Agricultural financing risk and ib agricultural financing: A long relationship

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Article Info	ABSTRACT
	Indonesia is destined to be an agrarian country because of its location on the equator, unfortunately not all farmers are able to access capital for their agricultural businesses while the contribution of the agricultural sector to employment is very high. It is also important to consider that Indonesia is also a country with the largest Muslim population in the world, so there should be a financing scheme in the agricultural sector that is in accordance with sharia compliance. Therefore, Islamic banking should be present to provide capital to farmers who need agricultural financing without violating sharia provisions. Identifying variables that affect Islamic bank financing in the agricultural sector in the long run is the aim of this study so that our findings can be one of the considerations for policy makers for future policies. To reveal the purpose of our research, we consider the factors affecting the agricultural financing of Islamic banks which consist of the risk of agricultural financing, farmer welfare, inflation and economic growth with observations for a decade from 2012 to 2021 on a quarterly basis. By using ARDL estimation, our findings find that in the long run relationship the welfare of farmers has no effect, while the other remaining variables have a significant effect. This study offers valuable implications indicating that the presence of Islamic banking can be considered as a viable financial solution within the agricultural sector

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INTRODUCTION

With its location on the equator, Indonesia is one of the agrarian countries in Asia. This makes Indonesia a country with many people who work as farmers. This implies that Indonesia has a strong dependence on the agricultural sector (Hatane et al., 2021). There is no doubt that there is an

assumption that farmers are considered the pillars of the nation. What is conveyed is indeed reasonable, because the food needs of the community are met with the existence of farmers who manage the agricultural sector. In addition, the extent of fertile land in Indonesia is a promising advantage and opportunity for Indonesia, both in order to meet domestic food needs and to be offered for export to the global market. With the advantages that Indonesia has in the agricultural sector, it makes the agricultural sector a sector that has a major contribution to Indonesia (Raihan, 2020). By taking closer look at the contribution of the agricultural sector to Indonesia's GDP, there is a fact that the agricultural sector is also one of the top three sectors that make a large contribution to Indonesia's GDP along with the manufacturing industry sector and the construction sector or the mining sector in the last decade. Even during the COVID-19 pandemic, the agricultural sector became one of the sectors that had immunity to the crisis (Khairad, 2020). In terms of employment uptake, the agricultural sector in Indonesia contributes to the creation of employment opportunities for the Indonesian people.

As one of the important sectors for Indonesia's GDP, decision makers must be able to uphold for more advanced agricultural development. The development of the agricultural sector can be executed by increasing the productivity of farmers' businesses. This is essential, because it is expected that farmers' income will increase, due to the assumption that the agricultural sector is still marginalized (Yandri & Sari, 2019). One form of support that can be done in increasing agricultural productivity from a financial point of view is by helping to facilitate access to capital for the agricultural sector to farmers (Prasiwi & Wulandari, 2018). Moreover, farmers are prone to being entangled with moneylenders practice because it is not easy for farmers to get capital from formal financial institutions because the agricultural sector is one sector that is considered to have high risk because it depends on natural factors so that the shade of uncertainty in harvest also to be proximate to the problem. This is where the important and strategic role of Islamic financial institutions in an effort to work up the productivity of the agricultural sector as well as the welfare of farmers through agricultural financing in conformity with sharia compliance.

According to data from the Financial Services Authority, in the period 2012 to 2021 Islamic bank agricultural financing has climbed by 649.08% or has gone up six times in the last decade. Therefore, this study seeks to outcrop the determinants of Islamic banking agricultural financing in Indonesia in long run based on econometric estimates using Autoregressive Distributed Lag (ARDL) by taking independent variables consisting of inflation and economic growth as macroeconomic variables, non-performing agriculture financing as a bank-specific variable in terms of agriculture financing risk, and farmers' welfare as proxied by the farmer's exchange rate. This study, try to put up in understanding the long run relationship of Islamic banking agricultural financing to the independent variables that have been determined in this study so that it can be one of the evidence in understanding the relationship between agricultural financing risks, macroeconomic factors, and farmer welfare on Islamic banking agriculture financing.

Literature Review
Islamic Bank Financing on Agricultural Sector

Financing (in Islamic banking) is a facility to support a project that requires funding. So, in other words financing facility is a facility used to support an investment desired by the customer (Muhamad, 2016). According to Sultan et al.,(2021) Islamic financing products offered by Islamic banking are one of the products that are the most important function of an Islamic bank as an intermediary institution. Islamic banking can offer surplus funds from funding customers to parties who need funds to enlarge their projects so that in this case, the sharia bank becomes the *shahibul mal* or the proprietary of the funds while the financing client is the party who has the trust of sharia banking to run the business that has been agreed previously (Sultan et al., 2021). From the explanation above, it can be stacked up that

Islamic financing is a form of funding support provided by Islamic banking to customers who need ancillary funding to run their business projects. In relation to agricultural financing, Islamic banking also come up with services in providing funds to bolster up agricultural projects. Although the *salam* contract has not yet been implemented in Indonesia to support agricultural financing, there are other contracts that can be used by farmers in order to secure financing support from Islamic banking, such as *murabahah* (sale contract) or *ijarah* (leasing contract). It is believed that Islamic banking agricultural financing could put up agriculture with capital support to farmers to enlarge their agricultural businesses by way of financing facilities provided by Islamic banking (Kocturk et al., 2013). Through agricultural financing support set by financial institutions (in this case, for example by using Islamic banks) to provide agricultural capital to farmers, farmers can take advantage of this financing for operational needs related to the emergence of costs to be paid, purchase of agricultural equipment, as well as extensification and intensification of agricultural businesses so that their businesses are more advanced and developed (Reddy & Subbaiah, 2012). As has been found by Sardar et al., (2013) that farmers also relish the benefits of Islamic bank agricultural financing by being able to increase the productivity of their business in Pakistan.

