7th International Scientific Conference on Business and Economics (ISCBE)

THE IMPACT OF MERGERS AND ACQUISITIONS ON EFFICIENCY AND PERFORMANCE IN BANKING: EMPIRICAL EVIDENCE FROM CROATIA

OVERVIEW OF THE RESEARCH

-impact and effect of M&A in the banking sector in Croatia;

-DEA methodology;

-BCC Data Envelopment Analysis (DEA) window technique model-to assess the relative efficiency of both the entire Croatian banking sector and each individual bank from the sample of 20 banks in the period 2011 - 2020

-Inputs: interest expenses and non-interest expenses

-Outputs: interest revenues and non-interest revenues

INTRODUCTION

- Role of the banks in the financial markets;
- M&A-increase in revenue or cost reduction;
- Increased competition in the global financial markets, deregulation, and liberalization in the financial services sector-increased efficiency of banks;
- BCC DEA model;
- 20 Croatian commercial banks in the period from 2011 to 2020

LITERATURE REVIEW

The application of DEA in the banking industry :
-an analysis of banks operating within one national economy;
-an analysis of bank branches of a bank;
-an analysis of banks in two or more national economies
-the efficiency of bank mergers
-the banking branch development strategies;

Importance of Mergers and Acquisitions:
-expansion of scale;
-cost savings;
-rich resources;

Mergers and Acquisitions in the banking sector (efficiency gains):
-stronger competition;
-lower cost of capital
-change in business models
-higher profitability and efficiency;
-potential to create long-term productivity improvement;

An overview of the Croatian banking sector:
-Croatian financial system is a bank-based Continental system
-characteristics of the Croatian banking system

METHODOLOGY AND DATA

-econometric methods or linear programming techniques;

-DEA-input and output variables-introduced by Charnes, Cooper, and Rhodes in a seminal paper published in 1978.

Character of variable	Label of the variables	Elements of the variables
INPUT	interest expenses (I1)	
	non-interest expenses (I2)	Expenses on fees and commissions General administrative expenses and depreciation Expenses on value adjustments and provisions Other operating expenses
OUTPUT	interest revenues (O1)	
	non-interest revenues (O2)	Income from fees and commissions Other operating income

- The used data has been extracted from the official and publicly available financial statements for the selected inputs and outputs for each commercial bank in the 2011-2020 period;
- The obtained efficiency result from the DEA methodology is usually presented either as a percentage (0-100%) or a number between 0 and 1, with 100% or 1 being relatively efficient, while values below 100% or 1 indicate relative inefficiency.
- In this study, the practical application of the DEA window technique is explored in the investigation of the relative efficiencies of banks operating in Croatia as well as the impact of M&A transactions on banks' efficiency.
- The number of windows (w) in the solved problem can be expressed using the following relationship:

$$w = k - p + 1$$

the number of DMUs in each window: np/2

and the number of different DMUs: npw

where: w = number of windows; n = number of DMUs; k = number of periods; p = duration of window (p≤k)

- Four case studies will be evaluated in detail as follows: the merger of Karlovačka Banka d.d. and Nava Banka d.d. in 2012, the acquisition of Banco Popolare Croatia by OTP Banka Hrvatska d.d. in 2014, the acquisition of Splitska Banka d.d. by OTP Banka Hrvatska d.d. in 2017, and the acquisition of Jadranska Banka d.d. by Hrvatska Poštanska Banka d.d. in 2018.

EMPIRICAL RESULTS

Window 1	2011	2012	2013	2014	2015					
window 2		2012	2013	2014	2015	2016				
window 3			2013	2014	2015	2016	2017			
window 4				2014	2015	2016	2017	2018		
window 5					2015	2016	2017	2018	2019	
window 6						2016	2017	2018	2019	2020

Total average efficiency of the Croatian banking sector
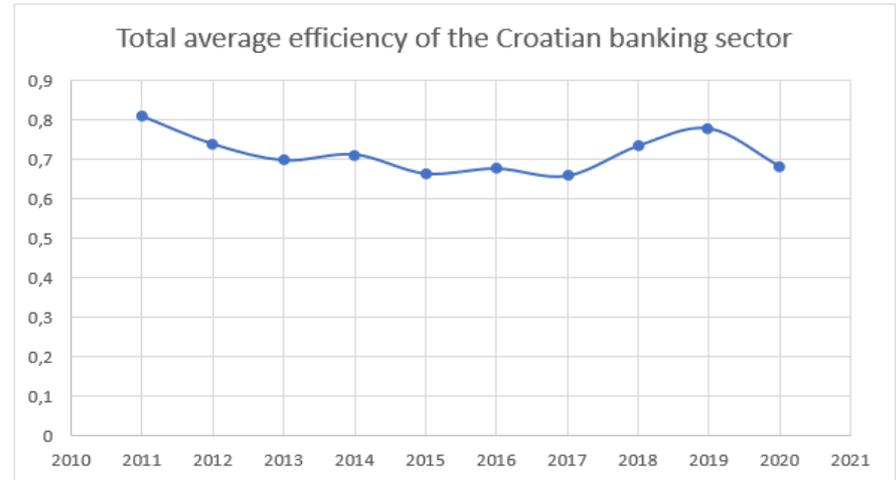
| Bank	Overall efficiency		
	by windows	by years	Type of bank
Addiko Bank d.d.	0.5507	0.5848	Middle-sized
Agram Banka d.d.	0.6877	0.6774	Middle-sized
Banka Kovanica d.d.	0.6885	0.6714	Small-sized
Croatia Banka d.d.	0.5609	0.5168	Small-sized
Erste&Steirmaerkische Bank d.d.	0.9324	0.8851	Large
Hrvatska poštenska Banka d.d.	0.6527	0.7031	Large
Imex Banka d.d.	0.6986	0.7776	Small-sized
Istarska Kreditna Banka Umag d.d.	0.7230	0.7699	Middle-sized
J&T Banka d.d.	0.4875	0.5227	Small-sized
Karlovačka Banka d.d.	0.6300	0.6390	Middle-sized
KentBank d.d.	0.6700	0.6728	Middle-sized
OTP Banka d.d.	0.7848	0.8167	Large
Partner Banka d.d.	0.6164	0.6368	Small-sized
Podravska Banka d.d.	0.6159	0.6427	Middle-sized
Privredna Banka Zagreb d.d.	0.9505	0.9623	Large
Reiffeisenbank Austria d.d.	0.6985	0.7298	Large
Samoborska Banka d.d.	0.8466	0.8971	Small-sized
Sberbank d.d. (Nova hrvatska banka d.d.)	0.6079	0.6100	Middle-sized
Slatinska Banka d.d.	0.6550	0.6998	Small-sized
Zagrebačka Banka d.d.	0.9550	0.8930	Large

