

BANKS' BUSINESS MODEL AND THEIR PROFITABILITY. THE CASE OF THE REPUBLIC OF NORTH MACEDONIA¹

Ljube Jolevski, Ph.D. in Economic Science from

University Ss. „Cyril and Methodius” – Skopje

Faculty of Economics – Skopje

ljubejol@yahoo.com

Snezana Dicevska, Full professor

University „St. Kliment Ohridski” – Bitola

Faculty of Tourism and Hospitality – Ohrid

sdicevska@yahoo.com

ABSTRACT

In conditions of significant change in the financial markets and the environment, the analysis of banks business models is an important tool for better understanding of the risks to which banks are exposed in their operations. The comprehensive analysis of the business model shows how and in what way the bank operates, i.e. makes a profit in the short term. Also, this analysis gives a complete picture of how the bank will operate in the future under the influence of long-term strategic decisions of the bank and changes in the business environment.

It is an indisputable fact that Macedonian banks apply traditional banking, with dominance of lending activity. With application of cluster analysis were identified two groups of banks with different strategies for business activities: banks that are more focused on corporate lending and banks that are more focused on household lending. Thereby, were used data for the period from 2010 to 2019 and on that basis was performed a comparative analysis of the performance. The analysis confirmed that banks that are more focused on household lending show better performance and lower risk.

The analysis unequivocally showed that in addition to the traditional performance indicators (ROA and ROE, banks should increasingly use the

¹ original research paper

RWA (Risk Weighted Assets) and RoRWA (Return on Risk Weighted Assets) indicators which incorporate the risk element, enabling more accurate measurement of their profitability. Significant changes in the business models of banks can be expected in the future, primarily due to the health crisis, which, among other things, accelerated the changes in digitalization initiated by the fintech industry.

KEYWORDS: banks, loans, deposits, business model, profitability

INTRODUCTION

Banks have a number of functions, mainly related to deposit collection, liquidity intermediation, maturity transformers, securing financial and investment assets, risk management and financial innovators. In the past few decades, banks have significantly increased their role in the financial intermediation process. Thus, they have become active players in the global financial markets, not only on the assets side through loans and investments, but also on the liabilities side, becoming active players in the global interbank market, including in insurance activities, trading in financial derivatives. introduction of financial innovations, etc.

Determining the business lines and activities, as well as the business goals is a starting point, and the competence and success in managing the bank can be a factor that will generate a comparative advantage. Typically, a business model is defined as a plan implemented by a company in order to generate revenue and make a profit from operations.

In conditions of significant change in the regulatory framework and changes in the financial markets, the analysis of business models of banks is an important tool for better understanding of the risks to which banks are exposed in their operations and measuring their performance. Measuring results and performance is essential to defining what and how a bank operates from an economic point of view.

The purpose of this paper is to identify the business models of Macedonian banks and determine their profitability. To this end, the paper consists of the first part which provides an overview of the literature, in the second part is given methodology for identifying banks' business models, in the third part are provided results from the analysis and at the end are provided some conclusions.

LITERATURE REVIEW

There are numerous researches that refer to certain aspects of banking operations, but the researches aimed at studying the business models of the banks do not have a long history. The number of researches related to systematic quantitative approaches for identifying and analyzing the business models of banks is relatively small.

The interest in analyzing the business models of banks and putting them in the focus of econometric research is especially noticeable after the global economic and financial crisis 2007/2008 in order to improve the economic analysis of the behavior of banks. In the period from 2012 to 2017, the number of scientific papers in which the business models of banks from different aspects are subject to analysis significantly increases. According to research by Goncharenko (2020), in 2017 the number of scientific papers dealing with business models of banks increased by 148% compared to 2012.

In 2018 and 2019, the number of scientific papers in this field has rapidly increased. Thereby, the trend of development of information systems, new sales channels (e-banking, mobile banking, etc.) and internal rules in business process management become an important part of the analysis of business models of banks. In fact, technology, fintech industry, e-sales, innovation and competition become an important part of the business models of banks and increase the interest of authors for their research. Goncharenko concludes that the key to leadership and innovation in banking is the balance between the triangle: profitability - risk - stability, on the one hand, and information technology on the other.