However, in general, agricultural financing has not become the main preference for commercial banking in Indonesia due to the high risk inherent in the agricultural sector (Beik & Aprianti, 2013). One of the consequences of lack of attention to agricultural financing by banks is causing limited access to capital for farmers so that there is still a lot of agricultural land that has not been worked on optimally (Wicaksono & Fitriyani, 2020). In fact, it is an opportunity for Islamic banking to sharpen its grip on the agricultural sector. Moreover, philosophically, Islamic banking is considered more closely related to the real sector than conventional banking. In more depth, demographic factors seem to be an opportunity for Islamic banks to support the agricultural sector because the majority of Indonesia's population adheres to Islam (Tsabita, 2014). In reality, the current agricultural financing of Islamic banking is still low when compared to conventional banking. This can be understood, at least the reason that farmers still lack understanding of Islamic banking products and the strong community paradigm in using conventional banking is a challenge factor that must be faced by Islamic banking (Saragih, 2017).

Sudarsono et al., (2019) found that the variable of non-performing financing in agricultural financing had a negative and significant effect on agricultural financing by Islamic banks in the long term. On the other hand, inflation has a positive effect on agricultural financing by Islamic banks in the long term. The study also revealed that interest rates have a negative effect on agricultural financing by Islamic banks in the long term and Bank Indonesia Syariah Certificates (BSBIS) have a significant negative effect on agricultural financing by Islamic banks. The study by Lestari (2019) found that Bank Indonesia Syariah Certificates (SBIS) partially had a significant positive effect on agricultural financing by Islamic banks while third party funds partially had a significant positive effect on agricultural financing by Islamic banks. The study also revealed that inflation partially has a significant negative effect on agricultural financing by Islamic banks, while non-performing financing has a significant positive effect on agricultural financing by Islamic banks, and interest rates do not affect agricultural financing by Islamic banks. Based on VECM estimates, Wicaksono & Fitriyani (2020) revealed that in a short run, they did not find any variables that had an effect on agricultural financing by Islamic banks. However, in the long run, the variables of third-party funds, the rupiah exchange rate, and the industrial production index have a significant effect on agricultural financing by Islamic banks. Third party funds and exchange rates have a negative effect, while the industrial production index has a positive effect on agricultural financing by Islamic banks. From the study, it was known that there was no significant effect on agricultural financing by Islamic banks by non-performing financing, inflation, and bank certificates of Indonesia. Beik & Aprianti (2013) also used VECM estimates, which in their study found that in short run only third-party funds have a significant effect

on agricultural financing by Islamic banks. Meanwhile, in the long run, central bank interest rates, Indonesian sharia bank certificates, third-party funds, equivalent rates for financing the agricultural sector, return of third-party funds from saving customers, and loan interest rates affect agricultural financing by Islamic banks. The study also revealed that in the long-run non-performing financing and inflation have no effect on agricultural financing by Islamic banks. In relation to the welfare of farmers as a factor that is considered to be one of the factors that affect agricultural financing provided by financial institutions in collaboration with the government, a study conducted by Nurjanah & Suryantini (2019) found that the exchange rate of farmers had no significant effect. In a related relationship, the study conducted by Maulana & Iskandar (2018) did not find any causality between Islamic bank agricultural financing and the exchange rate of farmers and vice versa. In the conclusion of his research, it is stated that Islamic bank agricultural financing is not very responsive to farmers' exchange rates.

Hypotheses Development

When farmers get a higher rate of return than the costs they have to bear as costs in working on their agricultural land, farmers will get greater income in line with the increase in the exchange rate of farmers so that farmers have a tendency to increase the amount of financing for their agricultural land to Islamic banks. As found by Javed et al., (2022) that farmer income is one of the determinants that has a positive impact on agricultural credit.

H_1. Farmer's exchange rate has a significant positive effect on Islamic bank agricultural financing.

Economic growth is one of the indicators in considering the economic conditions that occur in a region (Peterson, 2017) as well as an indicator in observing the business cycle (Alqaralleh, 2019). In the condition of the economy that continues to record positive growth, there are indications that in general all economic sectors have a trend to grow, including the agricultural sector. The growth of the agricultural sector will have an impact on increasing Islamic bank agricultural financing since the evidence of agricultural credit could enhance the agricultural productivity so that it also contributes to spurring economic growth (Hartarska et al., 2015).

H_2 Economic growth has a significant positive effect on agricultural financing of Islamic banks.

Inflation erodes the value of money, causing an increase of prices (Mubarok, 2021). In high inflationary regime conditions, farmers have to spend more to meet their needs on farmland (Wibowo, 2019) and may also have an influence on their business so Islamic bank agricultural financing could also get a negative impact from inflation.

H_3 Inflation has a significant negative effect on agricultural financing of Islamic banks.

Banks will certainly pay attention to the risk of non-performing financing as one of the important risks for the continuity of banking (Naili & Lahrichi, 2022). Non-performing financing can make banks undergo liquidity problems in the future (Maseke & Swartz, 2021). Banks may think twice draining off financing to sectors that have a tendency to have a high level of non-performing financing especially with the tendency of the risk profile of the agricultural sector which is considered high (Sun, 2022).

H$_4$ Non-performing Financing of the agricultural sector has a significant negative effect on agricultural financing of Islamic banks.

