The role of bank and startup fintech P2P lending in supporting financial credit for Indonesian farmers

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Abstract.
One of the challenges faced by farmers is securing capital for the development of their agricultural businesses. Banks and peer-to-peer (P2P) lending fintech startups employ various business models to assist farmers in obtaining the necessary capital. This study investigates the credit financing schemes available to farmers through banks and P2P lending fintech startups. The research, which utilized a qualitative approach, involved collecting both primary and secondary data. Primary data were gathered through comprehensive interviews with two academic experts in the agricultural business sector and five leaders of agri-tech startup companies. Secondary data included: (1) annual financial reports from BRI, Mandiri, and BNI; (2) statistical reports on P2P lending providers from the Financial Services Authority (OJK); and (3) models of financing schemes for farmers derived from a range of empirical sources. A descriptive analysis was subsequently conducted to explore the various financing schemes available to farmers through banks and P2P lending fintech startups, as well as to assess the performance of these financing programs via data on the rate of non-performing loans (NPLs). The findings indicate that the financing schemes implemented by banks predominantly focus on economic factors to facilitate loan repayment. In contrast, P2P lending fintech startup schemes emphasize both economic and social aspects, including enhancing farmers' knowledge in implementing Good Agricultural Practices (GAP) and improving financial literacy, aiming to ensure smooth loan repayments. Furthermore, the study observed an increase in the value of Non-Performing Loans (NPL) among both banks and P2P lending fintech startups during the Covid-19 pandemic.

Keywords: Access to financing, Bank, Financing scheme, Fintech P2P lending

JEL Classification: O39, P49, Q14.

INTRODUCTION

The agricultural sector is pivotal in shaping Indonesia's national and regional economies. It is widely acknowledged that agriculture not only provides essential food supplies for the nation's food security but also acts as a crucial mechanism for poverty alleviation, employment generation, and income creation, particularly for rural populations (Isnan et al., 2023; Pawlak & Kołodziejczak, 2020). Historically, agriculture has significantly contributed to Indonesia's Gross Domestic Product

(GDP). In 2020, the sector accounted for 13.71% of Indonesia's GDP (Badan Pusat Statistik, 2021), making it the second-largest contributor.

By 2023, the estimated area under cultivation was 10.20 million hectares, with a production output of approximately 53.63 million tonnes of dried cabbage (GKG). Compared to the previous year, there was a decrease of 2.45% in the cultivated area and a 2.05% reduction in production (BPS, 2023). However, the sector faces several challenges that hinder its progress. Among these challenges are difficulties in accessing formal financing (Gonzalez-Vega, 2021; Wulandari et al., 2017a) and marketing avenues for crops (Jouzi et al., 2017; Kopp & Sexton, 2021; Maspaitella et al., 2018). Furthermore, the insufficient adoption of Good Agricultural Practices (GAP) has led to suboptimal yield quality, resulting in lower prices for agricultural products (Jelsma et al., 2019). To mitigate these issues, farmers often sell their produce to intermediaries or loan sharks, who also provide loans to them (Ranjan, 2017; Zainuri & Yamaura, 2021). The debt incurred from these loans undermines the farmers' negotiating power (Ranjan, 2017; Rutten et al., 2019). Additionally, the high risk associated with agricultural ventures poses challenges for farmers seeking financing from formal financial institutions. This is evidenced by the history of agricultural credit programs in Indonesia, where problematic loans accounted for more than 50% of all agricultural lending between 1945 and 1999 (Sayaka & Pasaribu, 2019). In response to these enduring issues, the government has initiated various credit programs and financial support schemes for farmers, including rolling funds, capital reinforcement, interest subsidies, and commercial credit options.

To address the issue of capital for farmers, the Indonesian government has implemented various financing options for farmers over the past five decades, in addition to those detailed in Table 1. Despite these efforts, the agricultural credit program has been plagued by delays and inaccurate targeting, leading to its discontinuation (Adam & Lestari, 2017). This situation has significantly restricted farmers' access to credit from formal financial institutions, resulting in a notably low uptake (Wulandari et al., 2017a). Consequently, the distribution of credit to the agricultural sector remains suboptimal, adversely affecting the advancement of financial inclusion in Indonesia.

Several strategies have been implemented to tackle farmers' insufficient funding or capital financing issues. These strategies involve formal financial institutions (Harianto et al., 2019; Wulandari et al., 2017b), informal sources, and internally generated funds, such as contributions from family and friends. Nevertheless, formal financial entities, including commercial banks, people's credit banks, cooperatives, and microfinance institutions, often exclude those who are unbanked and possess limited financial information and collateral (Dang Duc, 2011; Mishra & Kushwaha, 2023), like many farmers. The informality of business transactions among farmers and a lack of necessary financial information complicate their access to external financing from formal sources (Anshari et al., 2019). Moreover, farmers face capital issues and limited access to markets. The presence of numerous intermediaries in the agricultural supply chain, from producers to consumers, adds extra costs (Anshari et al., 2019; Mariyono, 2019), further complicating the financial landscape for farmers.

Table 1. Historical records of various agricultural credit programmes provided by the government and the causes of their non-sustainability.

