

**THE EFFECT OF MERGERS ON THE EFFICIENCY OF COMMERCIAL BANKS:  
EVIDENCE FROM MALAYSIA**

A thesis submitted to the Faculty of Finance and Banking in fulfillment of the  
requirements for the degree of Master of Science (Banking),  
Faculty of Finance and Banking,  
Universiti Utara Malaysia.

By

Muhammad Hafiz Bin Desa

© MUHAMMAD HAFIZ BIN DESA, 2007. All rights reserved.

## **PERMISSION TO USE**

In presenting this thesis as partial fulfillment of the requirements for a postgraduate degree from Universiti Utara Malaysia, I agree that the Universiti Library may make it freely available for inspection. I further agree that permission for copying this thesis in any manner, in a whole or in a part, for scholarly purposes maybe granted by my supervisors or, in their absence, by my Dean of Faculty of Finance and Banking. It is understood that any copying or publications or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Requests for permission to copy or to make other use of materials in this thesis, in whole or in part, should be addressed to:

Dean  
Faculty of Finance and Banking  
Universiti Utara Malaysia  
06010 Sintok  
Kedah Darul Aman.

## ABSTRAK

Disertasi ini mengkaji kesan penggabungan terhadap kecekapan bank-bank perdagangan di Malaysia dari tahun 1995-2005. Kami menggunakan pendekatan sempadan bukan parametrik iaitu Data Envelopment Analysis (DEA), untuk menganalisa kecekapan bank-bank dalam tempoh semasa kegawatan, sebelum penggabungan, semasa penggabungan dan selepas penggabungan. Untuk perbandingan kecekapan bank-bank tempatan, sembilan bank-bank asing juga dikaji. Keputusan menunjukkan sebelum krisis kewangan, bank-bank asing lebih efisien berbanding bank-bank tempatan. Tanpa diduga, bank-bank tempatan lebih efisien berbanding bank-bank asing semasa krisis ekonomi dengan purata skor kecekapan masing-masing 96.6% dan 78.9%. Ini membuktikan sepuluh bank-bank tempatan yang telah dipilih oleh Bank Negara Malaysia sebagai peneraju bank-bank perdagangan tidak dipengaruhi oleh krisis kewangan pada 1997. Namun, bank-bank tempatan kurang efisien semasa tahun penggabungan berbanding bank-bank asing. Ini disebabkan beberapa bank yang mengambil alih bergabung dengan bank-bank yang lebih lemah, yang mana ianya mempengaruhi prestasi bank-bank tersebut. Penggabungan kelihatan membenarkan bank-bank yang cekap mengambil alih bank-bank yang lemah, maka ianya membantu meningkatkan kecekapan input. Bank-bank yang tidak cekap semasa tahun penggabungan adalah disebabkan oleh pengintegrasian sistem dan teknologi di lokasi dan kawasan yang berlainan. Keputusan juga menunjukkan bahawa bank-bank yang cekap adalah tidak dipengaruhi oleh saiz kerana bank-bank kecil dan sederhana adalah lebih efisien. Secara umumnya, kecekapan bank-bank tempatan bagi tempoh lima tahun sebelum dan selepas tahun penggabungan masing-masing ialah 92.3% dan 97.2%. Keputusan juga menunjukkan bank-bank tempatan Malaysia memperolehi purata kecekapan 100% pada tahun 2005. Secara keseluruhannya, kajian ini telah membuktikan bahawa program penggabungan bank-bank di Malaysia adalah berjaya.

## ABSTRACT

This paper studies the effect of mergers on the efficiency of commercial banks in Malaysia from 1995-2005. We utilise the non-parametric frontier approach, Data Envelopment Analysis (DEA), to analyse the efficiency of banks during the financial crisis, the merger year, and the pre-and post merger periods. To make comparison of the efficiency of domestic banks, nine foreign banks are also included in the sample. Results show that before financial crisis, foreign banks were more efficient than domestic banks. Surprisingly, domestic banks had a higher efficiency level than foreign banks in the crisis year with an average technical efficiency score of 96.6% compared to 78.9%. It is evidence that 10 domestic banks selected by Bank Negara Malaysia to be the anchor commercial banks were not really affected by financial crisis which hit the country in 1997. However, domestic banks were inefficient during merger year compared to foreign banks. This was due to some of the acquiring banks merged with weaker banks and influenced the bank's performance. Mergers seem to allow efficient banks to gain control of weaker banks, thus helping them to increase input efficiency. The inefficient banks in merger year were also influenced by integrating system and technology in different location and geographical area. We find that efficient banks are not determined by size as small and medium banks are more efficient. The technical efficiency of domestic banks in five years before and five years after the merger were 92.3% and 97.2% respectively. The results also reveal that Malaysian domestic banks experienced an average efficiency of 100% in year 2005. Overall, this study has established that the merger programme in Malaysia was successful.

