



# Factors Affecting the Sustainability of Fintech Financing System for Vegetable and Fruit Farmers in Yogyakarta, Indonesia

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**Abstract.** Financial technology (Fintech) offers capital cash through a financing system that is claimed to be easier to access because it uses digitalized technology. This study has three objectives: (1) to know the vegetable and fruit farmers attitudes towards the fintech, (2) to assess the level of sustainability of the fintech, and (3) to analyze factors that affect the fintech sustainability of vegetable and fruit farmers. 87 farmers of fintech institution partners were interviewed. The variable will be analyzed by applying an interval scale, proportion test, and z test. OLS regression model is used to determine the factors that affect the sustainability of fintech. The results of the study showed that the vegetable and fruit farmers have a positive attitude towards the Fintech financing system. Based on the proportion test, more than 50% of the vegetable and fruit farmers who have willingness to continue using the Fintech financing system and this has been proven by comparing the Zscore and the Ztable. Furthermore, the factors that influence the sustainability of the Fintech financing system are ease of use and farmer attitudes. Previous research also stated that ease of use and attitudes are the determining variables in making decisions to adopt a technology.

**Keywords:** Fintech · Vegetable and fruit farmers · Attitude · Cash capital · Willingness to continue · Sustainability

## 1 Introduction

In general, it is known that vegetable and fruit farmers have relatively high resilience and the level of adoption of modern technology is relatively high [1]. Fintech is one of the innovations in the financial sector that refers to modern technology [2]. According to Clayton, the innovation aims to introduce practicality, ease of access, convenience and economic cost [3]. Financial transactions that can be accessed through Fintech include payments, investments, lending money, transfers, financial plans and comparisons of financial products [4]. Banking or financial services that were initially only carried out by a bank institution, can now also be carried out by service providers, search engines or through social networks [5]. Based on data from the Financial Services Authority, there are already 157 Fintech companies that have been legally registered [6]. Changes

in the business environment that are affected by the rapid growth of Fintech require more innovative solutions, especially in the banking financing system.

Fintech offers financial product services that are more profitable with easier processes for consumers [7] compared to conventional systems, for example in credit providers. Fintech financing services use the Peer to Peer Lending (P2P) or Crowdfunding system to make it easier and closer to vegetable and fruit farmers with investors. Financing services on the Fintech platform require fewer complete files and can be done only by uploading the required documents via the internet [8]. If someone feels or believes that the information technology system offered is difficult to use, the desire to use the technology system will decrease [9].

It is known that several vegetable and fruit farmers from the Special Region of Yogyakarta have accessed the Fintech platform to meet their farming capital needs. Several Fintech platforms have been legally registered with the Financial Services Authority and implemented a profit-sharing system to distribute profits to farmers and investors from financed agricultural cultivation. Compared with conventional bank financing systems that use credit interest rates [10]. The use of a profit-sharing system is expected to provide better benefits compared to conventional bank financing systems that use credit interest rates.

In a study, it was revealed that the adoption of e-commerce technology in agriculture is very important to do in order to increase the productivity and welfare of poor vegetable and fruit farmers in developing countries [11]. This is motivated by the abundance of agricultural products in Indonesia and the desire of e-commerce players to help farmers market vegetable and fruit products [12]. The application of the latest technology is positively correlated with the condition of household food security of vegetable and fruit farmers, namely those who apply technological innovation more intensively have a better level of food security [13]. Vegetable and fruit farmers who are willing to implement the latest innovations or programs are influenced by the benefits and convenience factors that can be obtained, attitudes towards support in the implementation and contribution of farm income, and socio-economic factors of vegetable and fruit farmers [14]. The willingness of farmers to continue the program is important to do in the context of the sustainability of the program [15]. This study aims to determine the attitude of vegetable and fruit farmers, the willingness of vegetable and fruit farmers to continue the financing system, and the factors that influence it. This research is important to do because it can provide insight regarding things that can increase the amount of production and business scale by meeting capital needs by using Fintech financing services.

## 2 Methods

The selection of the location of this study was carried out purposively (deliberately) to adjust the research objectives [16]. The location determination is based on a decision from a fintech startup that chooses several regions to implement Fintech financing services. The area of Yogyakarta province is one of the areas chosen by the two platforms because it has vegetable and fruit farmers who are considered to have openness to the latest technology, after the other two regions Bogor and Bandung. The population of vegetable and fruit farmers who use financing services from two Fintech companies in Yogyakarta

**Table 1.** Category vegetable and fruit farmer statement

Variable	Statement Score	Category
Attitude	24–72	Negative
	73–120	Positive
Willingness to Continue	10–30	Low
	31–50	High

is 87 vegetables and fruit farmers. Thus, a sample of vegetable and fruit farmers will be taken by the census.