No.	Program Period	Financing Programme Period for Indonesian Farmers	Reasons for its discontinued
1.	1967-1983	Bimbingan Massal (BIMAS) and INMAS (Intensifikasi Masal) with credit managed by BRI	The Bimas program was not only an attempt to establish a rice base but also aimed to introduce the latest technological innovations to farmers. However, the challenge lies in the minimal education of farmers, which hinders their ability to transition from traditional to modern agricultural practices. Additionally, the BIMAS credit encountered significant delays, accumulating a debt of Rs. 180 billion, leading to its discontinuation in 1985 (Ashari, 2009; Muamaroh & Trilaksana, 2017).
2.	The beginning of the era of reformation (1985-2006)	Kredit Usaha Tani (KUT) through BRI and Koperasi Unit Desa (KUD)	It is estimated that the total allocation by the government amounts to Rp5.7 trillion, or 81.4% of the total Rp7 trillion designated for the agricultural sector. However, the absorption capacity for credit subsidies within this sector remains low. Moreover, the return rate is only 25% (Arifin, 2011; Ashari, 2009).
3.	1988-1998	Kredit Usaha tani Konservasi Daerah Aliran Sungai (KUK-DAS)	The loan arrangement includes both the loan itself and the interest. The disbursement of KUK - DAS funds from 1988 to 1999 saw an allocation of approximately Rp 41.91 billion, with a total credit repayment of Rp 21.78 billion, representing 52% of the loan. Consequently, the remaining credit arrangement amounted to Rp 20.12 billion, or 48% of the initial borrowing (Nugroho, 2011).
4.	2000-2006	Kredit Ketahanan Pangan (KKP) through 4 Executive Banks and Bank Pembangunan Daerah (BPD)	Banks, still traumatized by the KUT case, have adopted extra precautions, resulting in a relatively slow liquidation of funds. Additionally, the limited assets possessed by farmers and the scarcity of authorizers or guarantors for credit in financial markets further complicate the situation (Ashari, 2009).
5.	2007 and still ongoing	Kredit Usaha Tani (KUR Petani) through 7 Executive Banks and 26 BPD	The agricultural sector receives Rp 30.1 trillion, which constitutes 17.53 percent of KUR funds, indicating that more than 60% of KUR allocations do not reach farmers or the agricultural sector but are instead directed to commodity traders, service providers, retailers, and similar entities (Arifin, 2011). Moreover, despite KUR's original intent to provide working capital or investment funds, many KUR recipients divert their loans to non-commercial purposes, such as covering school fees, daily expenses, and other personal needs (Bidarti, 2021; Wahyuni et al., 2020).

The emergence of Financial Technology (fintech) has provided solutions to the issues of limited funding and market access faced by farmers. Fintech encourages public investment in agriculture through crowdfunding mechanisms, as

highlighted by Azganin et al. (2021). The government has been proactive in urging digital financial service providers, commonly called fintech, to enhance credit financing for farmers, particularly those in rural areas. Fintech began to gain prominence in Indonesia around 2016, following the enactment of Presidential Regulation Number 114 of 2020, which outlines the National Strategy for Financial Inclusion aimed at integrating individuals previously excluded by formal financial institutions. The swift expansion of fintech has captured the government's attention, prompting efforts to expedite financial inclusion across the country.

The surge in fintech startups represents an initiative to bridge the gap in credit financing for individuals and sectors still outside the purview of formal financial institutions, including agriculture (Rufaidah et al., 2023), fisheries (Utami & Ekaputra, 2021), and micro, small, and medium enterprises (MSMEs) (Karim et al., 2022; Nugraha et al., 2022). Particularly noteworthy is the rise of peer-to-peer (P2P) lending businesses within the agricultural sector. These fintech startups have introduced a novel model of credit financing for farmers, emphasizing economic and social improvement and the environmental sustainability of agricultural practices (Prihadyanti & Aziz, 2022). Fintech firms have managed to cover areas inadequately served by the banking industry, thereby fostering greater financial inclusion (Rufaidah et al., 2023; Sangwan et al., 2020). By offering convenient and user-friendly financial services and products, especially to those traditionally deemed unbankable such as farmers, fintech plays a crucial role (Anshari et al., 2019; Sangwan et al., 2020). Furthermore, fintech facilitates the integration of all stakeholders within the agricultural supply chain onto a single platform, providing farmers with market access to their products (Anshari et al., 2019).

The financing scheme and performance of P2P lending fintech startups in the agricultural sector merit further investigation to enhance their role in facilitating loans for Indonesian farmers. These startups occupy a distinctive niche, equipped to navigate the unique credit challenges confronting farmers in Indonesia. Notably, these fintech firms do not require the establishment of an account to operate their business. Furthermore, the security of transactions within these platforms is bolstered by oversight from the Bank of Indonesia (BI) and the Financial Services Authority (OJK), attributed to the direct interaction model between potential investors and borrowers that these platforms facilitate.

Beyond merely increasing funding, P2P lending fintech startups offer comprehensive support to farmers, spanning from the initial stages of cultivation to the harvest and including assistance with market access. A particularly innovative aspect of their financing scheme is the option for capital repayment to be made in the form of produce tonnage or harvest yields, simplifying farmers' repayment process. These practices position P2P lending fintech startups as significant contributors to enhancing the productivity and sustainability of the agricultural sector (Hudaefi, 2020; Palupi et al., 2021; Widiastuti et al., 2018).

Through data, this study aims to delineate and elucidate the contrast between traditional banking institutions and P2P lending fintech startups concerning their support for financing in Indonesia's burgeoning agricultural sector, building on the challenges previously outlined. Given the problems and scope of the study, the research aims to dissect the financing schemes employed by P2P lending fintech startups within the agricultural sector. It seeks to juxtapose the financing schemes

available to farmers via P2P lending fintech startups against those offered by traditional banks. Moreover, the study endeavours to evaluate the efficacy of the financing programs implemented by both fintech P2P lending startups and banks, employing non-performing loan (NPL) rates as a key metric for analysis.

METHODS

The methodology employed in this study incorporates a mixed methods approach by gathering both primary and secondary data. This approach is deemed appropriate for the research as it enables qualitative data to understand the funding schemes provided to farmers by the banking sector and P2P fintech companies. Concurrently, quantitative data elucidate the performance of loans extended to farmers by these entities.

Primary data were collected through in-depth interviews featuring semi-structured questions. Semi-structured interviews aimed to extract information on the core topics and explore additional insights beyond the predetermined questions provided they were relevant to the central research question. The selection of informants for primary data collection included two academic experts in agricultural business and five leaders from Indonesian agri-tech startup companies. The academic experts were chosen based on their extensive experience—over three years—in conducting research and practical work in the economic development of agricultural businesses. This criterion ensured that these experts understood farmers' challenges in advancing their agricultural ventures.

On the other hand, the leaders of the agri-tech startups were selected, considering that their companies had been operational for at least two years. This specific timeframe was selected to reflect the average operational duration of agricultural startups in Indonesia from their establishment to the primary data collection point for this study. The availability and willingness of the informants to participate were crucial criteria for their selection. Due to the constraints imposed by the COVID-19 pandemic, the interviews were conducted online using the Zoom platform.