There are papers in the literature that explore the relationship between different types of business models of European banks and their profitability. For example, Mergaerts and Vennet (2016) surveyed the impact of banks' business models on their long-term performance, using data from 505 banks in 30 European countries between 1998 and 2013. Given that there is a wide landscape of business models in the European banking sector, based on factor analysis, they identify two important business models of banks: retail and diversification, ie banks with lower share of loans. The variables they use to identify the groups of business models are: the structure of assets and

liabilities, the structure of income and capital. The authors continue their research on the impact of business models on results using four indicators: rate of return on equity (ROE), rate of return on assets (ROA), net interest margin (NIM) and stability measured by the Z-score. The research concludes that business models with real estate activities are characterized by higher profitability and long-term stability. These conclusions are in favor of the fact that in the post-crisis period, banks refocused on traditional activities. Banks with diversified business models are also profitable, but are more susceptible to stress, ie they are less stable.

Roengpitya, Tarashev, Tsatsaronis and Villegas (2017) conducted a survey based on a panel of 178 banks in 34 countries for the period 2005-2015. Using variables to identify business models on both the assets side and the liabilities side of banks' balance sheets, they identify four types of business models. Two models are alternative versions of the commercial banking model, one of which is mainly based on retail sources of financing (high share of retail deposits and household loans) and one of the corporate model financed by households and corporate clients. The third is the business model in which banks have opted for trading activities and significant dependence on wholesale financing. The fourth model is universal and incorporates the features of the other three business models.

The authors conclude that in the post-crisis period, there is a trend of changing the business models of banks with a greater focus on increasing the financing of retail banking. At the same time, banks that focused on retail activities increased their return on equity by 2.5 percentage points on average compared to those banks that did not change this business model. In contrast, the performance of banks that reoriented to the corporate model deteriorated by an average of 5 percentage points. Hence, the authors conclude that the transition to the type of business model of banks affects the performance of banks.

Di Fabio (2019) in his research raises the question of whether the business model affects the income generation of banks. It uses a sample of 198 banks from 27 European countries for the analysis over a period of 2004 to 2015. He individualized three business models of banks: retail banks, market-oriented banks and diversified retail banks. The results of the multivariate regressions showed that retail banks generate more revenue compared to other business models, which, among other things, is in line with greater access to information.

Liu and Ryan (1995, 2006) focus on the banking sector, analyzing the relationship between different types of business models and earnings management. According to them, the structure of the loan portfolio allows to determine the ability of the management of a bank to manage the allocation of appropriate impairment for the loan portfolio.

In market-oriented business models of banks, managers should take action to reduce earnings volatility, because in these banks the most significant source of income is non-interest income, which is usually volatile (Baele et al., 2007; Kohler, 2015). On the other hand, retail banks financed mainly by household deposits show a higher quality of earnings than banks that rely mainly on wholesale assets (Jin et al, 2018). Banks that are characterized by traditional financing and income diversification are better informed and show greater predictability of cash flow.

METHODOLOGY FOR IDENTIFYING BANKS' BUSINESS MODELS AND ASSESSING THEIR PROFITABILITY

Based on the basic theoretical assumptions and empirical research, as well as the experiences of developed countries, the basic research hypotheses in this paper are defined as follows:

- The defined business model affects the profitable position of the bank;
- Banks that are more focused on lending to households are more profitable than banks that are more focused on lending to the corporate sector.

The literature generally knows two approaches to identifying business models of banks:

- Judgment expert assessment based on descriptive statistics on one or more positions of the balance sheet and income statement. Bonaccorsi di Patti, Felici, Signoretti (2016) divide banks according to the share of loans in assets (whether below or above 50%), the size of assets, the share of non-resident exposure, and
- application of cluster analysis based on one or more characteristics (usually the structure of assets and / or liabilities and income).

