

The effect of covid-19 on bank profitability: Evidence of m-banking and e-banking in Indonesia

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ABSTRACT

Covid-19 affected the banks' financial activities globally and, therefore, mobile banking can become solution for doing a distancing transaction. This study tries to observe if mobile transaction has significant effect of income in private and public bank in Indonesia. This study collects the data about bank profitability and the number of mobile banking users before and during Covid-19 pandemic from BCA and BNI in Indonesia. The data of mobile transaction is divided into three, mobile, internet, and SMS banking. The data of income divided into two, premium/net and operational income. The data is analyzed using linear regression method to observe if mobile transaction has effect toward income variables. The data is analyzed using SPSS. The result showed that before pandemic, those three mobile transaction have strong correlation toward the increasing number of net and total operational income in BNI. In BCA, mobile banking has a significant effect on net and total operational income. During pandemic, mobile transactions have negative correlation toward net income, while operational income has positive one for BNI, but negative for BCA. It can be concluded that internet, mobile, and SMS banking have correlation toward net and total operational income.

ABSTRAK

Covid-19 berdampak pada aktivitas keuangan perbankan secara global sehingga mobile banking dapat menjadi solusi untuk melakukan transaksi jarak jauh. Penelitian ini menganalisis apakah transaksi mobile berpengaruh signifikan terhadap pendapatan bank swasta dan publik di Indonesia. Data diambil dari profitabilitas bank dan jumlah pengguna mobile banking sebelum dan selama pandemi Covid-19 dari BCA dan BNI di Indonesia. Data transaksi mobile terbagi menjadi tiga, mobile, internet, dan SMS banking. Data pendapatan dibagi menjadi dua, yaitu pendapatan premi/bersih dan pendapatan operasional. Analisis data menggunakan metode regresi linier untuk melihat apakah transaksi mobile berpengaruh terhadap variabel pendapatan. Data dianalisis menggunakan SPSS. Hasil penelitian menunjukkan bahwa sebelum pandemi, ketiga transaksi mobile tersebut memiliki korelasi yang kuat terhadap peningkatan jumlah pendapatan operasional bersih dan total di BNI. Di BCA, mobile banking berpengaruh signifikan terhadap pendapatan bersih dan total pendapatan operasional. Selama masa pandemi, transaksi mobile berkorelasi negatif terhadap laba bersih, sedangkan pendapatan operasional positif bagi BNI, namun negatif bagi BCA. Dapat disimpulkan bahwa internet, mobile, dan SMS banking memiliki korelasi terhadap pendapatan operasional bersih dan total.

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1. INTRODUCTION

Transaction in banks has been changing so much in the last decade. In this condition, banks provide mobile transaction for their customers for money deposit and withdrawing easily. In addition, mobile transaction allow customers to do transaction without burdening by distance and time (Thusi & Maduku, 2020). Mobile transaction also allows customers not to spend too much time waiting for deposit nor withdrawing money from teller (Ojambo & Yilmaz, 2020).

The digital era brings many changes in society's daily life, including in making financial transactions (Barata, 2019). Society can check balances, transfer money, pay bills is easier and more practical through digital banking services (Purwanto et al., 2020). Banks also provide customers with a Cash Machine (ATM) if they prefer to withdrawing physical money (Drigă & Isac, 2014). Mobile transaction now divides into three, internet banking using bank website to do transaction, mobile banking using apps, and SMS banking. Each of them has benefit and weakness for the definite customers. As long as customers have internet access or smartphone with active number (Wardhana, 2020a), they can make financial transactions anytime and anywhere (Ojambo & Yilmaz, 2020).

In 2019, Covid-19 causes all of the public activities temporarily disbanded. Many countries implement lockdown to stop the dissemination of the virus (Wardhana, 2020b). Government in each country issue health protocol to get followed by society (Arora et al., 2020). Most of the public activities especially in working were by online. It also included banning activities which implement mobile transaction to avoid direct physical contact between bank staff and customer (Abduh & Azmi Omar, 2012).