METHOD

Research Design

The estimation in this study uses a time series data processing approach using Auto Regressive Distributed Lag (ARDL). The reason that underlies the choice of ARDL is because estimation using the ARDL approach can execute variables in a stationary condition at the level or first-difference level. In addition, another boon of ARDL is its ability to analyze the relationship between short run and long run when cointegration occurs between endogenous and exogenous variables (Pesaran & Shin, 1998). In this study, the econometric estimation of ARDL is formulated as follows:

$$\Delta PPTN_t = \alpha_0 + \sum_{i=1}^{n} \alpha_1 PPTN_{t-1} + \sum_{i=1}^{n} \alpha_2 LNPF_{t-1} \sum_{i=1}^{n} \alpha_3 LNTP_{t-1} \sum_{i=1}^{n} \alpha_4 INFL_{t-1} \sum_{i=1}^{n} \alpha_5 PDB_{t-1}$$
$$+ \beta_1 PPTN_{t-1} + \beta_2 LNPF_{t-1} + \beta_3 LNTP_{t-1} + \beta_4 INFL_{t-1} + \beta_5 PDB_{t-1} + \delta EC_{t-1}$$
$$+ e_t$$

The above equation can be explained that the notation n as a sign of the lag length of the model, α_0 is a constant coefficient value, while α_{1-5} and β_{1-5} are estimators of each variable in short run and long run, δ is the speed of adjustment in error correction (EC) between short run and long run, and e is an unobservable variable.

Sample Selection, Data Sources and Variable Measurement

This study observes the agricultural financing of Islamic banks in a quarterly time series from first quarter of 2012 to fourth quarter of 2021, so we take a research timeframe of one decade. Data sources for Islamic bank agricultural financing and non-performing Islamic bank agricultural financing were obtained from the Financial Services Authority, while Indonesian macroeconomic variables consisting of inflation and economic growth came from the Central Statistics Agency. The variable of farmer welfare which is proxied by the exchange rate of farmers is also sourced from the Central Bureau of Statistics. The explanation of the operational definition of each variable in this study can be seen in the table 1.

Table 1. Summary of Operational Variable

Foothold Variable	Name	Unit of Measurement	Code	Data Source
Endogen	Islamic bank agricultural financing	Natural Logarithm of Islamic bank agricultural financing value	PPTN	Financial Services Authority
Exogen	Non-performing Islamic bank agricultural financing	Natural Logarithm of Non-performing Islamic bank agricultural financing value	LNPF	
	Inflation	Inflation Rate (%)	INFL	Central Statistics Agency
	Economic Growth	GDP Growth (%) quarter to quarter	PDB	
	Farmer's Welfare	Index of Farmer's Exchange Rate	NTP	

Data Analysis

To ensure the level of stationarity of each variable, the first step taken by the researcher as a pre-estimation is a unit root test based on the Augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1981). From the first test, it will be found out whether a variable is stationary at the level or at the first-difference level. When the test is at the level of the prob value <0.05 then it is stationary at the level, but if the prob value is> 0.05 then it is continued with testing at the first-difference level (Shrestha & Bhatta, 2018). In the first-difference test, the prob value must be <0.05 so that it can be justified that the variable is stationary at the first-difference level. ARDL estimation can be used when there are stationary variables at the level and first-difference level (Pesaran et al., 2001) ARDL estimation can be used if there are stationary variables at the first-difference level and level (Pesaran et al., 2001) by determining the optimum lag length based on the Akaike Information Criterion as the second step. The third step as a post-estimation after the ARDL estimation is carried out, then the serial correlation must be check to make sure that there is no serial correlation using Breusch-Godfrey Serial Correlation LM Test before the cointegration test based on the Bond-testing Cointegration test is carried out to determine whether in the estimate there is only a short run relationship or there is a long run relationship as the forth step (Pesaran et al., 2001). Decision making is based on the range of k values with a significance of 5% which must be above l (0) and l (1). The last step is to ensure the stability of the ARDL estimation model based on the Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) tests where stable conditions are obtained when the trend line does not exceed the upper bound line and lower bound line (Anis & Hamdi, 2022).

RESULTS AND DISCUSSION

Results

Desricptive Statistics and Correlation

Table 2 and table 3 below show the results of descriptive statistics and correlations between variables.

Table 2. Descriptive Statistics

Variable	Observation	Mean	Median	Maximum	Minimum	Std. Dev.
PPTN	40	29.65671	29.82765	30.4057	28.421	0.636927
LNPF	40	26.53999	26.6059	27.4891	25.152	0.543403
INFL	40	0.04115	0.0355	0.084	0.013	0.020293
PDB	40	0.011268	0.0093	0.0505	-0.0419	0.025552
LNTP	40	102.7008	102.275	108.34	99.6	1.917722

From the results of descriptive statistics, the standard deviation of the farmer's exchange rate as a proxy for the variable of farmer welfare has the most fluctuating value among other variables. This is an indication that the welfare of farmers during the period of observation has an up and down trend and is less stable. This can be one of the arguments that the agricultural sector does have a risk of uncertainty due to the dependence of harvest on natural conditions. However, from these results it is also shown that during the observation period, in statistical calculations, farmers can still delight in the harvest from their farms because the farmer's exchange rate is on average at 102.70 where according to the index number, if the farmer's exchange rate is above 100, the farmer receives the return is greater from the agricultural harvest than the costs to be borne.

In terms of correlation between variables, Islamic banking agricultural financing has a very strong correlation with non-performing agricultural financing positively and inflation negatively. On the other hand, there is a weak correlation between Islamic banking agricultural financing and

economic growth and farmers' exchange rates. The negative correlation observed between the exchange rate of farmers and the risk of agricultural financing implies the presence of an inverse association between these two variables.