Clustering is a simple statistical technique used to determine a set of observations (i.e. a particular bank in a given year) into groups (i.e. business models) that are generally different, i.e. do not overlap. By definition, excitations assigned to the same cluster share a high degree of similarity

within the cluster.

One of the most widely used measures is the calculation of the Kalinski-Harabaz (CH) index introduced in 1974 and is also known as the Variance ratio criterion. The CH index is a measure used to determine similarities of one's own cluster (cohesion) compared to other clusters (division).

The calculation of the Kalinski-Harabaz (CH) index for K-number of clusters from the database $D = [d_1, d_2, d_3, \dots, d_N]$ is defined as follows:

$$CH = \left[\frac{\sum_{k=1}^K n_k \|c_k - c\|^2}{K - 1} \right] / \left[\frac{\sum_{k=1}^K \sum_{i=1}^{n_k} \|d_i - c_k\|^2}{N - K} \right] \quad (1)$$

where:

- n_k and c_k are the number of points and the center of the cluster k ,
- c is a global centroid, and
- N is the total number of data.

Higher value of the CH index means that the clusters are dense and well separated, although there is no "acceptable" cut-off value. It is necessary to choose the solution that gives the highest value to the CH indices. The advantage of using this index is that the result is fast to calculate, and the disadvantage is that this index is generally higher for convex clusters than other cluster concepts, such as the results obtained through the Davies – Bouldin Index.

The second step in this part of the research is the analysis of the profitability of the identified business models of the banks. The following indicators are used to assess the financial and economic performance of banks' business models:

- The two key profitability indicators used in the banking literature to assess the financial performance of banks are: the rate of return on assets (ROA) and the rate of return on equity (ROE), calculated as the ratio of profit before tax and total average capital . Higher values of these indicators indicate higher profitability of banks. These indicators are important for evaluating the performance of banks, and, on the other hand, they are easy to compare the profitability of the banks themselves. Also, these indicators provide a solid baseline for the performance of banks, intended for the needs of both management and

shareholders, as well as potential investors.

- Given that lending is a dominant activity, and the realization of interest income is the main source of income, an important indicator for analyzing the success of business models is the indicator of the share of net interest income in total income. This indicator is important as an alternative indicator of how much a bank earns from the risks it assumes.

The analysis uses the media environment of the indicators calculated for the individual banks grouped according to the business model. Based on the calculation of the media environment in the analyzed period (2010-2019) a comparison was made of its values by individual business models. This methodology for calculating and comparing the profitability and efficiency of commercial banks has been applied by several authors: Mergaerts and Vennet (2016), Ayadi et al (2014, 2016, 2019), BIS (2017).

The third step is to use an economic model that covers the risks to which banks are exposed and their potential impact on variables that reflect the profitability of banks. In the study of the impact of business models on the performance of banks, two indicators are used as dependent variables: return on equity (ROE) and return on assets (ROA). The model is as follows:

$$ROA_{dt} = \beta_{1i} + \beta_2 LNAKTIVA_{it} + \beta_3 KRED_AKT_{it} + \beta_4 DEP_AKT + \beta_5 NETO_KAM_PRIHOD + \beta_6 COST2INCOME + \beta_7 RPA-KRED + \beta_8 NPL + \beta_9 KAPITAL_AKTIVA + \beta_{10} RoRWA + u_{it}$$

where:

- LNAKTIVA is the logarithmic value of the size of each bank's assets,
- KRED_AKT is the share of loans in total assets,
- DEP_AKT is the share of deposits in total assets,
- NETO_KAM_PRIHOD is net interest income as a percentage of total assets,
- COST2INCOME is an indicator of operational efficiency,
- RPA-KRED is the share of credit risk weighted assets in relation to total assets,
- NPL is the share of non-performing loans in total loans,
- KAPITAL_AKTIVA is the share of equity in total assets, and
- RoRWA is the rate of return divided by risk-weighted assets.

The **size of assets** determines the ability of banks to take advantage of economies of scale and scope.

The structure of assets is represented by the share of loans in assets, while the structure of liabilities is represented by the ratio of deposits to liabilities and reflects the reliance of banks on traditional sources of financing.

