HOW DOES THE QUALITY OF MOBILE
BANKING APPLICATION AFFECT THE
BANK DEPOSITS

by

Maksym Ivanov

A thesis submitted in partial fulfillment of the
requirements for the degree of

MA in Business and Financial Economics

Kyiv School of Economics

2021

Thesis Supervisor: <u>Professor Helena Besedina</u>

Approved by _____
        Head of the KSE Defense Committee, Professor

        _____

        _____

        _____

        Date _____

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

NBU National Bank of Ukraine

UAH Ukrainian Hryvnia (the official currency of Ukraine)

IT Information Technology

CHAPTER 1. INTRODUCTION

The world economy has undergone great changes that have been associated with the merging of IT, telecommunications, and innovation. It is these technological changes that have led to the emergence of such concepts as "digital economy", "digital technology" and others.

Digitalization is an important direction for the development of all spheres of the Ukrainian economy, including banking. To date, banking institutions are in a state where they need to constantly improve their products and services and switch to digital services to remain competitive.

Mobile Internet is of particular importance both for the bank and the customer, because with its help it is possible to cooperate with the bank at any place and time. It is with the help of mobile applications that banks have the ability to adjust to customers, thereby increasing the number of customers as well as financial transactions.

In the process, the impact of the digitalization of the economy as the development of mobile applications on the banking system has been identified. Also highlighted the model of the impact of the quality of mobile applications on the financial performance of the banking institution.

The last few years can be called very successful for the Ukrainian banking market. After the so-called "bankfall" between 2014 and 2016, there was more than enough room for the rest to develop.

The coronavirus pandemic also had a strong impact on the development of the banking and other sectors related to the provision of services to individuals. After people were asked not to go out or at most not to gather in groups to avoid infection, banks had a

need to attract customers without physically showing up at the branch. Bank ID technology was already available in Ukraine at that time.

The Bank ID System of the National Bank of Ukraine allows individuals to get more convenient and secure access to public and financial services that can be provided remotely and require identification. Thanks to this system, individuals who already have accounts in other banks (which are members of this system) can open an account in another member bank of the system without physical contact with the bank. Such an opportunity gave not only an influx of clients to the banks, but also expanded the opportunities for the users themselves. People who hadn't thought about actively using banking applications before were forced to at least try it.

Since most of a person's needs can be met with a phone these days, banking apps also provide not only the ability to keep track of their assets, but also often to conduct financial transactions.

In a time of self-isolation, people have begun to use their banking apps even more often than social media. In November 2020, a survey in the UK showed that three out of five respondents had their bank app installed, while Facebook was installed in only half of the cases.

This makes sense, because although we all need to keep in touch socially, we have to pay for most of the services people need. In such an active cycle of events as we are today, this requires keeping a constant finger on the pulse and having a proper understanding of personal finances.

In this light, many banks in the marketplace in Ukraine and beyond have begun to think about putting more emphasis on services provided remotely. And despite the significant economic problems caused by the coronavirus pandemic, banks could continue to attract customers in more innovative ways than cold calls and face-to-face meetings.

The main purpose of this study is to understand the reasons for the growth of attractiveness of banks' services for users on the Ukrainian market. What did the success of such projects as Privatbank and Monobank depend on? What was more important: efforts of employees responsible for creation of mobile application that users liked so much or competent approach of marketing campaign? Or maybe it was both in equal measure.

We hope that this research may be useful for startup investors, fintech startups, and banks already operating in the Ukrainian and other similar markets.

CHAPTER 2. INDUSTRY OVERVIEW AND RELATED STUDIES

As of May 1, 2021, 73 banks operate in the Ukrainian market. Almost half of them (45%) have foreign capital, and about a third (31.5%) are subsidiaries of foreign groups.

This situation can be explained by the fact that from 2014 to 2017 banks were actively leaving the market. And the active closing of banks was associated with the mass liquidation of small and unreliable banks. In just 3 years, more than 100 banks were closed.

Despite the broken confidence in the Ukrainian banking system, many experts agree that it has been restored over time. This can be judged at least by the 18% increase in term deposits and, in particular, by 25% increase in demand deposits.

Figure 1. Number of banks in Ukraine
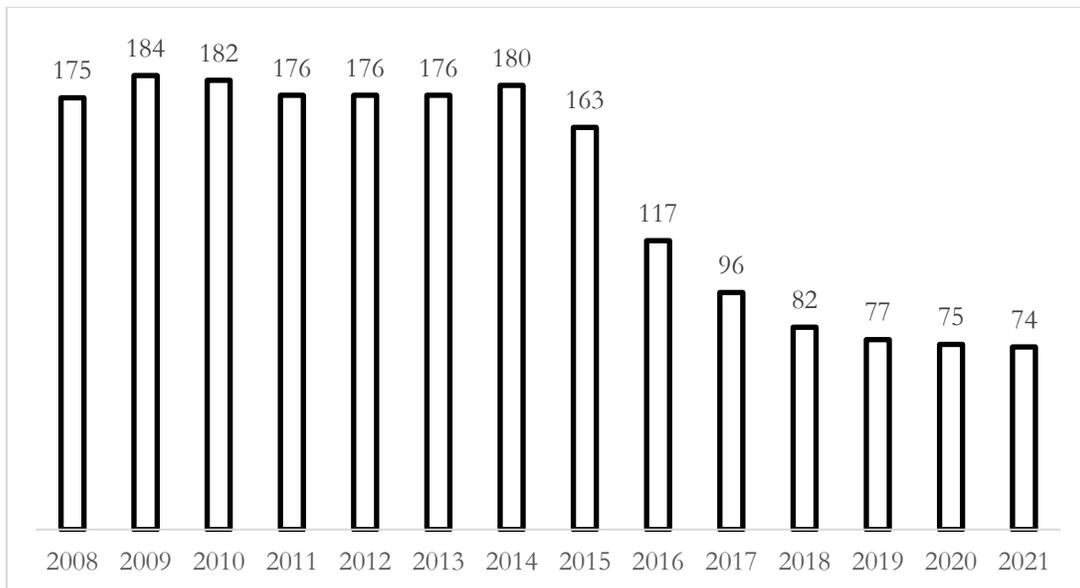
Source: National Bank of Ukraine