In analyzing the attitude of vegetable and fruit farmers towards the profit-sharing system implemented by Fintech startups in financing transactions, it is measured using a Likert scale from one to five. Farmers’ attitudes are measured using 3 statement indicators, namely cognitive, affective, and conative [17]. The three indicators have 24 statements which are divided into 9 cognitive statements, 10 affective statements and 5 conative statements. Furthermore, the statements are categorized using an interval scale. The results of categorization using an interval scale of each variable are divided into two categories, namely positive and negative categories for the level of statements on the attitude variable, and high and low categories for the level of the statement of willingness to continue the financing system (Table 1).

The statement of farmers who have been categorized with an interval scale will then be proven by using the Z test. The Z test is used to determine whether a population has an average that is equal to, smaller or greater than a certain average value in accordance with the established hypothesis. The hypothesis used for the first objective is  $p > 0.5$ , which means that more than 50% of farmers are suspected of having a positive attitude towards the fintech financing system, while the hypothesis used for the second objective is that it is suspected that more than 50% of farmers are willing to continue using the financing system. The willingness to continue variable has 10 statements based on the flow of the financing system on the Fintech platform in providing financing services to the agricultural sector. Furthermore, all statements in this study were tested with validity and reliability tests and the answers of statement items in the form of ordinal data would be converted into interval data using the successive interval method using Microsoft Excel software.

The next analysis is to find out the factors that affect the sustainability of the profit-sharing system on the Fintech platform analyzed using OLS regression test using SPSS version 25 software. Applying the regression analysis brings the consequences of fulfilling classical assumptions so that the estimator produced is Best Linear Unbiased Estimator (BLUE) so a classical assumption needs to be tested to determine the feasibility of the used regression model. The series of classical assumption tests in this research are normality test, collinearity test and heteroscedasticity test by using the Glejser method. The regression model used in this study is (Eq. 1):

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + e \tag{1}$$

Description:

Y= Willingness of vegetable and fruit farmers to continue the profit-sharing system.

$X_1$  = Ease of Use.

$X_2$  = Attitude of vegetable and fruit farmers.

$\beta_0$  = Constant.

$\beta_1$ - $\beta_2$  = Regression coefficient.

e = Disturbing factor (error).

### 3 Results and Discussion

Vegetable and fruit farmers who became respondents in this study were farmers of fintech startups partners who getting agricultural financing. Respondents also live and domiciled in the Yogyakarta area, and the other characteristics can be seen in Table 2.

Based on Table 2, it can be seen that the respondent has productive characteristics to become a farmer, especially in terms of age, income and farming experience. The characteristics of productive farmers are influenced by the standards of fintech startups in accepting a farmer to become a business partner. The fintech startup will include the characteristics of those farmers in the investment prospectus which aims to increase the confidence of investors to invest their funds into the business offered by farmers through fintech startups.

#### 3.1 Attitudes of Vegetable and Fruit Farmers Towards Fintech Services

Based on the statements of farmers who are put into two categories, namely positive and negative, it can be seen that there are 69.65% of farmers who have a positive attitude towards the fintech system, while there are 30.35% of farmers who have a negative attitude. Based on Table 3, it can be concluded that most of the respondents, namely 87 vegetable and fruit farmers who become a partner of Fintech startups, have a positive attitude towards the financing system using fintech.

Based on the results of the analysis using the Z test, it can be seen that all attitude indicators have a Zscore value greater than Ztable so that the proposed hypothesis is accepted and it can be concluded that more than 50% of farmers have a positive attitude

**Table 2.** Farmer characteristics

Characteristics	Measurement	Average
Age	Year	49
Education Level	Year	11
Family Members	Person	4
Income	Rupiah/Year	80.287.356
Farm Experience	Year	22
Land Area	Hectares	2

Source: Primary Data Analysis (2021).

**Table 3.** Attitude of vegetable and fruit farmers

Indicator	Average	Percentage (%)	Category
Cognitive	31.09	69.09	Positive
Affective	34.92	69.84	Positive
Conative	17.51	70.02	Positive
<b>Average</b>	<b>27,84</b>	<b>69.65</b>	<b>Positive</b>

Source: Primary Data Analysis (2021).

towards the use of the fintech financing system. Partner farmers can get convenience from the Fintech platform in receiving information on how to access the financing provided. The third party from the financial system of Fintech chooses to visit the residence of a prospective customer or farmer partner who has at least done the financing application stage on a digital application. Representatives from the two platforms will provide complete information on how the profit-sharing system is implemented in the financing program offered. Based on the results of the analysis and information in the field, it can be concluded that the use of the profit-sharing system from the two platforms allows vegetable and fruit farmers to receive a higher percentage of profits compared to using other financing systems so that automatically the majority of vegetable and fruit farmers have a positive attitude towards Fintech financing system.