Mobile transaction can become one of the solution for banking to keep banking activities, as well as in serving the customer the breakthrough in digital technology makes mobile transaction by internet and mobile application available (Tan et al., 2010). People have no need to bring money to deposit, transfer, or pay some bills to the bank. Instead, e-money will be transferred through bank account with just simple click, the cashless transaction has become the alternative for banking to stay active during pandemic (Patel et al., 2019).

Cashless transaction is more efficient because people do not need to bring a large sum of fiat money with heavy bag. Instead, one smartphone is enough to do any types of mobile transaction, such as internet banking, mobile banking, or SMS banking (Azali, 2016). The availability of internet connection on public facilities as well as cheap internet service providers for society also help in creating cashless transaction environment (Yang et al., 2021). Based on the background above, this study has a purpose to observe if mobile transaction has significant effect of income in private and public bank in Indonesia. The practical implication of this study is to give insight to banking management which type of mobile transaction should be implemented more to boost more income.

2. THEORITICAL FRAMEWORK AND HYPOTHESIS

Cashless Transaction as the New Culture of Payment in Society

The use of the cashless system has increased in society, which provides several benefits for both public and the state. For individuals, cashless is very convenient and practical. Cashless could also minimize risk by being exposed bringing a lot of money in public. Cashless also allowed society to make transactions abroad without the need to carry cash anymore because most transactions abroad have adopted a cashless payment system. In addition, the cashless system also allows individual or organization to view the history of transactions made. This could give benefit to manage the budget by monitoring the transaction's history. Cashless also has benefits for the state. With cashless payments, the collection of state taxes will increase significantly.

In the case of Indonesia, cashless had become the part of society to support the rise of e-commerce. The growth of the e-commerce industry in Indonesia was indeed getting faster in the midst of a slowdown in the country's economy. There is possibility that the future of e-commerce industry can become one of the backbones of the national economy. In terms of the scale, most of the e-commerce business players in Indonesia were manifested as small and medium scale (SMEs). The fact that SME business is the most resilient business even during the economic crisis, created the culture of cashless payment in society. Cashless payment could be done through mobile apps fintech.

There were major players of fintech which provided cashless payment application which could be used for any kinds of SMEs and transaction for retails. OVO and Gopay were the most common fintech used by society to conduct cashless payment. To add the money into account, users could add their money into OVO and Gopay through minimarket such as Alfamart and Indomaret. This was called as Top Up (Susilo et al., 2019). By using fintech service, the e-commerce would be developed even faster and could absorb more society to participate to become one of the player of the SMEs. The more SMEs developed and sustained in Indonesia, the stronger local and national economy were.

Cashless Banking in Preventing Covid-19 Dissemination

The covid-19 pandemic has supported banking performance. One of them was encouraging the society to use electronic money transactions in the banking sector, which is expected to continue until the end of the year. This was the way to support the government regulation to minimize physical contact during the covid-19 pandemic in 2020. As demand, increases during the pandemic, electronic money transactions are expected to increase until the end of 2021.

Faster and more convenient than cash, especially for valuable transactions made cashless banking become more popular than banking transaction through teller. Society also do not need to provide an exact amount of money for a transaction or have to keep change when they have business deal which involved with the high amount of money. Cashless banking also diminish boundaries to withdraw or deposit the money, even at home when the lockdown regulation was enacted by the government.

Model of Hypotheses

This study had two hypotheses based on the variable, which were:

- H1: *Internet, mobile, and SMS banking affect the Premium income-net income of BNI*
- H2: *Internet, mobile, and SMS banking affect the Premium income-net income of BCA*
- H3: *Internet, mobile, and SMS banking affect the total operational income of BNI*
- H4: *Internet, mobile, and SMS banking affect the total operational income of BNI*

3. RESEARCH METHOD

The sample consists of Indonesia national banks or BNI as public bank organized by government and Bank Central Asia or BCA as private bank managed by private company. This study collected the data of annual report from each website, started from 2016 to 2020. The sample were divided into two based on the criteria. The first sample were the number of customers who use mobile transaction service such as mobile banking, internet banking, and sms banking (Chelhi et al., 2017). The second sample were the total premium income and operational income. The duration of the sample is from 2016 to 2020 (Wardhana, 2020b).

