

DOES COVID-19 PANDEMIC INCREASE THE USE OF CASHLESS BANKING DIGITAL SERVICES? THE CASE OF INDONESIA



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Abstract

Restrictions in covid-19 pandemic have increased the need for digital services in all sectors including the banking industry. The purpose of this study is to analyze whether there has been a changes in Indonesian banks services before and during the covid-19 pandemic. This study uses a quantitative method and non-parametric Wilcoxon tests, using secondary data taken from 180 Annual Reports from 45 banks listed on the Indonesia Stock Exchange (IDX) for the 2018-2021 period as samples. The results shows that there has been significant change in cashless mobile banking transactions during the pandemic. This research adds new insights into the latest developments and evaluation topic for banking companies.

INTRODUCTION

The development of banking services over the last ten years until now, has also been influenced by developments in financial technology. There has also been an increase in demand from bank customers to provide faster services. Banks are constantly pushed to keep up with the latest advanced technology, forcing them to continuously transform their systems and services (Laucereno, 2020).

First digital services of banks came from the adoption of computer technology and internet networks (Onay, et al., 2008). Currently digital technology is centered on mobile phones and internet networks. Because the level of use of digital application-based payment services depend on mobile devices since it is easier and more practical to carry out daily transactions (Ompusunggu & Anugrah, 2021). Mobile phones have become a communication tool and also help fulfill many daily needs, so banks are required to create innovations that can bring banking services directly into customers hands without the need for face-to-face meetings and make transactions more cashless.

Technology adoption in digital banking services has a positive impact on banking and society at large, such us increasing performance efficiency, reducing costs, and increasing public financial inclusion by helping banks to provide services without restrictions on place and time, provides real time information exchange, and improving customer convenience (POJK No.12/POJK.03/2018).

In the last two years, there has been a pandemic of covid-19 virus which causes a multidimensional crisis that impacts all sectors including banking performance (Fahrika & Roy, 2020). The banking system has always been at the center of the crises, both in 2008 and in the 1930s. Banking financial institutions are a very important measure of the health of a country's economy (Candera, et al., 2021). In the previous crises, banks were considered as part of the problem, but this time they are perceived as part of the solution. This approach increases the role of banks in the coronavirus crisis and the strategies adopted by banks influence the whole economy. The pandemic has changed the world economy entirely and impacted tremendously most businesses. The banking system plays an essential role in this situation because it is a key component from an economic point of view. In recent years, the banking system has adapted continuously it has been reinvented to keep up with customer expectations and the need for cost reductions.

The covid-19 pandemic has accelerated digitalization in the banking system although, the need for innovation and digital strategies have been an important factor in banking even before the pandemic had started (Marcu, 2021). In times of crisis, innovation really needed to survive so that the situation does not worsen and can recover. Recent study argues that digital banking services are the best solutions for problems the world facing today (Wikan, 2020).

During the pandemic, all industries including banking experienced a decline in financial performance, especially profitability as a driver of company value (Widiastuti et al., 2022). To overcome losses during the pandemic, banks have a good opportunity to be able to increase the revenue they get from digital services. E-banking transactions are much cheaper than branch or non-cash transactions so that they can continue to increasing bank income during the pandemic (Keivani et al., 2012). Previous researchers have also revealed that technology can encourage financial stability by increasing bank performance and resilience (Dadoukis, et al., 2021).

When a pandemic occurs, the existence of digital services in banks can keep the wheels of economy safe, and even continue to be pushed forward. Digital transaction is considered safer because there is no need to make direct physical contact between the seller and the buyer, thereby reducing the transmission rate of Covid-19. that technology can foster financial stability by boosting bank performance and resiliency

Covid-19 pandemic became the driving force for faster digitalization in the banking sector, outside of normal conditions. Bank Indonesia (BI) reported that digital economic and financial transactions in Indonesia continued to increase, as did the expansion of digital payments, and the acceleration of digital banking during the pandemic. The drastic increase in the use of digital services during this pandemic is in line with the Technology Acceptance Model (TAM) theory which states that there are Perceived Ease of Use (PEOU) factors that make people willing to accept new technology.