### 3.2 Willingness to Continue Fintech Financing

The level of willingness of vegetable and fruit farmers to continue the fintech financing system is important to know because it can be used to evaluate whether the Fintech financing system has been implemented properly. This willingness is measured by several statements consisting of: (P1) willingness to access the application of each platform to meet the needs of farming capital; (P2) the willingness of vegetable and fruit farmers to complete the required documents for the financing process through the application; (P3) the willingness of vegetable and fruit farmers to apply for farming capital needs; (P4) the willingness of vegetable and fruit farmers to combine business capital; (P5) the willingness of vegetable and fruit farmers to enter into a profit-sharing agreement; (P6) the willingness of vegetable and fruit farmers to receive business capital; (P7) the willingness of vegetable and fruit farmers to run a business in accordance with the tasks agreed in the profit sharing agreement; (P8) the willingness of vegetable and fruit farmers to report farming developments to the Fintech platform on a regular basis; (P9) the willingness of vegetable and fruit farmers to sell their harvests together according to the agreed agreement; (P10) the willingness of vegetable and fruit farmers to continue to share profits with a profit-sharing agreement with a financing platform.

Based on the average statement of farmers who become a fintech partner in Yogyakarta, which is 70.97% of vegetable and fruit farmers enter into the category of a high level of willingness to continue the fintech financing system (Table 4), while the average statement of vegetable and fruit farmers who enter into the category of low willingness level is 29.03%. So, it can be concluded that on average, farmers who partner

**Table 4.** Level of the willingness of farmers

Indicator	Average	Percentage (%)	Category
Willingness to Continue Fintech Financing System	35.48	70.97	Positive

Source: Primary Data Analysis (2021).

with fintech platforms and cultivate vegetables and fruit crops have a high willingness to continue the fintech financing system.

Furthermore, it is proved whether vegetable and fruit farmers’ partners from Fintech startups are highly willing to continue the profit-sharing system in the very high category by using proportion parameter testing. Testing the proportion parameter will produce a calculated Z score that will be compared with the Z table at a significance level of 0.5%. The results of the Z test analysis can be identified if the calculated Z score of vegetable and fruit farmers who have a high willingness to continue the Fintech financing system is 4.74. The calculated Z score is compared with the Z table value at a significance level of 0.5%, then the result is  $4.74 < 1.64$  ( $Z_{Score} > Z_{table}$ ) so that  $H_0$  is accepted. This means that more than 50% of vegetable and fruit farmers have a high willingness to continue the Fintech financing system.

Based on the results of the Z test calculation in Table 5, most of the statement items show a higher Z score than the Z table. This means that more than 50% of vegetable and fruit farmers who enter into the high category are willing to carry out every stage that is a parameter of the willingness of vegetable and fruit farmers to continue the Fintech financing system. Based on field data, vegetable and fruit farmers who have been partners on the Fintech platform expressed a high willingness to choose to continue the fintech financing system because it is more profitable. The consideration of the majority of partner vegetable and fruit farmers in the fintech financing system is that the profit-sharing agreements offered by Fintech startups have a larger percentage compared to other types of financing offered by conventional banks. The percentage of profit sharing obtained by Fintech startup farming partners can reach 70% based on the type of plant and the planting period being cultivated.

**3.3 Factors Influencing the Willingness of Vegetable and Fruit Farmers to Continue the Fintech Financing System**

Testing the normality test obtained a significance value of  $0.200 > 0.05$ , meaning that the data is normally distributed. Based on the multicollinearity test, all independent variables have a tolerance value  $>0.1$  and a VIF value  $<10$ , which means that there is no multicollinearity in the data being tested. The value of heteroscedasticity test by using the Glejser method shows the significance of all independent variables  $>0.05$ , meaning that the regression model does not have heteroscedasticity problems. Based on the classical assumption test series, namely normality test, multicollinearity test and heteroscedasticity test above, it can be seen that the OLS regression test model used in this study is included in the Best Linear Unbias Estimator (BLUE) category.

The coefficient of determination used is adjusted  $R^2$ . The coefficient of determination adjusted  $R^2$  in this equation model is 0.53. This means that 53% of the variation in the

**Table 5.** Z-test results Level of willingness of vegetable and fruit farmers to continue the profit-sharing system

Statement Items	Z-Score	Z-Table	Conclusion
Q1	4.13	1.28	H0 accepted
Q2	4.24	1.28	H0 accepted
Q3	4.44	1.28	H0 accepted
Q4	4.44	1.28	H0 accepted
Q5	4.91	1.28	H0 accepted
Q6	4.81	1.28	H0 accepted
Q7	5.43	1.28	H0 accepted
Q8	5.01	1.28	H0 accepted
Q9	4.96	1.28	H0 accepted
Q10	5.01	1.28	H0 accepted

dependent variable of the willingness of vegetable and fruit farmers to continue the fintech financing system can be explained by the ease of the system variable and the attitude variable of vegetable and fruit farmers, while the remaining 47% is explained by other variables outside the model or variables not examined.