Net interest income is the main source of income in business models whose main business activity is lending. The most important component in the structure of banks' income is the net interest income, hence its dominant role in the income potential.

The **share of credit risk weighted assets (RWA)** in total assets is a regulatory risk measure. Banks with higher RWAs are expected to be more risk sensitive and are therefore required to have more regulatory capital to cover the risks to which they are exposed.

When it comes to **non-performing loans**, their participation is a reflection of the quality of the loan portfolio.

The **share of equity in total assets** is taken as a variable in the analysis. Additionally, two variables are already included which use risk weighted assets in the calculation.

Return on risk weighted assets (RoRWA) is a measure of the quality of risk management that has been used in recent times. It is calculated when the net profit is placed relative to the RWA. In this way, it integrates the management perspective of the balance sheet and the income statement, ie the income and expenses of the business.

On the other hand, a control variable is introduced to determine differences that are not directly related to the bank's business model, but are still important to determine the bank's performance. At the bank level, operational efficiency must be taken into account. It is a standard cost-benefit ratio, where costs include all operating costs, and revenue is defined as the sum of non-interest and net interest income. Operational efficiency is not a feature of a business model, as it can be considered as a result of the choice of strategy that the bank will apply.

RESULTS AND DISCUSSION

The main business line of Macedonian banks is lending. This is determined through the dominant share of loans of the non-financial sector in the total

assets (58.5%), the dominant share of deposits in the sources of financing, but also through the net interest income which with a share of 64.6% are the most significant in the structure of total revenue. Households are traditionally the most important depositor in the Macedonian banking sector with a share of 68.2% in total deposits. They prevail in the total liabilities of all banks. The main carriers of interest income and gross loans are households and the corporate sector.

The variables used to determine the clusters are: the percentage share of loans in assets, the percentage share of deposits in assets, the percentage share of trading activities in assets, as well as the separation of household lending and corporate lending by calculating the indicators for share of household loans in total loans and share of corporate sector loans in total loans.

By applying the Kalinski-Harabaz index, ie Pseudo-F, it was confirmed that the division of Macedonian banks into two clusters is optimal, given that this test has the highest value for two clusters.

Table 1. Pseudo F-index

Number of clusters	Pseudo-F
2	199,25
3	165,46
4	136,96

Source: Own calculations of the authors

Therefore, the factor analysis suggests that two important strategies for business activities have been identified, namely: **banks that are more focused on corporate lending** and **banks that are more focused on households lending**. It is important to emphasize that all banks, ie both business models lend to both households and the corporate sector, but the difference is in which sector they are more focused, ie which sector dominates in their loan portfolio.

Out of a total of 14 banks in the Macedonian banking market on the end of 2019, 7 banks were identified by applying a business model more focused on lending to the corporate sector and 7 banks by applying a business model more focused on lending to households. The assets of the banks identified with a business model more focused on lending to the corporate sector account for 54.6% of the total assets of the Macedonian banking sector,

while the assets of banks identified with a business model predominantly focused on lending to households account for 45.4%.

