Digital Products Increase Fee-based Income Banking in Indonesia

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Abstract
This study aims to analyze the effect of digital innovation on fee-based income for five commercial banks listed on the Indonesia Stock Exchange for the 2015-2019 period. The analytical tool used in this study is panel multiple regression equations with the dependent variable feebased income and the dependent variable Number of ATMs, CRM & CDM, Number of SMS, transactions Internet and Mobile Banking, Number of Branches. The results showed that Branches has an insignificant effect on fee-based income. The number of ATMs, CRM & CDM, and the number of SMS, Internet and Mobile Banking transactions has a significant positive effect on fee-based income. This indicates that digital innovation in banking can increase the bank's fee-based income.
Keywords: fee-based income, number of ATMs, CRM & CDM, number of SMS transactions, internet and mobile banking, number of branches.

Abstrak
Penelitian ini bertujuan untuk menganalisis pengaruh inovasi digital terhadap fee based income pada lima bank umum yang terdaftar di Bursa Efek Indonesia periode 2015-2019. Alat analisis yang digunakan dalam penelitian ini adalah persamaan regresi berganda panel dengan variabel dependen fee based income dan variabel dependen Jumlah ATM, CRM & CDM, Jumlah SMS, Transaksi Internet dan Mobile Banking, Jumlah Cabang. Hasil penelitian menunjukkan bahwa jumlah cabang berpengaruh tidak signifikan terhadap fee based income. Jumlah ATM, CRM & CDM, dan jumlah transaksi SMS, Internet dan Mobile Banking berpengaruh positif signifikan terhadap fee based income. Hal ini mengindikasikan bahwa inovasi digital pada perbankan dapat meningkatkan fee based income bank.
Kata Kunci: *fee based income, jumlah ATM, CRM & CDM, jumlah transaksi SMS, internet dan mobile banking, jumlah cabang.*

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1. Introduction

Banking is an important sector for the sustainability of a country's economy, in accordance with the Law of the Republic of Indonesia Number 10 of 1998 concerning banking states that banks are business entities that collect funds from the public in the form of deposits and then distribute them back to the public in the form of credit and other forms that aim to improve the standard of living of many people.

Along with the times, public demand is growing so that it demands that banks must always form sophisticated and easy-to-use innovations, in order to meet public satisfaction, these innovations are certainly expected to provide convenience for the public or customers, this has begun to be realized by banks by issuing *E-Banking*.

Mckinsey's latest survey of financial services customers across the country shows considerable growth in the use of mobile banking, suggesting that *computerized* channels will become increasingly important in building loyalty and generating growth for financial institutions. Consumers who are *computerized* or have been digitized can be said to be more valuable, the percentage of active Indonesian banking consumers has grown 2.5 times since 2014, and now they reach 32% of the bank's population. This growth is becoming more significant given the fact that digitally active consumers are more valuable in an economic sense to banks.

Barnes and Corbitt (2003) said that in the past decade or so, the development of technology industries such as tablets and *cell phones* has encouraged various banking industries to provide digital banking application services.

De Young, Lang, and Nolle (2006) consider *internet banking* as one of the elements of innovation that serves as a substitution for the procurement of branch offices or branches in order to expand banking services and services.

According to OJK (2015) *E-Banking* experienced growth starting with the growth of social media, technology and changes in people's lifestyles that provided positive changes for the banking industry in the form of *fee-based income* or income generated from costs. These developments can minimize the *cost of exchange*, business development, and can increase customer loyalty.

Figure 1 shows the data on the development of *fee-based income*, most of which show positive growth, in contrast to Bank Mandiri which experienced a decline in 2019. From 2015 to 2019 overall the bank had an average increase of 71.38%.

Based on the Figure 2, transaction growth from 2015 to 2019 increased by 168.28% some banks had an increase in the number of transactions every year, in contrast to Bank Mandiri which experienced a decline in 2018 and 2019.

Based on the Figure 3, the growth in the number of ATMs, CRM & CDM from 2015 to 2019 was 6.14%. Several banks have increased but are different from BRI which had a high decline in 2019.