The F test or coefficient test simultaneously is carried out to determine the effect of the independent variable on the dependent variable significantly or not. Based on Table 6, it can be seen that the F-Score is 50.667 with a probability value of  $< = 5\%$ , which is 0.000 and it can be concluded that H0 is rejected. This means that the ease of the profit-sharing system variable and also the attitude variable of vegetable and fruit farmers towards the profit-sharing system simultaneously affect the willingness of farmers vegetables and fruits to continue the profit-sharing system through the Fintech platform.

Based on the t-test, it is known that the variables of the convenience of the Fintech financing system and the attitude of vegetable and fruit farmers towards Fintech financing system have a significant influence on the willingness of vegetable and fruit farmers to continue the Fintech financing system. This statement is evidenced by the significance value of the variable convenience of the Fintech financing system below 0.01, the variable attitude of vegetable and fruit farmers to the Fintech financing system, farming experience and the land area below 0.05, while the education level variable has a value below 0.10.

Based on the results of the analysis in Table 6, it can be seen that. The ease of the financing system implemented by Fintech startups affects the willingness of vegetable and fruit farmers to continue the Fintech financing system with a percentage of 21% and a coefficient value of 1.386. It means, if all procedures for implementing the profit-sharing system become more accessible, it will increase the willingness of farmers to continue the fintech financing system. The previous research also states that Perceived

**Table 6.** Factors influencing the willingness of vegetable and fruit farmers to continue the profit-sharing system

Variables	Coefficient	t-Score	Sig.t	Partial
Constanta	-16.648***	-2.835	0.006	
Easy Profit Sharing System	1.386***	4.774	0.000	21%
Farmer Attitude	0.825***	4.084	0.000	16%
<b>R<sup>2</sup></b>	0.547		<b>F-Score</b>	50.667
<b>Adj R<sup>2</sup></b>	0.536		<b>Sig.F</b>	0.000

Description:

\*\*\*: Significant at 1% error rate.

\*\*: Significant at 5% error rate.

\*: Significant at 10% error rate.

ns: Not Significant

ease of use is a factor that customers consider to always use one of the Fintech service products, namely e-money [18].

The attitude of vegetable and fruit farmers towards the Fintech financing system affects the farmers’ willingness to continue the Fintech financing system with a percentage of 16% and a coefficient value of 0.825. It means, If the knowledge and information about fintech financing obtained by farmers increases and there are more positive assessments and actions given by farmers towards fintech financing, it will increase the willingness of farmers to continue the fintech financing system. The previous research also in line with this study and said that personal experience and related culture in which a person is raised become an attitude-forming factor that can influence action or a decision that will be taken by the individual [19].

Farmers who have previously used the Fintech financing system are accustomed to implementing steps in accessing the financing system, so that the willingness of vegetable and fruit farmers to continue implementing the Fintech financing system is high. In addition, the ease of the system and farmer attitude also have a positive effect on farmers’ interest in continuing because the information and the quality of services obtained while accessing Fintech financing is felt to be more satisfying with the profit-sharing system implemented. Likewise, the socio-economic characteristics of farmers that have a positive effect on sustainability, the higher the level of education of farmers, the longer the experience in farming and the wider the area of land controlled, the farmers will continue to move in search of a solution that can provide benefits with the lowest risk, especially in using the means of fulfilling business capital. The high adoption rate of FinTech financing systems is due to more transparent and effective policies such as eliminating middlemen as a financial intermediation process. An example is FinTech companies such as “Wealthfront” which take advantage of business opportunities that are still in bad shape to manage their investment portfolio models without a broker to reduce transaction costs [20].



## 4 Conclusion

Vegetable and fruit farmers have a positive attitude towards the Fintech financing system. More than 50% of vegetable and fruit farmers are willing to continue the Fintech financing system with a very high statement category. Based on the results of research on the ease of Fintech financing systems and the attitude of vegetable and fruit farmers have a significant also positive influence on the willingness to continue the Fintech financing system. Therefore, it is necessary to have support from related parties to support the positive attitude of partner farmers to disseminate information that using the fintech financing system can provide benefits. There needs to be a cooperation agreement given by the fintech platform to maintain farmers who still have a high willingness to continue the profit-sharing system. So that these farmers can feel that they are needed and can also create a desire to continue using the Fintech financing system.

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