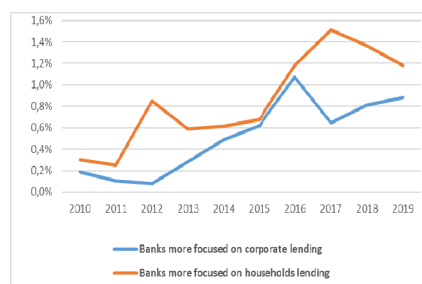


Chart.1 ROA indicator for Macedonian banks

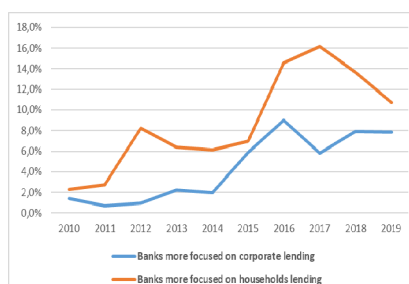


Chart 2. ROE indicator for Macedonian banks

Source: Own calculations of the authors

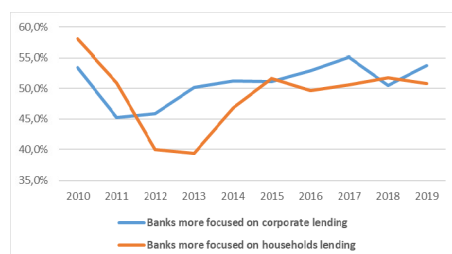


Chart 3. Median of the net interest income/total income

Source: Own calculations of the authors

The analysis of ROA and ROE shows that higher values in the entire analyzed period were achieved by the group of banks that are more oriented towards household lending. In 2019, both rates recorded a more pronounced decrease in this business model. The driver of this decrease was the narrowing of the banks' net interest margin, represented by the reduced contribution of net interest income to the formation of rates of return (for the second year in a row). In 2018, one of the banks, more focused on lending to the corporate sector, realized a profit from a large non-recurring items, ie collection of a relatively high amount of non-performing exposure from a domestic legal entity, which was reflected in the amount and the movement of profitability indicators, not only for this group of banks, but also for the entire banking sector. However, despite the decrease in 2019, the rates of

return are still at a relatively high level compared to the performance in the last ten years, ie they are 0.26 and 2.37 percentage points (pp) above their ten-year averages. , which are 1.01% and 9.29%, respectively.

The analysis of the individual components that form the ROE in 2019, shows that the most important single driver of its decline was the reduction of the profit margin. The profit margin of the domestic banking sector declined on an annual basis by 5.4 percentage points and at the end of 2019 was 28.77%. However, the profit margin is still at a higher level compared to the average in the previous 10-year period (2010-2019) of 19.84%. The net interest margin at the level of the banking sector has been continuously decreasing over four years. Thereby, unlike the previous three years, in 2019 there was a slightly more pronounced decrease of 0.38 pp, which reached a historically lowest level of 3.38%. The decrease in the net interest margin in 2019 is due to the decrease in the net interest income (by 2.4%) and the acceleration of the annual growth of average interest assets (from 4.8% in 2018 to 8.6% in 2019).

The comparative analysis of the indicator of the share of net interest income in total income shows that there is no significant difference, although a slightly higher rate is shown by banks more focused on lending to the corporate sector. However, this is due to the fact that the banks in both business models are basically oriented towards traditional banking activities, ie lending and collecting deposits, in conditions of increased lending activity and present downward trend of average interest rates, as for loans to the corporate sector as well as households.

From the analysis of the above indicators we can conclude that both hypotheses are confirmed that the defined business model affects the profitable position of the bank, as well as the hypothesis that banks that are more oriented towards household lending are more profitable than banks that are more oriented towards corporate lending. sector.

In the past period, there is a trend of increased lending to the household sector. In fact, all banks have a tendency for increased lending to households. Although this trend is expected to continue in the same (upward) direction, the potential risks that exist with the increased funding of this sector are noteworthy. Structurally, although the household loan portfolio has significantly better quality for the undertaken level of risk, still the growing trend of household indebtedness and the approval of long-term loans with uncertain creditworthiness, can lead to greater materialization of

credit risk. Also, significant changes in the business models of banks can be expected in the future, primarily due to the health crisis, which, among other things, accelerated the changes in digitalization initiated by the fintech industry

The profitability of Macedonian banks more focused on household lending measured by the ROA indicator shows that operationally efficient banks are more profitable, ie an increase in the operating efficiency indicator by 1 pp, causes a decrease in the ROA indicator by 0.0487 pp. This suggests that these banks should carefully manage costs by expanding the business network to serve households.

