

**EXAMINING THE RELATIONSHIP BETWEEN OPERATIONAL RISK,
CREDIT RISK AND LIQUIDITY RISK WITH PERFORMANCE OF MALAYSIA
BANKS**

**BY
MAYTHAM HUSSEIN SAEED
814431**

**Thesis Submitted to
Othman Yeop Abdullah Graduate School of Business
Universiti Utara Malaysia
In Fulfillment of the Requirement for the Degree of Master of Science (Banking)**

DECLARATION

I declare that the substance of this project paper has never been submitted for any degree or postgraduate program and qualifications.

I certify that all the support and assistance received in preparing this project paper and the entire source abstracted have been acknowledged in this stated project paper.

MAYTHAM HUSSEIN SAEED

814431

Othman Yeop Abdullah

Graduate School of Business

Universiti Utara Malaysia

06010 Sintok

Kedah Darul Aman

PERMISSION TO USE

In presenting this thesis in fulfilment of the requirement for a postgraduate degree from Universiti Utara Malaysia, I agree that university library may make it freely for inspection. I further agree that permission for the copying of the thesis in any manner, whole or in part for the scholarly purpose may be granted by my supervisor, or in her absence by the Dean of Othman Yeop Abdullah Graduate school of Business. It is understood that any copying or publication or use of thesis or parts therefore for financial gain shall not be allowed without any written permission. It is also understood that due recognition will be given to me and Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Request for permission to copy or to make other use of the material in this thesis, in whole or part should be addressed to:

Dean of Othman Yeop Abdullah Graduate School of Business

Universiti Utara Malaysia

06010 UUM Sintok

Kedah Darul Aman, Malaysia.

ABSTRAK

Kajian ini mengkaji kesan pengurusan risiko kepada prestasi bank di Malaysia. Data kajian ini diambil daripada Datastream dan laporan tahunan bagi semua bank-bank konvensional di negara ini. Sampel kajian terdiri daripada 27 bank perdagangan konvensional di Malaysia dan tempoh pengajian adalah terhad kepada 2005-2013; menghasilkan 208 pemerhatian. Pembolehubah bersandar kajian ini adalah prestasi bank dan diwakili oleh ROA dan ROE, manakala pengurusan risiko adalah pembolehubah bebas dan diwakili oleh risiko operasi, risiko kredit dan risiko kecairan. Analisis regresi dengan GLS anggaran dijalankan untuk menguji hipotesis kajian dan keputusan menunjukkan bahawa risiko operasi, risiko kredit dan risiko kecairan mempunyai pengaruh yang signifikan ke atas ROE. Walau bagaimanapun, keputusan regresi menunjukkan bahawa hanya risiko operasi dan risiko kredit adalah signifikan kepada ROA manakala risiko mudah tunai didapati tidak mempunyai hubungan yang signifikan dengan ROA. Oleh itu, hipotesis tentang hubungan yang signifikan di antara risiko operasi dan risiko kredit dengan prestasi bank disokong manakala hipotesis tentang hubungan yang signifikan risiko mudah tunai dan prestasi bank tidak disokong.

Kata Kunci: risiko operasi, risiko kredit, risiko kecairan, ROA, ROE.

ABSTRACT

This study examines the impact of risk management on bank performance in Malaysia. The data of this study are retrieved from DataStream and annual reports of all conventional banks in the country. The sample of the study comprises of 27 conventional commercial banks in Malaysia and the period of study is confined to 2005-2013; making up to 208 observations. The dependent variable of this study is bank performance and is proxy by ROA and ROE, while risk management is the independent variable and is proxy by operational risk, credit risk, and liquidity risk. A regression analysis with GLS estimation is run to test the hypotheses of the study and the results show that operational risk, credit risk and liquidity risk have significant influence on ROE. However, the regression results show that only operational risk and credit risk are significant to ROA while liquidity risk is found to have insignificant relationship with ROA. Hence, the hypotheses of the significant relationship of operational risk and credit risk with bank performance are supported while the hypothesis of significant relationship of liquidity risk and bank performance is not supported.

Keywords: Operational risk, Credit risk, Liquidity risk, ROA, ROE.