Enough time has passed since the significant contraction of the banking system and now there are no such fluctuations in the number of banking institutions.

In turn, banks and customers have a mutual need for high-quality software that would help even customers who are not skilled in interacting with technology to connect and start using it.

The result is evident in these numbers:

Vladimir Moskalenko, director of the department of e-commerce and payment instruments of Oshchadbank, 4 million clients have already connected to Oshchad 24/7, application of one of the largest Ukrainian banks, which is 61% of all active cardholders of the bank. 70% of their digital customers use exclusively the mobile application, 15% use only the website, and another 15% combine both products.

No less important is another indicator - the number of those who not only joined the new channels, but also actively uses them. According to the Digital Business and Distance Channels Development Department Director of PUMB Mikhail Sergienko, almost 40% of PUMB's customers regularly use digital service channels. It is expected that in 2020 the number of digital customers will exceed 50%.

For Privat24, the mobile application of Ukraine's largest bank by the number of clients, the situation has also improved. If before the pandemic the program was downloaded 15,000 times, in 2020 this figure has increased by 5 times and reached 75,000 downloads per day.

Even banks that had not previously used mobile banking as a major way to attract new customers were now forced to invest in this area in order to keep up with the market leaders. However, despite all efforts, the pandemic has accelerated the leaders' breakaway, as they have also focused on this segment. The fact is that the pandemic accelerated not only the digitalization, the digital processes in the banking system, it

accelerated the processes and digitalization of society as a whole. Even those users who previously did not use mobile applications and were forced to switch to them at first, then still got used to them and decided to use them on a regular basis.

It's not hard to understand if a bank has a problem with digitals, because this channel has an established feedback channel - reviews in the App Store and Play Market, two of the most popular app stores. From the ratings and feedback, you can see what needs improvement and how satisfied users are with the overall performance of the program.

The problem, however, for many of even the larger banks was that they hadn't invested enough time and money in mobile apps before because they were used to a different business model. In what many are calling the year of the black swan, this proved to be the wrong decision.

The fact is that many banks do not have the application at the moment, as you can see in the Figure 2.

Figure 2. Share of banks that have mobile apps
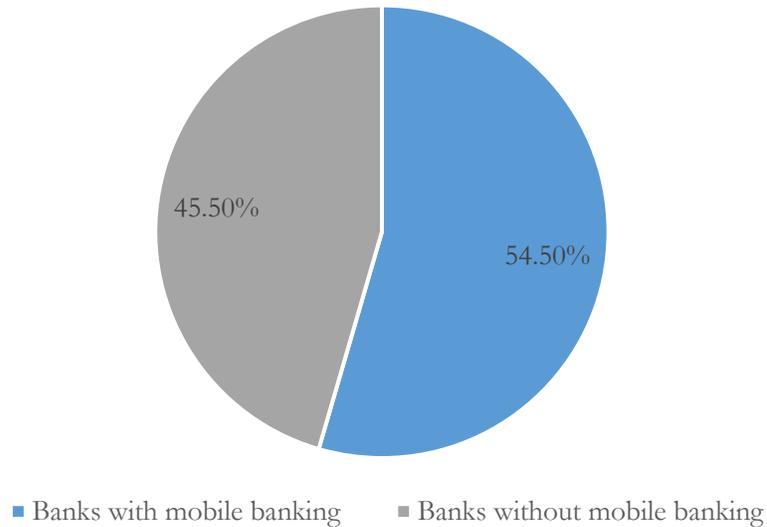
Source: minfin.com.ua

Despite the fact that many restrictive measures have already been lifted and branches are already working at full capacity again, many people no longer need such a thing, having learned in the process of self-isolation to satisfy almost all their needs directly through the internet or mobile application.

As it turned out, the coronavirus crisis was the first in the history of Ukraine, which did not contribute to the outflow of customers' funds from banks. People did withdraw cash in the first two weeks of the crisis, but as banks had high liquidity ratios and instilled confidence in depositors, this trend quickly came to an end. Moreover, during the pandemic the deposits among the population grew by 26.5%, and business funds in hryvnia grew by 35%.