## **ACKNOWLEDGEMENTS**

Alhamdulillah, all praise to Allah the Al-Mighty for the blessing and opportunity bestowed upon me to undertake my MSc. Blessing and salutation also is on Prophet of Allah, Muhammad S.A.W. Thanks also for the strength and courage granted to me to accomplish my study.

I would like to express my gratitude and appreciation to the Faculty of Finance and Banking of Universiti Utara Malaysia (UUM), especially to Dr. Rohani Md Rus and Dr. Kamarun Nisham Taufil Mohd of their continuous guidance in preparing this thesis and reviewing my project paper.

My deepest thanks to the Dean of Faculty of Finance and banking, Assoc. Prof. Dr Nor Hayati Ahmad and lecturers for their help and cooperation given during preparing and finishing this thesis. My gratitude also to Mr. Fadzlan Sufian from CIMB Bank for his help in sharing his great knowledge in DEAP version 2.1.

I would like to dedicate my thesis and special thanks to my parents Haji Desa bin Senawi and Hajjah Che Onin binti Che Dat for their support and constant encouragement throughout my MSc study. I would also like to thank all my colleagues at Citigroup Trade Services (M) Sdn Bhd for their constant words of encouragement.

Last but not least, thanks also to all my friends, who had encouraged and supported me during the process of completing this thesis.

Thank you to all of them.

## TABLE OF CONTENTS

	Page
<b>PERMISSION TO USE</b>	i
<b>ABSTRAK</b>	ii
<b>ABSTRACT</b>	iii
<b>ACKNOWLEDGEMENTS</b>	iv
<b>TABLE OF CONTENTS</b>	v
<b>LIST OF TABLES</b>	vii
<b>LIST OF FIGURES</b>	viii
<b>LIST OF APPENDICES</b>	ix
<b>CHAPTER 1: INTRODUCTION</b>	
1.1 Chapter Overview	1
1.2 Malaysian Banking at Glance	1
1.3 Mergers and Acquisitions in Malaysia	5
1.4 Objectives of the Study	9
<b>CHAPTER 2: LITERATURE REVIEW</b>	
2.1 Chapter Overview	12
2.2 Bank Mergers and Economy Development	12
2.3 Characteristics of Acquirer and Acquired Banks	14
2.4 Effects of Bank Mergers	17
2.5 Data Envelopment Analysis (DEA) as an Efficiency Indicator	22
<b>CHAPTER 3: METHODOLOGY</b>	
3.1 Chapter Overview	29
3.2 Data and Period of Study	29
3.3 Specification of Inputs and Outputs	30
3.4 Data Envelopment Analysis (DEA)	31
3.4.1 Efficiency Measurement	33

**CHAPTER 4: EMPIRICAL RESULTS**

4.1 Chapter Overview	38
4.2 Descriptive Statistics	38
4.2.1 Personnel Cost	41
4.2.2 Fixed Assets	43
4.2.3 Total Deposits	44
4.2.4 Loans, Advances and Financing	46
4.2.5 Investment and Dealing Securities	48
4.3 DEA Results of 10 Commercial Banks in Malaysia	50
4.3.1 Analysis of the Efficiency Scores for Domestic Banks	51
4.4 DEA Results of Domestic and Foreign Banks	58

**CHAPTER 5: CONCLUSIONS**

5.1 Chapter Overview	66
5.2 Conclusions	66

**REFERENCES**

x

**APPENDICES**

xvi

## **LIST OF TABLES**

<b>TABLE</b>	<b>TITLE</b>	<b>PAGE</b>
1	Total Assets, Shareholders' Funds and Net Income of Domestic Commercial Banks in 2005	3
2	Number of Commercial Banks in Malaysia	4
3	Summary of Acquiring Banks and Acquired Institutions, 1999-2002	8
4	Summary Statistics of Input and Output Variables of Domestic Banks	39
5	Estimated DEA Efficiency Levels of Malaysian Domestic Commercial Banks	50
6	Abbreviation of Malaysian Commercial Banks	51
7	Summary of Efficiency Score by Bank Ownership	58

