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THE EFFECT OF INDUSTRIAL DIGITALIZATION ON TOTAL HALAL MEAT PRODUCTION IN JAVA

PENGARUH DIGITALISASI INDUSTRI PADA TOTAL PRODUKSI DAGING HALAL DI JAWA

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ABSTRACT

The demand for halal meat in Indonesia is very large. Java Island is an area with a large production of halal meat in Indonesia. This study aims to analyze the effect of the number of digital equipment, Human Development Index levels, and digital payment modes on the productivity level of halal meat in the three largest provinces on the island of Java. This study uses panel data on the number of digital device usage, Human Development Index, number of digital payments, and total production of halal meat in East Java, West Java, and Central Java in 2015-2022. Data were analyzed using Eviews 10 software. The results show that digital devices used in the halal meat industry do not necessarily affect halal meat production in the provinces of East Java, Central Java, and West Java. However, HDI and the number of digital payments have a positive effect on halal meat production in the provinces of East Java, Central Java

Keywords: Halal culture, knowledge, attitude

ABSTRAK

Permintaan daging halal di Indonesia sangat besar. Pulau Jawa merupakan daerah dengan produksi daging halal yang besar di Indonesia. Penelitian ini bertujuan untuk menganalisis pengaruh jumlah peralatan digital, tingkat Index Pembangunan Manusia (IPM) , dan moda pembayaran digital terhadap tingkat produktivitas daging halal di tiga provinsi terbesar di Pulau Jawa. Penelitian ini menggunakan data panel jumlah penggunaan perangkat digital, IPM, jumlah pembayaran digital, dan total produksi daging halal di Jawa Timur, Jawa Barat, dan Jawa Tengah pada tahun 2015-2022. Data dianalisis menggunakan software Eviews 10. Hasilnya menunjukkan bahwa perangkat digital yang digunakan dalam industri daging halal belum tentu mempengaruhi produksi daging halal di provinsi Jawa Timur, Jawa Tengah, dan Jawa Barat. Namun HDI dan jumlah pembayaran digital berpengaruh positif terhadap produksi daging halal di provinsi Jawa Timur, Jawa Tengah

Kata Kunci: *budaya halal, pengetahuan, sikap*

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INTRODUCTION

Indonesia is the world's most popular Muslim-majority country, with more than 227 million Muslims according to data reported by the World Bank(Choiriyah, Kafi, Hikmah, & Indrawan, 2020). The largest number of Muslim countries in the world makes Indonesia the largest potential market for halal meat in the world. As a result, the demand for halal meat in Indonesia has increased rapidly, because Muslims are only allowed to consume halal food. Moreover, the growth of the birth rate of Muslims is also increasing, thus creating more demand in the market(Sumarliah, Li, Wang, Fauziyah, & Indriya, 2022).

What's more, the massive preaching of Islamic styles, rules, and culture by several Islamic scholars in Indonesia has increased awareness of the benefits of halal meat for health. The increasing popularity of convenience food promoted by several fast food chains is also a trigger for high demand. The potential for the halal meat market in Indonesia itself is very large. According to Dinar Standard (2021) on Global Islamic Economy Report, its reaches 6.2 percent in 2024, total spending of USD3.2 trillion.

Java Island is an area with a large production of halal meat in Indonesia. Apart from being an island where the governance of Indonesia is centralized, the island of Java has the potential to become a major producer of halal meat. The island has several advantages that make it well positioned for the sector, including a large Muslim population, thus providing a large market for Halal meat. According to a survey report by the Central Bureau of Statistic (Badan Pusat Statistic/BPS) until 2022, Islam will become the majority on the Java Islad, with a percentage of around 96.02%, or around 148.19 million people (online BPS database, processed).

The economy of Java Island is growing rapidly, thus causing an increase in income and demand for halal meat. Java Island also has a tropical climate that is ideal for livestock production. Land and water resources are also available in abundance on the island of Java, so industry players with large financial strength can invest their money in the halal livestock sector. In addition, the island of Java is equipped with various supporting infrastructure facilities and suggestions, both for the management of livestock, as well as the production and distribution of halal meat supply.(Vanany, Maarif, & Soon, 2019).