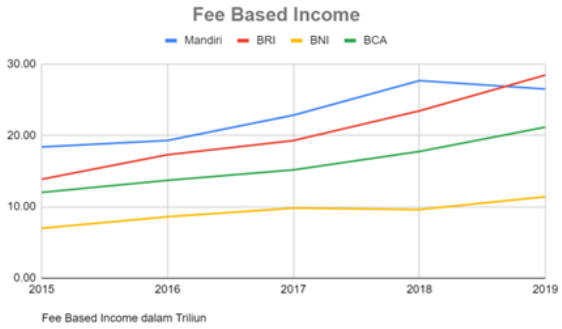

Figure 1. Fee based income Commercial Banks on the IDX Period 2015 - 2019

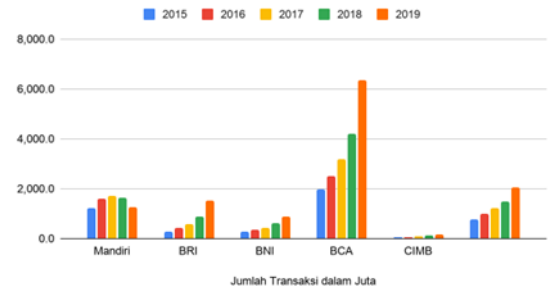

Figure 2. SMS, Mobile and Internet Banking Transactions at Commercial Banks on the IDX for the Period 2015 - 2019

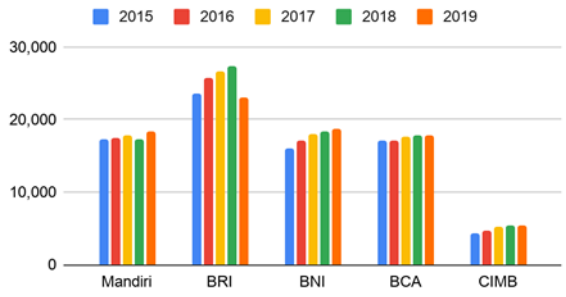

Figure 3. Number of ATMs, CRM and CDM at Commercial Banks on the IDX for the Period 2015 - 2019

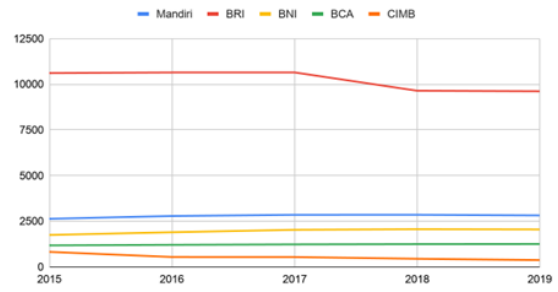

Figure 4. Number of Branch Offices (Branches) in Commercial Banks on the IDX for the Period 2015 - 2019

Sources: Bank financial statements (processed 2020)

Overall, the banking industry has a negative growth rate of -5.20%, a significant decrease occurred in BRI banks. unlike other banks, BCA bank has an increase in the number of *branches* in 2019.

According to Kasmir (2001) the profit on the transaction of services other than *spread-based* is called *fee-based income*. According to OJK (2015) *The growth of e-banking* as a banking innovation is supported by technological developments and changes in people's lifestyles to *computerized*, this provides benefits for the banking industry by generating income from *expenses* called *charge-based pay*. So that with this innovation, the bank is able to increase *fee-based income* which also increases all out bank profits.

Research by Tahun & Ferli (2020) shows that ATM and Branch banks affect ROA but do not affect the ROE of banks in Indonesia, on the contrary, Mobile Banking affects ROE but does not affect ROA. Ferli (2020) gets in the short term Mobile Banking affects profitability, while in the long term ATM per Branch and Internet Banking which affects profitability.

Based on the explanation in the previous background, the formulation of the problem in this study is how the growth of SMS, mobile and *internet banking* transactions affects *fee-based income*, how the number of ATMs, CRM and CDM *affects fee-based income* and how the number of branch offices affects *the fee-based income* of commercial banks on the Indonesian stock exchange for the period 2015 - 2019.

2. Theoretical Framework and Hypothesis Development (If Any)

Bank

According to the Indonesian Bankers Association (2016) in accordance with Law Number 10 of 1998, it is explained that a bank is a business entity that has the main function of receiving public funds storage, and disbursing these funds in the form of credit for business development, as well as providing various other services in order to improve people's living standards.

Electronic Banking (E-Banking)

According to OJK (2015) E-banking is a service provided by banks so that they allow their customers to obtain information, communicate, and carry out various banking transaction activities through electronic intermediary media such as ATMs or Automatic Teller Machines, EDC or Electronic Data Capture, SMS Banking, Phone Banking, Mobile Banking, Internet Banking, E-Commerce, and Video Banking, etc.

Fee Based Income

According to Kasmir (2001) Charge income or fee-based income is the profit generated on transactions of services or other banking services or other than spread based. The focus is on how a bank's business gets additional profits that can be obtained apart from the benefits of interest on credit or other securities. As for bank income in the form of other operations or non-interest, there are several elements that are classified as in it, namely provision and commission income, income from foreign exchange transactions (foreign exchange) or foreign exchange and various other operating income.