The study utilized secondary data from multiple sources, including (1) annual financial reports from banks, (2) statistical reports from the Financial Services Authority (OJK) regarding P2P lending fintech organizers, and (3) data on financing model schemes for farmers. Specifically, the first category of secondary data comprised annual financial reports from three major Indonesian government-owned banks: Bank BRI, Bank Mandiri, and Bank BNI. These institutions were selected for their extensive network across Indonesia and their significant role in loan distribution to the community. Additionally, their status as publicly listed companies facilitated easier access to their data. The annual financial reports from these banks spanned from 2012 to 2021, a decade deemed sufficient to assess the banks' performance in extending credit to farmers amid varying economic conditions and government policies.

The second set of secondary data was derived from statistical reports of OJK P2P lending providers, covering 2018 to 2022. This dataset includes TKB90 and TWP90 indicators. TKB90 represents the success rate of P2P lending fintech companies in ensuring the settlement of loan obligations between borrowers and lenders within 90 days of the maturity date. A higher TKB90 percentage indicates more effective lending and borrowing processes. Conversely, TWP90 measures the default rate or failure to fulfil loan obligations beyond 90 days from the due date, akin to a non-performing loan (NPL) or bad loan.

The third category of secondary data, about farmers' financing model schemes,

was sourced from online searches through Google Scholar and various publications by financial institutions. Search terms included phrases like "farmer funding schemes," "bank funding for farmers," and "P2P fintech funding for farmers," aiming to compile comprehensive information on the available financing models for farmers.

The study conducted a descriptive analysis using primary and secondary data to elucidate the various financing schemes available to farmers through banks and P2P lending fintech startups. Thematic analysis techniques were utilized to integrate the primary and secondary data, facilitating the organization of similar topics into cohesive clusters. Following this organization, a detailed descriptive analysis was undertaken on these clusters to shed light on the diverse financing schemes banks and P2P lending fintech startups offered to farmers. Additionally, the study delved into analyzing loan performance within the agricultural sector by detailing the prevalence of non-performing loans (NPLs) among banks and P2P lending fintech startups. This aspect of the analysis involved quantitative data examination of secondary sources to compute the growth in NPLs. Specifically, the growth of NPLs was calculated using the annual financial reports from the three selected banks for the years 2012 to 2021. Furthermore, quantitative analysis was also applied to the statistical reports from OJK P2P lending providers, aiming to determine the NPL amount through the calculated growth of TKB90 and TWP90 from 2018 to 2022.

RESULTS AND DISCUSSION

Based on the research data analysis, distinct differences exist between the financing schemes provided to farmers by banks and those offered by P2P lending fintech startups. Banks primarily focus on the economic aspects of financing, whereas P2P lending fintech startups extend their focus to include both economic and social aspects of farmers' lives. These startups have identified various social issues in the agricultural sector, particularly affecting small and medium-sized farmers. The support from P2P lending fintech startups encompasses several areas, including innovation training in agriculture, facilitation of agricultural facilities and supplies, assistance with the collection and sale of crops, help in finding business partners for farmers, and access to direct marketing through digital platforms (Widiastuti et al., 2018). Agricultural development is perceived as a process of social change, particularly in a country like Indonesia, which boasts a diverse social fabric. As such, the socio-cultural factors of different regions significantly influence the characteristics of farmers, leading to varying farming practices and business activities, including how they access funding. For instance, farmers in the western and eastern regions of Indonesia adopt different farming methods and show varying levels of confidence in their business activities, which impacts the approach P2P lending fintech startups take when recommending pesticides as one form of funding distribution to farmers in these diverse areas (Palupi et al., 2021).

### The financing model scheme provided by the bank to farmers.

The financing model scheme offered by the bank to farmers involves rigorous criteria in determining which farmers will be eligible for loans. The bank evaluates potential debtors by applying the "5C" requirements—character, capacity, capital, collateral, and condition— Banks exhibit a high degree of caution when financing agricultural ventures due to the inherent risks associated with the sector. This caution reflects the prudent nature expected of banking institutions. Furthermore, this credit model places all business risks solely on the borrower, typically the farmer. The

expectation is the loan repayment in monetary form, while the bank consistently earns a profit through a fixed interest rate (Widiana & Annisa, 2017).

There are three distinct models of banking financing schemes for providing loans to farmers: 1) banking financing without insurance; 2) banking financing with insurance; and 3) banking financing that includes insurance and engages in business-to-business (B2B) collaboration with the post-harvest processing industry companies.

1) Banking financing without insurance

Farmers seek funding from the bank by presenting the agricultural projects they intend to undertake in the banking financing scheme without insurance, as depicted in Figure 1.
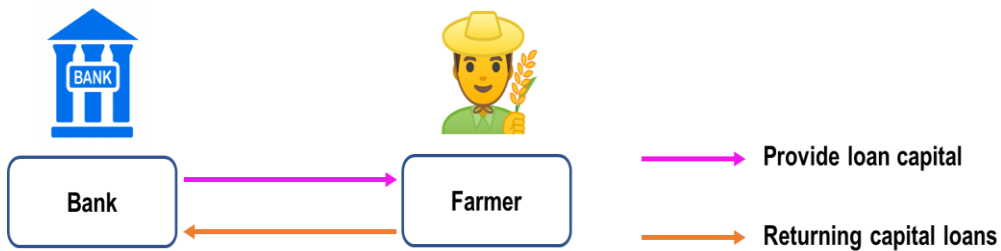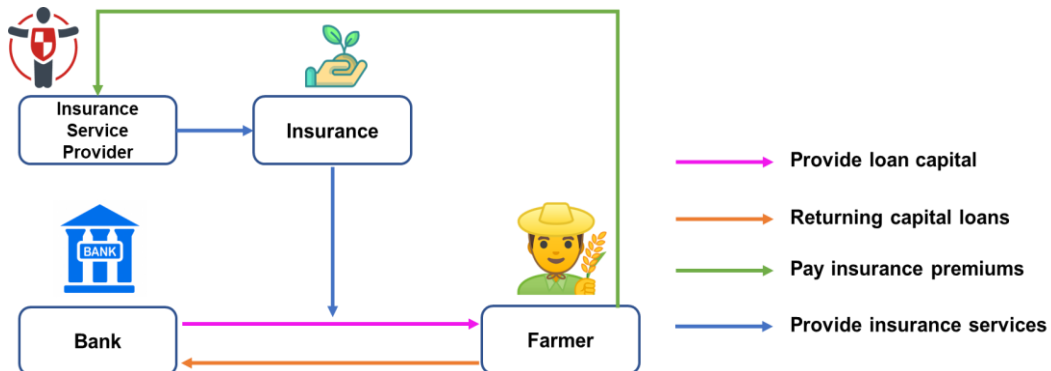

Figure 1. Farmer financing scheme by banking without insurance

If the farmers satisfy the specified requirements, the bank disburses capital loans to them. The repayment of these loans to the bank is structured according to a mutually agreed upon arrangement, allowing farmers to make payments in instalments or settle the full amount at harvest time. Most financial service providers commonly adopt this financing scheme.