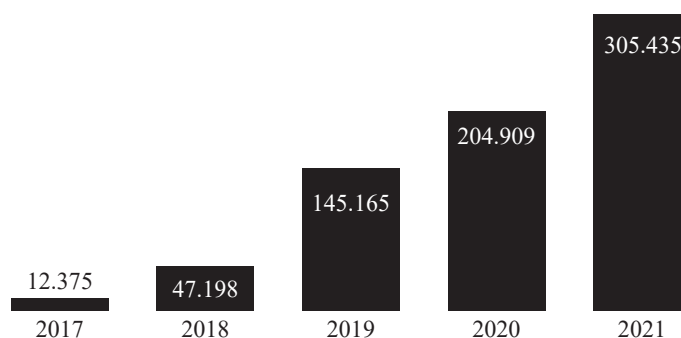


Figure 1. Growth of Digital Transactions in Indonesia 2017-2021

Source : Bank Indonesia

From Figure 1, it can be seen that every year, the value of digital payment transactions in Indonesian experiences significant growth from year to year. According to Bank Indonesia, this increase occurred in line with the rise of online shopping during the pandemic. Out of a total digital payment transactions of IDR 305.4 trillion, the transaction value of digital banking services reached IDR 3,468.4 trillion, growing 61.80% yoy in August 2021 (Walfajri, 2021).

From this increase the financial services authority of Indonesia (herein "OJK"), mentioned several digitalization challenges that must be faced by Indonesian banks during the pandemic (Intan & Aminah, 2022). First, due to social restrictions to prevent the spread of covid-19 virus, cause the need for face-to-face decreases, so that the need for digital interaction is increasing, and the need for banking services that are easy, fast, accessible in anytime and anywhere, so banks are required to quickly create excellent digital services for customers. Second, there is a change in people's expectations that are likely to be permanent, this will

bring disruptif effect that must bank anticipated. This changes also will create other potential new risks such as threats to customer data security and increase the risk of cyber crime.

Banking in Indonesia must be able to improve the quality and security of digital services in the future. Because most likely digital services will later become the main choice of customers. Because it can meet the demands of faster transaction needs and the development of technological sophistication in the future. The phenomenon of accelerated digitalization and the experience of disruption experienced by the banking industry during the Covid-19 pandemic can have an impact on the development of banking business models going forward which are important to explore. So this research wants to see how the development of digital services in Indonesian banking today, from before and during the Covid-19 pandemic.

From previous research, there is (Sang, 2021) which states that there have been changes in digital banking services and changes in customer behavior in various parts of the world, especially developing countries before and during the Covid-19 pandemic. Likewise with research (Khatun, et al., 2021) which reveals that digital services such as mobile banking can contribute to accelerating public access to finance but did not receive proper attention before the covid-19 pandemic. The study revealed that there was a change in the number of mobile banking customers which increased during the Covid-19 pandemic era.

The phenomenon of increasing digital services that occurred during this pandemic will become a research question in this study. And differences in the results of previous studies have created a research gap that prompted the authors of this paper to expand on previous research on digital bank services. The difference between this study and previous research is that it uses more samples of digital bank services with two data variations, namely delivery channels and total transactions. Based on previous description, the conceptual framework is formed as follows:

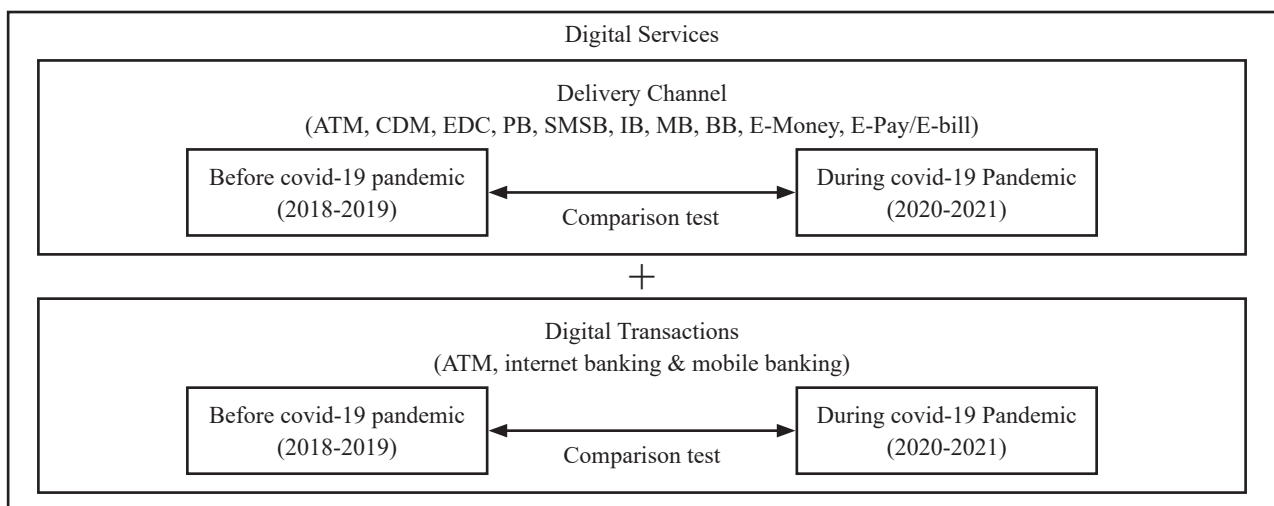


Figure 2. Conceptual Framework

From Figure 2, the conceptual frame work in this study can be seen, that there are one independent variable, namely digital services. Through two approaches with data on the number of delivery channels and digital transactions (ATM, internet banking and mobile banking). To see in general the condition of digital services in Indonesian banks, and to investigate whether there have been significant changes in digital banking services during the pandemic compared to the pre-pandemic period.

The contribution of this study that it is can provide new information & help show the development of digital service trends in banking companies in Indonesia. Updates in this research can also be used as a new reference for the development of science.

METHODS

This research employs quantitative method and using secondary data from various reliable sources. The population in this study are conventional banking companies including state-owned banks, regional banks, private banks and digital banks in Indonesia. The sample of this study is a bank listed on the Indonesia Stock Exchange.

This research instrument developed by adapting and combining several types of data from previous studies. The variables of this research are digital services, using indicator data of delivery channel that adapted from

Susanti (2019), Gusevi (2019) and Ahiadorme (2018). Then indicator data of Mobile Banking, ATM and Internet Banking transactions adapted from Alfatihah & B (2021), Mayasari, et al. (2021), and Arofany & Tandika (2019).

This study applies purposive sampling, which is a technique for determining the sample by considering certain criteria (Sugiyono, 2016). The data source is from the Annual Reports or Banking Financial Statements that have been listed on the Indonesia Stock Exchange for the 2018-2021 period which are available on the websites of each company. There is two types of samples were used in this study, with the following criteria :

Table 1. Sampling Criteria

Criteria	Samples
Banks that show data of their delivery channels services during the 2018-2021 period	45 Banks listed on the IDX
Banks that show data of digital service transactions during the 2018-2021 period	6 banks (BNI, BRI, BTN, BCA, CIMB-Niaga, BCA)

After selecting and matching data availability to examine bank digital services variable, the total sample used in this study was 45 banks for delivery channel section, and 6 major Indonesian banks for the transaction section. In the delivery channel data, this research will collect the number of index ratios to see the development of trends in the use of digital services, which will take the top 10 services from delivery channels in Indonesia, including ATM, CDM, EDC, Phone Banking, SMS Banking, Internet Banking, Mobile Banking, E-Money, branch offices and E-Payments based on POJK Number 12/POJK.03/2018. In the digital service transaction data to assess changes in the trend of cashless services, three services are taken, namely the number of ATM transactions, Internet Banking and mobile banking.

Table 2. Digital Delivery Channel Index Ratio Formula

Formula :
$\text{Digital Delivery Channel Index Ratio} = \frac{\text{Score obtained by the Bank}}{\text{Maximum Scor}}$
Example Index Calculation: Bank Central Asia = 10/10 = 1 or 100% Bank Jago = 6/10 = 0.6 or 60%

To illustrate, Table 2 shows if Bank Central Asia, out of 10 digital banking delivery channel services has an ATM it will be counted as 1, if it has an ATM and CDM it will be counted as 2, and so on. Then, if it has all services it will be counted as 10 then it will be converted into ratio and get 100%.