Table 3. Correlations between Variables

Correlation	PPTN	LNPF	INFL	PDB	NTP
PPTN	1				
LNPF	0.805366	1			
INFL	-0.715522	-0.456124	1		
PDB	-0.096123	-0.164133	0.064328	1	
LNTP	-0.192142	-0.40597	-0.196449	0.097945	1

Unit Root Test

Table 4 below shows the stationarity from unit root test of each variable. From the table, it can be seen that only the agricultural financing Islamic banks variable meets the stationary conditions at the level, while the other variables are found to be stationary at the first-difference level. From these results, we decided that the ARDL estimation can be taken because the estimation prerequisites have been met.

Table 4. Unit Root Test

Variable	Prob. at Level l(0)	Prob. at First Difference l(1)	Stationary At l(0)/l(1)
PPTN	0.0063	0.0050	l(0)
LNPF	0.0881	0.0000	l(1)
INFL	0.8755	0.0010	l(1)
PDB	0.7923	0.0002	l(1)
NTP	0.7432	0.0000	l(1)

ARDL Estimation and The Optimum Lag Length

The estimated ARDL results can be seen in table 5 below. The best optimum lag length in ARDL estimation is at values of 4, 4, 4, 4, 4 as shown in figure 1.
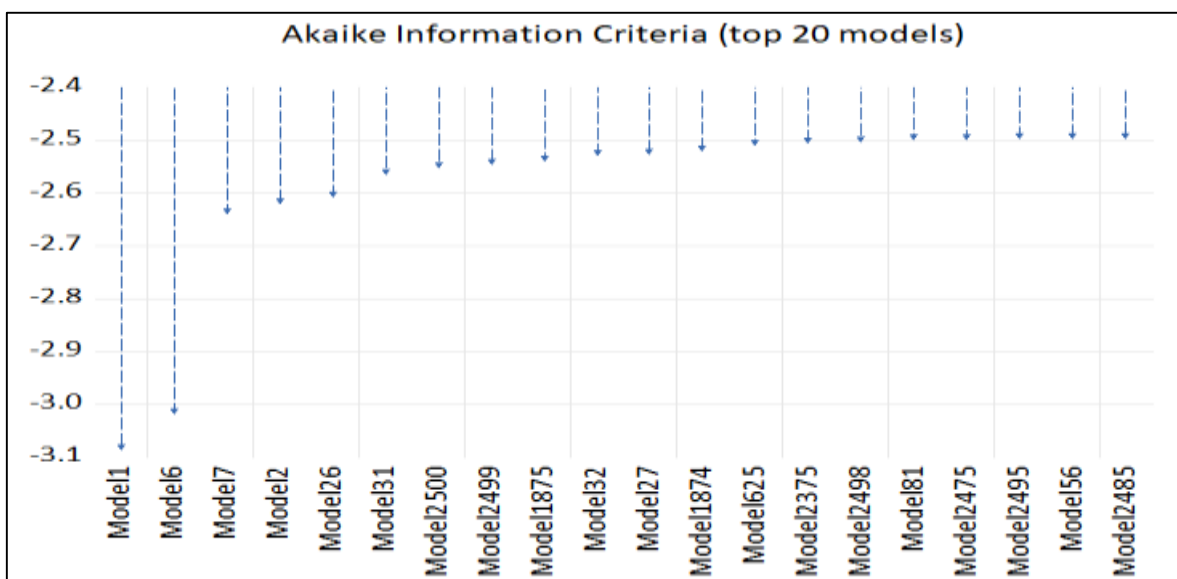

Figure 1: Optimum Lag Length Criteria

Table 5. ARDL Estimation at values of 4, 4, 4, 4, 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PPTN(-1)	0.381923	0.190789	2.00181	0.0706
PPTN(-2)	0.171078	0.21704	0.788233	0.4472
PPTN(-3)	-0.3172	0.223039	-1.422176	0.1827
PPTN(-4)	0.623837	0.172891	3.60826	0.0041
LNPF	0.032476	0.060265	0.53888	0.6007
LNPF(-1)	0.050308	0.076374	0.658697	0.5236
LNPF(-2)	0.40348	0.093608	4.310307	0.0012
LNPF(-3)	0.071718	0.082723	0.866961	0.4045
LNPF(-4)	-0.395674	0.090275	-4.382967	0.0011
LNTP	4.050167	1.578881	2.565214	0.0263
LNTP(-1)	-6.260636	2.196529	-2.850241	0.0158
LNTP(-2)	3.275446	2.230245	1.468649	0.1699
LNTP(-3)	-7.781013	2.347518	-3.314571	0.0069
LNTP(-4)	5.021485	1.80073	2.788583	0.0176
INFL	-0.08842	1.123858	-0.078676	0.9387
INFL(-1)	1.121183	1.246259	0.899639	0.3876
INFL(-2)	1.849783	1.179094	1.568816	0.1450
INFL(-3)	-4.582378	1.125441	-4.071629	0.0018
INFL(-4)	-1.310676	1.081745	-1.211632	0.2510
PDB	2.0547	0.98671	2.082374	0.0614
PDB(-1)	5.363124	1.275399	4.205055	0.0015
PDB(-2)	3.379572	1.185582	2.85056	0.0158
PDB(-3)	6.747071	1.411106	4.781406	0.0006
PDB(-4)	1.977828	0.720014	2.746928	0.0190
C	7.715841	8.123543	0.949812	0.3626
R-squared	0.997548	Mean dependent var	29.78559	
Adjusted R-squared	0.992197	S.D. dependent var	0.529732	
S.E. of regression	0.046794	Akaike info criterion	-3.082849	
Sum squared resid	0.024087	Schwarz criterion	-1.983183	
Log likelihood	80.49128	Hannan-Quinn criter.	-2.699036	
F-statistic	186.4312	Durbin-Watson stat	2.39529	
Prob(F-statistic)	0			

From the selection of the best ARDL model (ARDL Estimation at values of 4, 4, 4, 4, 4), it can be seen that the selected model has a high value of R-Square and Adjusted R-Square which makes this model feasible to be used for further testing to find out whether the selected model has cointegration or not. Moreover, in this selected model, the F-Statistic value is significant.