The researchers analyzed the data into tables to show whether there is an increasing or decreasing over time. The data then is analyzed using regression method to analyze mobile transaction as independent variable has influence toward two kinds of income as dependent variables between the number of mobile transaction with premium and operational income. The minimum number of R square is around 0.75 to be considered has a correlation (Abduh & Azmi Omar, 2012).

This study also uses Pearson correlation method to determine the strength of the correlation between independent and dependent variables. The standard score for correlation is above 0.7 as strong, 0.5-0.7 as moderate, below 0.5 to 0.4 as weak, and below 0.4 as no correlation at all. Both of the correlation and regression will be calculated using SPSS software (Bombarda, 2013).

4. DATA ANALYSIS AND DISCUSSION

Descriptive Analysis

Table 1 shows that sms banking is still favorite among customers than other two types of distance transaction. The number of sms banking is almost five times higher than internet banking. Even though the era of smartphone has become booming in present, the number of sms banking cannot be surpassed by mobile banking.

Based on Table 1, it indicates that one of the reason why mobile banking has the lowest users than other two is that it is due to the customers getting more errors in using application, rather than website. The application get forced close is one of the problem. Moreover, some of the customers experienced with the problem that when the smartphone's system is getting rebooted or the application is uninstalled accidentally,

the username and password is returned being unregistered. Thus the customers have to come to the branch office again to register their mobile banking account (Widagdo et al., 2020).

Although SMS banking is a bit outdated in technology, it is still predominant for older generation as well as majority of millennial generation. Most of the customers of banking in Indonesia prefer pulling cash from ATM, rather than transferring money from website or application (Purwanto et al., 2020). The culture of preferring getting real money in physic rather than in digital is the major reason why SMS banking is still popular in Indonesia (Abbas, 2017). Moreover, during an important religious event of Islam such as Eid Mubarak or Eid Adha, Indonesian Muslims prefer in getting money by cash in physique too. Society tends to do transaction of food and primary needs using physical money, rather than e-money. The traditional market, groceries store, or even supermarkets are seldom to provide e-banking service for the customer (Azali, 2016).

Kumari & Khanna state on their study that developing country tendencies in choosing cash rather than electronic money is also related to the availability of digital facility, such as smartphone, computer, and strong internet connection (Kumari & Khanna, 2017). The problem in Indonesia is not far away with the availability of digital hardware, which is

quite hard for low-income people and grass root. Moreover, the perspective of owning electronic money as fraud rather than cash which have physical appearance also shape society mind to prioritize cash rather than digital one (Sariningsih et al., 2019).

Another problem the customers are encountered deals with the application have to get updated where there is a new update available in google playstore. Otherwise, the application cannot be opened (Ojambo & Yilmaz, 2020). This will give a serious problem, if customers in a critical situation, such as in important business deal when they have to do immediate transaction or when they need immediate money to buy daily necessities in a far place (Lim et al., 2020). It is contradictory with internet banking that never needs any update like application or sms banking that does not even needs to open any website (Azali, 2016).

Mobile apps are the easiest one in doing transaction, all by using smartphone. But some problem with error, lagging, and regular updates from Google Play store can makes future transaction be delayed (Lim et al., 2020). Internet banking is easier than mobile apps since it does not need installation and transaction will be executed through website of purposed bank (Purwanegara et al., 2014). Nevertheless, it also has some minor problem

Table 1
Number of Mobile Transaction in BNI During 2016-2020

Year	Number of users		
	Internet banking	Mobile banking	SMS banking
2016	1,538,020	506,564	6,873,626
2017	1,781,297	1,368,771	8,497,014
2018	1,893,721	2,892,518	9,819,514
2019	1,996,653	4,877,738	10,865,581
2020	2,060,221	7,786,849	11,837,176

Source: Data Processed

Table 2
Premium and Total Operational Income of BNI during 2016-2020

Year	Premium income-net income (Rp billion)	Total operational income (Rp billion)
2016	1,342	41,299
2017	1,768	45,212
2018	1,712	48,771
2019	1,697	52,012
2020	1,471	52,036

Source: Data Processed

such as bank has to spend much resource to build strong firewall and protection system from hacker. SMS banking does not need any internet connection because it can be accessed directly through cellphones using the SMS media (Ojambo & Yilmaz, 2020). SMS Banking features include information services ranging from balances, account mutations, credit card bills, to interest rates. In addition, SMS Banking also provides transaction services, such as transfers, bill payments. However, SMS banking is also vulnerable from fake SMS from intended bank. Each of those mobile transaction has its own weakness and strength (Obinna et al., 2017).