Then for digital transaction data from ATM, internet banking and mobile banking services will be obtained directly from the annual reports of 6 banks from 2018-2021 which are used as research samples. In this study, the comparison time will be separated into 2 periods before the pandemic in 2018-2019 and the pandemic in 2020-2021.

Because the sample size is small, data tended to be not normally distributed. Then the hypothesis test will be carried out using a non-parametric test which is another form of paired t-test, namely the Wilcoxon signed Rank test. The Wilcoxon test does not require data to be normally distributed and is used to analyze paired data under two different circumstances, which is suitable for research needs.

To measure how many changes have occurred in digital banking services in Indonesia, there is two hypothesis in this study, First, there was a change in the number of banking delivery channels before and during the Covid-19 pandemic. Second, there were changes in the number of ATM, internet banking and mobile banking transactions before and during the Covid-19 pandemic.

The presentation of the results of this study will be explained using descriptive statistics, and explain the results of the nonparametric Wilcoxon Test with SPSS version 27, to compare data and see changes that have occurred in digital services in Indonesian banking before and during the covid-19 pandemic.

RESULTS

The first result to be shown is the development of digital banking services, as seen from delivery channels data that has been collected. The number growth of banking delivery channel services in Indonesia during 2018-2021 is shown in the graph below:

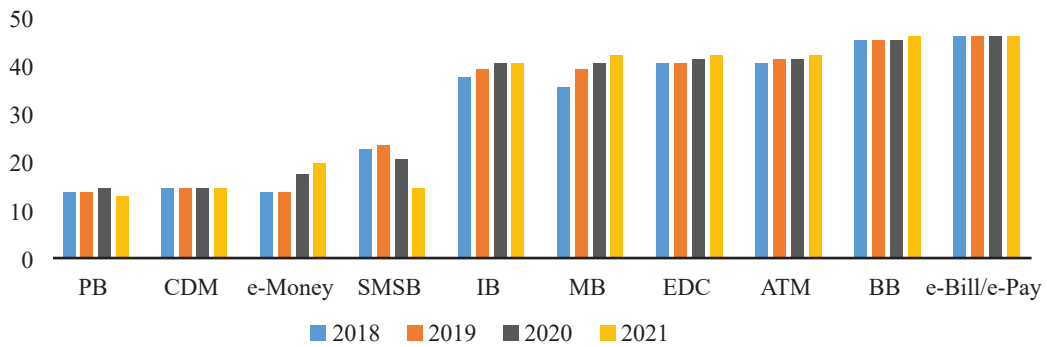


Figure 3. Graph comparison of bank delivery channels growth in Indonesia 2018-2019
Source: Data collected by researchers from 45 banks listed on the Indonesia Stock Exchange

Figure 3, shows that the top ten banking delivery channel services in Indonesia are experiencing different growth. The least service available at banks is phone banking, the most services available at banks are E-Bill/E-Payment services and digital services at Branch Banking. In 2020-2021 two years during the covid-19 pandemic, there was a big increase in mobile banking and E-Money. Other services, such as internet banking and EDC, experienced a steady increase from the previous year. Digital machine services such as ATMs have only experienced a small increase in numbers during the pandemic, and there are SMSB, CDM & PB services whose availability continues to decrease at banks.

General developments of banking delivery channels. It can be seen in descriptive statistics using average index ratio of delivery channel in Indonesian banks, below:

Table 3. Delivery channels Descriptive Statistics

	Mean	Std. Deviation	Minimum	Maximum
Delivery Channel Before Pandemic 2018-2019	.6744	.21440	.10	1.00
Delivery Channel During Pandemic 2020-2021	.6922	.19385	.10	1.00

Source: Data processing by researchers using SPSS

Based on the Table 3, it shows that maximum value shows 1.00 or 100% which means the most complete bank that has digital services in Indonesia, must have provided all the top ten delivery channels. Then minimum value shows 0,1 or 10%, which means banks in Indonesia have at least one digital service. Lastly pointing to mean value, in general Indonesia banks have six digital services, with the average digital service in Indonesia increasing during the pandemic by 1.728 (0.6922-0.6744) or the change is close to 2%. It means that on average, banks has added one or two digital services during pandemic.