Serial-Correlation Check

However, before testing cointegration, we first tested whether the selected model was free from serial-correlation so as to avoid biased results. Based on the Breusch-Godfrey Serial Correlation LM Test, it can be ascertained that the selected model is free from serial-correlation as can be seen in table 6 where the F-statistic value is greater than 5%.

Table 6. Serial-Correlation Test

F-Statistic	Prob. F(2,9)	Result
1.772952	0.2243	No Serial-Correlation

Bound-testing Cointegration Test

To insure whether there is a long run relationship between exogenous variables and endogenous variables, cointegration testing needs to be undertaken using the F-Bound Test with the results shown in table 7. The cointegration test results confirm the existence of a long run relationship between exogenous variables and endogenous variables because the F-statistic value is equal to 7.7971 is at levels above l(0) and I(1) at various levels of significance between 1% to 10%.

Table 7. F-Bound Test

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	7.79719	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.50%	2.88	3.87
		1%	3.29	4.37

Stability Test

After getting sureness that there is a cointegration in the model, the final procedure to ensure the feasibility of the selected model is to test the stability of the model by testing the CUSUM Test and CUSUMQ Test. From figure 2, both the CUSUM Test and CUSUMQ Test show that the selected model has met the stable condition because the CUSUM and CUSUMQ lines do not cross the upper bond and lower band at a significance level of 0.05.
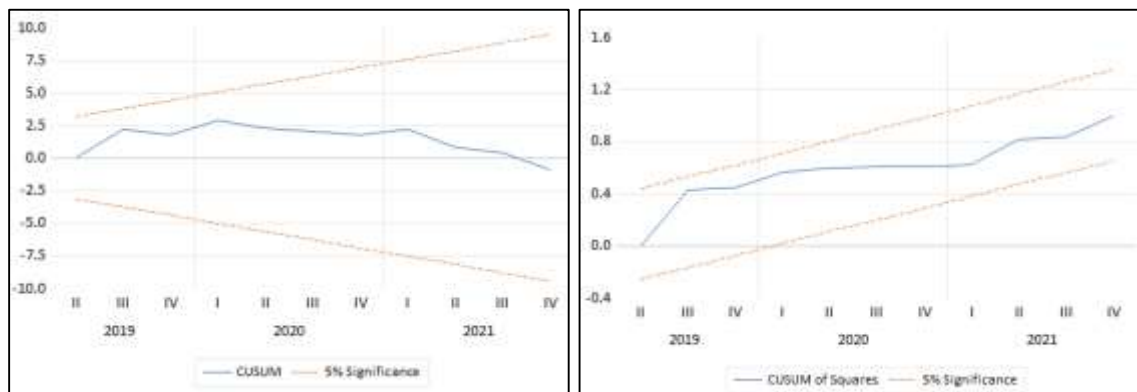

Figure 2: Result of Stability Test

ECM Regression and Long Run Relationship

In addition to bond-testing, the important thing to consider in ensuring a long run relationship is to know the error correction (EC) value derived from the error correction model (ECM) regression. The EC value shows the speed of adjustment of the short run correction to the long run equilibrium as the results can be seen in table 8. From the results of ECM Regression, the value of CointEq(-1) has a coefficient of -0.140363 with a negative sign indicating a correction process, especially with a prob. value of less than 0.05, a significant correction process occurs towards long run equilibrium.

Table 8. ECM Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PPTN(-1))	-0.477714	0.143376	-3.331899	0.0067
D(PPTN(-2))	-0.306636	0.143598	-2.135374	0.0561
D(PPTN(-3))	-0.623837	0.123348	-5.057516	0.0004
D(LNPF)	0.032476	0.040671	0.798503	0.4415
D(LNPF(-1))	-0.079523	0.040792	-1.949493	0.0772
D(LNPF(-2))	0.323956	0.059498	5.444839	0.0002
D(LNPF(-3))	0.395674	0.062185	6.362872	0.0001
D(LNTP)	4.050167	1.14807	3.527806	0.0047
D(LNTP(-1))	-0.515919	1.111418	-0.464199	0.6516
D(LNTP(-2))	2.759527	1.16873	2.361132	0.0377
D(LNTP(-3))	-5.021485	1.123036	-4.47135	0.0009
D(INFL)	-0.08842	0.723896	-0.122145	0.905
D(INFL(-1))	4.043272	0.968523	4.174677	0.0016
D(INFL(-2))	5.893054	0.986077	5.976261	0.0001
D(INFL(-3))	1.310676	0.756937	1.731553	0.1113
D(PDB)	2.0547	0.624633	3.289451	0.0072
D(PDB(-1))	-12.10447	1.524142	-7.941827	0.0000
D(PDB(-2))	-8.724898	1.13931	-7.658054	0.0000
D(PDB(-3))	-1.977828	0.511811	-3.864375	0.0026
CointEq(-1)*	-0.140363	0.017015	-8.249134	0.0000
R-squared	0.863266	Mean dependent var		0.050647
Adjusted R-squared	0.700895	S.D. dependent var		0.070944
S.E. of regression	0.0388	Akaike info criterion		-3.360627
Sum squared resid	0.024087	Schwarz criterion		-2.480894
Log likelihood	80.49128	Hannan-Quinn criter.		-3.053576
Durbin-Watson stat	2.39529			

The long run relationship between exogenous variables and endogenous variables can be seen in table 9. The results show that in the long run relationship, Islamic banking financing is significantly influenced by the risk of agricultural financing which is reflected in the non-performing financing of agricultural financing in a positive way and macroeconomic factors where inflation has a negative significant clout while economic growth has a positive significant effect. Unfortunately, from the results of the long run relationship, we did not find any significant influence between farmer welfare on endogenous variables. So, from these results, hypotheses 2 and 3 that we have formulated can be accepted, while hypotheses 1 and 4 are rejected.