Table 2 shows that total operational income are keep rising since 2016. It can be concluded that those two incomes keep rising, even though there is pandemic in 2020. Year 2020 was surprisingly has the highest in total operational income, but second lowest in premium income – net income.

Table 3
Number of Mobile Transaction in BCA
During 2016-2020

Year	Number of users	
	Internet banking	Mobile banking
2016	1705	786
2017	2040	1161
2018	6,321	2,264
2019	3,848	3,264
2020	6,321	2,508

Source: Data Processed

Table 3 shows that there is no SMS banking and only 2 kinds of mobile transaction exist in BCA. Moreover, the number of internet banking is higher than mobile. The number of internet banking users was the highest in 2020, while mobile on in 2019.

Table 4
Premium and Total Operational Income of
BCA During 2016-2020

Year	Premium income- net income (Rp trillion)	Total operational income (Rp trillion)
2016	20.6	53.8
2017	23.3	57
2018	25.9	63
2019	28.6	71.2
2020	27.1	75.2

Source: Data Processed

Table 4 shows that total operational income surpass net income in several folds. Total of operational income keeps increasing until 2020, while net income decreased in 2020.

Normality Test

Table 5 shows that the data distribution was normal. It could be seen from the significant score of each variable that was higher than 0.05.

Hypothesis Testing

Table 6 shows that internet and mobile banking has no effect toward net income, but SMS banking yes. Three banking methods above have significant effect toward operational

Table 5
Normality Test Result

One-Sample Kolmogorov-Smirnov Test						
		Internet Banking	Mobile Banking	SMS Banking	Premium Income Net	Total Income
N		5	5	5	5	5
Normal Parameters ^{a,b}	Mean	1546686	439829,8	8205232	1,5980	47,8660
	Std. Deviation	870222,2	242913,8	4747963	0,18259	4,62511
Most Extreme Differences	Absolute	0,406	0,192	0,325	0,306	0,215
	Positive	0,278	0,192	0,222	0,176	0,184
	Negative	-0,406	-0,178	-0,325	-0,306	-0,215
Test Statistic		0,406	0,192	0,325	0,306	0,215
Asymp. Sig. (2-tailed)		,070 ^c	,200 ^{c,d}	,092 ^c	,141 ^c	,200 ^{c,d}

a. Test distribution is Normal.

b. Calculated from data.

Source: Data Processed

income during 2016 to 2018. Based on table 6, the H1 was accepted only for SMS banking, while H3 was accepted.

Table 6
R Square/R² Point Between Mobile Transactions Toward Income in BNI

	Internet banking	Mobile banking	SMS banking
Net income	0.16	0.001	0.9
Operational Income	0.97	0.8	0.9

Source: Data Processed

Table 7
R Square/ R² Point Between Mobile Transactions Toward Income in BCA

	Internet banking	Mobile banking
Net income	0.49	0.96
Operational Income	0.54	0.79

Source: Data Processed

Table 8
R Point Between Mobile Transactions Toward Income in BNI During 2016-2018

	Internet banking	Mobile banking	SMS banking
Net income	0.91	0.69	0.83
Operational Income	0.98	0.98	1

Source: Data Processed

Table 7 shows that internet banking has no significant effect on the net and operational income. Yet, mobile banking has. One of the reason BCA mobile banking service correlates to two types of income because BCA launches the program of Express savings for young ages that can start to the low deposit point and using mobile apps to do transaction (Prasetia & Syah, 2020). Moreover, the content of the apps allows customers to customize the appearance of the photo bio data, along with the appearance of the application (Zulkhibri & Sukmana, 2017). They stated that the segment of young age especially millennial generation has huge impact to generate more income, because that generation holds more purchasing power and wealth than former generation. Former generation and baby boomer tend to sue more outdated way in transaction. They also take less attention toward apps appearance and customization

features than young ages (SINGH et al., 2021). Based on Table 7, H2 and H4 was accepted.

