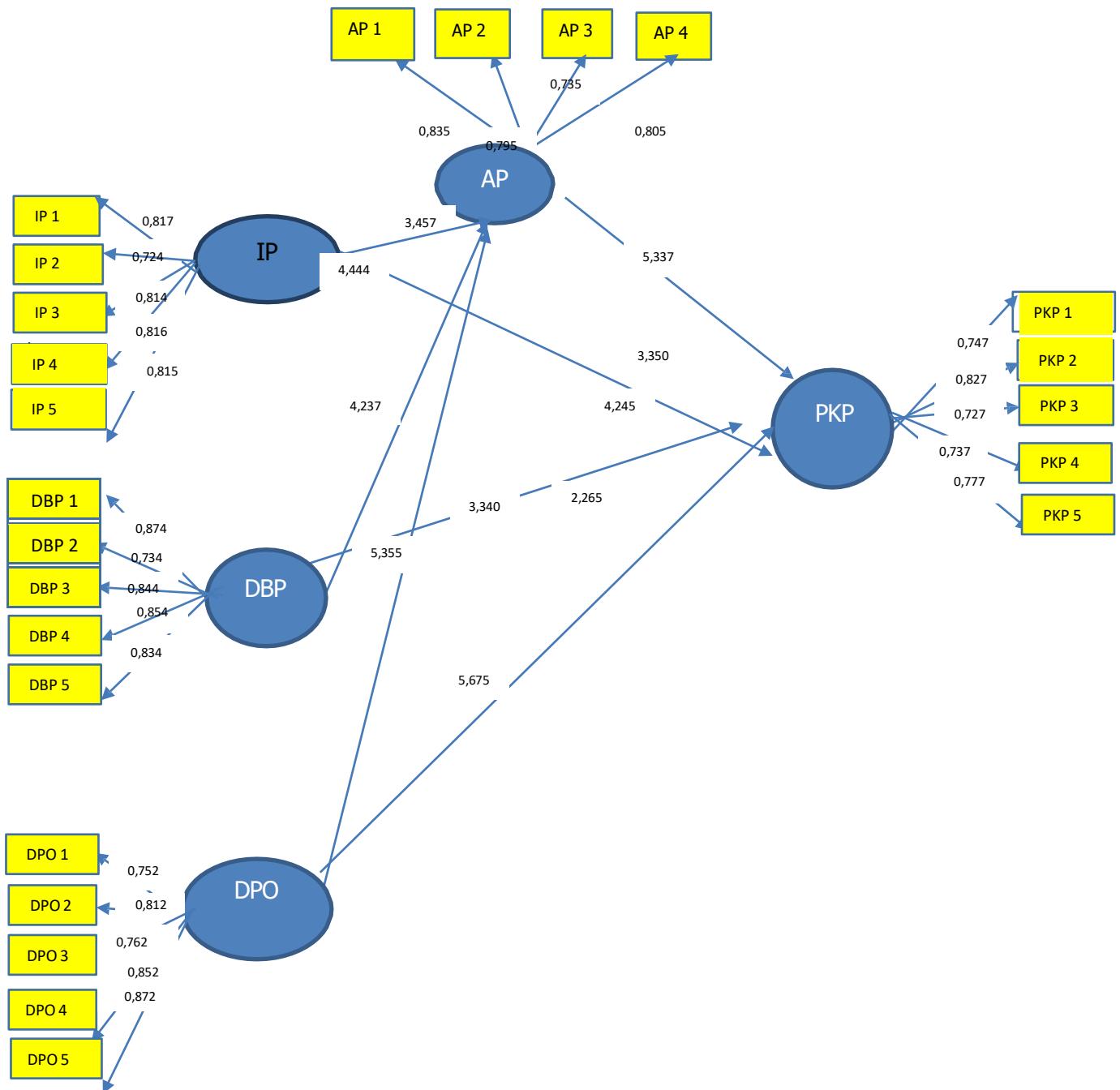


Figure 2: *Bootsraping* diagram

Convergent Validity Analysis

(Pradipta, Indry Aristianto and Tresia, 2021) stated that the *convergent validity* test in the SEM PLS test is a data test that aims to create valid data in several construct variables so that, where data analysis for *convergent validity* is carried out by looking at the outer loading value.

Table 6: Convergent Validity Test

| Variables | Indicator | Outer Loading |
|--|-----------|---------------|
| Food Inflation (X) ₁ | IP 1 | 0,817 |
| | IP 2 | 0,724 |
| | IP 3 | 0,814 |
| | IP 4 | 0,816 |
| | IP 5 | 0,815 |
| Distribution of Basic Materials (X) ₂ | DBP 1 | 0,874 |
| | DBP 2 | 0,734 |
| | DBP 3 | 0,844 |
| | DBP 4 | 0,854 |
| | DBP 5 | 0,834 |
| Organic Fertilizer Distribution (X) ₃ | DPO 1 | 0,752 |
| | DPO 2 | 0,812 |
| | DPO 3 | 0,762 |
| | DPO 4 | 0,852 |
| | DPO 5 | 0,872 |
| Market Access (Z) | AP 1 | 0,835 |
| | AP 2 | 0,795 |
| | AP 3 | 0,735 |
| | AP 4 | 0,805 |
| Increased Food Availability (Y) | PKP 1 | 0,747 |
| | PKP 2 | 0,827 |
| | PKP 3 | 0,727 |
| | PKP 4 | 0,737 |
| | PKP 5 | 0,777 |

Source: Result Data, 2023

Table 6 above can explain the *outer loading* value of several variables obtained from observations that have a distribution of data that is suitable for hypothesis testing.