There have been many studies on the use of technology to support halal meat production in Indonesia. Such studies (Abdul Kadir E, et al 2018), (Larissa & Parung, 2021),(Mardiyah et al., 2021), (Sumarliah, Li, Wang, Fauziyah, & Indriya, 2022), is one of them. However, studies that discuss the use of digital equipment, the level of the human development index (HDI), and digital payment support to increase the productivity of halal meat on the island of Java are still very rare. Especially in testing whether the number of digital smart devices can synergize with HDI on the island of Java, there are still not many preliminary studies. The author sees that there are research gaps that need to be observed to get potential findings. Based on this, this study aims to analyze the effect of the number of digital equipment, HDI levels, and digital payment modes on the productivity level of halal meat in the three largest provinces on the Java island.

LITERATURE REVIEW

Number of Digital Devices on Halal Meat Production

According to research by(Ahmad Tarmizi, Kamarulzaman, Abd Rahman, & Atan, 2020), digital devices can help halal meat producers increase efficiency and productivity, such as monitoring livestock health, meat preservation processes, and supervision in packaging. In addition, using digital devices can help halal meat producers improve food safety by monitoring temperature, humidity, and the content of pathogenic bacteria in meat. Based on this statement, the hypothesis is formulated as follows:

H1: The number of digital devices has a significant positive effect on the total production of halal meat

Human Development Index on Halal Meat Production

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According to a study by(Zailani, Iranmanesh, Jafarzadeh, & Foroughi, 2020), countries with a higher human development index (HDI) tend to produce more meat. This is because countries with higher HDI tend to have higher incomes, thus enabling their people to be able to eat more meat. The people's high purchasing power can open up a larger market share for halal meat. In addition, countries with higher HDI tend to have more efficient agricultural production systems, which allow them to produce more meat per unit of land and labor. Efficiency in this case can be due to the higher competence of industrial players so that production efficiency can be increased. Based on this statement, the hypothesis is formulated as follows:

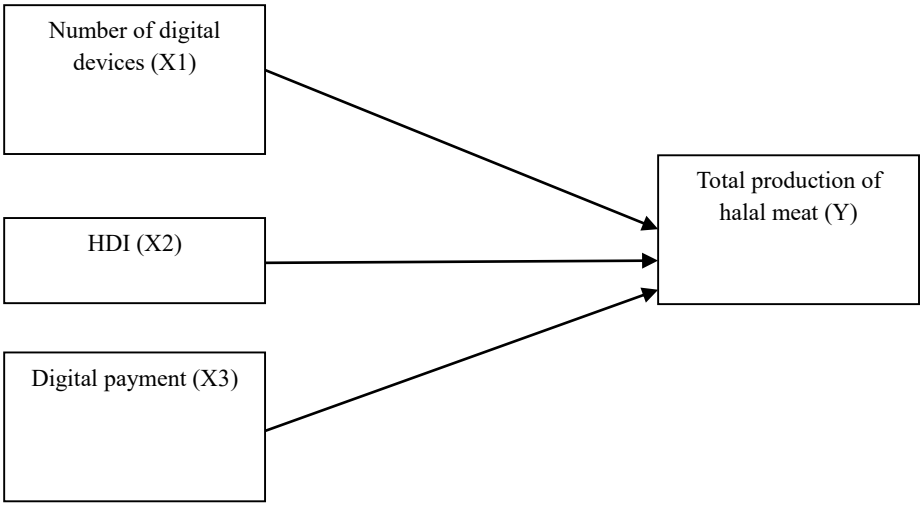
H2: HDI has a significant positive effect on total halal meat production

Digital Transactions on Halal Meat Production

According to a study by(Rejeb, Rejeb, Zailani, Treiblmaier, & Hand, 2021), digital payments can indirectly boost productivity in the meat production process. For example, digital payments can be used to automate payments for livestock, feed, and other inputs, saving time and money. Industry players can spend more time caring for livestock. Digital payments can help improve traceability in the meat production process. This means it will be easier to track the movement of meat from farm to table. This can help ensure food safety and prevent fraud. Based on this statement, the hypothesis is formulated as follows:

H3: The number of digital transactions has a significant positive effect on total halal meat production

Hypothesis and Variables



Source: Compiled by the author
Figure 1. Research variable model

MATERIALS AND METHOD

Data Type

This research uses quantitative methods. Data was collected by purposive sampling. The data type is static panel data. Data regarding the number of digital devices used in the halal industry in East Java, West Java, and Central Java were taken at bps.go.id. Data on HDI in East Java, West Java, and Central Java, as well as total halal meat production in East Java, West Java, and Central Java, were also taken on the bps.go.id website. Data on the number of digital payments for halal meat in East Java, West Java, and Central Java were taken from *ojk.go.id*. Data was taken from 2015-2022.

Data Analysis

Data were analyzed using the static panel method. Previously, the data was determined for analysis whether to use the Random, Common, or Fixed Effect Model (REM/CEM/FEM) through the Chow test and Haussman test. If in the Chow test, the value is p> 0.05, then the data is more suitable to use the Common Effect Model (CEM). However, if p <0.05, then the data is more suitable using the Fixed Effect Model (FEM). After carrying out the Chow test, the data was tested again using the Haussman test. Data is processed using Eviews 10 software using the ordinary least squares (OLS) method.

Variable Indicator

Table 1. Variable indicator

Variable Name	Variable Type	Unit	Reference source
The number of digital devices used in the halal industry in East Java, West Java and Central Java	Independent –X1	Fruit	(Ahmad Tarmizi et al., 2020)
The human development index (IPM/HDI) in East Java, West Java and Central Java	Independent – X2	Percentage	(Zailani et al., 2020)
The number of digital transactions in the halal industry in East Java, West Java and Central Java	Independent – X3	Dollar	(Rejeb et al., 2021)
Total production of halal meat in East Java, West Java and Central Java	Dependent - Y	tons	(Kabir, 2015)

Source: arranged by author

FINDING AND DISCUSSION

Chow Test Results

Table 2 Chow test results

Redundant Fixed Effects Tests			
Equation: Untitled			
Test cross-section fixed effects			
Effect Test	Statistics	df	Prob.
Cross-section F	39.43409158	(3,25)	0.000
Chi-square cross-sections	55.87457228	3	0.000

Source: Data processed by Eviews 10

Table 2 shows that the p-value <0.05, so the FEM model is more suitable to use than the CEM model. Likewise, in the Haussman test shown in Table 3, the value of p <0.05, so the FEM model is more suitable to use than the REM model.

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Table 3 Haussman Test Results

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistics	Chi-Sq. df	Prob.
Random cross-sections	118.3022743	3	0.000

Source: Data processed by Eviews 10

Table 4. Fixed effect model test results

Dependent Variable: Y				
Method: Panel EGLS (Cross-section weights)				
Date: 08/25/23 Time: 14:55				
Sample: 2015 2022				
The period included: 8				
Cross-sections included: 4				
Total panel (balanced) observations: 32				
Linear estimation after one-step weighting matrix				
Variables	coefficient	std. Error	t-Statistics	Prob.
C	-47,745	10081	-4,736	0.000
X1	0.024	0.070	0.344	0.734
X2	7,294	1668	4,372	0.000
X3	0.241	0.055	4,359	0.000
Cross-section fixed (dummy variables)				
	Weighted Statistics			
R-squared	0987	Mean dependent var		9,210
Adjusted R-squared	0.984	SD dependent var		7007
SE of regression	0.120	Sum squared residue		0.359
F-statistics	310,112	Durbin-Watson stat		0.391
Prob (F-statistic)	0.000			

Source: Data processed with Eviews 10

From Table 3, it can be seen that H-1 is rejected. The number of digital devices used in the halal industry in East Java, West Java, and Central Java did not significantly affect the total production of halal meat in East Java, West Java, and Central Java. This is contrary to research by(Ahmad Tarmizi et al., 2020), where the availability of digital devices can improve meat quality and industry productivity in supplying halal meat.