The next case, we will see the growth of digital transactions that seen from top three digital banking services in Indonesia. It is mobile banking, internet banking and ATM services. The development of ATM, internet banking and mobile banking transactions in Indonesia in 2016-2021 can be seen in the graph below:

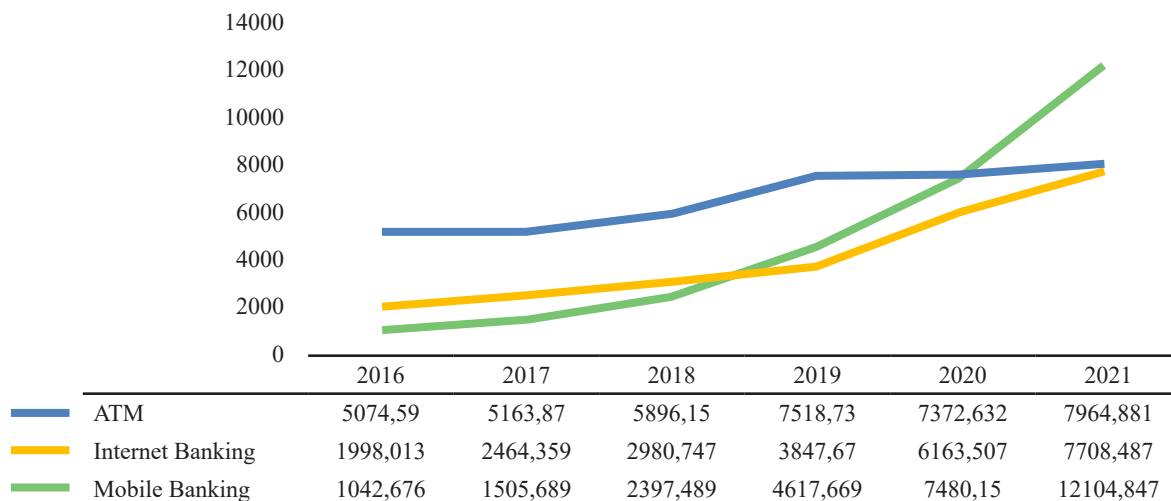


Figure 4. Growth of ATM, Internet Banking and Mobile Banking transactions in Indonesia 2016-2021

Source: Data collected by researchers

It can be seen in Figure 4. That growth of ATM transactions, was always in the top position as the most transactions made from 2016 to 2019 and always increase from year to year. However, in 2020 when the covid-19 pandemic spread in Indonesia, there was a significant decrease in ATM transactions, surpassed by cashless digital services. That can be seen from mobile banking transactions which have increased rapidly in 2020-2021. A large increase also occurred in internet banking transactions in 2020-2021 which have become close to the growth of ATM transactions. General developments of digital transactions in MB, IB and ATM. It can be seen in descriptive statistics below:

Table 4. Descriptive Statistics Amount of transaction of MB, IB and ATM

	N	Mean	Std. Deviation	Minimum	Maximum
Total transaction of Mobile Banking 2018-2019	6	584.5965	1138.60543	3.05	2890.00
Total transaction of ATM machiness 2018-2019	6	1117.9067	1248.12474	26.55	3023.00
Total transaction of Internet Banking 2018-2019	6	569.0348	951.47087	.86	2386.00
Total transaction of Mobile Banking 2020-2021	6	1632.0831	3246.34116	19.70	8215.00
Total transaction of ATM machiness 2020-2021	6	1278.1261	1559.49889	16.20	3992.50
Total transaction of Internet Banking 2020-2021	6	1155.9995	1724.31422	2.88	3758.00

Source : Data processing by researchers using SPSS

Based on the Table 4, the Mean value of three digital banking service transactions in Indonesia shows that mobile banking transactions two years before pandemic in 2018-2019 were 584,59 million transactions, then two years during the pandemic in 2020-2021 were 1.632,08 million. This is shows that mobile banking transactions in Indonesia experienced a large increase during the covid-19 pandemic which reached up to 1.047,49 (1.632,08-584.59) million transactions. Mobile banking transactions in Indonesian have tripled during the pandemic.

