The Impact of Fintech Payment on Bank Fee-Based Income

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JEL Classification:
G18
G21
G28

Abstract
This study investigates the effect of the growth of financial technology payment on bank fee-based income by studying conventional banks in Indonesia from 2012 to 2019. We employ Random Effect (RE) to estimate our empirical model. Fintech payment is measured by using the log of volume transactions made by fintech payment firms. Our result shows a negative and significant relationship between fintech payment and bank fee-based income. This result indicating that, in general, fintech payment disrupts banks' fee based-income. In particular, we find that fintech is a complement for small commercial banks.

Keywords:
fintech payment; bank fee-based income, Indonesia

How to Cite:
INTRODUCTION

There are two primary income sources of traditional banks, interest income and non-interest income (Ghosh, 2019; Saunders et al., 2020; Smith et al., 2003). Interest income comes from the interest margin banks earn by lending activity, while non-interest income comes from activities that generate fees (Deyoung & Rice, 2004; Markova et al., 2018). Non-interest income activities include service fees, securitization, investment banking, brokerage activities, and trading activities (Saunders et al., 2020).

Banks generally diversify their source of income to reduce risk (Smith et al., 2003). Due to high competition in the banking industry and the advancement of communication and information technology, since 1980, banks have started to move into other activities that generate fees. Since then, non-interest income has generated more revenue for banks than interest-based revenue (Damankah et al., 2015; Rogers & Sinkey, 1999; Saunders et al., 2020; Smith et al., 2003). There is a positive relationship between non-interest income and profitability, which means that the higher the share of non-interest income, the higher its profitability (Saunders, Schmid, and Wolter, 2020). Saunders et al. (2020); and Stiroh (2005) found that the growth of non-interest income shares was higher than the interest income with the most significant increase in fees and other incomes (Stiroh, 2005).

The advancement of information and communication technology in the last decade has driven the financial market into using a financial technology innovation called Financial Technology (Fintech), which has made everything cheaper and more functional (Thakor, 2019). These innovations involve non-intermediated transactions, such as peer-to-peer lending, cryptocurrencies, and mobile payments (Frame et al., 2018).

According to Alt et al. (2018), there are four phases of Fintech: first, Fintech in the 1500s – 1860s, this was a period when people did transactions through transferring documents or coins across distance using physical modes of transportation. Second, in Fintech 1860 – 1960, there was a transmission of financial information. People did transactions and payments using analog technologies such as the telegraph. Third, during Fintech 1960 – 2008, traditional financial institutions made use of digital technology. In this phase, people did transactions and payments using electronic banking such as ATMs and online banking. Fourth, from fintech 2008 – present, new entrance provides direct financial services without intermediates to the customer using their new technology.

In the third phase of Fintech, the role of e-banking methods such as ATMs, mobile banking, internet banking, and debit and credit cards increased significantly. People with a bank account have such payment instruments (Schuh & Stavins, 2013). Through these instruments, banks generate a transaction fee. Many banks adopted internet/online banking to reduce costs, increase revenue growth, and customer convenience. A bank that offers internet banking products to their customers has a higher performance because bank income increases through raising transaction fees (Ciciretti et al., 2009; Shahabi & Faeyz Razi, 2019). In this phase, fee-based income has a considerable contribution to the bank’s profit (Smith et al., 2003).

But recently, in the fourth phase, as the number of smartphone users has increased,
customers who initially were not reached by bank’s services can access digital services from their phone, with a richer, value-added experience across the globe (Haddad & Hornuf, 2019). Transactions using Fintech are easier, cheaper, and faster because they eliminate existing intermediaries. Through smartphones, people can perform various types of activities, including financial transactions. This phenomenon has fueled people’s excitement over the rapid development of Fintech, which is predicted to threaten traditional business banking (Thakor, 2019). In the fourth phase of Fintech, which started in 2008, new businesses enter the industry by providing new technology and non-intermediary financial services. People were able to make a financial activity without a bank as an intermediary. Fintech payment is one of these innovations.

Thakor (2019) found that payments, clearing, and settlement services are the highest number of fintech service providers, followed by credit, deposit, and capital-raising services. The innovations on payment, clearing, and settlement service, include mobile wallets, peer-to-peer transfers, digital currencies, B2B point of sale, F.X. wholesale, and digital exchange platforms. Haddad and Hornuf (2019) defined “fintech payment as the category payment which entails business models that provide new and innovative payment solutions, such as mobile payment systems, e-wallet, or cryptocurrencies.”