Research Hypothesis

Effect of E-Channel (Number of ATM, CRM & CDM) on Bank Fee based income

Automatic Teller Machine (ATM) is a banking machine connected to a network that provides access to customers to carry out various financial transactions independently without assistance from bank officers. With the development of technology today, banks have also followed these developments by providing several types such as non-cash ATMs, ATMs that serve cash deposit transactions (Cash Deposit Machine / CDM) and ATMs that can serve all transactions previously mentioned (Cash Recycling Machine / CRM). The financial transactions that customers make will certainly provide charges or administrative discount fees that will increase bank income.

In the research of Le and Ngo (2020) the number of automated teller machines (ATMs) can increase the profitability (ROA & NIM) of banks. Based on research by Kartika and Kustina (2017) said that the increase in fee-based income has a positive effect on the company's profit. In addition, in hadi & Nurjanah's research (2017) the number of machines and transaction volume positively affect fee-based income. In contrast to the results of research by Gumilang and Azib (2019) which states that ATMs have a negative influence on fee-based income

H1: The number of ATMs, CRM & CDM (Ec) has a positive effect on *fee-based income.*

Effect of E-Banking (Number of SMS, Mobile & Internet Banking transactions) on Bank Fee based income

E-Banking is a service that helps conduct bank transactions independently through communication networks such as sms, applications (which can be installed by customers), and/or the web. This activity utilizes technology as an intermediary medium in connecting customers or clients with banks without visiting the bank office. Customers can use devices such as work area computers, PCs, tablets, or cell phones as a means of connecting with the bank system.

Hapsari (2015) shows that E-Banking has a relationship with increasing company profits where E-Banking is a complement to bank branch office services so that basically the E-Banking feature is one of the many innovations developed by the banking

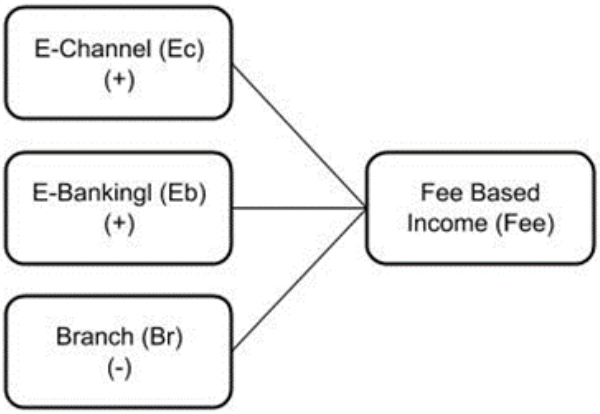

Figure 5. Research Framework

industry in order to improve the quality of service to its customers, with this innovation it is assumed that banks will get input in the form of increasing bank profits. So it can be interpreted that the higher or more intensive the customer in using financial service features, the bank will have the opportunity to get income from these innovations.

In Dong et al. (2020) said that the development of Internet Finance has a positive impact on profitability (ROA). Based on research by Kartika and Kustina (2017) said that the increase in charge-based pay has a positive effect on company profits. Gumilang and Azib (2019) in their research also stated that Internet Banking and Mobile Banking have a positive influence on fee-based income.

H2: The number of SMS, Internet and Mobile Banking (Eb) transactions has a positive effect on fee-based income.

Effect of Branch Amount on Bank Fee based income

Branch or branch office is an office that functions as an operational office that has the aim of providing services to customers in obtaining information or conducting banking transactions. transaction services through branch offices are considered to have relatively high operational costs, namely to pay employees, building rent, security, electricity, and so on based on Siagian research (2020) stated that branch has no effect on earnings before tax banks. This is different from muchlis's research, et al. (2021) which shows that Branch has a significant positive influence on profitability.

H3: Number of *Branches* (Br) negatively affects *fee-based income.*

Based on the presentation that has been submitted above, a framework of thought was made as a result of the modification of several journals, namely with the main journal *Impact of internet finance on the performance of commercial banks in China* by Dong, et al. (2020) and research on the effect of the Number of machines and Transaction Volume of EDC Machines on *Fee Base Income* by Hadi & Nurjanah (2017).

The variables in this study are E-Channel (number of atm, crm and cdm), E-Banking (number of sms, mobile and internet banking transactions) and *Branch and fee-based income*, the framework of thought is presented in the Figure 5.

3. Research Method

This research was conducted with a quantitative approach, where in this analysis it is emphasized on numerical data or numbers processed based on statistical methods.

This study uses panel data which is a combination of cross section data and time series data so that it can allow researchers to study more complex behavioral models (Gujarati, 2015).