ACKNOWLEDGEMENT

This thesis has been packaged with the help of Allah (S.W.T) and the support of many people. Firstly, I give thanks to Allah the lord of the universe, who in His infinite mercy and grace set my affairs right and made the completion of this thesis a reality. I wish to express my profound gratitude to my reliable supervisor, Dr. Nora Azureen Abdul Rahman for her inspiration and motivation in ensuring that a standard was accomplished for this thesis. Her inspiration, tolerance, advises, understanding and encouragement cannot be quantified. This indeed made my work a great learning experience; surely you will remain in my memory.

I am also grateful to my family members especially my wife for her inspiration, endurance and understanding during the course of this project, then to my siblings for their encouragements and support towards the achievement of this thesis. I pray that Allah protect and guide them through all their endeavours.

I also use this medium to appreciate the support and advice of all my friends who have contributed in one way or the other towards the success of this study. I pray that Allah reward them abundantly.

Maytham Hussein Saeed

TABLE OF CONTENTS

DECLARATION	ii
PERMISSION TO USE	iii
ABSTRAK	iv
ABSTRACT	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS	vii
LIST OF FIGURES	x
LIST OF TABLES	xii
CHAPTER ONE : INTRODUCTION	1
1.1 DEFINITION OF RISK	1
1.2 RISK MANAGEMENT	2
1.3 OPERATIONAL RISK	8
1.4 CREDIT RISK	10
1.5 LIQUIDITY RISK	11
1.6 PROBLEM STATEMENT	14
1.7 RESEARCH QUESTIONS	15
1.8 RESEARCH OBJECTIVES	16
1.9 SIGNIFICANT OF THE STUDY	16
1.10 SCOPE AND LIMITATION OF THE STUDY	17
1.11 ORGANIZATION OF THE STUDY	17
1.12 SUMMARY OF CHAPTER	17
CHAPTER TWO : LITERATURE REVIEW	18
2.0 INTRODUCTION	18

2.1	RISK IN THE BANKING SECTOR	18
2.2	THE IMPORTANCE OF FINANCIAL RISK MANAGEMENT IN BANKING	21
2.3	RISK MANAGEMENT AND BANK PERFORMANCE	24
2.4	OPERATIONAL RISK AND BANK PERFORMANCE	25
2.5	CREDIT RISK AND BANK PERFORMANCE	26
2.6	LIQUIDITY RISK AND BANK PERFORMANCE	29
2.7	SUMMARY OF CHAPTER	32
	CHAPTER THREE : METHODOLOGY	33
3.0	INTRODUCTION	33
3.1	THEORETICAL FRAMEWORK	33
3.2	MEASUREMENT OF VARIABLES	34
3.2.1	Dependent Variables	34
3.2.2	Independent Variables	36
3.3	DATA SOURCES	38
3.4	POPULATION AND DATA COLLECTION	38
3.5	HYPOTHESES DEVELOPMENT	39
3.7	DIAGNOSTIC TESTS	41
3.7.1	Normality	42
3.7.2	Heteroscedasticity	42
3.7.3	Auto-correlation	42
3.7.4	Regression Analysis	43
3.8	SUMMARY OF CHAPTER	43
	CHAPTER FOUR : ANALYSIS AND FINDINGS	44
4.0	INTRODUCTION	44

4.1	DESCRIPTIVES STATISTICS OF VARIABLES	44
4.2	NORMALITY TEST	46
4.3	CORRELATION	47
4.4	REGRESSION ANALYSIS	48
4.5	DISCUSSION OF FINDINGS	50
4.6	SUMMARY OF THE CHAPTER	53
	CHAPTER FIVE : CONCLUSION AND RECOMMENDATION	54
5.0	INTRODUCTION	54
5.1	RESEARCH OVERVIEW	54
5.2	CONTRIBUTION	55
5.2.1	Body of Knowledge	55
5.2.2	Policy Implications	56
5.2.3	Practical Implications	56
5.4	SUGGESTIONS FOR FUTURE RESEARCH	57
	REFERENCES	58
	APPENDICES	69