2) Banking financing with insurance

Farmers submit applications for financing to the bank through the banking financing scheme with insurance. Upon meeting the required criteria, the bank approves and disburses capital loans to the farmers. Additionally, farmers must pay insurance premiums to secure their loans, safeguarding against unforeseen risks such as crop failure due to adverse weather conditions, pest infestations, and natural disasters. This arrangement enables farmers to repay the loans to the bank as per the agreed terms, including instalment payments or a lump-sum payment at harvest, as illustrated in Figure 2. Importantly, including insurance in this scheme mitigates the risk of loan default by providing a protective layer for the farmer loans.
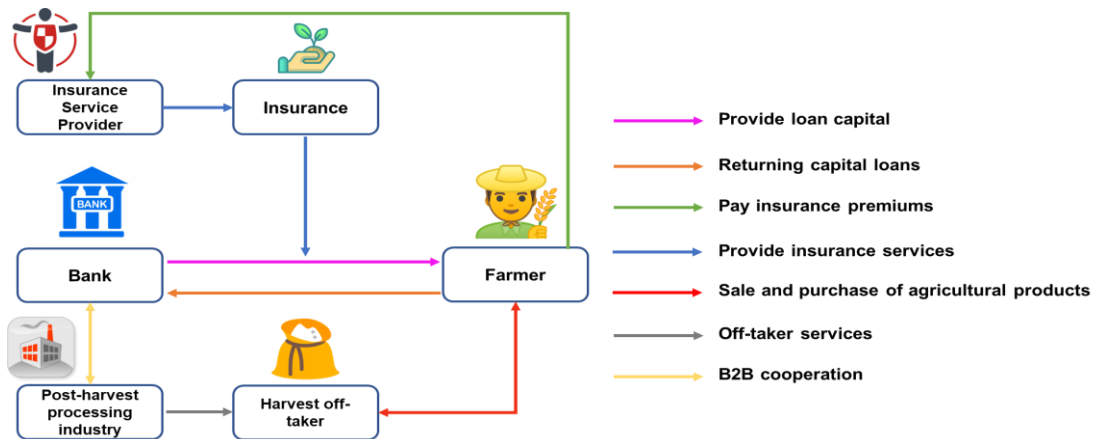

Figure 2. Farmer financing scheme by banking with insurance

3) Banking financing with insurance and B2B cooperation with business actors providing agricultural facilities, infrastructure, and post-harvest processing industry companies.

This financing scheme engages business entities that supply agricultural facilities and infrastructure, acting as suppliers and post-harvest processing industry companies, serving as off-takers, as depicted in Figure 3. Within this framework, farmers apply for financing from the bank. Should the farmers fulfil the stipulated criteria, the bank extends capital loans to them. Additionally, farmers must pay insurance premiums on their loans to mitigate unforeseen risks such as crop failure due to adverse weather, pest infestations, and natural disasters.

Moreover, this scheme facilitates farmers with referrals to purchase necessary agricultural facilities and infrastructure from business actors in a Business-to-Business (B2B) partnership with the lending banks. Upon reaching the harvest season, farmers can sell their crops to post-harvest processing industries, collaborating with the banks that disbursed their loans. Subsequently, farmers repay the loan to the bank by the terms agreed upon in the loan agreement.

Figure 3. Farmer financing scheme by banking with insurance and B2B cooperation with   post-harvest processing industry companies

From the three financing schemes offered by the bank, the involvement of various stakeholders, such as insurance companies and post-harvest processing industries, primarily targets the economic objective of facilitating the repayment process for farmer loans. These models have served as safety nets for banks to prevent credit defaults. However, they have not been universally accessible, especially to smaller-scale farmers in rural areas who often rely on informal borrowing methods. The challenges of repayment difficulty and failure pose unique obstacles to the sustainability of bank credit. Consequently, this situation has prompted banks to enforce stricter criteria for granting loans to farmers.

Nevertheless, the significance of the agricultural sector to economic development, particularly in developing countries like Indonesia, is immense. According to Todaro & Smith (2020), the sector plays several critical roles: (1) as a major source of employment, (2) contributing to public income, (3) ensuring a supply of food, (4) serving as a supplier of raw materials for industries, (5) aiding in capital formation, and (6) acting as a source of foreign exchange. Despite the risk factors associated with farming, it is evident that the government still prioritizes this sector, though full access has yet to be achieved. The government supports the agricultural sector by collaborating

with the banking and insurance industries and businesses, suppliers, farmers, and post-harvest processing companies to manage agricultural financing. This support stems from the agricultural sector's pivotal role in national development, particularly in the strategic management and utilization of outcomes related to food commodities (Nasikh et al., 2021).

The sector's impact on Indonesia's food security is notable, with the country's ranking in the Global Food Security Index (GFSI) improving to 63rd out of 113 countries in 2022, according to The Economist Impact (2022). Implementing these three financing schemes for farmers will enhance food availability and sustainability nationally. The agricultural sector indirectly supports economic growth by improving poor populations' nutritional intake, stabilizing food prices, ensuring food availability, and alleviating poverty (Awokuse & Xie, 2015). Thus, increased production and food security significantly influence Indonesia's economic growth momentum.

Performance of the bank's financing to farmers

National banks theoretically possess significant potential to support agricultural financing, acting as formal financial intermediaries. Yet, in practice, loans provided by national banks to the agricultural sector remain surprisingly limited, constituting less than 6 per cent of their total lending. Among these, Bank BRI and Bank Mandiri emerge as the predominant players in agricultural financing, contributing the largest shares. Over the period from 2012 to 2021, the average annual distribution cost has exceeded Rp60 trillion. However, the agricultural financing landscape is further complicated by the low rate of return or the emergence of problematic loans. Figure 4 illustrates the growth in the number of troubled loans at three major banks—Bank BRI, Bank Mandiri, and Bank BNI—from 2013 to 2021, highlighting the challenges faced in agricultural lending.