The population used in this study was a National Commercial Bank listed on the Indonesia Stock Exchange (IDX) in the 2015-2019 period. The sampling method is Purposive Sampling with consideration of several criteria as follows:

1. Companies that are classified as banking industries listed on the Indonesia Stock Exchange.
2. Banking companies listed on the IDX in the period 2015-2019.
3. A banking company that has ATM, CRM & CDM products.
4. Banking companies that have SMS, Internet and Mobile Banking services.
5. Companies that have complete financial statements for the period 2015 - 2019.

With these criteria, there are 5 banking companies that are listed on the IDX and have products that meet the criteria in the period 2015 to 2019.

The data used is secondary data in the form of company financial statements from data obtained on the *websites* of each bank.

In this study, the independent variable used was the number of electronic media used to make transactions used in this study was ATM, CRM & CDM. The size used for this variable is in accord-

Table 1. Research Object

No.	Bank	Group
1.	PT. Bank Rakyat Indonesia (Persero), Tbk.	IV
2.	PT. Bank Negara Indonesia (Persero), Tbk.	IV
3.	PT. Bank Mandiri (Persero), Tbk.	IV
4.	PT Bank Central Asia Tbk.	IV
5.	PT. Bank CIMB Niaga Tbk.	IV

ance with Le and Ngo Research (2020) and Gumilang and Azib research (2019). With the modification of the addition of CRM & CDM because some banks do not distinguish but are mentioned in one unit.

SMS, *Internet* and *Mobile Banking* (Eb) transactions, which are calculated based on the total number of transactions each year. The measure used in this variable is in accordance with the research of Dong, Yin, et al (2020) namely *Internet Financial Transactions*. Gumilang and Azib (2019) namely *Internet Banking* and *Mobile Banking*. As well as modifications with the addition of SMS *Banking*.

Branch (Br), the size used in this variable is the number of *branches* presented in *the annual report.*

The dependent variable in this study is *Fee based income* (Fee), which is in accordance with the research of Hadi & Nurjanah (2017), the size used is *fee-based income* presented in the bank's financial statements.

In this study, the authors used a regression analysis method with panel data. In this equation the regression model can be written as follows:

$$Feei,t = \beta 0 + \beta 1Eci,t + \beta 2Ebi,t + \beta 3Bri,t + ei,t$$

The selection of Panel Data Regression Estimation Techniques uses the Chow test, Hausman test and LM test, to determine whether the model used is *a Fixed Effect, Random,* or *Common Effect Model.*

Ghozali (2011) says that the classical assumption test will be used to detect whether or not deviations occur. This assumption tester consists of several tests, namely the normality test using Jarque Berra, the multicollinearity test using correlation, the heteroskedasticity test using the Glesjer test, and the autocorrelation test using Durbin Watson

4. Result, Discussion, and Managerial Implication

Based on the Panel Data Analysis Requirements Test, it can be concluded that the best model that can be used in this study is the Random Effect model. The data in this study were also normally distributed and free from problems of multicollinearity, heterocedasticity, and autocorrelation.

In Table 2, we can see the correlation between the independent variables used in this study. It can be seen that the correlation is quite high between *fee-based* income banks and variable numbers of ATM, CRM & CDM (Ec), *Brach* (Br), and SMS, *Internet* and *Mobile Banking* (Eb) Transactions. In addition, the variable number of ATMs, CRM & CDM (Ec) and *Branch* (Br) also has a fairly high correlation.

Based on the data in Table 3, them odel of the study had a significant F test showing the model was feasible. As well as the Adjusted R Square value of 0.534693 indicates that the independent variable (Ec, Eb & Br) can explain the dependent variable *fee based income* (Fee) of 53.4%, while the remaining 46.6% is explained by other variables that are not present and are not described in the model.

Table 2. Correlation of Research Variables

	Fee	Ec	Eb	Br
Fee	1.000000	0.723924	0.465108	0.501126
Ec	0.723924	1.000000	0.233241	0.760234
Eb	0.465108	0.233241	1.000000	-0.177379
Br	0.501126	0.760234	-0.177379	1.000000

Table 3. Goodness of Fit Test

R-squared	0.582828	**F-statistic**	12.10813
Adjusted R-squared	0.534693	**Prob(F-statistic)**	0.000038*

Table 4. Multiple Regression

Variable	Coefficient	Prob.
C	-4.388697	0.5127
Ec	0.001168	0.0039
Eb	0.002770	0.0004
Br	-0.001318	0.2270

Based on the results of the regression of panel data in Table 4 using the Eviews 10 application, the regression equation was obtained as follows:

Fee = -4.388697+ 0.001168Ec + 0.002770 Eb - 0.001318Br

Effect of ATM, CRM & CDM (Ec) amount on Fee based income (Fee)

The results of hypothesis testing concluded that ec has a positive effect on fee-based income. With a coefficient of **0.001168** units. The magnitude of the coefficient of positive value indicates that an increase in Ec of 1 unit will be followed by an increase in fee of **0.001168** units, with a probability value of 0.0039 less than 5%.