## **LIST OF FIGURES**

<b>FIGURE</b>	<b>TITLE</b>	<b>PAGE</b>
1	Scale Economies in DEA	36
2	Personnel Cost	42
3	Fixed Assets	43
4	Total Deposits	45
5	Loans, Advances and Financing	46
6	Investment and Dealing Securities	48

## **LIST OF APPENDICES**

<b>APPENDIX</b>	<b>TITLE</b>	<b>PAGE</b>
1	Results For Domestic Banks From DEAP Version 2.1	xvi
2	Results For Foreign Banks From DEAP Version 2.1	vlix

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 CHAPTER OVERVIEW**

The rationale of this chapter is to provide the main objectives and aim of this study. This chapter covers a brief introduction of commercial banking overview before and after mergers. We also discuss in relation to economic crisis in 1997 that prompted to mergers of financial institutions.

### **1.2 MALAYSIAN BANKING AT A GLANCE**

The banking system in Malaysia is vibrant, strong and profitable. In fact, the banking system is at the strongest position since the financial crisis. Substantial enhancements in the areas of corporate governance and risk management standards have reinforced the high level of capital, improving asset quality and strong profitability.

These enhancements have enabled the banking institutions, particularly the Malaysian domestic banks to remain competitive and to offer different products and value-added services to customers. The major competition today is the soundness and scrambling of foreign banks to offer products based on the Islamic principles which indicates that customer's demand is the priority. The threat of competition forces banks to focus on their effectiveness in providing financial services and in offering the increasing demands from customers. This situation requires an appropriate assessment of

The contents of  
the thesis is for  
internal user  
only

## REFERENCES

Akhavein, J. D., Berger, A. N. and Humphrey, D. B., (1997). "The effects of megamergers on efficiency and prices: Evidence from a bank profit function", *Review of Industrial Organization*, 12, 95–139.

Barr, R. S., Killgo, K. A., Siems, T. F. and Zimmel, S., (2002). "Evaluating the productive efficiency and performance of U.S. commercial banks", *Managerial Finance*, 28(8), 3.

Benston, G.J., Hunter, W.C., Wall, L.D., 1995. "Motivations for bank mergers and acquisitions: Enhancing the deposit insurance put option versus earnings diversification", *Journal of Money, Credit, and Banking*, 27, 777-788.

Berger, A. N., and R. DeYoung, (2001). "The effect of geographical expansion on efficiency", *Journal of Financial Research Services*, 19, 163-184.

Berger, A. N., Bonime S., Covitz D., and D. Hancock (2000). "Why are Bank Profits so Persistent? The Roles of Product Market Competition, Informational Opacity, and Regional / Macroeconomic Shocks", *Journal of Banking and Finance*, 24(7), 1203-1235.

Berger, A. N., Demsetz, R.S. and Strahan, P.E. (1999). "The consolidation of the financial services industry: Causes, consequences, and implications for the future", *Journal of Banking & Finance*, 23, 135-194.

Berger, A. N., and Humphrey, D.B., (1997). "Efficiency of financial institutions: International survey and directions for future research," *European Journal of Operations Research*, 98, 175-212.

Berger, A. N., Humphrey, D. B., (1992). "Measurement and efficiency issues in commercial banking. In:Griliches, Z. (Ed.), Output Measurement in the Service Sectors", *National Bureau of Economic Research, University of Chicago Press, Chicago*, 245–279.

Berger, A. N., and Humphrey, D.B., (1992). "Megamergers in banking and the use of cost efficiency as in antitrust defense," *Antitrust Bulletin*, 37, 541-600.

Casu, B. and Girardone, C., (2002). "A Comparative Study of the Cost Efficiency of Italian Bank Conglomerates", *Managerial Finance*, 28, 3–23.

Chamberlain, Sandra L., (1998). "The Effect of Bank Ownership Changes on Subsidiary-Level Earnings." In *Bank Mergers & Acquisitions*, edited by Yakov Amihud and Geoffrey Miller, Kluwer Academic Publishers.

Charnes, A., Cooper, W. W., and Rhodes, E., (1978). "Measuring the Efficiency of Decision Making Units", *European Journal of Operational Research*, 2, 429–444.

Chen, T. Y. and Yeh, T. L., (1998) “A study of efficiency evaluation in Taiwan’s banks,” *International Journal of Service Industry Management*, 9(5), 402-15.