Table 7 shows that only mobile banking that has moderate correlation toward net income. SMS banking has absolute correlation strength toward operational income of BNI during 2016-2018.

Table 9
R Point Between Mobile Transactions Toward Income in BCA During 2016-2018

	Internet Banking	Mobile Banking
Net income	0.89	0.96
Operational income	0.98	0.99

Source: Data Processed

Table 8 shows that internet and mobile banking has strong correlation toward net and operational income.

Table 10
R Point Between Mobile Transactions Toward Income in BNI During 2019-2020

	Internet banking	Mobile banking	SMS banking
Net income	-1	-1	-1
Operational income	1	1	1

Source: Data Processed

Table 10 shows that internet, mobile, and SMS banking has no correlation toward net income, but has strong correlation toward operational income. Based on the result, this study showed that there is a significant correlation between operational cost and three kinds of mobile transaction in BNI. It is shown in table 3 that those 3 kinds of transaction has score more than 0.75 for net income, only SMS banking has correlation. But mobile and internet banking scores are less than 0.75, means that no correlation at all.

During 2019-2020, mobile transaction toward total operational cost of BNI was significant, rather than BCA. The reason is because BNI is one of the public banks which are protected and subsidized by the government, so that society will put more trust in doing mobile transaction than in private banks (Wardhana, 2021a). Society think that the government will substitute if there is money lost as a result of bank's mistake in transaction or fraud (Lasmini et al., 2020). This is because

government has almost unlimited amount of money in supporting public bank, while private bank is much more limited (Madavan & Vethirajan, 2020).

Table 11
R Point Between Mobile Transactions
Toward Income in BCA During 2019-2020

	Internet banking	Mobile banking
Net income	-1	1
Operational income	-1	-1

Source: Data Processed

Table 10 shows that only mobile banking that has strong correlation toward net income, while other do not. It also shows that there is no significant correlation between two types of incomes and internet banking. But mobile banking has high R square strong, means that there is correlation between mobile banking and two incomes (Wardhana, 2021b). In BCA case, net income has stronger correlation with mobile banking than BNI. It can be said that net income or the last line of income in report after calculating all expenses, debts, operational cost, as well as additional incomes is correlated to the number of mobile banking (Purwanto et al., 2020).

The result above also shows that the R square scores which are lower than 0.75, means that the independent variable, mobile and internet banking, has no effect toward dependent variable, the net income. But SMS banking has significant R square to net income. However, the three independent variables has significant effect to the total operational income of BNI during 2016-2018. It is depicted by those R square scores which are over than 0.7.

The result presented in Table 11 also shows that during 2019-2020, both mobile and internet banking has absolute negative R score toward operational income. It is clear that only mobile banking toward net income that has absolute positive R score. It also means that mobile and internet banking have inversely effect toward operational income that using mobile and internet banking ironically causes total operational income to decrease. The implication of negative R score based on the result above can be bad for BCA to continue in operating internet banking for customer to follow Covid-19 health protocol, because it will impact to the Net and total operational income.

5. CONCLUSION, IMPLICATION, SUGGESTION AND LIMITATION

In this study, it can be concluded that SMS banking has significant effect toward net and total operational income in BNI. For BCA, mobile banking has a higher significant effect on the net and total operational income. BCA has no SMS banking service like BNI. Before pandemic, those three mobile transactions have strong correlation toward the increasing number of net and total operational income in BNI. Only mobile banking has moderate correlation strength toward net income in BNI. For BCA, no transaction has weak correlation. However, during pandemic three mobile transactions has negative correlation toward net income, while operational income has positive one for BNI. For BCA, only mobile banking that has strong correlation strength toward net income, while other are negative.

This study is limited to the observation of mobile transaction toward net and total operational income. For that reason, further study needs to get more transactions, using of mobile transaction. Since Indonesia has big potential in sharia finance and banking, perhaps further study can elaborate sharia banking for the subject of the study.

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