The pandemic of past years showed that not all banks were prepared for such circumstances. Due to abrupt quarantine closures of a large number of institutions, banks during the pandemic closed about 25% of offices for the time being, the other part of the offices continued to work on reduced working hours and for compliance

with quarantine restrictions. However, according to the survey conducted among customers of banks in Ukraine, which was discussed above, we can see that most of the surveyed customers noted that after the pandemic will continue to actively use online banking, that is remotely through mobile applications, online banking, and chat bots. We can see this in the increase in the relative numbers of mobile app users, online banking users, and chat-bot users.

We can also pay attention to the fact that the total amount of assets of banks continues to grow despite a rather difficult year 2020 due to the above mentioned reasons. This trend can be traced in the Figure 3.

Figure 3. Total Assets of Ukrainian Banks, trillions UAH
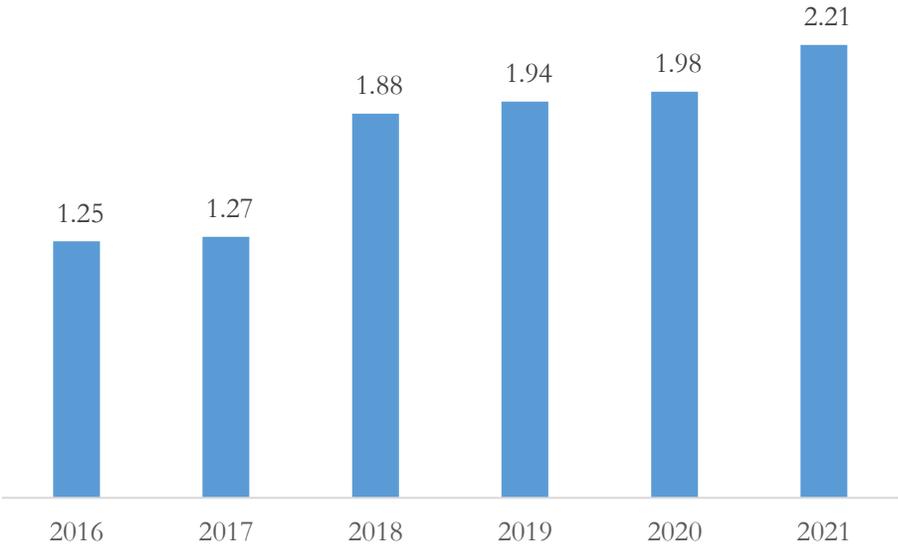
Source: National Bank of Ukraine

It is also necessary to point out that there are almost no other studies on this topic. This is primarily due to the fact that there is a problem based on the difficulty of collecting the data needed for the relevant analysis.

The problem with the analysis of similar studies was that this issue is mostly not raised in articles of an academic nature. Rather, various industry representatives write on this topic in forums or on personal pages of social networks: start-ups, investors, and simply employees of the IT departments of banks.

CHAPTER 3. METHODOLOGY

Not everyone looks at app reviews on the App Store and Play Market, but every company that depends on customer impressions and needs to monetize them does. It is in the role of such a company that all banks in Ukraine in 2020.

In the course of the study, several hypotheses were proposed:

H1: The amount of funds raised per period depends on the quality of the application.

H2: The quality of the application depends on the size of the bank.

The first hypothesis will help to better understand this market in terms of investment feasibility.

The second hypothesis will help to better understand which players are currently the main players in the market and the main reasons for their digital success and customer satisfaction.

This study used data from 31 banks. They were selected according to several characteristics that the author considered important

3.1. Data collection

The data was collected primarily from the Play Market and App Store, the two most popular phone app stores. In the case of app review analysis, it is divided into two parts:

- First, app reviews are collected and the number of stars (the user's overall evaluation of the app) is calculated

- Also, to simplify things a bit, we can assume that reviews with 5 and 4 stars are positive. In this case we can calculate the share of such reviews and use in the study.

- From the official report of the NBU with monthly data on the results of banks and the current state of their assets we can find information about the costs of renting premises.

- From the same reports the information about the banks' advertising and marketing expenses was taken.

- Keywords and topics are searched. In this case, the search included words and phrases such as "absent", "terrible", "fine", "excellent", "bad", and "doesn't work".

Initially the idea was to find data simply on the number of branches of each bank in different periods, but it was soon decided that such an indicator could be replaced by information on the costs of renting premises. The fact is that its use is more convenient for several reasons:

First, it takes into account the location of the branch. Branches in residential neighborhoods can be cheaper than downtown, which affects the efficiency of their work.

Secondly, it seemed difficult to collect data on the number of branches each quarter, and data on the rental of premises can be extracted from official reports.

3.2. Data description

Since many users at banks who previously did not pay much attention to mobile apps started using them only recently, in many cases most of the reviews were left after the beginning of 2020. It's also important to take into account that users who have had negative experiences are more likely to leave reviews than those who have been satisfied.

3.3 Data preparation

Since the report data in the NBU are collected in separate files depending on the period, it was necessary to collect all the data in one database. Thus, several indicators were taken.

The data were also taken from the Play Market and Appstore using the Appbot service. Since each bank has at least two applications (for iOS and Android), it was necessary to collect the data in one table.

The data, which usually in NBU reports refers to the "Financial Results" section, started from zero each year. Thus, it was necessary to create additional variables in order for the data to show exclusively the banks' results for each individual period.

3.4 Empirical model

The first model as the dependent variable Y contains the change in the amount of demand funds of individuals in the last quarter. A linear model was used because the relationship is linear.