Table 9. ECM Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNPF	1.156337	0.472855	2.445438	0.0325
LNTP	-12.07265	9.499853	-1.270825	0.2300
INFL	-21.44807	8.017992	-2.674993	0.0216
PDB	139.0847	61.62547	2.256935	0.0453
C	54.97075	50.83486	1.081359	0.3027

EC = PPTN - (1.1563*LNPF -12.0726*LNTP -21.4481*INFL + 139.0847*PDB + 54.9708)

Discussion

From the results that have been disclosed above, it can be seen that in the long term the agricultural financing of Islamic banks is not significantly affected by the welfare of farmers, but is more significantly influenced by the risk factors of agricultural financing and macroeconomic conditions. The insignificantness of farmer welfare proxied by farmer exchange rate in our findings is in line with the previous finding by Nurjanah & Suryantini (2019) and Maulana & Iskandar (2018). Our findings also strengthen the previous finding by Lestari (2019) that there is a positive significant

relationship between the risk of Islamic bank agriculture financing and Islamic bank's agricultural financing where the increase in risk does not make Islamic banking reduce agricultural financing. This finding also confirms the existing data that the trend of increasing Islamic bank agricultural financing is also followed by the trend of Islamic bank agricultural financing risk as shown in figure 3. From the macroeconomic point of view, the significant negative clout of inflation has similar finding to Lestari (2019) and the positive influence of economic growth is an indication that in the long-term macroeconomic conditions will also determine the agricultural financing of Islamic banks. The results of this study are in contrast to the findings of Sudarsono et al., (2019) who previously found that non-performing financing in the agricultural sector and inflation each had a negative and positive effect on agricultural financing in Islamic banking. Our findings are also different from those previously obtained by Wicaksono & Fitriyani (2020) and Beik & Aprianti (2013) because they did not find a significant effect of non-performing financing in the agricultural sector and inflation on Islamic banking agricultural financing.
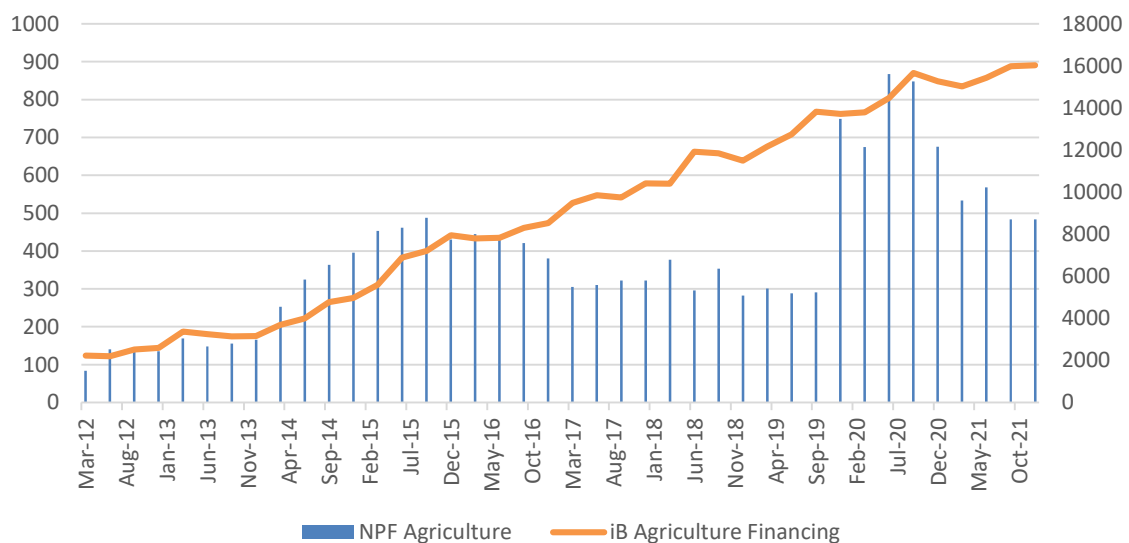

Figure 3: Trend of Islamic Bank Agriculture Financing

From these findings, at least we can give esteem to Islamic banking that although agricultural financing is a high-risk financing portfolio, in the last decade Islamic banking has continued to increase financing in the agriculture sector, although at the same time the increase in financing in the agricultural sector was accompanied by trend of non-performing financing that continues to increase. This becomes the homework for Islamic banking to be able to carry out good risk management for financing in the agricultural sector. Indeed, having a portfolio in the agricultural sector is not a handy for Islamic banking because the nature of this sector has unique and different characteristics as in other real sectors due to the large dependence on natural factors that occur.

In addition, from the results of this study, macroeconomic factors also influence the agricultural financing of Islamic banks. Inflation has a negative effect, indicating that Islamic banking financing is sensitive when there is an increase in the prices of goods and services that occur in general. Good inflation control is absolutely necessary so that the prices of goods and services remain stable, at least within the inflation target set by the central bank. From the estimation results of the long run relationship, the thing that entails more attention is the coefficient value of economic growth because it is the largest value so that this is an indication of the greatest long-term influence on agricultural financing for Islamic banks is economic growth. Even during the COVID-19 period, the agricultural

sector was still able to grow and contribute to the national economy when economic growth in general was contracted due to limited mobility of lockdown. With these findings, at least we can say that as long as the economy grows, in line with this, Islamic bank financing in the agricultural sector will follow and go hand in hand. This is the important role of the government to ensure that national economic growth remains in a positive trend amid the current global economic uncertainty.