The factors of rapid electronic payment growth are digital native expectations as well as the government’s desire to boost financial inclusion and reduce the use of cash. They encouraged many fintech innovators to start entering the payment market (PWC, 2016). Mobile payment and mobile banking are two different things (Iman, 2018). Mobile payments are generally related to a universal service provided by service providers other than financial institutions. Contrastingly, mobile banking is a facility offered by a bank with a narrower scope than mobile payment. Another factor that led to mobile payments' rapid growth is the large number of people in the emerging market who do not have a checking account or debit and credit card because money transfer service was expensive. Their transactions are mostly low in value but high in volume, making mobile payment services cheaper. Mobile payment is also considered more convenient because the customer does not have to travel far from home to complete a transaction (Iman, 2018).

According to (Thakor, 2019), Fintech is an innovation in payment systems, including marketplace lending (P2P lending), investment, and insurance. P2P lending is a financial service platform that directly brings together the lender and borrower, without the bank as an intermediary. In December 2019, there were 164 lending platforms in Indonesia listed in OJK, for example, Modalku, Kredit Pintar, Mekar, Kreditpro, and Indodana. Digital wallet is one of the innovations in the payment system which provides safer transactions. This service enables people to make online payments without disclosing debit or credit card details and to make transactions without a bank account. Therefore, this service aims to replace both physical wallets and credit or debit card services. By February 2020, there were 179 payment platforms listed in Bank Indonesia, some of them are GoPay by PT Dompet Anak Bangsa, AtozPay by PT Finnet Indonesia, LinkAja by PT Fintek Karya Nusantara, PaymentGateway, Biller Gateway, mBayar by PT Ez2pay Global Utama, and Dana by PT Espay Debit Indonesia Koe.
Insurtech is a type of Fintech that operates in the insurance sector. One of the insurtech companies in Indonesia is FWD Life, which has adopted technology innovation in its business through FWD Mobile. FWD Mobile is a mobile application that allows people to buy insurance products easier and faster. Fintech in the investment segment included foreign exchange trading, financial advisory, and asset management service. Another type of fintech is the Robo advisor platform that provides digital financial advice with minimal human intervention.

Due to its rapid growth, it is unavoidable that Fintech will take some of the bank’s market share. This phenomenon can be observed from how P2P lending in Indonesia has taken the banks’ lending market and reduces the bank’s interest income. The bank’s income also experiences further threats from Fintech payment, which took its market for payment services, reducing its fee-based income. The latest study that examines the impact of fintech firms on the bank’s performance concludes that it negatively affects bank’s performance with state-owned banks receiving a more substantial effect than private banks (Phan, Dinh Hoang Bach et al., 2019). The current study examines a bank’s performance more specifically on its fee-based income because, according to PWC (2016) and Thakor (2019), payment is one of the most likely disrupted areas by Fintech. The payment services fee is the largest source of non-interest income for a bank, which means that when this source of income is disrupted by Fintech payment, the bank faces the threat of losing its largest income source (Deyoung & Rice, 2004; Ozili & Outa, 2019).

The current study is conducted in Indonesia because, according to an eMarketer survey in 2018, Indonesia has the fourth-largest number of smartphone users in the world. The growth of the fintech industry in Indonesia is also considered phenomenal among emerging market countries (Phan et al., 2019). More than 100 million people in Indonesia are active smartphone users. Developed based on Bank Indonesia Statistics, Figures 1 and 2 show that between 2012 and 2017, both the volume and nominal of electronic transactions grow slowly, but in 2018 the growth was significant. Volume and nominal transactions experienced 210% and 300% growth respectively.

METHODS

The current study collected data directly from the target population to provide a more accurate estimation value in investigating the relationship between fintech payment firms and bank’s fee-based income. In this research, the target population is all banks in the Indonesian banking industry, excluding the Islamic Bank because it has different characteristics from conventional banks (Beck et al., 2013).

The data were collected from multiple sources, including the Bankfocus database and www.ojk.go.id, which provides a complete balance sheet and income statement data from each bank. Bank-level financial data such as bank’s fee-based income and characteristics are computed based on the data acquired from both data sources. www.bi.go.id provides the data on the volume of fintech transactions, and www.bps.go.id provides macroeconomics data, which are used to compute country-level datasets.
Unbalanced panel data on 97 commercial banks for the period between 2012 and 2019, resulting in 776 observations, is generated from the collected data. The financial data is collected from 2012 because fintech payment firms began to prosper in Indonesia then.