Thus, the model looks like this:

$$Y_{i,t} = \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \varepsilon$$

Where i – bank

t – quarter

x1 - average rating of the bank's application in the last quarter. A positive indicator is expected, which will show the impact of the application's current rating on the amount of funds raised by individuals during the last quarter.

x2 - number of reviews in the last quarter. Introduced to test the effect of user activity on the amount of funds raised. A positive sign is expected.

x3 - share of positive reviews for the last quarter. A positive indicator is expected. This indicator was chosen to determine the impact of positive feedback left over the last quarter on the amount of client funds raised over the same period.

x4 – ratio of advertising and marketing expenses in the last quarter to the assets of the bank in the same period. Advertising and marketing costs were taken to check their impact on the volume of funds raised by individuals. The data is taken from the same period, since the overwhelming majority of advertising expenditures come from the Internet segment, where there is an instant conversion. A positive indicator is expected.

x5 – the ratio of the bank's payroll expenses to the bank's assets. A positive sign is expected. The implication is that the higher this indicator, the higher the motivation of employees.

For the second model, a measure of bank assets was taken and the relationship between the size of bank assets and the application rating was analyzed.

This model is a one-factor model.

$$Y_{i,t} = \beta_1 x_1 + \varepsilon$$

Where i – bank

t – quarter

x1 - the size of the bank's assets for the period under study. A positive indicator is expected.

The dependent variable in this case is the application rating for the period under study.

The second model is investigated in order to confirm or refute the second hypothesis.

In case bank assets do affect the application rating, it will mean that cases like Monobank are exceptions to the rule.

CHAPTER 4. DATA

Data was collected on app reviews for 31 banks for 21 quarters, beginning in Q1 2016 and ending in Q1 2021. The 31 banks have 65 mobile apps.

Figure 4. Number of reviews of banking applications by year
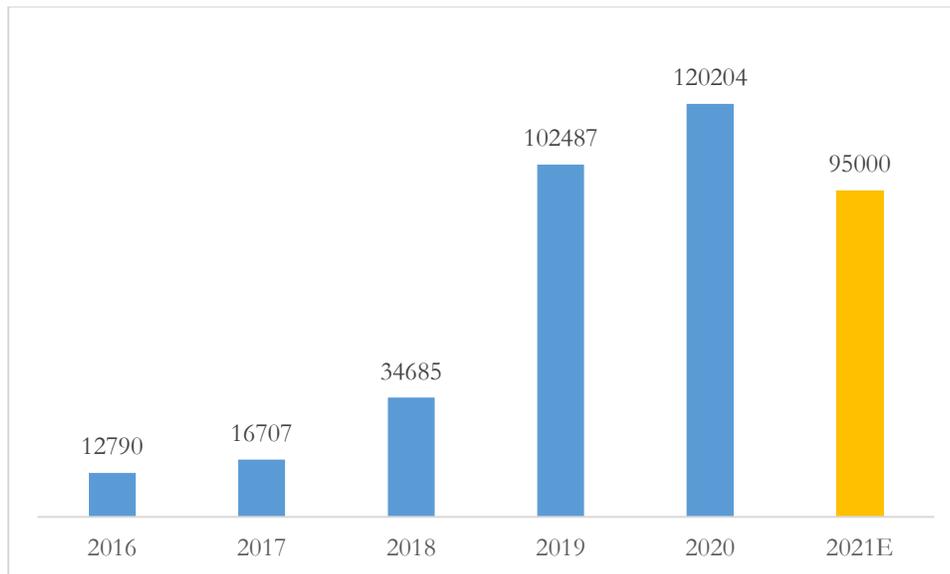
Source: Appstore, Play Market, Researcher Estimates

As you can see in Figure 4, the largest increase in the number of recalls came in 2019 (+195%). At the same time, for 2020, the pandemic is only +20%. This could mean that for 2019, the most money was invested in attracting customers to mobile banking apps. The year 2021 so far shows a decrease in the number of recalls to banking apps. It can be hypothesized that during the pandemic, people tried different banking apps and in 2021, having already decided on a choice if necessary, write reviews only for those apps that they use on a regular basis.

Figure 5. Distribution of user ratings in 2016
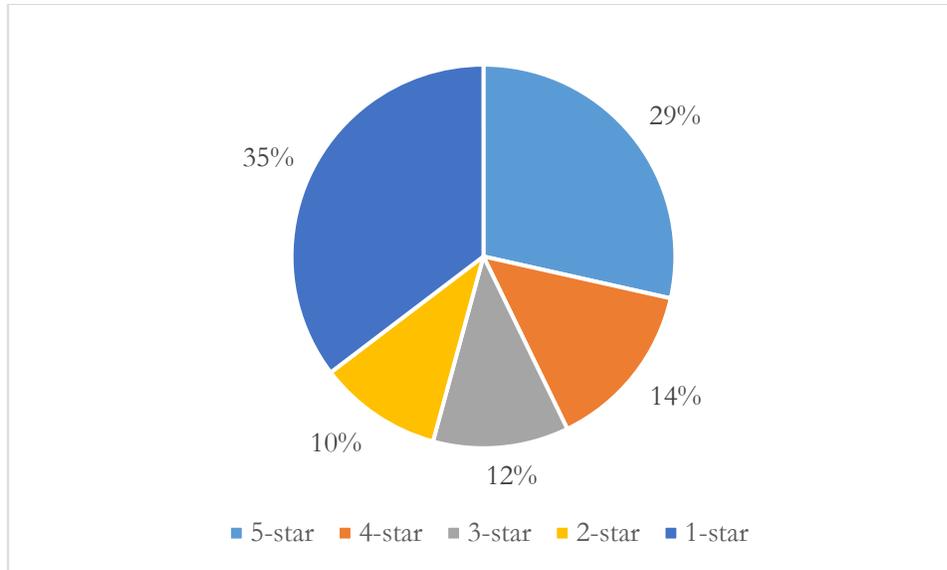
Source: Appstore, Play Market, Researcher Estimates