Table 2. Evaluation of the ROA model for banks that are more focused on household lending

```
. streg roadl lnaktivadi kred_atndi dep_atndi costlincomedi rpa_kreddi npldi cardl rorvadi if
> g1abs==1, fe vce(cluster banka)
```

Fixed-effects (within) regression
Group variable: banka

Number of obs = 48
Number of groups = 10

R-sq: within = 0.5142
between = 0.6545
overall = 0.5220

Obs per group: min = 1
avg = 4.8
max = 7

F(7,3) =
Prob > F =

corr(u_i, Xb) = -0.0067

(Std. Err. adjusted for 10 clusters in banka)

roadl	Coef.	Std. Err.	z	P> t	[95% Conf. Interval]
lnaktivadi	-.0221881	.0272894	-0.81	0.437	-.0829251 .0385589
kred_atndi	-.1426871	.0760677	-1.88	0.059	-.3147448 .02941
dep_atndi	.0529519	.0304698	1.72	0.120	-.0165755 .1212794
costlincomedi	-.0487627	.0124071	-3.87	0.004	-.077282 .0202434
rpa_kreddi	-.0054189	.0174971	-0.31	0.766	-.045652 .0346153
npldi	.0022221	.1530428	0.54	0.604	-.2638949 .4304291
cardl	-.0615397	.1370205	-0.45	0.664	-.3715017 .2484222
rorvadi	.0032142	.0038824	0.83	0.429	-.0055684 .0119567
_cons	.0036487	.0037428	0.98	0.353	-.0047392 .0112136
sigma_u	.00355706				
sigma_e	.01121817				
rho	.05139269				(fraction of variance due to u_i)

Table 3. Evaluation of the ROA model for banks that are more focused on corporate lending

```
. streg roadl lnaktivadi kred_atndi dep_atndi costlincomedi rpa_kreddi npldi cardl rorvadi if
> g1abs==0, fe vce(cluster banka)
```

Fixed-effects (within) regression
Group variable: banka

Number of obs = 48
Number of groups = 9

R-sq: within = 0.9895
between = 0.9496
overall = 0.9952

Obs per group: min = 2
avg = 5.4
max = 7

F(8,8) = 437561.63
Prob > F = 0.0000

corr(u_i, Xb) = 0.0828

(Std. Err. adjusted for 9 clusters in banka)

roadl	Coef.	Std. Err.	z	P> t	[95% Conf. Interval]
lnaktivadi	.0136077	.0048958	2.94	0.018	.0039086 .024296
kred_atndi	.0099147	.0102417	0.97	0.361	-.0137026 .0335321
dep_atndi	-.0054951	.0042598	-1.28	0.237	-.0154145 .0044202
costlincomedi	-.0048946	.0024943	-1.73	0.123	-.0105644 .0014472
rpa_kreddi	.0181494	.0024956	12.23	0.000	.0147483 .0215509
npldi	.0180926	.014676	1.24	0.250	-.0166276 .0513926
cardl	.0027392	.0268288	1.22	0.267	-.0251281 .0346046
rorvadi	.0314805	.0204188	25.78	0.000	.0099383 .0530228
_cons	-.0007479	.0008229	-2.38	0.045	-.0018125 .0003222
sigma_u	.01124357				
sigma_e	.00287509				
rho	.21491571				(fraction of variance due to u_i)

Source: Own calculations of the authors

In the business model of banks more focused on lending to the corporate sector, the size of assets and RWA affect the effective management of assets. Large banks are more profitable, ie an increase in assets by 1 pp. is reflected in the increase of the value of the ROA indicator by 0.014 pp. If the RWA increases by 1 pp, the ROA indicator will increase by 0.0181, and if the RoRWA indicator increases by 1 pp, it will cause the ROA indicator to increase by 0.531. This confirms the importance of the need for proper

identification and management of RWA (Table3).

In both banks' business models, the RWA, i.e. the RoRWA indicator have a significant impact on the ROE indicator. Thus, if the RoRWA indicator increases by 1 pp, it will cause an increase in ROE by 5,079 pp. (Table 4), i.e. 4,257 pp. (Table 5) with banks more focused on corporate lending.