We employ the following regression model to investigate the impact of fintech payment on a bank’s fee-based income:

\[ FEE_{it} = \alpha + \beta_1 \log_{finvol_t} + INEXP_{it} + SIZE_{it} + LEV_{it} + ROA_{it} + INF_t + GDP_t + \epsilon_{it} \]

FEE is the bank’s fee-based income, the dependent variable in the current study. Following Tennant and Sutherland (2014), the ratio of bank net fee and commission to the total of customer deposits is used as the proxy of the dependent variable.

Fintech payment is the main independent variable in this study. It is defined as payment transactions made through a fintech firm. Following Chen et al. (2020), this variable was measured using the log of a payment transaction made through fintech firms (Log_finvol). A negative sign is expected because the fintech payment business was estimated to pose a threat to the bank business. Thus, it was expected to decrease bank fee-based income (Haddad and Hornuf, 2019; Phan et al., 2019; Thakor, 2019).

Country-level data is used to measure fintech transactions. Transactions made through fintech firms are not restricted by time and space since they run their business transactions through the internet. This industry can cover payments across the county. Therefore, a fintech firm located in a big city also has the power to affect the competition and performance at all types of banks (Chen et al., 2020).

Following Chen et al. (2020), the ratio of interest expense to total customer deposits (INEXP) is used to identify the financing cost and illustrate how fintech firms have influenced bank’s performance.

Bank characteristics and macroeconomic variables are included as the control variables in the regression model. The bank characteristics include bank size, leverage, and profitability. Larger banks are set to gain from the economics of scale, offer more products to their customers, and have more cross-selling opportunities (Naruševičius, 2018; Phan et al., 2019; Rogers and Sinkey, 1999). Therefore, larger banks tend to offer lower deposit rates and charge higher retail fees than smaller banks (Tennant and Sutherland, 2014). Larger banks also more readily adopt new technologies (Rogers and Sinkey, 1999). Banks with larger assets have better technology that can increase service revenue and employ more specialized human resources than smaller banks. Bank size is expected to have a positive relationship with fee-based income. Following Ozili and Outa (2019); Phan et al. (2019); Trinugroho et al. (2018), total assets are used as the proxy of bank size.

Banks with high capital can absorb any negative shocks. It also has the resources to provide an incentive for its shareholders to monitor management activities, which lowers managers’ probability of taking an excessive risk (Ahamed, 2017). Banks tend to be riskier if they hold a lower equity level in their asset-liability portfolio (Ghosh, 2019). Financial leverage (LEV) is expected to have a positive relationship with bank...
profitability. This study used the Equity to Total Assets Ratio to control the degree of financial leverage.

In a highly competitive environment, banks have more diversification in their revenue (Trinugroho et al., 2018). The banking industry has never limited itself to the earning interest margin, and it has moved to increase non-interest income (Deyoung and Rice, 2004). Profitability is expected to have a positive sign on bank fee-based income. Following Chen et al. (2020), Return on Average Asset (ROA) is used as the proxy of bank profitability in this study.

For macroeconomic variables, inflation (INF) and Gross Domestic Product (GDP) are included in the model. According to Ghosh (2019), real GDP growth controls macroeconomic fluctuations and the overall performance of the economy. According to Naruševičius (2018), in a study regarding the determinants of bank profitability in Lithuania, there is a significant relationship between bank fee income and macroeconomic variables in the long term. A high level of inflation is expected to impact bank’s interest revenues adversely and are more likely to increase bank’s fee-based income (Tennant and Sutherland, 2014). The current study used Indonesia’s Annual Inflation Rate to measure inflation and Annual GDP Growth as the measure of GDP (Phan et al., 2019).