LIST OF FIGURES

Figure 3.1: Theoretical Framework

34

LIST OF APPENDICES

Appendix 1: Names of banks and number available years	69
---	----

LIST OF TABLES

Table 3.1: Summary of Variables and Measurement	37
Table 4.1: Summary of descriptive statistics	44
Table 4.2: Normality Test Result	46
Table 4.3: Correlation Matrix	47
Table 4.4: Variance Inflation Factors (VIF) for Multicollinearity test	47
Table 4.5: Regression Analysis of the independent variables on ROA	48
Table 4.6: Regression Analysis of the independent variables on ROE	49
Table 4.7: Summary of the hypotheses testing results	52

CHAPTER ONE

BACKGROUND OF THE STUDY

1.0 INTRODUCTION

This chapter begins with the introduction to the study. Section 1.1 deals with the definition of risk in real term. Section 1.2 deliberates on the definition of risk management practices in banking sector. Definitions and explanations of the risk factors used for this study are stated in section 1.3, 1.4, and 1.5. Meanwhile, the problem statement of this study is explained in section 1.6. The research questions of this study are highlighted in section 1.7; followed by the research objectives in section 1.8. The significance of this study is revealed in section 1.9. Meanwhile, scope of this study is expressed in section 1.10. Finally, organization of the study is highlighted in section 1.11.

1.1 DEFINITION OF RISK

Risk can be regarded as the possibility of something occurring and the level of losing, which happens from an activity or situation (Partnerships BC, 2005). Losses can occur directly or indirectly. An instance is when an earthquake causes direct loss of buildings; meanwhile, indirect losses occur when there is reputation loss, loss of customers' confidence, and increase in operational costs in the time of recovery. The possibility of something to occur will influence achieving objectives (News Straits Times, 2004). According to the State Bank of Pakistan (2003), "Risks are usually defined by the adverse impact on profitability of several distinct sources of uncertainty". Meanwhile,

The contents of
the thesis is for
internal user
only

REFERENCES

- Abbasoglu, O. F., Aysan, A. F., & Gunes, A. (2007). Concentration, competition, efficiency and profitability of the Turkish banking sector in the post-crisis period. *Banks and Bank Systems* 2(3), 106–115.
- Abiola, I., & Olausi, A. S. (2014). The impact of credit risk management on the commercial banks performance in Nigeria.
- Abu Hussain, H., & Al-Ajmi, J. (2012). Risk management practices of conventional and Islamic banks in Bahrain. *The Journal of Risk Finance Vol. 13 No. 3* , 215-239.
- Acerbi, C., & Scandolo §, G. (2008). Liquidity risk theory and coherent measures of risk. *Quantitative Finance*, 8(7), 681-692.
- Adeusi, S. O., Akeke, N. I., Adebisi, O. S., & Oladunjoye, O. (2014). Risk Management and Financial Performance of Banks in Nigeria. *European Journal of Business and Management*, 6(31), 336-342.
- Aebi, V., Sabato, G., & Schmid, M. (2012). Risk management, corporate governance, and bank performance in the financial crisis. *Journal of Banking & Finance*, 36(12), 3213-3226.
- Alam, T. (2013). An Evaluation of Financial Performance of Private Commercial Banks in Bangladesh: Ratio Analysis.
- Ali, K., Akhtar, M. F., & Sadaqat, S. (2011). Financial and Non-Financial Business Risk Perspectives–Empirical Evidence from Commercial Banks. *Middle Eastern Finance and Economics*, 12, 150-159.
- Ali, K., Akhtar, M. F., & Ahmed, P. H. (2011). "Bank-Specific and Macroeconomic Indicators of Profitability - Empirical Evidence from the Commercial Banks of Pakistan". *International Journal of Business and Social Science*, 2 (6), 235-242.
- Akhtar, M. F., Ali, K., & Sadaqat, S. (2011). Liquidity risk management: a comparative study between conventional and Islamic banks of Pakistan. *Interdisciplinary Journal of Research in Business*, 1(1), 35-44.
- Alkhatib, A., & Harasheh, M. (2012). Financial performance of Palestinian commercial banks. *International Journal of Business and Social Science*, 3(3).
- Allen, L., DeLong, G., & Saunders, A. (2004). Issues in the credit risk modeling of retail markets. *Journal of Banking & Finance*, 28(4), 727-752.
- Ally, Z. (2013). Comparative Analysis of Financial Performance of Commercial Banks in Tanzania. *Research Journal of Finance and Accounting*, 4(19), 133-143.
- Almazan, A. (2002). A model of competition in banking: Bank capital vs expertise. *Journal of Financial Intermediation*, 11(1), 87-121.
- Altman, E. I. & Hotchkiss, E. (2006). Corporate financial distress and bankruptcy: Predict and avoid bankruptcy, analyze and invest in distressed debt (Vol. 289). John Wiley & Sons.
- Altman, E. I., & Sabato, G. (2007). Modelling credit risk for SMEs: Evidence from the US market. *Abacus*, 43(3), 332-357.
- Almumani, M. A. (2013). Liquidity Risk Management: A Comparative Study between Saudi and Jordanian Banks.
- Alrabei, A. M. (2013). Evaluate the Profitability in Commercial Bank-Comparative Study