A study by(Ahmad Tarmizi et al., 2020) presented various obstacles to adopting Internet of Things (IoT) devices by SMEs in the food agribusiness sector in Malaysia. IoT besides having the potential to increase efficiency and productivity, the challenges faced are no less great than the benefits. There are several challenges faced by SMEs in adopting IoT in Malaysia such as the high cost of

implementation. IoT devices require expensive investment for SMEs, and this is very burdensome for SMEs who have limited financial resources.

In addition, SMEs in Malaysia still lack available human resources with technical expertise. SMEs are also worried about adopting IoT devices because they are worried about the security of the IoT system. After all, it is prone to cyber-attacks. The lack of awareness by SMEs who are not aware of the benefits of IoT or how to adopt it is the reason why there is a lack of competence about IoT in SMEs in Malaysia.

Governments can provide financial assistance and technical support to SMEs to help them adopt IoT. There needs to be more training programs organized by central and local governments and education for SMEs regarding IoT. The government can also collaborate with public-private partnerships, where public-private partnerships can be formed to share resources and expertise in training HR in SMEs.

Table 3 shows that H-2 is accepted. The human development index in East Java, West Java, and Central Java significantly affects the total production of halal meat in East Java, West Java, and Central Java. This is following the study by(Zailani et al., 2020), where HDI can also affect meat production through education. Farmers' knowledge of livestock management and production affects livestock productivity. The more a farmer understands the science of animal husbandry, the more aware of the importance of livestock health and comfort which will indirectly increase the life expectancy of livestock and the quality of their meat.

In line with this, a study (Sihite, 2021)stated that health knowledge about livestock is also very important, as healthy animals tend to produce more meat. For poultry, health can increase the productivity of the eggs produced. Environmental protection is also important because it can help ensure meat production and the hygienic level of meat in the long term.

Table 3 shows that H-3 is accepted. The number of digital transactions in the halal industry in East Java, West Java, and Central Java affects the total production of halal meat in East Java, West Java, and Central Java. This is following the study by(Kabir, 2015)where digital payments can help increase transparency in the meat production process. This means that it will be easier for consumers to know where their meat comes from and how it is produced. This can help build trust between consumers and producers. P

In line with this, a study by(Raharja et al, 2020), digital payments can create new business opportunities in the meat production sector. For example, digital payments could be used to create new marketing channels for meat producers. It can also be used to create new supply chain management solutions.

Table 3 also shows where the F-stat value is <0.05, which means that X1, X2, and X3 simultaneously have a positive effect on total halal meat production in East Java, West Java, and Central Java. A study by Agus and Widi (2018) argues that Indonesia can increase livestock productivity by providing better empowerment of farmers and suitable, adaptable technology must be used to preserve feed availability, increase feed quality, and optimize the nutritional content of the diet.. This can be done through government programs and private-sector investment. Indonesia can simplify its meat supply chain by improving coordination between producers, processors, and distributors. This can be done by forming industry associations and developing standards for the meat industry. If these steps prove to be effective, farmers can be helped and their standard of living can increase, so that the capital for business is also getting bigger.

Moreover, the island of Java has a long history of livestock production, thus providing the island with a strong foundation in this sector. Since ancient times, besides farming, raising livestock has also been a side job for them to improve family nutrition(Perbawasari, Sjuchro, Setianti, Nugraha, & Syamsu, 2020). In the modern era, the island of Java has a well-developed infrastructure that makes it easier to transport livestock and meat products. Java Island has access to advanced technology that can be used to increase the efficiency of halal meat production(Ismoyowati, 2015).

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CONCLUSION

Based on the above results, it can be concluded that the number of digital devices used in the halal meat industry does not necessarily affect halal meat production in the provinces of East Java, Central Java, and West Java. However, HDI and the number of digital payments have a positive effect on halal meat production in the provinces of East Java, Central Java, and West Java. Java Island is the center of government and the availability of infrastructure also supports the existence of a halal meat industry. Future research is expected to be able to examine the factors that influence meat production in SMEs in the village so that it can provide policy contributions for stakeholders.

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