RESULTS AND DISCUSSION

Table 1 summarized the descriptive statistics of the variables in the study. The mean value of fee-based income is 0.0107719, which shows that the total customer deposit fee-based income is 1.08%.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>OBS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEE</td>
<td>657</td>
<td>0.0107719</td>
<td>0.0817251</td>
<td>1.97E-07</td>
<td>2.079292</td>
</tr>
<tr>
<td>INEXP</td>
<td>659</td>
<td>0.0665995</td>
<td>0.1599762</td>
<td>0.003207</td>
<td>3.958224</td>
</tr>
<tr>
<td>SIZE</td>
<td>765</td>
<td>23.56223</td>
<td>1.598368</td>
<td>1.598368</td>
<td>27.97939</td>
</tr>
<tr>
<td>LEV</td>
<td>669</td>
<td>15.44211</td>
<td>7.992568</td>
<td>-0.21</td>
<td>86.208</td>
</tr>
<tr>
<td>ROAA</td>
<td>714</td>
<td>1.233854</td>
<td>1.715581</td>
<td>-12.28423</td>
<td>4.656807</td>
</tr>
</tbody>
</table>

The generated panel data is analyzed using the panel regression method. Hausman Test is conducted to select the regression method that gives the most consistent and efficient estimation. Table 3 summarizes the result of the Hausman Test. The Prob>chi2 value is 0.4442, which is greater than 0.05 and indicates that Random Effect is the best regression method. In the baseline model, this study investigates whether fintech payment firms’ development affects the fee-based income of banks. The empirical results are presented in Table 2.

The data in Table 2 suggest that fintech payment firms measured by fintech payment transaction volume negatively affect the bank’s fee-based income (significance level of
10%). This finding is consistent with Christensen’s (1997) disruptive theory, which explains that the disruptive innovation formed in a niche market may appear unattractive to industry incumbents, but eventually, the new product completely redefines the industry. It is also consistent with Haddad and Hornuf (2019); Phan et al. (2019); and Thakor (2019), who found that Fintech negatively affects bank income.

The regression result in Table 2 also shows the analysis results conducted after the data were split between BUKU 1, BUKU 2, BUKU 3, and BUKU 4. The empirical results show that fintech payment has a negative effect on banks’ fee-based income in BUKU 2, BUKU 3, and BUKU 4, regardless of whether it is significant. This is consistent with the previous analysis result. The effect is not significant because 82% of fintech payment firms claim that they have difficulty penetrating the rural areas in Java and the region outside Java. The biggest challenge is the basic infrastructure problem, low financial literacy, and limited capital (AFTECH, 2018). However, a positive impact is observed in BUKU 1 banks’ fee-based income, which is significant at a 10% level. This result means that fintech payment creates synergies with BUKU 1, especially in generating fee-based income.

### Table 2. Baseline Regression

<table>
<thead>
<tr>
<th>Variables</th>
<th>(all banks)</th>
<th>(BUKU 1)</th>
<th>(BUKU 2)</th>
<th>(BUKU 3)</th>
<th>(BUKU 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>fee</td>
<td>fee</td>
<td>fee</td>
<td>fee</td>
<td>Fee</td>
</tr>
<tr>
<td>log_finvol</td>
<td>-0.000382*</td>
<td>0.000576*</td>
<td>-0.000323</td>
<td>-0.000988</td>
<td>-0.000381</td>
</tr>
<tr>
<td></td>
<td>(0.000218)</td>
<td>(0.000317)</td>
<td>(0.000310)</td>
<td>(0.000638)</td>
<td>(0.000926)</td>
</tr>
<tr>
<td>inexp</td>
<td>0.0544***</td>
<td>0.0531***</td>
<td>0.0426***</td>
<td>-0.0826*</td>
<td>-0.291***</td>
</tr>
<tr>
<td></td>
<td>(0.00119)</td>
<td>(0.000861)</td>
<td>(0.00988)</td>
<td>(0.0451)</td>
<td>(0.0854)</td>
</tr>
<tr>
<td>size</td>
<td>0.00258***</td>
<td>0.000834*</td>
<td>0.00257***</td>
<td>0.00645***</td>
<td>0.000754</td>
</tr>
<tr>
<td></td>
<td>(0.000420)</td>
<td>(0.000451)</td>
<td>(0.00943)</td>
<td>(0.00248)</td>
<td>(0.00170)</td>
</tr>
<tr>
<td>lev</td>
<td>0.000123***</td>
<td>0.000220***</td>
<td>0.000177***</td>
<td>-0.000545**</td>
<td>0.00101**</td>
</tr>
<tr>
<td></td>
<td>(4.07e-05)</td>
<td>(5.63e-05)</td>
<td>(6.19e-05)</td>
<td>(0.000222)</td>
<td>(0.000413)</td>
</tr>
<tr>
<td>roa</td>
<td>0.000386**</td>
<td>0.000385**</td>
<td>0.000613***</td>
<td>0.000354</td>
<td>-0.00175</td>
</tr>
<tr>
<td></td>
<td>(0.000156)</td>
<td>(0.000150)</td>
<td>(0.000199)</td>
<td>(0.000759)</td>
<td>(0.00130)</td>
</tr>
<tr>
<td>gdp</td>
<td>-0.000159</td>
<td>-0.0160</td>
<td>0.0136</td>
<td>-0.0488*</td>
<td>-0.0382</td>
</tr>
<tr>
<td></td>
<td>(0.0114)</td>
<td>(0.0146)</td>
<td>(0.0164)</td>
<td>(0.0288)</td>
<td>(0.0383)</td>
</tr>
<tr>
<td>inf</td>
<td>0.000132</td>
<td>0.000112</td>
<td>9.71e-05</td>
<td>0.000314</td>
<td>0.000419</td>
</tr>
<tr>
<td></td>
<td>(0.000120)</td>
<td>(0.000162)</td>
<td>(0.000159)</td>
<td>(0.000307)</td>
<td>(0.000452)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.0522***</td>
<td>-0.0339***</td>
<td>-0.0545**</td>
<td>-0.116**</td>
<td>-0.00628</td>
</tr>
<tr>
<td></td>
<td>(0.00934)</td>
<td>(0.0114)</td>
<td>(0.0213)</td>
<td>(0.0569)</td>
<td>(0.0402)</td>
</tr>
</tbody>
</table>