From ATM transactions in 2018-2019 it was 1.117,91 million, then in 2020-2021 it was 1.278,13 million. This is shows that ATM transactions in Indonesia was slightly increased during the covid-19 pandemic reached up to 160.22 (1.278,13-1.117,91) million transactions.

From internet banking transactions in 2018-2019 it was 569.03 million, then in 2020-2021 it was 1.156 million. This shows that internet banking transactions in Indonesia for the 2018-2021 period that there was slightly increased of internet banking transactions during the covid-19 pandemic reached up to 586.96 (1.155.99-569.03) million. Internet banking transactions in Indonesian have doubled during the pandemic.

From these descriptive statistics results, it can be seen that the biggest change occurred in mobile banking services which large increase with an additional 1.047,49 million transactions, the smallest change occurred in ATM service which slightly increased with an additional 160.22 million transactions during the covid-19 pandemic.

Then, to prove whether there has been a significant change in the number of delivery channels and the number of banking cashless service transactions, a statistical comparison test will be carried out, by comparing samples from the two years before and two years during the covid-19 pandemic.

To see the developments and significance changes in the banking digital service measured by delivery channels, it was tested using Wilcoxon nonparametric test which compares the index ratio of the top 10 digital services in Indonesia. It can be seen in the Table 5 and 6 below:

Table 5. Delivery channels Wilcoxon Signed Ranks Test

		N	Mean Rank	Sum of Ranks
Delivery Channel Before and During Pandemic	Negative Ranks	16	18.25	292.00
	Positive Ranks	23	21.22	488.00
	Ties	51		
	Total	90		

Source: Data processing by researchers using SPSS

As presented in Table 5, using Wilcoxon Signed Ranks Test for delivery channels, there are 16 Negative Ranks, 23 Positive Ranks and 51 Ties. It means that there are 16 digital services that experienced a reduction and according to the findings, most banks reduce their digital services that are no longer used by the public such as SMS banking and phone banking. Then there are 23 digital services that have been added, based on the findings, most all these banks add mobile banking and e-money services during the pandemic. Next there are 51 digital services that remain the same before and during pandemic. It means that in general banks in Indonesia already have provided many types of digital services even before pandemic appeared.

Table 6. Delivery Channels Wilcoxon Significance Test

	Delivery Before and During Pandemic
Z	-1.459
Asymp. Sig. (2-tailed)	.145

Source: Data processing by researchers using SPSS

As presented in Table 6. The Wilcoxon test statistic value is -1.459 and significance 0.145. The significance level obtained is bigger than 0.05 ($0.145 > 0.05$). So, it can be concluded that first hypothesis is rejected. The result is there are no differences in digital services measured by delivery channels before and after the pandemic.

To see the developments and significant changes in digital banking services measured by transactions, it was tested using Wilcoxon nonparametric test which in this study compares three digital services of ATM, Mobile banking and internet banking transactions. It can be seen in the Table 7 and 8 below :

Table 7. Mobile Banking, Internet Banking & ATM Transactions Wilcoxon Signed Ranks Test

		N	Mean Rank	Sum of Ranks
Total transaction of Mobile Banking before – during covid-19 Pandemi	Negative Ranks	0	.00	.00
	Positive Ranks	6	3.50	21.00
	Ties	0		
	Total	6		
Total transaction of ATM before – during covid-19 Pandemi	Negative Ranks	3	2.67	8.00
	Positive Ranks	3	4.33	13.00
	Ties	0		
	Total	6		
Total transaction of Internet Banking before – during covid-19 Pandemi	Negative Ranks	2	2.50	5.00
	Positive Ranks	4	4.00	16.00
	Ties	0		
	Total	6		

Source : Data processing by researchers using SPSS

Based on Table 7, Wilcoxon Signed Ranks Test shows that Mobile Banking transactions get 0 Negative Ratings, this indicates there is no decrease in mobile banking transactions at Indonesian banks, then 6 Positive Ratings which indicate that there are six banks that have increased their mobile banking transactions.