CONCLUSION

Disclosing the long run relationship of agricultural financing risk, farmer welfare, and macroeconomic factors and their influence on Islamic bank agricultural financing is the aim of this study. Our findings show that in a long run relationship, macroeconomic factors and agricultural financing risk are the determinants. Inflation has a significant negative impact on Islamic bank agricultural financing, economic growth is the variable with the largest level of influence and has a positive significant relationship on Islamic bank agricultural financing, while we do not find any significant effect of farmer welfare on Islamic bank agricultural financing. Interestingly, the risk of agricultural financing has a significant positive effect on agricultural financing of Islamic banks so that our findings are in line with existing data that the trend of increasing agricultural financing of Islamic banks is also accompanied by an increasing trend of risk of agricultural financing of Islamic banks. From this research, we try to contribute to future policy making that maintaining positive economic growth and controlling inflation to stay on the target that has been set is very necessary because these two external factors have a significant influence on Islamic bank agricultural financing. Until this research was conducted, the absence of significance on the welfare of farmers towards Islamic bank agricultural financing indicates that Islamic bank agricultural financing is still in demand by farmers even in circumstances that may not be in their favor. The continued increase in Islamic bank financing in the agricultural sector in the last decade, which is also accompanied by the increasing trend of non-performing financing for agricultural financing, seems to be an important task that must receive attention from Islamic banking. However, this can also be understood, because the agricultural sector has unique and different characteristics compared to other real sectors. At the very least, appreciation should be given to Islamic banking in Indonesia, because in our opinion, despite the continuous increase in the trend of non-performing financing for agricultural financing, Islamic banks continue to increase financing in the agricultural sector amidst the need for agricultural capital for farmers to develop their businesses in Indonesia.

Encouragement and support from the government is also needed so that the agricultural sector continues to grow and develop considering that this sector is very important for Indonesia as an agricultural country. The provision of capital support is still very much needed to support agricultural businesses from farmers, including the availability of agricultural financing based on compliance with sharia values considering that Indonesia is a country with the largest Muslim majority in the world. By understanding the long-term relationship that occurs in Islamic bank agricultural financing, it can be one of the studies for future policy making. We acknowledge that only consider three factors consisting of financing risk, farmer welfare, and macroeconomics as variables that have an influence on Islamic bank agricultural financing so that it is still open for further researchers to consider other factors that we have not considered. In addition, further research can also compare agricultural financing in the agricultural sector in Islamic banks and conventional banks to the factors that have been tried to be disclosed in this study. Finally, researchers also need to extend the duration of the observations because even though we studied the span of a decade from the 1st quarter of 2012 to the 4th quarter of 2021, we only got 40 observations so that more observations are highly expected.

REFERENCES

Alqaralleh, H. (2019). Measuring business cycles: Empirical evidence based on an unobserved component approach. Cogent Economics & Finance, 7(1), 1571692. https://doi.org/10.1080/23322039.2019.1571692

Anis, M., & Hamdi, B. (2022). Liquidity risk in economic uncertainty: Evidence from Indonesian Islamic banks. Jurnal Ekonomi & Keuangan Islam, 8(1), 32–46. https://doi.org/10.20885/jeki.vol8.iss1.art3

Beik, I. S., & Aprianti, W. N. (2013). Analisis Faktor-Faktor Yang Memengaruhi Pembiayaan Bank Syariah Untuk Sektor Pertanian Di Indonesia. Jurnal Agro Ekonomi, 31(1). https://dx.doi.org/10.21082/jae.v31n1.2013.19-36

Dickey, D. A., & Fuller, W. A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. Econometrica, 49(4), 1057. https://doi.org/10.2307/1912517

Hartarska, V., Nadolnyak, D., & Shen, X. (2015). Agricultural credit and economic growth in rural areas. Agricultural Finance Review, 75(3), 302–312. https://doi.org/10.1108/AFR-04-2015-0018

Hatane, S.E., Tarigan, J., Kuanda, E.S. and Cornelius, E. (2022), "The contributing factors of intellectual capital disclosures in agriculture and mining sectors of Indonesia and Thailand", Accounting Research Journal, 35 (2), 196-218. https://doi.org/10.1108/ARJ-02-2020-0022

Javed, I., Yasin, M., Hayat, M. M., Raza, M., Ahmad, S., & Gilani, D. Q. (2022). Determinants of Agricultural Credit Utilization among Small Farm Holders: An Evidence from Southern Punjab, Pakistan. Journal of South Asian Studies, 10(3), 307–315. https://doi.org/10.33687/jsas.010.03.4431

Khairad, F. (2020). Sektor Pertanian di Tengah Pandemi Covid-19 Ditinjau dari Aspek Agribisnis. Jounal Agriuma, 2(2), 82–89. http://www.ojs.uma.ac.id/index.php/agriuma/article/view/4357

Kocturk, O. M., Tepeci, M., Duramaz, S., & Yatbaz, A. (2013). The use of agricultural loan: An analysis of farmers' bank selection decisions in Manisa, Turkey. Journal of Food, Agriculture and Environment, 11(3–4), 764–768. https://www.cabdirect.org/cabdirect/abstract/20143023618

Lestari, T. (2019). Analysis of Islamic Bank Influence on Agricultural Financing Sector Period 2014-2016. Journal of Islamic Economic Laws, 2(1), 88–119. https://doi.org/10.23917/jisel.v2i1.7706