Table 4. Evaluation of the ROE model for banks that are more focused on household lending

```

streg roewd lnactivedi kred_aktndi dep_aktndi costclinnmeddi rpa_kredwi rpldi cardd roewdi if
> q1tabewd, fe vce(cluster banks)

```

Fixed-effects (within) regression		Number of obs	=	49	
Group variable: banks		Number of groups	=	9	
R-sq:	within = 0.7724	Obs per group:	min =	2	
	between = 0.0276		avg =	5.4	
	overall = 0.4949		max =	7	
		F(9, 4)	=	5693.33	
		Prob > F	=	0.0000	
corr(u_i, Xb) = -0.1466					
(Std. Err. adjusted for 9 clusters in banks)					
roewd	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lnactivedi	.7469436	.5119503	1.50	0.172	-.2613999 1.748197
kred_aktndi	1.476305	.3344130	4.42	0.000	.8054802 2.147130
dep_aktndi	-.1209414	.3132121	-0.41	0.693	-.7360397 .5942268
costclinnmeddi	.1496766	.1656223	0.91	0.367	-.1732404 .4725436
rpa_kredwi	.1647962	.0558236	2.93	0.006	.0530994 .2764930
rpldi	.3839748	.5117033	0.75	0.459	-.6325212 1.444471
cardd	9.142261	2.464442	3.71	0.000	4.209395 13.87513
_cons	4.287142	1.045645	4.09	0.000	2.204891 6.369493
_sigma_u					
_sigma_e	.07887468				
_rho	-.11939966				
(Fraction of variance due to u_i)					

Table 5. Evaluation of the ROE model for banks that are more focused on corporate lending

```
streg roewd lnactivedi kred_aktndi dep_aktndi costclinnmeddi rpa_kredwi rpldi cardd roewdi if > q1tabewd, fe vce(cluster banks)
```

Fixed-effects (within) regression		Number of obs	=	49	
Group variable: banks		Number of groups	=	9	
R-sq:	within = 0.7724	Obs per group:	min =	2	
	between = 0.0276		avg =	5.4	
	overall = 0.4949		max =	7	
		F(9, 4)	=	5693.33	
		Prob > F	=	0.0000	
corr(u_i, Xb) = -0.1466					
(Std. Err. adjusted for 9 clusters in banks)					
roewd	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lnactivedi	.7469436	.5119503	1.46	0.172	-.2613999 1.748197
kred_aktndi	1.476305	.3344130	4.42	0.000	.8054802 2.147130
dep_aktndi	-.1209414	.3132121	-0.41	0.693	-.7360397 .5942268
costclinnmeddi	.1496766	.1656223	0.91	0.367	-.1732404 .4725436
rpa_kredwi	.1647962	.0558236	2.93	0.006	.0530994 .2764930
rpldi	.3839748	.5117033	0.75	0.459	-.6325212 1.444471
cardd	9.142261	2.464442	3.71	0.000	4.209395 13.87513
_cons	4.287142	1.045645	4.09	0.000	2.204891 6.369493
_sigma_u					
_sigma_e	.07887468				
_rho	-.11939966				
(fraction of variance due to u_i)					

Source: Own calculations of the authors

CONCLUSION

The business model of a bank is a multidimensional, complex and relatively new concept. Each business model is unique, although similar features of their business models can be found among banks. Determining the business model of the bank is a starting premise and a basic criterion for evaluating the performance of the bank as a whole. Hence, the care of the management of each bank to study all the elements and aspects of the business models of the banks is justified.

The analysis of the business model contributes to a better understanding of the financial and economic performance, but also the attitude of the bank towards the risks and their management. This is necessary not only for shareholders and investors, but also for regulators to be able to monitor the

prudence in the behavior of banks and assess the accumulation of risk.

The conclusions support the thesis that the bank's performance is important for explaining their business models, ie long-term strategic choices, as well as that banks that are more oriented towards household lending show higher profitability.

However, it should be emphasized that the data from the balance sheet and success are not always a sufficient indicator to measure profitability, given that the engagement of banks in performing off-balance sheet activities from which they generate income is not reflected in the assets of banks, which is the basis for ROA calculation. When banks have a significant volume of off-balance sheet activities, they will have a higher ROA in the end result. The analysis unequivocally showed that in addition to the traditional performance indicators (ROA and ROE, banks should increasingly use the RWA and RoRWA indicators which incorporate the risk element, enabling more accurate measurement of their profitability.