| Observations | 644 | 158 | 292 | 153 | 40 |
| Number of Code | 96 | 43 | 65 | 28 | 7 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
In table 2, SIZE, LEV, and ROAA variables, under most circumstances, have a positive and significant effect at a 1% significance level for both SIZE and LEV and a 5% level for ROAA. Naruševičius (2018) also found a similar result of SIZE. It implies that bank fee-based income increased with growth in assets. The increased shares of equity increase the fee-based income. ROAA has a positive and significant effect at a 5% and 1% significance level only in BUKU 1 and BUKU 2 respectively. It implies that bank fee-based income increased with the growth in profitability.

The GDP coefficient reports a negative sign, while the inflation coefficient reports a positive sign, but both GDP and inflation have a non-significant effect. Ozili and Outa (2019) also find a similar result. This result implies that bank fee-based income in Indonesia does not exhibit significant cyclical behavior in response to changing economic conditions.

Damankah et al., 2015 found that non-interest income has heterogeneous compositions. The income consists of income generated from trust activities, service charges on deposit accounts, trading revenue, other fee income, and other interest income. Fees and commissions are the main components of this type of income, with approximately 55% of the total non-interest income.

According to Feldman and Anggeler (1998), fees earned from non-loan product services such as issuing money orders, selling insurance products, and servicing loans, contributed 40% to the total non-interest income. Besides, service fees on saving accounts and the use of ATMs contributed 26% to the total non-interest income.

Radecki (1999) analyzed the sources of bank revenue derived from transaction services. He defined transaction service as all customer support and transfer capabilities provided to a transaction account owner, which is considered a part of the service. This service is valid for the actual transfer, to clear and settle a personal check, to meet a cash withdrawal, card transactions, and web-based transactions. The study found that revenue derived from payment service has a substantial amount, accounting for between one-third and two-fifths of the combined operating revenue in twenty-five largest Bank Holding Companies. This finding indicates that payment services have a considerable contribution to the bank’s total revenue.

In the third phase of Fintech in 1960 – 2008, financial services mainly became a digital industry by relying on electronic transactions between financial institutions, financial market participants, and customers worldwide (Alt et al., 2018). Banks also started to develop I.T. systems that enabled electronic interfaces to the customer such as ATMs and online banking. The role of e-banking tools significantly increased, including bank cards used in e-business to identify the owner and his/her bank account (Markova et al., 2018). The card serves as an instrument to access a bank account and as an instrument of withdrawal, payment, settlement, and fund transfer.

According to Markova et al. (2018), bank card service operation may increase the bank’s fee income. It would allow the banks to achieve a competitive advantage, ensure the development of customer sentries approach, encourage banks to build a personalized customer service model, and increase customer loyalty to the bank. Shahabi & Faeye
Razi (2019) found a positive relationship between investment in e-banking and online customers, which caused transaction fees to rise and the bank income to increase. The expansion of e-banking can reduce physical and associated costs because of the increase in the number of traditional customers who use electronic banking services. Finally, the increasing income and cost reduction have increased bank profitability.