According to Figure 4, which outlines the growth of Non-Performing Loans (NPLs) in the agricultural sector, the most significant increases in NPLs for the three state-owned banks (BUMN banks) occurred in 2014, 2016, and 2019, with respective growth rates of 128%, 46%, and 155% compared to the previous year. However, by 2021, a recovery or decline in NPLs was observed in two banks, namely Bank BRI and Bank BNI, which experienced decreases of 6% and 41%, respectively, compared to the preceding year. Conversely, Bank Mandiri saw a substantial increase in credit issues, with a 204% rise in 2021.

Banking data further reveals that the government's financing through these three major state-owned banks (Bank BRI, Bank Mandiri, Bank BNI) has consistently increased yearly. In 2021, the total financing reached more than Rp 285 trillion, with Bank BRI accounting for the largest portion at 46%. Over the period from 2012 to 2021, agricultural sector loans from these three banks were predominantly distributed by Bank Mandiri, which contributed almost 40% of the total loans each year. This was particularly notable between 2012 and 2017 when Bank Mandiri's agricultural sector lending surpassed Bank BRI's.

Consequently, the surge in NPLs within Bank Mandiri's agricultural sector significantly outpaced those of the other two banks. This trend warrants the government's attention and highlights the necessity for a comprehensive evaluation of each bank's health. Furthermore, it underscores the importance of reviewing and restructuring the distribution of agricultural credit and the repayment systems for farmers facing credit difficulties.
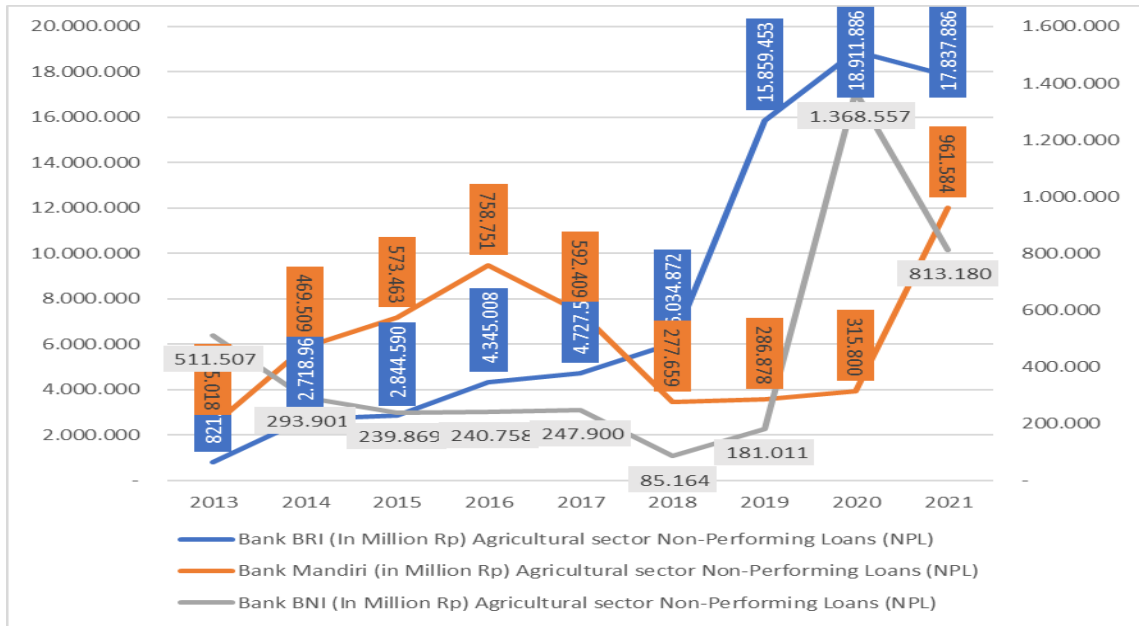
Source: Elaborated by the Author

Figure 4. Growth of Non-Performing Loans (NPL) in the Agricultural Sector from Three State-Owned Banks in Indonesia (Bank BRI, Bank Mandiri, and Bank BNI), 2013-2021 (in millions of rupiah)

The analysis of the Non-Performing Loan (NPL) value in the agricultural sector from 2013 to 2021, as shown in Figure 5, reveals a significant rise in NPLs over the last three years (2019-2021), coinciding with the COVID-19 pandemic. Specifically, the NPL rates for the combined agricultural sector of three state-owned banks in Indonesia were recorded at 7%, 8%, and 7% respectively. These rates surpass the minimum health threshold of 5% established by the Indonesian government's Health Rating System for General Banks, as stipulated in Bank Indonesia Regulation (PBI) Number 23/2/PBI/2021, thus indicating the sector's financial distress. This situation contrasts with the approaches taken by Malaysia and Thailand, which Indonesia has not adopted, such as the mortgage moratorium in response to the pandemic (Singh & Singh, 2022). Nevertheless, Indonesia has sought to mitigate the impact through the OJK Regulation Number 11 of 2020, which simplifies restructuring and debt quality assessment criteria for those affected by COVID-19.
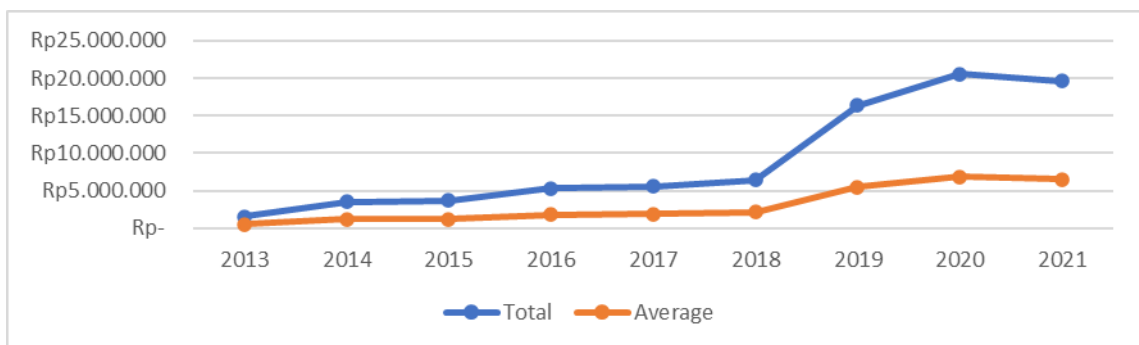
Source: Elaborated by the Author