As we can see, in 2016 (Figure 5) users were extremely dissatisfied with the quality of software developed by banks. The largest specific weight is the minimum rating of 1 (35%). It is important to understand that this also indicates that the technical support was also at a very low level. According to the XM institute report on ROI of Customer Experience, about 80% of users are ready to forgive the shortcomings of an application if they like the technical support.

Figure 6. Distribution of user ratings in 2019
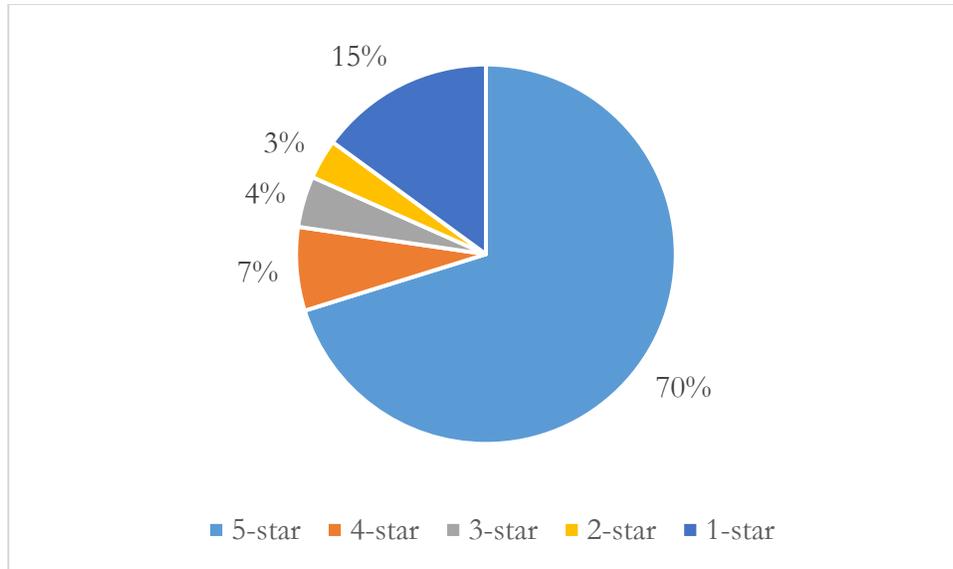
Source: Appstore, Play Market, Researcher Estimates

Among these 65 applications, they were divided by category of evaluation in Google market and App Store. During the period, we observed a positive characteristic of the number of apps with a 5-star rating (Figure 6) - more than half of the total number of apps (71%). The remaining 29% are split between apps with a 4-star rating (9%), apps with a 3-star rating (6%), apps with a 2-star rating (3%) and apps with a 1-star rating (11%). The apps that ranked lowest part in the ranking could be created by banks due to the trend of increasing growth in liabilities thanks to apps, but the lack of investment in the app made it impossible to achieve the same results as for other banks.

Figure 7. Average scores of banking apps by feedback received during the year
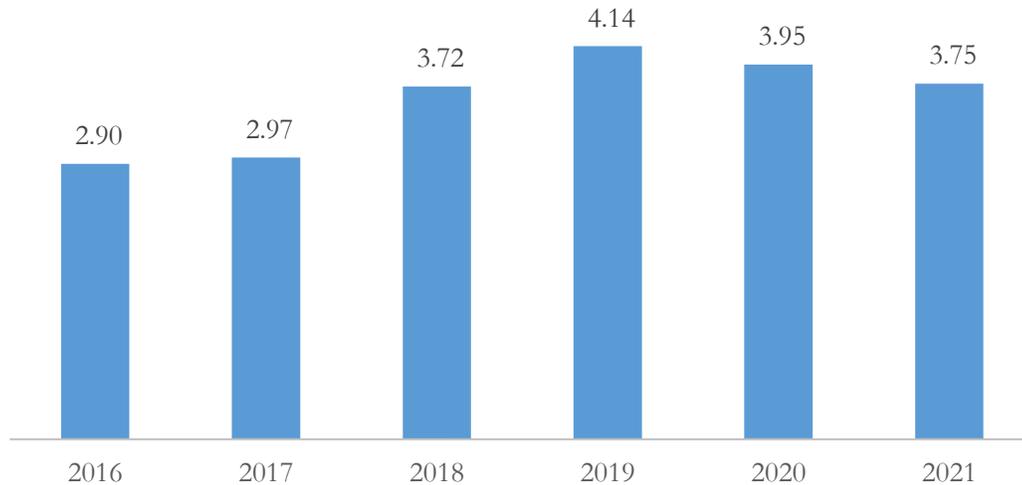
Source: Appstore, Play Market, Researcher Estimates

Figure 7 shows the average rating for all banking apps over the year. As you can see, this indicator showed strong growth in 2018 (more than 25%). It peaked in 2019 and went down again in 2020. There is no objective evidence as to what could have caused this. However, we can assume that up to and including 2019, there was a natural increase in the quality of mobile apps from banks, which had an impact on user satisfaction. Since the beginning of the quarantine period in Ukraine in 2020, users who previously preferred other ways of interacting with banks were also forced to start using mobile software. This led to people not understanding the complex apps leaving disappointed reviews.