Business model analysis remains a useful tool to understand what banks do, how they make a profit, and how they contribute to the level of risk in the system. The results of the research suggest certain knowledge and directions that every banking institution should strive for, as well as the creators of banking regulations. Banks are aware that they are active in a rapidly changing environment and are ready to respond to a number of challenges, timely and efficiently adapting their business models to new trends and requirements of both regulation and customers.

REFERENCES:

1. Ayadi, R. and de Groen W. (2014), *Banking business models monitor 2014 – Europe*, Centre for European Policy Studies and International Observatory on Financial Services Cooperatives.
2. Ayadi, R. et al. (2016), "Banking Business Models Monitor 2015: Europe", Montreal, International Research Centre On Cooperative Finance, HEC Montreal.
3. Ayadi, R., Cucinelli, D. De Groen, W. (2019), *Banking Business Models Monitor, Performance, Risk Response to Regulation and Resolution 2005-2017*,
4. Baele, V., Pungulescu, C. and Horst, J. (2007), Model uncertainty, financial market integration and the home bias puzzle, *Journal of International Money and Finance*, Vol. 26, p. 606-630.

5. Basel Committee on Banking Supervision (2017), *Twelfth progress report on adoption of the Basel regulatory framework.*, <https://www.bis.org/bcbs/publ/d404.pdf>.
6. Bonaccorsi di Patti, E. and Palazzo, F. (2018), Bank profitability and macroeconomic conditions: Are Business models different?, *Bank of Italy Occasional Paper*, Vol 436.
7. Bonaccorsi di Patti, E. and Sette, E. (2016), Did the securitization market freeze affect bank lending during the financial crisis? Evidence from a credit register, *Journal of Financial Intermediation*, Vol. 25, p. 54-76.
8. Dagher, J. and Kazimov, K. (2015), Banks' liability structure and mortgage lending during the financial crisis, *Journal of Financial Economics*, Vol. 116, issue 3, p. 565-582.
9. Di Fabio, C. (2019), Does the business model influence income smoothing? Evidence from European banks, *Journal of Applied Accounting Research*, Vol. 20, issue 3, p. 311-330.
10. Goncharenko, T. (2020). "From Business Modelling to the Leadership and Innovation in Business: Bibliometric Analysis (Banking as a Case), *Business Ethics and Leadership*", Volume 4, Issue 1, ISSN -2520-6311.
11. Jin, J., Kanagaretnam, K. and Lobo, G.J. (2018), Discretion in bank loan loss allowance, risk taking and earnings management, *Accounting and Finance*, Vol. 58, No. 1, p. 171-193.
12. Klang D., Wallnöfer, M. and Hacklin, F. (2014), The Business Model Paradox: A Systematic Review and Exploration of Antecedents, *International Journal of Management Reviews*, Vol 16, issue 4, p. 454-478.
13. Kohler, M. (2015), "Which banks are more risky? The impact of business models on bank stability", *Journal of Financial Stability*, 16, p. 195-212.
14. Liu, C. and Ryan, S. (1995), The Effect of Bank Loan Portfolio Composition on the Market Reaction to and Anticipation of Loan Loss Provisions, *Journal of Accounting Research*, Vol. 33, p. 77-94.
15. Mergaerts, F. and Vennet, V. R. (2016), "Business models and bank performance: A long-term perspective", *Journal of Financial Stability*, 22, p. 57-75.
16. Roengpitya, R., Tarashev, N. and Tsatsaronis, K. (2014), "Bank business models," *BIS Quarterly Review*, (December), p.55-65.
17. Zott, C., Amit, R. and Massa, L. (2011), The Business Model: Recent Developments and Future Research, *Journal of Management*, Vol. 37, Issue 4, p. 1019-1042.
18. NBRNM, Report on the risks in the banking system of the Republic of North Macedonia, 2010-2019.