Clark, N. M. and Wheelock, D., (1997). “Why Does Bank Performance Vary Across States ?”, *Review, Federal Reserve Bank of Saint-Louis*, 79(2), 27-40.

Coelli, T.J., (1996). “A Guide to DEAP Version 2.1: A Data Envelopment Analysis (Computer) Program”, *Centre for Efficiency and Productivity Analysis (CEPA) Working Paper*, 8/96.

Cybo-Ottone, A. and Murgia, M., (2000), “Mergers and shareholder wealth in European banking”, *Journal of Banking and Finance* 24, 831-59.

De Young, R., and Whalen, G. (1994). “Banking industry consolidation: Efficiency issues. Economic & Policy Analysis”, *Office of the Comptroller of the Currency Working Paper*.

Dietrich, J. K., and Sorensen, E., (1984). “An application of logit analysis to prediction of merger target,” *Journal of Business Research*, 12, 393-402.

Drake, L. and Hall, M. J. B., (2003). “Efficiency in Japanese banking: An empirical analysis”, *Journal of Banking & Finance*, 27, 891–917.

Farrell, M.J., (1957). “The measurement of productive efficiency”. *Journal of the Royal Statistical Society, Series A (part III)*, 253–281.

Focarelli, D., Panetta, F. and Salle, C., (2002). “Why do Banks Merge?”, *Journal of Money, Credit and Banking*, 34, 1047-1066.

Galagedera, D.U.A. and Edirisuriya., (2005). “Performance of Indian commercial banks 1995-2002”, *South Asian Journal of Management*, 12(4), 52.

Gunther, J. and Robinson, K., (1999). “Industry Mix and Lending Environment Variability: What Does the Average Bank Face?”, *Economic and Financial Review*, Federal Reserve Bank of Dallas, Q2, 24-31.

Hadlock, C., Houston, J. and Ryngaert, M., (1999). “The Role of Managerial Incentives in Bank Acquisitions,” *Journal of Banking and Finance*, 23, 221-249.

Halkos, G. E. and Salamouris, D. S., (2004). “Efficiency measurement of the Greek commercial banks with the use of financial ratios: a data envelopment analysis approach”, *Management Accounting Research*, 15, 201–224.

Huh, C. and Kim. S., (1994). “Financial Regulation and Banking Sector Performance: A Comparison of Bad Loan Problems in Japan and Korea”, *Economic Review*, Federal Reserve Bank of San Francisco, 0(2), 18-29.

Jemric, I. and Vujcic, B., (2002). "Efficiency of Banks in Croatia: A DEA Approach", *Working Papers, Croatian National Bank*, W- 7 February.

Karim, M.Z.A., (2001). "Comparative bank efficiency across select ASEAN countries", *ASEAN Economic Bulletin*, 18(3), 289-304.

Katib, M. N., and Mathews, K. (1999). "A non-parametric approach to efficiency measurement in the Malaysian banking sector," *The Singapore Economic Review*, 44, 89-114.

Krishnasamy, G., Ridzwa, A.F. and Vignesan, P. (2004). "Malaysian Post-Merger Banks' Productivity: Application of Malmquist Productivity Index," *Managerial Finance*, 30, 63-74.

Lang, G., and P. Welzel (1999). "Mergers among German Cooperative banks: A Panel-Based Stochastic Frontier Analysis," *Small Business Economics*, 13, 273-286.

Maudos, J, J.M. Pastor, F. Perez and J. Quesada, (2002). "Cost and profit efficiency in European banks", *Journal of International Financial Markets, Institutions and Money*, 12(1), 33-58.

Mahesh H P and Rajeev, M., (2006). "Liberalisation and Productive Efficiency of Indian Commercial Banks: A Stochastic Frontier Analysis", *Working Paper*, MPRA Paper No. 827, <http://mpra.ub.uni-muenchen.de/827/>

Milbourn, T. T., Boot, A. W.A. and Thakor, A. V., (1999). "Megamergers and expanded scope: Theories of bank size and activity diversity", *Journal of Banking & Finance*, 23, 195-214.

Miller, S. M. and Noulas, A. G., (1996). "The technical efficiency of large bank production", *Journal of Banking & Finance*, 20, 495-509.

Oral, M. and Yolalan, R., (1990). "An empirical study on measuring operating efficiency and Profitability of bank branches," *European Journal of Operational Research*, 46, 282-294.

O'Keefe, J.P., (1996). "Banking Industry Consolidation: Financial Attributes of Merging Banks," *FDIC Banking Review*, 9, 18-38.