Average Variant Extracted (AVE) Analysis

(Pradipta, Indry Aristianto and Tresia, 2021) stated that the AVE test aims to the data in each

construct variable is feasible and valid for testing. The results of the *Average Variant Extracted* (AVE) test can be seen in Table 7 below:

Table 7: AVE Test

| Variables | AVE |
|--|-------|
| Food Inflation (X) ₁ | 0,830 |
| Distribution of Basic Materials (X) ₂ | 0,770 |
| Organic Fertilizer Distribution (X) ₃ | 0,850 |
| Market Access (Z) | 0,740 |
| Increased Food Availability (Y) | 0,760 |

Source: Result Data, 2023

Table 7 above for the *Average Variant Extracted* (AVE) test results of the variables obtained from observations the value is greater than the significance value of 0.5, where all data from existing and scattered construct variables are very suitable for regression testing, as well as for hypothesis testing.

Composite Reliability Test

According to (Pradipta, Indry Aristianto and Tresia, 2021) This *Composite Reliability* test is to describe whether the distribution of construct variable data has the ability to increase the accuracy of the data distribution, where this data analysis can be seen in the following table:

Table 8: Composite Reliability Test

| Variables | Composite Reliability |
|--|-----------------------|
| Food Inflation (X) ₁ | 0,784 |
| Distribution of Basic Materials (X) ₂ | 0,824 |
| Organic Fertilizer Distribution (X) ₃ | 0,744 |
| Market Access (Z) | 0,854 |
| Increased Food Availability (Y) | 0,844 |

Source: Result Data, 2023

Table 8 above, the results of the *composite reliability* test of the variables obtained from observations are greater than the significance of 0.6, the data from several variables that have been distributed are suitable for other tests.

Path Coefficient Test

The *path coefficient* test of the existing variables can be seen in Table 9 to Table 15 below:

Table 9: R Square Test

| Variables | R Square |
|---------------------------------|----------|
| Food Inflation (X) ₁ | 0,844 |
| Increased Food Availability (Y) | 0,727 |

Source: Result Data, 2023

From Table 9 above, it states that the R Square value of the food inflation variable is 0.844, which or 84.4% can be explained by the variable of increasing food availability and the rest will be explained by other variables that are not included in the research material by 15.6%.

Table 10: R Square Test

| Variables | R Square |
|--|----------|
| Distribution of Basic Materials (X) ₂ | 0,864 |
| Increased Food Availability (Y) | 0,729 |

Source: Result Data, 2023

From Table 10 above, it states that the R Square value of the staple distribution variable is 0.864, which or 86.4% can be explained by the variable of increasing food availability and the rest will be explained by other variables that are not included in the research material by 13.6%.

Table 11: R Square Test

| Variables | R Square |
|--|----------|
| Organic Fertilizer Distribution (X) ₃ | 0,854 |
| Increased Food Availability (Y) | 0,724 |

Source: Result Data, 2023

From Table 11 above, it states that the R Square value of the organic fertilizer distribution variable is 0.854, which or 85.4% can be explained by the variable of increasing food availability and the rest will be explained by other variables that are not included in the research material by 14.6%.

Table 12: R Square Test

| Variables | R Square |
|---------------------------------|----------|
| Food Inflation (X) ₁ | 0,804 |
| Market Access (Z) | 0,722 |

Source: Result Data, 2023

From Table 12 above, it states that the R Square value of the food inflation variable is 0.804,

which or 80.4% can be explained by the market access variable and the rest will be explained by other variables that are not included in the research material by 19.6%.

Table 13: R Square Test

| Variables | R Square |
|--|----------|
| Distribution of Basic Materials (X) ₂ | 0,824 |
| Market Access (Z) | 0,742 |

Source: Result Data, 2023

From Table 13 above, it states that the R Square value of the staple distribution variable is 0.824, which or 82.4% can be explained by the market access variable and the rest will be explained by other variables that are not included in the research material by 17.6%.

Table 14: R Square Test

| Variables | R Square |
|--|----------|
| Organic Fertilizer Distribution (X) ₃ | 0,841 |
| Market Access (Z) | 0,732 |

Source: Result Data, 2023

From Table 14 above, it states that the R Square value of the organic fertilizer distribution variable is 0.841, which or 84.1% can be explained by the market access variable and the rest will be explained by other variables that are not included in the research material by 15.9%.