Figure 5. Total and average Non-Performing Loans (NPL) in the agricultural sector from the accumulation of three state-owned banks in Indonesia (Bank BRI, Bank Mandiri, and Bank BNI), 2013-2021 (in millions of rupiah)

Compared to its regional counterparts, the NPL rate of Indonesian banks is higher than that of Malaysian banks, a disparity attributed to the high Operating Expenses to Operating Income (BOPO) ratio, rendering some Indonesian banks financially unhealthy (Marisya, 2021). Meanwhile, in Thailand, Lancaster (2006) found that debt suspension programs adversely affected NPLs, whereas average borrowing positively impacted NPLs within the Bank for Agriculture and Agricultural Cooperatives (BAAC). In contrast, with its agriculture-centric economy, Vietnam experienced a positive effect on bank profitability and performance from a high proportion of agricultural financing (Dang et al., 2021).

These findings suggest that banks should prioritize investment in the agricultural sector, which significantly contributes to the GDP of developing countries. Recruiting experts in agriculture can enhance financial assessments for approving or declining financing requests for agricultural projects. Furthermore, initiatives promoting entrepreneurship and innovation within the agricultural sector (Nigjeh et al., 2023) and debt suspension or restructuring programs (Lancaster, 2006) are essential to reducing the agricultural NPL ratio.

Farmers, typically characterized by low income levels, often struggle to repay loans with high-interest rates. This challenge has been identified as a key factor contributing to the rise in Non-Performing Loans (NPLs). The situation has been further exacerbated by the COVID-19 pandemic, which has negatively impacted economic activities across Indonesia, including the agricultural sector. This downturn has reduced various economic transactions within this sector, affecting the banking sector through increased NPLs. A higher NPL ratio signifies elevated credit risk, which is detrimental to the financial health of banks (Sullivan & Widoatmodjo, 2021). Consequently, a significant rise in NPLs can adversely affect a bank's financial performance, such as disrupted cash flow. This, in turn, hampers the banks' ability to distribute substantial credit amounts to the public (Putri & Idris, 2020).

From the analysis of the three state-owned banks mentioned, it is apparent that the government's strategy of involving formal banks as executing agencies in credit policy for the agricultural sector, particularly in the context of recovery from the COVID-19 pandemic, is prudent. Nonetheless, for this policy to be effectively implemented, it should be complemented by concerted efforts to assist farmers. These efforts should focus on expanding their business scale, enhancing their managerial skills, and improving their accessibility to formal banking services. Such comprehensive support would not only aid in the recovery of the agricultural sector but also contribute to the stability and health of the banking sector by mitigating the rise in NPLs.

A financing model scheme for farmers provided by P2P lending fintech startups in the agricultural sector

Fintech startups specializing in P2P lending within the agricultural sector utilize specific criteria to select their financing targets. Initially, this involves identifying agricultural products that demonstrate high market demand, price stability, and favourable characteristics (Fatimah et al., 2020). Subsequently, farmers are chosen based on either individual or farmer-group applications, with a preference often given to farmer groups due to their potential to mitigate risks in agricultural projects (Pratiwi, 2021). Furthermore, farmers aspiring to apply for funding must first prepare a Cost Budget Plan (RAB) and necessary personal information. These applications are then assessed and verified by the field operator team. Upon approval, the project details are published on the website, allowing investors to select the projects they wish to finance

and determine the funding amount (Anjani & Waluyati, 2022; Fatimah et al., 2020). After securing investors, the Fintech P2P lending startup offers various business models, including a capital lending system for procuring agricultural resources and production inputs such as seeds, fertilizers, pesticides, and labour. Additionally, a return scheme is provided that aligns with the specific conditions and commodities of the agricultural sector (Palupi et al., 2021).

Figure 6 outlines how fintech P2P lending startups offer loans to farmers in the agricultural sector. Initially, upon entering an area, these startups select farmers and farmer groups, known as "Poktan," based on specific criteria. Farmers and Poktan deemed suitable are eligible to become partners and propose financing. At this juncture, the P2P lending fintech startups assist in financial planning for a single planting project, aiming to enhance farmers' financial literacy, particularly in crafting proposals for financing planting projects. Subsequently, the received financing proposals are added to a list of projects awaiting funding, which can be viewed on the crowdfunding platform—typically through a website or a smartphone application (Android/iOS) operated by the fintech startup. Crowdfunding is a mechanism to gather funds from various individuals or institutions to support business development, accessible through online platforms or social media (Mollick, 2014), enabling the broader community to participate as investors.
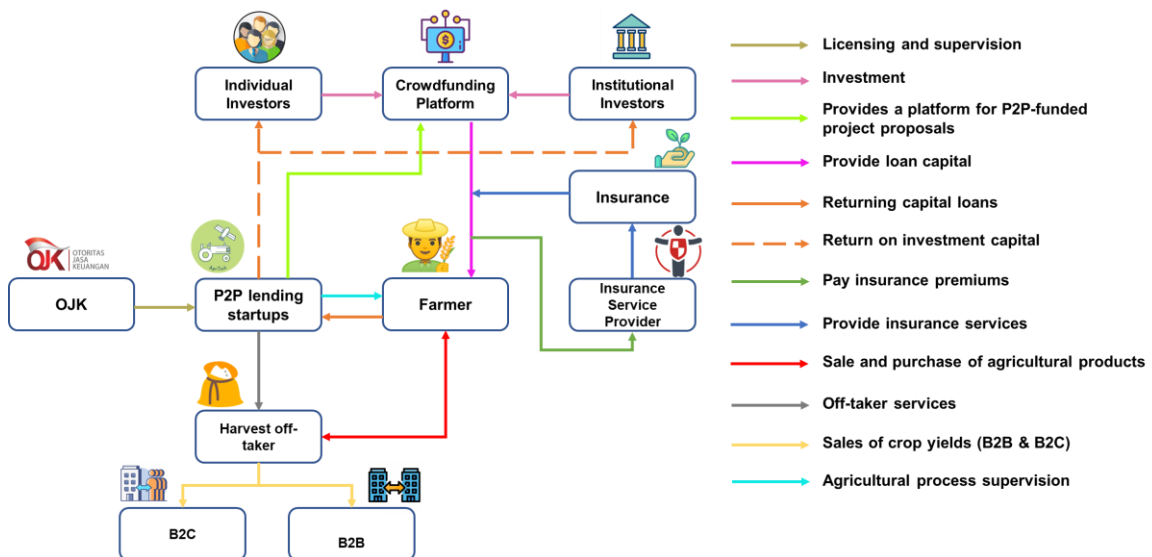
Figure 6. A financing model scheme for farmers provided by P2P lending fintech startups in the agricultural sector