The second group that lowered the overall ranking of banks apps were people who faced the need to use mobile banking apps that were not designed for important functions. Many companies for the sake of minimizing costs and other goals for payroll projects choose not the most popular banks. As a result, employees prefer to withdraw cash from ATMs and keep it that way. As a result of the quarantine in Ukraine, these people were forced to learn how to use their funds online. Since many banks have a

18

business model that does not involve active online interactions with individuals, the experience of using their apps may also have had a significant impact on the decline in overall evaluation of banks' mobile apps.

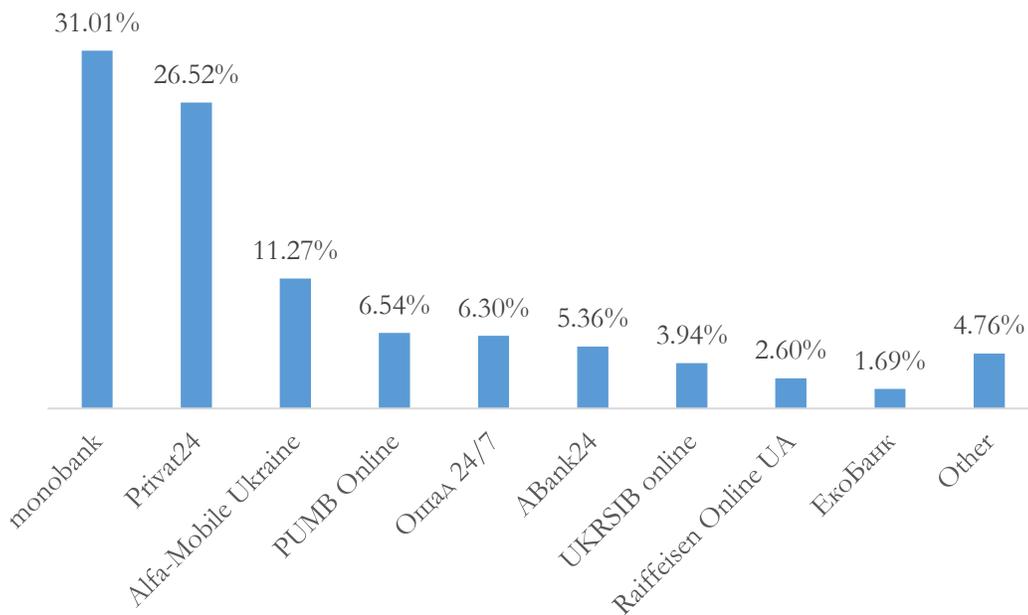Figure 8. Distribution of reviews across banks, 2016 – 2021

Source: Appstore, Play Market, Researcher Estimates

Figure 8 shows the share of banks in the structure of reviews. As can be seen, the dominant banks are Universal (monobank) and Privatbank (Privat24), with a slight lag - Alfabank (Alfa-Mobile, Sense Superapp). Despite the fact that Privat remains the largest bank in the domestic market of Ukraine, however, by the number of reviews is inferior to Universalbank, which is in 14th place in the ranking of assets. Moreover, it should be noted that the Monobank application entered the market only in 2017, while Privat developed its application back in 2010. At the moment 13 million people are clients of PrivatBank mobile application, while Monobank has 4,3 million clients.

To construct one of the dependent variables (share of positive reviews) a sentimental analysis of the reviewes was conducted.

Figure 9 shows the distrtibution of the keywords used in bank app reviews. The red color identifies the words that were identified in negative comments, the green ones, respectively, in positive comments. The word size in the figure indicates the frequency of the words used in the reviews.

This analysis was conducted based on all of the text reviews that were left in the Appstore and Play Market for the bank apps that were included in the Bath study. One of the problems was that many users apparently wrote reviews without paying much attention to grammar. This led to the need to contact open databases with the most common grammatical errors to replace misspelled comments. In this way, more than 5% of the original reviews were replaced.

On the other hand, however, the importance of textual app reviews should not be overestimated. Although it is one important channel of communication between users and developers, a comment containing a critique can often also have a high evaluation of an app. This is due to the fact that, as mentioned earlier, comments are more likely to be written by people who have a negative opinion of the product.

In 2016 the most frequent words are: "version", "return", "convenient", "was", "do", "no". For the studied periods of 2016 and 2021 there was a noticeable increase in the number of positive app reviews, in consequence the key words for the period of 2021 were: "convenient", "excellent", "super", "best" and "good". The process of digitalization of the banking system has focused the attention of banks on the quality and convenience of their applications. It is also worth noting the rapid development of such banking product as monobank, thanks to which banks have analyzed that the quality and functionality of the application increases customer loyalty to the bank, as well as increases the amount of funds of individuals in their accounts. Also a relevant

factor is the "coronacrisis" of the banking system, when remote execution of banking products has become a priority.