Fee-based income has a substantial and growing portion in the banking industry (Radecki, 1999). Subsequently, transactions made with fintech payments have increased in demand (Phan et al., 2019). This increase has led to the impressive growth of fintech payment transactions in Indonesia (Phan et al., 2019). Formal banking reached 40% of the population of emerging markets, while mobile phone penetration reached 90% (PWC, 2016). It means that 60% of people in the world are unbanked. Technology has transformed branch banking to electronic banking and then mobile payment to reach the unbanked populations (PWC, 2016). Based on the CEB insight statistic, mobile money incurred a considerably lower cost of serving customers than electronic banking, supporting its rapid development.

Mobile payments provide convenient, cashless, and cardless payment methods, so both credit and debit cards are no longer needed. Omarini (2018) classified mobile payment into three categories based on the purpose of use: (a) Mobile remote payment is a service that enables customers to pay for their e-commerce transactions and is performed independently by the mobile phone's location; (b) Mobile proximity payment is a service that allows customers to make payments to an offline merchant directly through their smartphone. This type of payment replaced card transactions; (c) Mobile P2P (Person to Person) and Mobile P2B (Person to Business). These payments allow people to make money transfers directly between two users and/or between merchants and customers.

Mobile money is an alternative payment tool for bank services, which has outstripped bank accounts in several emerging countries in terms of market penetration (PWC, 2016). The rapid growth of smartphones has driven merchants to replace their Electronic Data Capture (EDC) with tablets linked to the Mobile Point of Sale (POS) device (PWC, 2016). Integrating a mobile POS device is much cheaper and easier than integrating a traditional payment terminal. The market payment system has changed, triggered by the rapid growth of e-commerce coupled with the integration between e-commerce and mobile technology. Payment in the marketplace could be completed using an e-wallet. In the five-force theory, Porter stated that the number and power of substitution products might influence firm profitability. Fintech firms provide services that can substitute banking services. Therefore, the industry will affect bank profitability.

Following Chen et al. (2020), cost of fund (INEXP) is employed to detect the potential mechanism. Fintech payment influences bank business mainly through bank's customer deposits. The rapid growth of fintech payment has reduced bank's customer deposits (Chen et al., 2020). In the full banks in column 1, the fintech payment transaction has a significant positive effect on the banks' fee-based income, but there is a different effect on the small bank (BUKU 1 and BUKU 2) and large bank (BUKU 3 and BUKU 4). Fintech payment has a positive and significant effect at a 1% level.
on the small bank, which is consistent with the previous analysis result that there is a positive impact between fintech payment and a small bank. It is also compatible with the previous analysis result that there is a synergy between fintech payment firms and small banks. However, fintech payment also has a negative and significant effect at the 10% and 1% significance levels on the large bank (BUKU 3 and BUKU 4). This result implies that the share of large bank’s customer deposits has reduced, they have to raise their interest rate to attract depositors, thus the interest rate has increased.

**CONCLUSION**

According to our empirical results, several conclusions can be drawn. First, there is a direct effect of fintech payment on Indonesian bank’s fee-based income. The result is negatively significant. In general, Fintech disrupts the banks’ fee-based income. In particular, Fintech is a complement for banks in BUKU 1. The impact of fintech payment is negative but not significant for BUKU 2, BUKU 3, and BUKU 4. Second, there is a direct effect of fintech payment on bank customer deposits. The result was different between small and large banks. Fintech payment has a significant and positive impact on small banks but a significant and negative impact on large banks.

There is a different impact of fintech payment firms between small and large banks. However, they can create a mutual symbiosis through creating fintech-bank collaboration. Small banks need to increase their share of fee-based income to reduce their risk, while large banks’ disadvantages come from interest. Fintech payment firms need to increase their brand awareness to increase market penetration, which requires a large investment, but most do not have the scale yet. Collaboration between fintech payment firms and small banks could expand fintech payment firms’ market reach and increase bank fee-based income. By entering fintech-bank collaboration, banks will get additional profit from the fintech business. In return, fintech payment firms will obtain financial resources, infrastructures, access to customers, and a security reputation from banks. This study’s limitation is that it does not include rural banks in the research subject, as they are smaller than BUKU 1. We suggest that future research further investigates rural banks as research subjects, aiming to examine the direct effect of fintech payment on rural banks’ fee-based income.

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