Peek, J. and Rosengren, E. S., (1998). "Bank consolidation and small business lending: It's not just bank size that matters", *Journal of Banking & Finance*, 22, 799-819.

Peristiani, S., (1997). "Do mergers improve the X-efficiency and scale efficiency of U.S. banks? Evidence from the 1980s", *Journal of Money, Credit and Banking*, 29, 326-337.

Rhoades, S. A., (1993). "The efficiency effects of horizontal bank mergers", *Journal of Banking and Finance*, 17, 411-422.

Rhoades, S. A., (1998). "The efficiency effects of bank mergers: An overview of case studies of nine mergers", *Journal of Banking & Finance*, 22, 273-291.

Rose, P. S., (1995). "The Distribution of Outcomes from Corporate Mergers: Evidence from Commercial Bank Acquisition Strategies", *Journal of Accounting, Auditing, and Finance*, 10(2), 343–364.

Shaffer, S., (1994). "Bank competition in concentrated markets," *Federal Reserve Bank of Philadelphia Business Review*, Jan-Feb, 3-16.

Shanmugam, M., (2000). "The Main Players, Major Banks in The Run for Anchor Status Malaysian Business", Feb 16.

Sharma, S. C. and Margono, H., (2004). "Cost efficiency, Economies of Scale, Technological progress and Productivity in Indonesian Banks," *Working Paper, Southern Illinois University Carbondale*.

Sherman, H. D. and Rupert, T. J., (2006). "Do bank mergers have hidden or foregone value? Realized and unrealized operating synergies in one bank merger", *European Journal of Operational Research*, 168, 253–268.

Shih, M.S.H. (2003). "An investigation into the use of mergers as a solution for the Asian banking sector crisis," *The Quarterly Review of Economics and Finance*, 43, 31-49.

Sufian, F., (2004). "The Efficiency Effects Of Bank Mergers And Acquisitions In A Developing Economy: Evidence From Malaysia," *International Journal of Applied Econometrics and Quantitative Studies* Vol.1-4, 53-74.

Waxman, M., (1998). "A legal framework for systemic bank restructuring," *The World Bank Development Research Group and IMF Research Department*.

Weill, L., (2004). "Measuring Cost Efficiency in European Banking: A Comparison of Frontier Techniques", *Journal of Productivity Analysis*, 21, 133–152.

**Book:**

Timothy J, Coelli, D.S. Pradasa Rao Christopher J. O'Donnell and George E. Battese, (2005). *An Introduction to Efficiency and Productivity Analysis* (2<sup>nd</sup> edition), Springer.

**Website Sources:**

Bank Negara Malaysia website  
<http://www.bnm.gov.my/>

Bursa Malaysia website  
<http://www.bursamalaysia.com.my/>

Sultanah Bahiyah Library website, UUM  
<http://www.lib.uum.edu.my/>

Institut Bank- Bank Malaysia  
<http://www.ibbm.org.my/>

i) **Domestic Commercial Banks:**

Affin Bank  
<http://www.affinbank.com.my/>

Alliance Bank  
<http://www.alliancebank.com.my/>

AmBank  
<http://www.ambank.com.my/>

Bumiputra-Commerce  
<http://www.bcb.com.my/>

EON Bank  
<http://www.eonbank.com.my/>

Hong Leong Bank Bhd  
<http://www.hlb.com.my/>

Malayan Banking Bhd  
<http://www.maybank.com.my/>

Public Bank Bhd  
<http://www.publicbank.com.my/>

RHB Bank Bhd  
<http://www.rhbbank.com.my/>

Southern Bank Bhd  
<http://www.sbbgroup.com.my/>

ii) **Foreign Commercial Banks:**

ABN Amro Bank Bhd  
<http://www.abnamromalaysia.com/>

Bank Of Tokyo-Mitsubishi UFJ (M) Bhd  
<http://www.bk.mufg.jp/english/malaysia/>

Citibank Bhd  
<http://www.citibank.com.my/>

Deutsche Bank (M) Bhd  
<http://www.db.com/malaysia/>

HSBC Bank (M) Bhd  
<http://www.hsbc.com.my/>

OCBC Bank (M) Bhd  
<http://www.ocbc.com.my/>

Standard Chartered Bank (M) Bhd  
<http://www.standardchartered.com.my/>

The Bank Of Nova Scotia Bhd  
<http://www.scotiabank.com.my/>

United Overseas Bank (M) Bhd  
<http://www.uob.com.my/>