After the automatic word selection, a manual selection of words that would be indicative was made, resulting in the diagrams in Figure 9.

Figure 9. The most frequently used words in reviews for 2016 (left) and six months of 2021 (right)
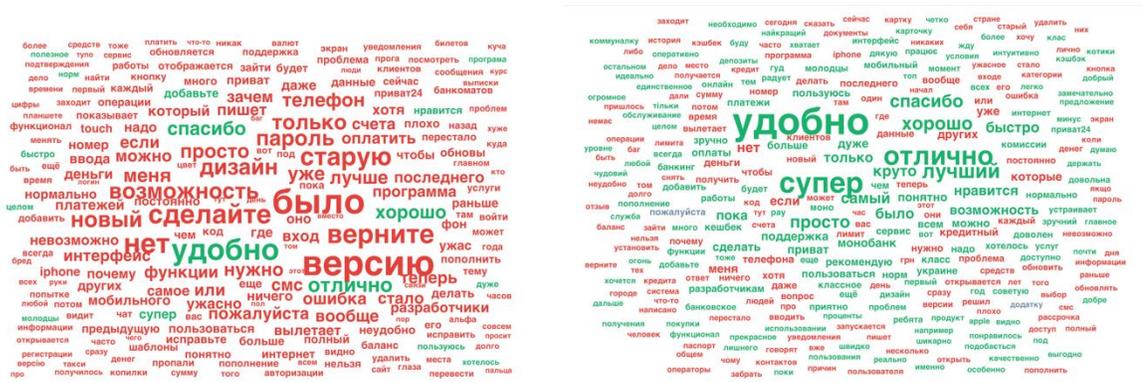
Source: Appstore, Play Market, Researcher Estimates

It should be noted that some words that do not have a brightly colored emotional nature can nevertheless help to give a general impression of the nature of the commentary. Thus, the word "was", which was often encountered in 2016, can mean that the app had some features that were removed in subsequent versions and, therefore, caused discomfort to customers who left comments.

The presence of certain features in applications is also an important indicator. For example, the word "impossible" can tell us that certain features that users need are missing. It is most often found in comments with a low rating. At the same time, the word "add," which most often has the same semantic character as "impossible," is mostly found in positive comments in all periods.

Also included in this analysis are the words that were most frequently included in comments with 5 and 1 stars. Thus, the frequent occurrence of the word "design" in comments with a 1-star rating in 2016 tells us that people were most likely extremely dissatisfied with the design. Thus, the frequent occurrence of the word "support" in reviews with 5 stars may hint that even people who had to contact technical support were satisfied with its work.

It is also important to note that the quality of technical support greatly affects the income of companies whose work is related to individuals. In this regard, it should be noted that in 2016 the word "support" was mostly found in negative comments, while in 2021 it started to be found in positive comments for the most part.

CHAPTER 5. RESULTS

In the first model, where the dependent variable was the total amount of funds raised
from individuals:

Table 1. Model of dependence of funds attracted from individuals on selected variables

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	424.41413602104	479.8974161180	0.884	0.37685
Average rating	-0.00158415324	0.0033114802	-0.478	0.63256
Reviews number	0.0000068440	0.0000012740	5.372	< 0.01 ***
Share of positive reviews	0.0000001921	0.0000002172	0.884	0.37686
Marketing expenditures	10.4557376635	3.3255865306	3.144	0.00175 **
Wage expenditures	0.7294429250	0.3356348823	2.173	0.03016 *

Only half of the variables in their model are significant.

The following conclusions can be drawn from the results of this model:

- If the average rating increases by 1, the proportion of customer funds raised per
  quarter decreases by 0.01 percentage point. However, based on the data obtained
  with the model, we can conclude that the rating of applications is not a significant
  indicator. Thus, we can conclude that the quality of the applications also has no

influence on the attracted funds in most cases. It should be noted that this may be due to the fact that in less popular applications reviews may be artificially inflated in order to increase in the rating. In this way banks may be trying to attract the attention of users.

- The total number of reviews is also a statistically significant indicator. Thus, with the increase of the number of reviews by 10000, the amount of investment of individuals increases by 0.068 percentage points. However, this connection is quite logical, because the more users the bank has, the greater their number in absolute terms leaves feedback on the application. At the same time, a greater number of users of the application implies a greater number of funds placed with the bank by these clients.

- The share of positive reviews is not a statistically significant indicator. As in the case of the average rating of the application, we can assume that this may be due to the add-on. This indicator is significant in the model built.

- From the results we can conclude that if the share of marketing expenses increases by 1 percentage point, the share of customer funds in assets will increase by 10 percentage points. This indicator is significant in the constructed model.

- Salary costs for bank employees are a significant indicator based on the results of this model. If the ratio of payroll expenses to assets increases by 1 percentage point, the ratio of customer funds to bank assets increases by 0.79 percentage points. Thus, given the data obtained, we can conclude that the quality of the developed application is not a determining factor when choosing a bank in Ukraine. This can be explained by the research conducted on the propensity of customers to change banking institutions in the last 10 years. According to this study, most customers prefer big banks, because they believe that the bigger the bank, the better it is.