Maseke, B. F., & Swartz, E. M. (2021). Risk Management Impact on Non-Performing Loans and Profitability in the Namibian Banking Sector. OALib, 08(06), 1–20. https://doi.org/10.4236/oalib.1106943

Maulana, H., & Iskandar, E. (2018). Analisis integrasi pembiayaan sektor pertanian dan nilai tukar petani di Indonesia. Jurnal Ekonomi Regional Unimal, 1(3), 108. https://doi.org/10.29103/jeru.v1i3.1075

Mubarok, F. (2021). Acceleration of Islamic Bank Financing in Indonesian Agriculture Sector. Shirkah: Journal of Economics and Business, 6(2), 185. https://doi.org/10.22515/shirkah.v6i2.341

Muhamad. (2016). Manajemen Pembiayaan Bank Syariah (Kedua). UPP STIM YKPN.

Naili, M., & Lahrichi, Y. (2022). Banks' credit risk, systematic determinants and specific factors: recent evidence from emerging markets. Heliyon, 8(2), e08960. https://doi.org/10.1016/j.heliyon.2022.e08960

Nurjanah, D., & Suryantini, A. (2019). Faktor-Faktor yang Mempengaruhi Permintaan Kredit Program KKPE dan KUR Sektor Pertanian di Indonesia. Jurnal Ekonomi Pertanian Dan Agribisnis, 3(1), 96–107. https://doi.org/10.21776/ub.jepa.2019.003.01.10

Pesaran, M. H., & Shin, Y. (1998). An Autoregressive Distributed-Lag Modelling Approach to Cointegration Analysis. In S. Strom (Ed.), Econometrics and Economic Theory in the 20th Century 31 (1), pp. 371–413. Cambridge University Press. https://doi.org/10.1017/CBO9781139052221.011

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289–326. https://doi.org/10.1002/jae.616

Peterson, E. W. F. (2017). The Role of Population in Economic Growth. SAGE Open, 7(4), 215824401773609. https://doi.org/10.1177/2158244017736094

Prasiwi, A., & Wulandari, E. (2018). Persepsi Petani Terhadap Syarat-Syarat Penting Untuk Mendapatkan Pembiayaan. Agroland, 25(1), 1–11.

http://jurnal.untad.ac.id/jurnal/index.php/AGROLAND/article/view/10301

Raihan, A. M. (2020). Analisis Faktor-Faktor Yang Mempengaruhi Pembiayaan Perbankan Syariah Sektor Pertanian DI Indonesia Tahun 2015 - 2017. http://eprints.ums.ac.id/86225/

Reddy, A. P., & Subbaiah, V. (2012). Impact of Agricultural Credit On Employment Generation of The Farmers. Journal of Commerce & Accounting Research, 1(1), 31–37. http://www.publishingindia.com/GetBrochure.aspx?query=UERGQnJvY2h1cmVzfC85NTcuc GRmfC85NTcucGRm

Saragih, F. H. (2017). Pembiayaan Syariah Sektor Pertanian. Jurnal Agrica, 10(2), 112. https://doi.org/10.31289/agrica.v10i2.1458

Sardar, A., Azeem, M. M., Hassan, S., & Bakhsh, K. (2013). Comparison of efficiency between pure islamic banks and islamic bank windows and role of islamic banking in agriculture sector. Pakistan Journal of Agricultural Sciences, 50 (1), 155–161. https://agris.fao.org/agris-search/search.do?recordID=PK2013000874

Shrestha, M. B., & Bhatta, G. R. (2018). Selecting appropriate methodological framework for time series data analysis. Journal of Finance and Data Science, 4(2), 71–89. https://doi.org/10.1016/j.jfds.2017.11.001

Sudarsono, H., Mifrahi, M. N., Susantun, I., Rudatin, A., & Ruchba, S. M. (2019). Analysis of factor affecting financing with Islamic banks in agriculture sectors. Asian Journal of Islamic Management (AJIM), 1(2), 116–126. https://doi.org/10.20885/ajim.vol1.iss2.art6

Sultan, A., Mayapada, A. G., Halwi, M. D., & Syafaat, M. (2021). Determinasi Nilai Perusahaan Melalui Profitabilitas : Studi Pada Bank Umum Syariah di Indonesia. 3(2). https://doi.org/10.24239/jipsya.v3i2.57.174-184

Sun, F. (2022). Agricultural Credit Risk Assessment in China Based on the BP and GA-BP Neural Network. Modern Economy, 13(06), 860–884. https://doi.org/10.4236/me.2022.136047

Tsabita, K. (2014). Risk Analysis of Islamic Finance in Agricultural Sector Risk Analysis of Islamic Finance in Agricultural Sector. Al-Muzara'ah, 2(2), 88–120. https://doi.org/10.29244/jam.2.2.88-120

Wibowo, B. (2019). Bank Loan, Inflation, and Farmers Welfare: Data Analysis by Province in Indonesia. Asian Development Policy Review, 7(1), 23–30. https://doi.org/10.18488/journal.107.2019.71.23.30.

Wicaksono, S. A., & Fitriyani, Y. (2020). Analysis of factor affecting Islamic commercial bank financing for the agricultural sector in Indonesia. Asian Journal of Islamic Management (AJIM), 2(2), 123–137. https://doi.org/10.20885/ajim.vol2.iss2.art5

Yandri, L. I., & Sari, I. P. (2019). Strategi Pembangunan Pedesaan Berbasis Pertanian Lahan Basah Di Nagari Sungai Rimbang Kecamatan Suliki Kabupaten Lima Puluh Kota. Jurnal Menara Ilmu, 13(11), 33–43. https://doi.org/10.31869/mi.v13i11.1644