In ATM transactions, there are 3 Negative Ratings indicating that there are three banks that experienced a decrease in ATM transactions, then there are also 3 Positive Ratings indicating that there are three banks that experienced an increase in their ATM transactions. Then Internet Banking transactions get 2 Negative Ratings, this indicates that there are two banks that experienced a decrease in internet banking transactions at Indonesian banks, then 4 Positive Ratings indicate that there are four banks that experienced an increase in internet banking transactions. The three digital services show a value of 0 Ties, this shows that there are no banks in Indonesia that have stagnated digital transactions during the covid-19 pandemic.

Table 8. Mobile Banking, Internet Banking & ATM Transactions Wilcoxon Significance Test

	Z	Asymp. Sig. (2-tailed)
Total transaction of Mobile Banking before – during covid-19 Pandemi	-2.201 ^b	.028
Total transaction of ATM before – during covid-19 Pandemi	-.524	.600
Total transaction of Internet Banking before – during covid-19 Pandemi	-1.153	.249

Source : Data processing by researchers using SPSS

As presented in Table 8. The results of the Wilcoxon statistical test show that total mobile banking transactions show a significance value of 0.028 which is smaller than 0.05. So it can be decided that the second hypothesis is accepted for mobile banking services. It means that there are significant differences in mobile banking transactions in Indonesia before and during the covid-19 pandemic.

Total ATM transactions show a significance value of 0.60 which is greater than 0.05. So it can be decided that the second hypothesis is rejected for ATM services. It means that there is no significant difference in ATM banking transactions in Indonesia before and during the covid-19 pandemic. Total internet banking transactions show a significance value of 0.249 which is greater than 0.05. So it can be decided that the second hypothesis is rejected for internet banking services. It means that there is no significant difference in internet banking transactions in Indonesia before and during the covid-19 pandemic.

DISCUSSION

Based on the test results, the following results were obtained. First, there are no significant change in the number of delivery channels before and during the Covid-19 pandemic, but the average growth trend for bank digital services has increased. From top 10 types channels, the average bank has at least 6 channels. During the pandemic average banks in Indonesia add two new digital services, which is seen from the delivery channel graph, those two services that are rapidly increasing are mobile banking and internet banking, which are more cashless and do not require a physical presence to use them. From the results of the delivery channel test, it is shown how trend of Indonesian digital banking services has changed in the past four years. It is known that the availability of several types of delivery channels at each bank are different, possibly due to internal conditions, demand and customer characteristics of each bank are also different.

Second, there are significant differences in mobile banking transactions in Indonesia before and during the covid-19 pandemic, but there are no significant differences in ATM and internet banking transactions. These results support the TAM theory with the perceived usefulness factor which states that acceptance of a new system or technology is based on the usefulness that obtained by users of digital services (Sang, 2021).

This study also provides information that the development of digital service transactions in Indonesian banks shows a large increase in mobile banking transactions and there are significant changes before and during the covid-19 pandemic. Bank digital services whose increased the most were cashless mobile banking services. Mobile banking transactions in Indonesian have tripled during the pandemic.

The internet banking transactions have increased but there is no significant change. Then different changes are experienced by ATM transactions that have slightly increased from the previous year, and during the pandemic was surpassed by mobile banking transactions. However, disruption of digital services that still require physical presence has been seen from the growth of ATM transactions that getting smaller and transactions of mobile and internet banking that getting bigger year by year. The pandemic has accelerated the process of disruption to the digital banking services that still require physical contact (Yogatama, 2021). It can be seen from one of digital services that have been used by many people and have been around for a long time, such as ATM machines which began to decline, especially during the pandemic. It has been replaced by mobile banking and internet banking, their transactions increase rapidly, even surpassing other digital services.

This cashless disruption can also be seen in the number of ATM and Mobile Banking users. Before the pandemic mobile banking has 4.904.616 users, during the pandemic there were 9.373.032 users. This means that there was an 91,11% increase in mobile banking users during the covid-19 pandemic, with 4.468.417 users. While ATM has 19.085 users before pandemic and it decreased to 15.377 users during the pandemic. This means that there has been a reduction in ATM users during the covid-19 pandemic decreased 19,43% with 3.707 users. The biggest changes occurred in mobile banking users who experienced an increase in users, and ATM machines which experienced a decrease in users during the covid-19 pandemic. The number of atm users and atm machines which continues to decrease year by year, while mobile banking users increase doubled during the pandemic.