Once the financing goal for a project is achieved, the proposing farmer or Poktan receives the loan capital, which may also include provisions for agricultural production necessities such as seeds, fertilizers, hoes, and tractors. Furthermore, the P2P lending fintech startups dispatch agricultural experts to act as advisors, aiding the farmers in properly conducting their farming activities. The presence of these experts is pivotal in mitigating the risk of crop failure by ensuring adherence to good agricultural practices (GAP) and, concurrently, contributes to enhancing farmers' understanding of such practices and improving their financial literacy about managing loan funds efficiently.

This approach not only aids in advancing agricultural and financial management practices among farmers but also includes an insurance provision for the funded projects to minimize the risk of crop failure. At harvest, the fintech startups may serve as off-

takers, ensuring the crops are sold fairly and reducing the risks associated with prolonged storage and difficulties in finding buyers. Additionally, the startups engage in various business-to-business (B2B) and business-to-consumer (B2C) collaborations for distributing agricultural produce. B2B partnerships are established with entities in the food and beverage industry, as well as with modern (hotels, restaurants, cafes, and supermarkets) and traditional marketplaces (grocery stores and traditional markets), facilitating a comprehensive distribution network for the farmers' produce.

Performance of the P2P lending fintech startup financing to farmers

Numerous fintech P2P lending companies offer financial support to farmers. However, verifying that these companies possess official business licenses and that their operational activities are regulated by the OJK (Financial Services Authority) is essential. This is crucial to prevent capital loan schemes that could harm farmers. According to data from the OJK, the performance of P2P lending fintech startups in conducting their operations can be evaluated using the TKB90 and TWP90 metrics. Figure 7 illustrates the loan quality performance of fintech P2P lending companies that have secured OJK business licenses from January 2018 to June 2022. Subsequently, Table 2 presents the annual growth rates of TKB90 and TWP90 from 2018 to 2021.
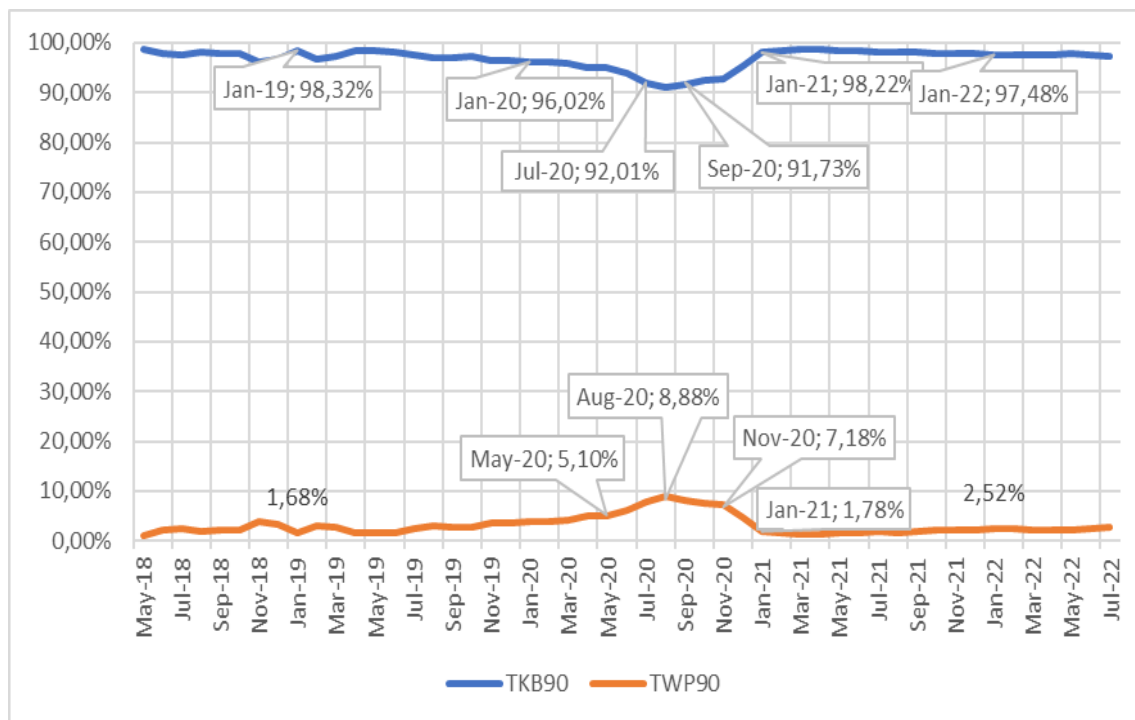
Source: Elaborated by the Author

Figure 7. Graph of average loan quality performance from fintech P2P lending startups, 2018-2022

According to the OJK report from 2018 to 2022, depicted in Figure 7 above, a noticeable increase in TWP90 indicates a rise in non-performing loans (NPLs) exceeding 5% from May 2020 to December 2020. This surge led to a decline in TKB90, representing the success rate of fintech P2P lending platforms in facilitating the resolution of loan obligations, dropping below 95%. This downturn was attributed to the onset of the COVID-19 pandemic at the beginning of 2020, adversely affecting the economy across various sectors, including agriculture. Nonetheless, in 2021, fintech

P2P lending demonstrated a rebound in its performance in supporting borrowing activities, evidenced by a 2.66% growth in TKB90 and an average repayment rate of 98.02% of the total loan amount. The data reveals that the average success rate of fintech P2P lending in facilitating the settlement of loan obligations within 90 days (TKB90) consistently exceeded 94%. Consequently, it can be inferred that fintech P2P lending has effectively served as a valuable partner for farmers in capital lending, back-to-back financing, and marketing, enabling them to fulfil their loan repayments promptly.