The test results of the effect of Ec on Fees are in accordance with hypothesis 1 (H1) which states that the number of ATMs, CRM & CDM (Ec) has a significant positive influence on changes in fee-based income. This study showed the same results as the research conducted by Le & Ngo (2020) and the research of Hadi & Nurjanah (2017).

Number of SMS, Internet, and Mobile Banking (Eb) Transactions against Fee based income (Fee)

The results of hypothesis testing concluded that Eb had a positive effect on Fees. With a coefficient of 0.002770 units. The magnitude of the coefficient that is positively valued indicates that an increase in Eb of 1 unit will be followed by an increase in fee of 0.002770 units, with a probability value of 0.0004 less than 5%.

The test results of the effect of Eb on Fees are in accordance with hypothesis 1 (H1) which states that the number of SMS, Internet and Mobile Banking (Eb) transactions has a significant positive influence on fee-based income. This study showed similar results with the research conducted by Dong, et al. (2020) and the research of Gumilang and Azib (2019).

Effect of Branch Amount (Br) on Fee based income (Fee)

The results of hypothesis testing concluded that Br had a negative effect on Fees. With a coefficient of -0.001318 units. The amount of the coefficient that is negatively valued indicates that an increase in Eb of 1 unit will be followed by a decrease in fee of 0.000972 units, with a probability value of 0.2270 greater than 5%.

The test results of the effect of Br on Fees are in accordance with hypothesis 1 (H1) which states that the number of Branches (Br) has a negative but not significant influence on changes in fee-based income. This research shows the same results as research conducted by Siagian (2020) which states that Branch has no effect on earnings before tax banks.

5. Conclusion, Suggestion, and Limitation

The results showed based on empirical data that the number of ATMs, CRM & CDM (Ec) had a significant effect on fee-based income. This indicates that banks earn significant revenue from the procurement of ATMs, CRM, and CDMs for customers. There is an increase in the number of machines every year, this is in addition to being a source of bank income, it can also be a form of service for customers.

The number of SMS, Internet and Mobile Banking (Eb) transactions has a significant positive influence on fee-based income. This shows that the development of internet-based banking service products has a tendency to increase every year and increase banking income in the form of fee-based income. Changes in the transaction pattern of customers who are getting used to making online transactions are an advantage for banks. Internet-based banking transactions make efficiency in the implementation of banking transactions so that they have fewer operational costs both for customers and for banks.

With the development of the digital era, banking must be able to provide practical solutions by developing digital products. With today's digital products providing a good income but by not being able to directly replace the old way (old-ways). Considering that internet penetration in the community is also still uneven, so not all customers can use internet-based products. So that banks still maintain the procurement of ATMs, CRM, and CDM for customers.

On the other hand, banks also need to pay attention to the new risks that may arise in these digital products, so that in addition to developing digital-based banking transaction products that are easy to use, they must also develop and ensure product security and backup due to technological failures such as reserves for credit risk.

The number of Branches (Br) has no significant

effect on fee-based income. This indicates that the number of branch offices in banks does not have an influence on fee-based income because banking fee -based income is more obtained from banking products, while the number of branch offices is more of a bank's operational needs and becomes a service center for customers. In addition, the Branch does not give an idea of the effectiveness of collection and distribution and by banks and the increase in the number of offices followed by the addition of costs makes the addition of the number of offices not always followed by an increase in profits.

Banks need to reconsider the strategy of reducing branch offices considering that the costs needed are quite high, while currently people have begun to move to more practical technology and transact cashlessly. So that it can carry out banking operational activities more efficiently.

This research has limitations on the object of research, which is only 5 commercial banks listed on the Indonesia Stock Exchange with a research period of 5 years. Banking fee-based income data is also still common, less specific to digital product services in banking, so data cannot be generalized. Based on the adjusted value of R^2, the three independent variables have an influence on Fee-based income by 53.46%%, while the remaining 46.54% is explained by other independent variables outside the model of this study.

Based on the limitations of the study, the next study is expected to add other independent variables, not only the Ec, Eb, and Br variables in influencing fee-based income banks. Fee-based income is better to use fee-based income data specifically according to each dependent variable. So the next study is expected to increase the number of bank samples and the research period.

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