Table 15: R Square Test

| Variables | R Square |
|---------------------------------|----------|
| Market Access (Z) | 0,847 |
| Increased Food Availability (Y) | 0,622 |

Source: Result Data, 2023

From Table 15 above, it states that the R Square value of the market access variable is 0.847, which or 84.7% can be explained by the variable of increasing food availability and the rest will be explained by other variables that are not included in the research material by 15.3%.

Hypothesis Test

The results of the hypothesis test according to Table 16 below:

Table 16: Hypothesis Test

| Hypothesis | Influence | T-Statistics | P-Value | Results |
|------------|-----------|--------------|---------|---------|
| | | | | |

| | | | | |
|-----|---|-------|-------|----------|
| H1 | Food inflation to increase food availability | 4,444 | 0,001 | Accepted |
| H2 | Distribution of staple foods to increase food availability | 3,340 | 0,010 | Accepted |
| H3 | Distribution of organic fertilizer to increase food availability | 5,675 | 0,006 | Accepted |
| H4 | Food inflation on market access | 3,457 | 0,000 | Accepted |
| H5 | Distribution of staples to market access | 4,237 | 0,010 | Accepted |
| H6 | Distribution of organic fertilizer towards market access | 5,355 | 0,002 | Accepted |
| H7 | Market access to increased food availability | 5,337 | 0,001 | Accepted |
| H8 | Food inflation on increasing food availability through market access as a moderating variable | 3,350 | 0,000 | Accepted |
| H9 | Distribution of staple goods on increasing food availability through market access as a moderating variable | 4,245 | 0,001 | Accepted |
| H10 | Distribution of organic fertilizer on food availability through market access as a moderating variable | 2,265 | 0,002 | Accepted |

Source: Result Data, 2023

According to Table 16 above, it can be seen that partially the variables of food inflation, staple food distribution and organic fertilizer distribution affect the increase in food availability and also affect market access. Simultaneously, the variables of food inflation, staple food distribution and organic fertilizer distribution affect the variable of increasing food availability through market access as a moderating variable.

DISCUSSION

The results state that food inflation variables affect the increase in food availability. This situation is in accordance with research (Hu, Allen H., 2019) Food inflation will make prices increase and have an impact on reducing production which makes food availability scarce. The results also state that the variable distribution of staples affects the availability of food. This situation is in accordance with research (Hirich, Abdelaziz, 2021) The results of the study state that the variable distribution of organic fertilizers has an effect on the availability of food. This situation is in accordance with research (Donner, Mechthild and de Vries, 2021) which states that the distribution of scarce fertilizers will make farmers unable to produce a lot of food which results in limited food availability. The results also state that the food inflation variable affects market access, where the results of this study are in accordance with the research of (Fassio, Franco and de Vries, 2021). (Fassio, Franco, 2022) which states that increasing food inflation

will make prices increase, decrease food availability and reduce market access to food. The results showed that the variable distribution of staple foods had an effect on market access, which is in accordance with research (Türkten, 2023) (Türkten, 2023) stated that the limited distribution of corner materials will reduce market access to staples to the community which makes it difficult for people to find the staples they want in the market. The results of the study state that the variable distribution of organic fertilizer has an effect on market access, this is in accordance with the research of (Grabs, Janina and Carodenuto, 2021) which states that the smooth distribution of organic fertilizers will make it easier for farmers to produce, as well as improve food distribution and reduce price increases and inflation. The results of the study state that market access will affect the availability of food. This is in accordance with research (Pato, 2020) broad market access to foodstuffs from farmer production will create maximum and comprehensive food availability. The results of the study state that food inflation affects the availability of food through market access as a moderating variable. This is in accordance with research (Hernandez-Aguilera, J. Nicolas, 2018) which states that the availability of food found in the market will be available, if inflation decreases and prices are affordable, where this situation will make goods available in the asar can provide access to the public to buy these products. The results of the study describe that the variable distribution of staples affects the availability of food through market access as a moderating variable. This situation is in accordance with research (Asai, Masayasu, 2018) which states that difficult market access means that the distribution of staples is also limited in availability and affects the amount of staples on the market that are difficult to meet the needs of the community due to limited goods. The results of the study describe that the variable distribution of organic fertilizer affects the availability of food through market access as a moderating variable. This is in accordance with research (Perey, Robert, 2018) which states that the disrupted distribution of organic fertilizer will threaten the availability of staples in the market and will tend to reduce market access to staples in the community. With food inflation, it affects the decrease in the availability of food in the market, where this is caused by the limited distribution of organic fertilizers which makes it difficult for farmers to produce food in large quantities, thus disrupting the distribution of food products, because the limited availability of food will increase prices and reduce market access to the public to buy food for their needs.

CONCLUSION

From the results of this study, the conclusion is that partially the variables of food inflation, staple food distribution and organic fertilizer distribution affect the increase in food availability and also affect market access. Simultaneously, the variables of food inflation, staple food distribution and organic fertilizer distribution affect the variable of increasing food availability through market access as a moderating variable.

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