The efficiency of Karlovačka Banka d.d. (2011-2020)
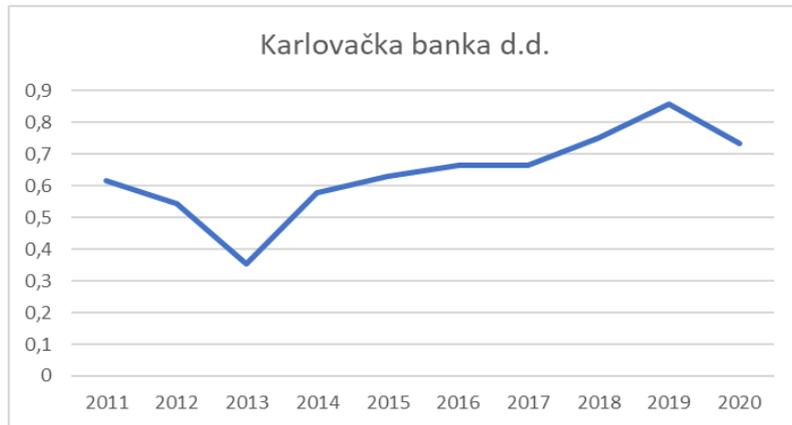
The efficiency of Hrvatska Poštanska Banka d.d. (2011-2020)
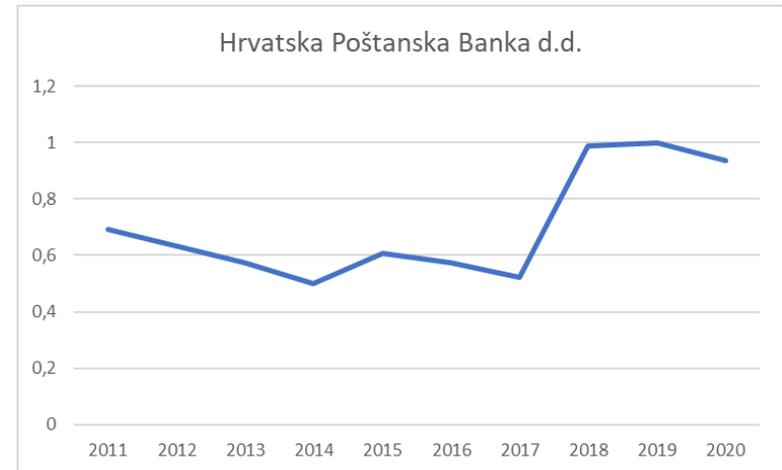
The efficiency of OTP Banka d.d. (2011-2020)
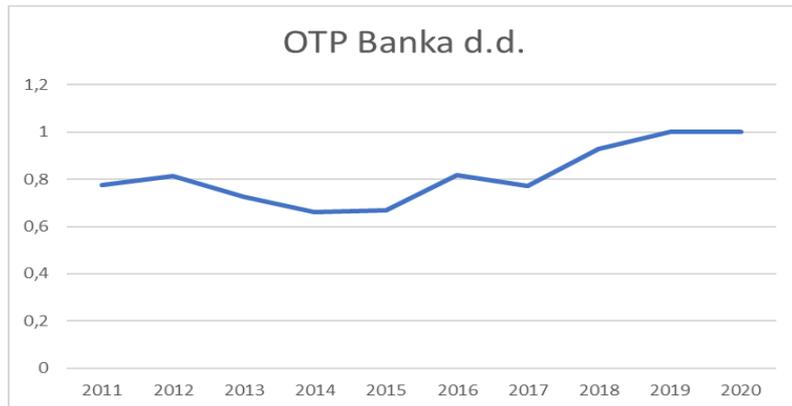
CONCLUSION

-The findings reveal that the most efficient Croatian banks in the period 2011-2020 belong to the group of large banks, namely Erste&Steirmaerkische bank d.d.; Privredna Banka Zagreb d.d. and Zagrebačka Banka d.d;

-The least efficient banks are two small-sized commercial banks, Croatia banka d.d and J&T Banka d.d;

-The average relative efficiency of the Croatian banking sector for the entire observed period (2011-2020) is 71.5%;

-M&A activities in the Croatian banking sector have contributed to increasing the efficiency of both merged banks and the banking sector in general;

-The second stage of the study contains a case study approach to investigate whether the analysed M&A transactions had a positive efficiency impact on banks. In all of the four analysed case studies of M&A in the Croatian banking sector, the banks experienced efficiency gains and improved relative performance after the M&A transaction;

-Limitations of the study;