The second model serves to confirm the second hypothesis.

Table 2. Model of dependence of app rating from assets size

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.4389848203995	0.0739281463249	19.465	< 0.01 ***
Assets	0.0000000036847	0.0000000006794	5.423	< 0.01 ***

The conclusion from this model is that indeed banks' assets affect such an indicator as the average app rating.

If assets increase by 100 billion, the average app rating rises by 0.36 points.

The results of this model are significant, indicating that these results can be relied upon.

Thus, we can conclude that, in most cases, large banks do allocate significantly more funds for the development of the digital direction related to the development of programs for mobile devices. This leads us also to the conclusion that such high popularity of Monobank is rather an exception, taking into account that Universalbank by the size of assets ranks 12th among Ukrainian banks at the moment. Moreover, it should be noted that the lag is more than 7.5 times even with the bank, which is on the 3rd line.

However, it should be noted that this can also be attributed to the fact that larger banks can afford to buy app reviews. This causes the app's rating to go up and, consequently, raises the app's level in the store for downloads. This, in turn, creates additional advertising and demand for the app.

Based on the results of the two models, we reject the first hypothesis that the quality of the app significantly influenced the amount of funds raised by banks in favor of the conclusion that the app has no effect at all on the attraction of individuals.

Due to the second model, we conclude that we should accept the second hypothesis, according to which the quality of the banking application depended on the size of its assets.

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

So, we can conclude that the banks that started investing in app development in 2020 (like Alfa Bank) really got the trend right and were able to get extra points of appeal in the eyes of users.

Today we live in a time when one of the leading mechanisms behind the future is digital technology. Over the past two years, the banking industry has also seen big changes under the influence of Covid-19. Many banking institutions were forced to accelerate the process of digital transformation of their products and services, because without this it would be difficult for banks to remain competitive in the banking services market of Ukraine.

This paper provides theoretical and analytical research on the issue of digitalization of banking business in Ukraine. Therefore, the following conclusions can be made:

The use of the Internet is gaining more and more momentum every year, as a result of widespread in the use of social networks, changing the way of collecting data has increased the expectations and demands of a new generation, both technology natives and old bank customers, have applied this technology.

While classic banking is shrinking globally, it is clear that digital app banking, mobile payment systems and newly discovered banking apps are gaining momentum worldwide.

The introduction of Internet banking and cell phone banking has become a promising direction for the further successful development of banking institutions. As it was mentioned earlier the Internet has become a part of everyday life of each person.

It should be noted that based on the results of this work, the example of banks such as Monobank, for example, is an exception and does not mean that users will bring money

to financial institutions just because the bank app is better than the competitors. Businesses should also be aware that despite the expanding market of financial company app offerings, one should pay attention to the fact that their quality does not at all guarantee an influx of customers. The success of every financial institution depends on a combination of factors.

REFERENCES

COVID and the financial services consumer: Supporting customers and driving engagement through the pandemic and beyond. Capgemini Research Institute. https://www.capgemini.com/research/covid-19-and-the-financial-services-consumer/

Digital Banking As The New Normal In 2021: What To Expect From Banks https://www.forbes.com/advisor/banking/digital-banking-as-new-normal-2021-what-to-expect/.

Ranking of bank stability at the end of the 2nd quarter of 2021. https://minfin.com.ua/banks/rating/

Steven MacDonald. 25 reasons live chat can help you grow your business in 2021. https://www.superoffice.com/blog/live-chat-statistics/

Individuals using the internet for internet banking. European Commission. https://ec.europa.eu/eurostat/databrowser/view/tin00099/default/table?lang=en.

International Monetary Fund. (2021, June 10). POLICY RESPONSES TO COVID-19. https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19

Internet penetration rate in Ukraine from 2004 to 2023 https://www.statista.com/statistics/1023197/ukraine-internet-penetration/

Mathieu, V. (2001). Product services: From a service supporting the product to a service supporting the client. Journal of Business and Industrial Marketing, 16, 39-61.

National Bank of Ukraine. (2020). Annual report 2020 NBU. NBU. https://bank.gov.ua/admin_uploads/article/annual_report_2020_eng.pdf?v=4

National Bank of Ukraine. (2020, October 10). NBU and Ministry of Digital Transformation to Digitalize the Ukrainian Banking System. NBU. https://bank.gov.ua/en/news/all/nbu-ta-mintsifri-spilno-pratsyuyut-nad-tsifrovizatsiyeyu-bankivskoyi-sistemi-ukrayini

New Research from Dimension Data Reveals Uncomfortable CX Truths. https://www.prnewswire.com/news-releases/new-research-from-dimension-data-reveals-uncomfortable-cx-truths-300433878.html

Ron Shevlin. Why People Don't Switch Banks Anymore.
https://www.forbes.com/sites/ronshevlin/2019/05/01/why-are-fewer-consumers-switching-banks-because-checking-accounts-have-become-paycheck-motels/?sh=11b66f22aa95

Ten Years After Great Recession, Innovation Overcomes Reputation as Bank Switching Hits Record Low, J.D. Power Finds.
https://www.jdpower.com/business/press-releases/2019-us-retail-banking-satisfaction-study

The IMD World Digital Competitiveness Ranking 2020 results. https://www.imd.org/