According to Table 2, the year-to-date (YTD) growth of TKB90 throughout 2018 was 0.80%, with the highest TKB90 value recorded in April 2018 at 99.25%. This indicates that during 2018, there was an increase in the success rate of fintech P2P lending platforms in facilitating lending and borrowing activities by 0.80%, with an average rate of return of 97.81%. The peak TKB90 value was observed in April 2018 (99.25%). In 2019, however, TKB90 growth experienced a decline of -2.23%, signifying a decrease in the performance of fintech P2P lending platforms in mediating lending and borrowing activities, with an average loan repayment rate of 97.23%. The highest TKB90 value in 2019 was noted in April (98.37%). Moreover, in 2020, TKB90 growth further declined by -1.17%, accompanied by an average rate of return of 94.54%. This downturn is likely attributable to the worsening global economic crisis in 2018 and the outbreak of the COVID-19 pandemic, which affected currency exchange rates against the dollar. Nevertheless, by 2021, the average TKB90 value increased to 98.02%, demonstrating that fintech P2P lending has effectively assisted farmers with resolving loan obligations.

Table 2. Annual growth of TKB90 and TWP90, Year 2018-2021

% Δ (ytd)	2018	2019	2020	2021
%YTD TKB90	0,80%	-2,23%	-1,17%	2,66%
%YTD TWP90	-18,91%	150,99%	30,83%	-53,02%
Average TKB90	97,81%	97,23%	94,54%	98,02%
Highest TKB90	99,25% (Apr'18)	98,37% (Apr'19)	96,08% (Feb'20)	98,68% (Mar'21)

Source: Elaborated by the Author

These findings suggest that the disparity in financing allocation between the agricultural and non-agricultural sectors is not merely due to the former's inability to secure financing. Rather, it is significantly influenced by the sector's exceedingly low mortgage rates and the stringent credit policies historically implemented by the banking industry, especially towards agribusiness farmers. The P2P lending model is deemed appropriate for the economic activities of farmers, offering schemes that can be tailored to their social conditions, types of agricultural commodities, and financial capabilities. However, this research identifies certain limitations that warrant further investigation, such as the need for case studies on specific fintech startups serving the agricultural sector that are officially registered with the Financial Services Authority (OJK) as exemplary practices. Additionally, future research should examine the social impact of financing provided by fintech P2P lending startups on farmers, including gender, cultural practices in agriculture, and the distinctiveness of agricultural products in the study location.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Various banking financing schemes involving insurance companies and the post-harvest processing industry are designed to support the economic development of farmers, facilitating the smooth repayment of farmer loans. In contrast, fintech P2P lending startups emerge as significant financial service providers for Indonesian farmers, offering economic support in the form of financing capital and assistance with agricultural facilities and infrastructure, facilitating the aggregation and sale of crops, and sourcing business partners for purchasing farmers' produce. Furthermore, these startups positively impact social aspects by enhancing farmers' understanding of Good Agricultural Practices (GAP) by providing farming expertise from the initial stages of cultivation to the end-point of marketing. Another notable social benefit includes the improvement of financial literacy among farmers, achieved through guidance in preparing cost plans for planting projects and financial management during the plantation phase.

The traditional banking system, however, faces challenges in extending credit financing to farmers at a national level, with rigid credit requirements, lengthy credit settlement periods, and monthly repayment schemes that often do not align with the cyclical nature of agricultural production, among other issues. Conversely, P2P lending fintech startups encounter their own disadvantages, including limited internet access among farmers, a scarcity of legally recognized fintech startups specializing in agricultural financing, and the potential for fraud due to insufficient financial information on their platforms. Additionally, there is a risk of identification bias, where lenders may preferentially fund projects of personal interest rather than based on their financial merit.

The COVID-19 pandemic in 2020 led to an increase in non-performing loans (NPLs) for both banks and P2P lending fintech startups, with the banking sector's NPL in agriculture reaching 8% and the NPL for P2P lending startups, as indicated by TWP90 data, hitting 8.88%. This exceeded the regulatory thresholds set by the Financial Services Authority (OJK) and Bank Indonesia, which is 5%. Strategic measures were taken in response, including loan restructuring, interest burden reduction, and marketing support for farmers' products. These interventions have helped banks and P2P lending startups navigate the pandemic-induced crisis. Moreover, the contributions of fintech startups to P2P lending have had a lasting impact on the economic and social aspects of farming. Economically, farmers receive capital financing, while socially, they benefit from enhanced capacity and innovation in agriculture, improved post-harvest management, and, consequently, greater marketability of their agricultural products.

Recommendations

This study underscores the significance of P2P lending fintech startups, specifically those approved by the Financial Services Authority (OJK), as alternative financing avenues for farmers in Indonesia. Nevertheless, given the sophistication of digital technology, which facilitates the operation of illegal P2P lending entities, stringent supervision by the OJK is imperative to shield the public from various fraudulent activities associated with unlicensed P2P lending fintech businesses.

Additionally, P2P lending fintech startups should adhere to specific regulatory measures, including obtaining official certification, executing notarial deeds, and establishing clear operational protocols to enhance transparency and credibility.

To further bolster trust among users, P2P lending fintech startups are encouraged to maintain an official website, streamline registration processes, and ensure transparent loan repayment agreements. Moreover, developing proprietary credit and social impact rating systems could be complementary tools for assessing borrower creditworthiness and conveying mission-critical information to socially motivated investors.

Furthermore, enhancing transparency and communication between banks, P2P fintech lending startups, and farmers regarding interest rates, fees, and other pertinent conditions is crucial. This measure aims to safeguard farmers from potential exploitation by clarifying financial obligations and terms of service.

Lastly, considering the advantages and disadvantages of banks and P2P fintech lending startups in providing agricultural financing, adopting a collaborative approach may offer the most comprehensive support to farmers. A synergistic relationship can be established by harmonizing the efforts of traditional banks and P2P lending fintech startups, addressing the economic aspects of capital provision and impacting social aspects. Such collaboration could lead to the advancement of modern farming facilities, increased crop yields, and an expanded marketing reach, ultimately contributing to the sustainable development of the agricultural sector.

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