- of Indian and Jordanian Banks. *Asian Journal of Finance & Accounting*, 5(1), 259-273.
- Al-Tamimi, H. A. (2005). The Determinants of the UAE Commercial Banks' Performance: A Comparison of the National and Foreign Banks. *Journal of Transnational Management*, 10 (4), 35 — 47.
- Al-Tamimi, H. A. H., & Al-Mazrooei, F. M. (2007). Banks' risk management: a comparison study of UAE national and foreign banks. *Journal of Risk Finance, The*, 8(4), 394-409.
- Altunbas, Y., M.H. Liu, P. Molyneux & R. Seth, (2000). Efficiency and risk in Japanese banking. *Journal of Banking and Finance*, 24(10): 1605-1628.
- Altunbas, Y., Carbo, S., Gardener, E. P., & Molyneux, P. (2007). Examining the relationships between capital, risk and efficiency in European banking. *European Financial Management*, 13(1), 49-70.
- Anderson, K. and Terp, A. (2006), Risk Management, Andersen T.J. (ed.), Perspectives on Strategic Risk Management: 27-46. Denmark: Copenhagen Business School Press
- Arif, A., & Anees, A. N. (2012). Liquidity risk and performance of banking system. *Journal of Financial Regulation and Compliance*, 20(2), 182-195.
- Ariffin, N. M., & Kassim, S. H. (2011). Risk Management Practices and Financial Performance of Islamic Banks: Malaysian Evidence. *Center for Islamic Economics and Finance, Qatar Faculty of Islamic Studies, Qatar Foundation*.
- Ascarelli, S., (2002). Woes at allied Irish banks, Elan don't taint Irish stock exchange. *Wall Street Journal* (February 8).
- Ashraf, D., Altunbas, Y., & Goddard, J. (2007). Who transfers credit risk? Determinants of the use of credit derivatives by large US banks. *The European Journal of Finance*, 13(5), 483-500.
- Athanasoglou, P.P, S.N. Brissimis and M.D. Delis. (2005). "Bank Specific, Industry Specific and Macroeconomic Determinants of Bank Profitability," Bank of Greece Working Paper, No. 25 (Athens: Bank of Greece)
- Athanasoglou, P.P., Delis, M.D. & Staikouras, C.K. (2006). The Determinants of Bank profitability in the South Eastern European Region, Bank of Greece Working Paper.
- Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). "Bank-specific, industry-specific and macroeconomic determinants of bank profitability". *Journal of International Financial Markets Institutions and Money*, 121–136.
- Bacha, O.I. (2001), Financial Derivatives: Markets and Applications in Malaysia, Penerbit Universiti Putra Malaysia, Kuala Lumpur. Banking Industry Surveys. (June 25, 2009) Standard and Poor's.
- Bank Negara Malaysia (1999), The Central Bank and the Financial System in Malaysia: A Decade of Change (1989-1999), Bank Negara Malaysia, Kuala Lumpur.
- Banker, R.D., Chang, H., Lee, S.-Y., 2010. Differential impact of Korean banking system reforms on bank productivity. *Journal of Banking and Finance* 34, 1450– 1460.
- Barnhill, T. M., Papapanagiotou, J. P., & Schumacher, L. (2002). "Measuring Integrated Market and Credit Risk in Bank Portfolios: An Application to a Set of Hypothetical.
- Basel Committee on Banking Supervision (BCBS) (2001), Consultative Document:

- Principles for the Management and Supervision of Interest Rate Risk, Bank for International Settlements, Basel.
- Basel Committee (2003). Sound Practices for the Management and Supervision of Operational Risk. Bank for International Settlements: Basel Committee Publications No. 96.
- Basel Committee [on Banking Supervision, The], 2010, Basel III: International Framework for Liquidity Risk Measurement, Standards and Monitoring.
- Bauer, W., & Ryser, M. (2004). "Risk management strategies for banks". *Journal of Banking & Finance*, 28, 331–352.
- Berger, A.N., & C.H.S. Bouwman, (2005), "Bank Capital and Liquidity Production," mimeo.
- Berger, A. N., & DeYoung, R. (2001). Problem Loans and Cost Efficiency in Commercial Banks. *INTERNATIONAL LIBRARY OF CRITICAL WRITINGS IN ECONOMICS*, 133, 79-100.
- Berger, A.N., Hasan, I., Zhou, M., 2009. Bank ownership and efficiency in China: what will happen in the world's largest nation? *Journal of Banking and Finance* 33, 113–130.
- Behr, P., & Güttler, A. (2007). Credit Risk Assessment and Relationship Lending: An Empirical Analysis of German Small and Medium-Sized Enterprises*. *Journal of Small Business Management*, 45(2), 194-213.
- Ben Naceur, S., & Goaied, M. (2008). The determinants of commercial bank interest margin and profitability: Evidence from Tunisia. *Frontiers in Finance and Economics* 5(1), 106–130.
- Blacker, K. (2000). "Mitigating Operational Risk in British Retail Banks". *Risk Management*, 2(3), 23-33.
- Bobakovia, I.V., (2003). Raising the profitability of commercial banks, BIATEC, Retrieved on April, 2005, 11. Available from <http://www/nbs.SK/BIATEC/>.
- Boudriga, A., Taktak, N. B., & Jellouli, S. (2009). "Banking supervision and nonperforming loans: a cross-country analysis". 1 (4), 286-318.
- Brewer, E., Jackson, W. E., & Moser, J. T. (2001). The value of using interest rate derivatives to manage risk at US banking organizations. *Economic Perspectives-Federal Reserve Bank of Chicago*, 25(3), 49-65.
- Brown, C., & Davis, K. (2008). The sub-prime crisis down under. *Journal of Applied Finance*, 18(1), 16-28.
- Cebenoyan, A. S., & Strahan, P. E. (2004). Risk management, capital structure and lending at banks. *Journal of Banking & Finance*, 28(1), 19-43.
- Central Bank of Barbados (2008), Liquidity Risk Management Guideline, Bank Supervision Department, Central Bank of Barbados, Bridgetown.
- Chapelle, A., Crama, Y., Hübner, G., & Peters, J. P. (2008). Practical methods for measuring and managing operational risk in the financial sector: A clinical study. *Journal of Banking & Finance*, 32(6), 1049-1061.
- Chaplin, G., A. Emblow, I. Michael, (2000), "Banking System Liquidity: Developments and Issues," Bank of England Financial Stability Review, Dec: 93-112.
- Chari, V.V., & Jagannathan, R., (1988). Banking panics, information, and rational expectations equilibrium. *J. Finance* 43, 749–761.
- Chiu, Y.-H., Chen, Y.-C., (2009). The analysis of Taiwanese bank efficiency:

- incorporating both external environment risk and internal risk. *Economic Modelling* 26, 456–463.
- Choon, Y. V., Thim, C. K., & Kyzy, B. T. (2012). Performance of Islamic Commercial Banks in Malaysia: An Empirical study. *Journal of Islamic Economics, Banking and Finance*, 8(2), 67-79.
- Committee of Sponsoring Organizations of the Treadway Commission (2004). *Enterprise Risk Management: Integrated Framework*.
- Cooper, M.J., Jackson III, W.E. & Patterson, G.A. (2003). Evidence of predictability in the cross-section of bank stock returns. *Journal of Banking and Finance* 27, 817-850.
- Cooper, T., Speh, C., & Downey, A. (2011). Creating a Culture of Risk Management. *Wolters Kluwer Financial Services*.
- Cornalba, C., & Giudici, P. (2004). "Statistical models for operational risk management". *Physica*, A (338), 166 – 172.
- Cummins, J. D., Lewis, C. M., & Wei, R. (2006). The market value impact of operational loss events for US banks and insurers. *Journal of Banking & Finance*, 30(10), 2605-2634.
- Daniels, K., & Ramirez, G. G. (2008). Information, credit risk, lender specialization and loan pricing: Evidence from the DIP financing market. *Journal of Financial Services Research*, 34(1), 35-59.
- Demirovic, A., & Thomasn, D. C. (2007). "The Relevance of Accounting Data in the Measurement of Credit Risk". *The European Journal of Finance*, 13 (3), 253–268.
- Diamond, D.W., & Dybvig, P.H., (1983). Bank runs, deposit insurance, and liquidity. *J. Polit. Economy* 91 (3), 401–419.
- Diamond, D. W., & Rajan, R. G. (1999). *Liquidity risk, liquidity creation and financial fragility: A theory of banking* (No. w7430). National bureau of economic research.
- Diamond, D.W., & Rajan, R.G., (2001). "Liquidity Risk, Liquidity Creation and Financial Fragility: A Theory of Banking." *Journal of Political Economy*, 109(2): 287-327.
- Diamond, D. W., & Rajan, R. G. (2005). Liquidity shortages and banking crises. *The Journal of finance*, 60(2), 615-647.
- Dima, A. M., & Orzea, I.(2012). Risk Management in Banking.
- Dinger, V. (2009). Do foreign-owned banks affect banking system liquidity risk?. *Journal of Comparative Economics*, 37(4), 647-657.
- Distinguin, I., Roulet, C., & Tarazi, A. (2012). Bank Capital Buffer and Liquidity: Evidence from US and European publicly traded banks.
- Dowd, K. (2005). *Measuring Market Risk*. Chichester, UK: John Wiley & Sons Ltd.
- Drehmann, M., & Nikolaou, K. (2013). Funding liquidity risk: definition and measurement. *Journal of Banking & Finance*, 37(7), 2173-2182.
- Drehmann, M., Sorensen, S., & Stringa, M. (2008). The integrated impact of credit and interest rate risk on banks: An economic value and capital adequacy perspective.
- Duca, J. and McLaughlin, M. M. 1990. Developments affecting the profitability of Commercial banks. *Federal Reserve Bulletin* 76(7), 477-499.
- Economist Intelligence Unit (2010). Too good to fail? New challenges for risk management in financial services. *The Economist Intelligence Unit Limited*.

- Edwards, H. (2004). Barings – A Case Study Risk Management and Internal Controls. *The Risk & Regulatory Forum (TRRF)*.
- Elliott, D., Letza, S., McGuinness, M., & Smallman, C. (2000). "Governance, Control and Operational Risk: The Turnbull Effect". *Risk Management*, 2 (3), 47-59.
- Falconer, B. (2001), "Structural liquidity: the worry beneath the surface", *Balance Sheet*, Vol. 9 No. 3, pp. 13-19.
- Farhi, E., Tirole, J., 2012. Collective moral hazard, maturity mismatch, and systemic bailouts. *Amer. Econ. Rev.* 102 (1), 60–93.
- Fatemi, A., & Fooladi, I. (2006). "Credit risk management: a survey of practices". *Managerial Finance*, 32 (3), 227-233.
- Fernando, J. R., & Nimal, P. D. (2014). Does Risk Management Effect On Bank Efficiency? An Analysis of Sri Lankan Banking Sector. *International Journal of Management and Sustainability*, 3(2), 97-110.
- Fiordelisi, F., Marques-Ibanez, D., & Molyneux, P. (2011). Efficiency and risk in European banking. *Journal of Banking & Finance*, 35(5), 1315-1326.
- Flannery, M., 1996. Financial crises, payment system problems, and discount window lending. *J. Money, Credit Banking* 28 (4), 804–824.
- Flores, F., Ponte, E. B., & Rodriguez, T. E. (2006). "Operational risk information system: a challenge for the banking sector". *Journal of Financial Regulation and Compliance*, 14 (4), 383-401.
- Frame, W. Scott & White, Lawrence J. (2002). "Empirical Studies of Financial Innovation: Lots of Talk Little Action?". Working Paper 2002-12. Federal Reserve Bank of Atlanta, Atlanta GA, USA.
- Freixas, X., Parigi, B.M., Rochet, J.-C., 2004. The lender of the last resort: a twenty-first century approach. *J. Europ. Econ. Assoc.* 2 (6), 1085–1115.
- Froot, K. A. (2007). Risk management, capital budgeting, and capital structure policy for insurers and reinsurers. *Journal of Risk and Insurance*, 74(2), 273-299.
- Fu, X., Heffernan, S., 2007. Cost X-efficiency in China's banking sector. *China Economic Review* 18, 35–53.
- Gallati, R.R. (2003). *Risk Management and Capital Adequacy*. New York, US: McGraw-Hill.
- Gatev, E. & Strahan, P.E., (2006). Banks' advantage in hedging liquidity risk: theory and evidence from the commercial paper market. *J. Finance* 61 (2), 867–892.
- Gatev, E., Schuermann, T., & Strahan, P. E. (2009). Managing bank liquidity risk: How deposit-loan synergies vary with market conditions. *Review of Financial studies*, 22(3), 995-1020.
- Gillet, R., Hubner, G., & Plunus, S. (2010). "Operational risk and reputation in the financial industry". *Journal of Banking & Finance*, 34, 224–235.
- Goddard, J., Molyneux, P., & Wilson, J. O. (2004). The profitability of european banks: a cross-sectional and dynamic panel analysis. *The Manchester School*, 72(3), 363-381.
- Goddard, J., Molyneux, P., & Wilson, J. O. (2009). The financial crisis in Europe: evolution, policy responses and lessons for the future. *Journal of Financial Regulation and Compliance*, 17(4), 362-380.
- Goldsmith-Pinkham, P., Yorulmazer, T., (2010). Liquidity, bank runs and bailouts:

- spillover effects during the Northern Rock episode. *J. Fin. Services Res.* 37 (2–3), 83–98.
- Greuning, H.V. and Bratanovic, S.B. (2009, 3rd Edition). *Analyzing and Managing Banking Risk: “A Framework for Assessing Corporate Governance and Financial Risk”*. Washington, D.C, The World Bank.
- Grody, A. D., Hughes, P. J., & Toms, S. (2011). *Risk Accounting: A Next Generation Risk Management System for Financial Institutions. Society of Actuaries.*
- Gujarati, D. N. (2003). *Basic Econometrics*. 4th ed. McGraw-Hill. Singapore.
- Gup, B.E. & Kolari, J.W. (2005), *Commercial Banking: The Management of Risk*, 3rd ed., Wiley, San Francisco, CA.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006) *Multivariate Data Analysis*. 6th Ed. Prentice Hall, USA.
- Hamzah, R. B. (2014). The Determinant Factors for a Successful Risk Culture in Banking Sector: Malaysian Case.
- Haque, A. (2014). Comparison of Financial Performance of Commercial Banks: A Case Study in the Context of India (2009-2013). *Journal of Finance*, 2(2), 01-14.
- Hassan, M. K., & Bashir, A. H. M. (2003, December). Determinants of Islamic banking profitability. In *10th ERF Annual Conference, Morocco* (pp. 16-18).
- Hauswald, R. and R. Marquez (2003), “Information Technology and Financial Services Competition,” *Review of Financial Studies* 16: 921-948.
- Hauswald, R., & Marquez, R. (2006). Competition and strategic information acquisition in credit markets. *Review of Financial Studies*, 19(3), 967-1000.
- Haw, I.-M., Ho, S.S.M., Hu, B., Wu, D., 2010. Concentrated control, institutions, and banking sector: an international study. *Journal of Banking and Finance* 34, 485–497.
- Hawkins, J., & Mihaljek, D. (2001). The banking industry in the emerging market economies: competition, consolidation and systemic stability: an overview. *BIS papers*, 4, 1-44.
- Holmström, B., & Tirole, J. (2000). Liquidity and risk management. *Journal of Money, Credit and Banking*, 295-319.
- Holmstrom, B. & Tirole, J. (2011). *Inside and Outside Liquidity*. MIT Press.
- How, J. C., Karim, M. A., & Verhoeven, P. (2005). "Islamic Financing and Bank Risks: The Case of Malaysia". *Thunderbird International Business Review*, 47 (1), 75–94.
- Hsiao, H.-C., Chang, H., Cianci, A.M., Huang, L.-H., (2010). First financial restructuring and operating efficiency: evidence from Taiwanese commercial banks. *Journal of Banking and Finance* 34, 1461–1471.
- Huang, R., Ratnovski, L. (2011). The dark side of bank wholesale funding. *J. Finan. Intermediation* 20 (2), 248–263.
- Hughes, J. P., Lang, W., Mester, L. J., & Moon, C. G. (2000). Recovering risky technologies using the almost ideal demand system: An application to US banking. *Journal of Financial Services Research*, 18(1), 5-27.
- IFRI – CRO Forum (2007), *Survey on economic capital practice and applications*, The Institute of the Chief Risk Officers (CRO) and International Financial Risk Institute.
- IMF (2008), *Global Financial Stability Report*, (April).