This phenomenon occurs perhaps because of the demands from everyone who currently fulfills their daily needs using a smartphone, and with the lockdown social restriction policy during the pandemic, as well the need to prevent the spread of the virus through cash, so customers need services that are easily accessible without having to go to the bank. Users from the millennial generation also think that the benefits of technology are more prioritized during a pandemic like this (Musyaffi et al., 2022). So it can be said that the covid-19 pandemic has encouraged banks to provide more cashless digital mobile banking services for customers.

Before the pandemic the use of bank digital services was considered only as a complement, not a substitute for physical branches (Hernando & Nieto, 2007). However, this assumption has changed during the pandemic era, which can be seen from the changes that have occurred. However, it should be noted that with the increasing use of multiple delivery channels in bank services, they should not only have to focus on technology in developing their digital services, but also have to develop their new digital business models. Because with the emergence of changes and new habits during the pandemic, which are likely to have long-term impacts, new strategies are also needed going forward.

This is what needs to be strived for to complement each other between digital services and banking access. (Omarini, 2013). A good cashless digital service strategy will also improve bank performance. (Ben Uche, et.al., 2022). This study is in line with (Obeidat et al., 2021; Soko & Harjanti, 2022; Fuad et al., 2022 ; Sullivan & Widodoatmodjo, 2021 ; and Palupi & Izzalqurny, 2021) research that supports the idea that there have been changes in banking performance before and during the covid-19 pandemic, in this study the focus variable was banks digital services especially in Indonesian banks the biggest change occurred in mobile banking services. Then, this study is in line with (Kustina & Sugiarto, 2020; Riftingasari & Sugiarti, 2020; Sugiharto, et al. 2021) research which showed, that there was no significant change in bank performance before and during the covid-19 pandemic, in

this study the variable was Indonesian banks digital services especially in general delivery channel, ATM and internet banking. From these results, it can be seen that the more efficient and cashless service was chosen by bank customer today. Because it helps prevent the spread of the virus and increases public safety. This condition can change the banking digital services trend in the day ahead. So it is important for Indonesian banks to improve their digital services as well keep up with technology developments and changes that occur.

CONCLUSION

Based on the analysis, this study provides two results. First, there were no significant changes found in digital banking services as seen from the number of delivery channels before and during the Covid-19 pandemic. This shows that during the pandemic, banks in Indonesia generally did not added their delivery channels. Because digital banking services in Indonesia has been growing since before the pandemic. Digital services in Indonesian banks are still employee service oriented at branch offices, but this has begun to shift with the development of more cashless digital self-service during the pandemic. This is supported by the second result.

Second, result shows that there was a significant change in the number of mobile banking transactions before and during the Covid-19 pandemic. But not at ATM & Internet Banking. These results show that there has been an increase in cashless digital transactions during the pandemic. This is possible because it meets customer needs when mobility restrictions occur during a pandemic and it is safer to use to prevent the spread of the Covid-19 virus. ATM services that still require a physical presence to use are no longer used much differently than before the pandemic.

The author's recommendation for the banking industry in Indonesia is to develop better digital services going forward to support economic recovery after the Covid-19 pandemic. Judging from the trend developments during the pandemic, digital cashless services have the opportunity to become customers' top choice of services in the future. This is because digital services encourage faster economic transactions and can replace services that are less efficient. Therefore, banks must continue to develop and adapt in the face of change.

The limitation of this research is that this research was only conducted in Indonesia. Due to data limitations, this research uses several types of digital service data to strengthen the analysis. For academics who carry out further research, they can develop research methods with different approaches such as conducting interviews and surveys to increase the scope and variety of research data, also add other new variables or compare digital services in Indonesia with other countries in the world. To get broader results about the impact of digital services on banking and to find out the problems that will be faced by banks in the future, so that research can help find the best solution.

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