- Instefjord, N. (2005). Risk and hedging: Do credit derivatives increase bank risk?. *Journal of Banking & Finance*, 29(2), 333-345.
- Isshaq, Z., & Bokpin, G. A. (2009). "Corporate liquidity management of listed firms in Ghana". 1 (12), 189-198.
- Jacobson, T. J., Linde, J., & Roszbach, K. (2006). "Internal ratings systems, implied credit risk and the consistency of banks' risk classification policies". *Journal of Banking & Finance*, 30, 1899–1926.
- Jarrow, R. A. (2008). Operational risk. *Journal of Banking & Finance*, 32(5), 870-879.
- Jarrow, R A & Turnbull, S M (2000). 'The intersection of market and credit risk', *Journal of Banking & Finance*, Vol. 24, pages 271-99.
- Jenkinson, N. (2008). Strengthening regimes for controlling liquidity risk: some lessons from the recent turmoil. *Bank of England Quarterly Bulletin, Quarterly*, 2.
- Jensen, M. C. (2004). The agency costs of overvalued equity and the current state of corporate finance. *European Financial Management*, 10(4), 549-565.
- Jeonk, HK (201). "Essays on banking: screening technology". Department of Economics. Kranert Graduate Schol of Management. Purdue University.
- Jha, S., & Hui, X. (2012). A comparison of financial performance of commercial banks: A case study of Nepal. *African Journal of Business Management*, 6(25), 7601-7611.
- Khwaja, A.I & Mian, A. (2005), "Tracing the Impact of Bank Liquidity Shocks," mimeo.
- Kosmidou, K., Tanna, S., & Pasiouras, F. (2005). Determinants of profitability of domestic UK commercial banks: panel evidence from the period 1995-2002. In *Money Macro and Finance (MMF) Research Group Conference* (Vol. 45).
- Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration. *Managerial Finance* 34(3), 146–159.
- Kumbirai, M., & Webb, R. (2010). A financial ratio analysis of commercial bank performance in South Africa. *African Review of Economics and Finance*, 2(1), 30-53.
- Kuritzkes, A., Schuermann, T., & Weiner, S. M. (2003). Risk measurement, risk management, and capital adequacy in financial conglomerates. *Brookings-Wharton Papers on Financial Services*, 2003(1), 141-193.
- Laviada, A. F. (2007). "Internal audit function role in operational risk management". *Journal of Financial Regulation and Compliance* , 15 (2), 143-155.
- Lee, W. S., & Kwok, C. C. (2000). Domestic and international practice of deposit insurance: a survey. *Journal of Multinational Financial Management*, 10(1), 29-62.
- Lopez, J. A., & Saidenberg, M. R. (2000). Evaluating credit risk models. *Journal of Banking & Finance*, 24(1), 151-165.
- Lozano-Vivas, A., Pasiouras, F., 2010. The impact of non-traditional activities on the estimation of bank efficiency: international evidence. *Journal of Banking and Finance* 34, 1436–1449.
- Loutskina, E. (2005). "Does Securitization affect Bank Lending? Evidence from Bank Responses to Funding Shocks," mimeo.
- Loutskina, E. & Strahan, P.E. (2006). "Securitization and the Declining Impact of Bank Financial Condition on Loan Supply: Evidence from Mortgage Acceptance Rates," mimeo.

- Malhotra, D. K., Poteau, R., & Singh, R. (2011). Evaluating the Performance of Commercial Banks in India. *Asia Pacific Journal of Finance and Banking Research Vol, 5*(5).
- Matthews, K. and J. Thompson, (2008). The Economics of Banking. Chichester: Wiley, 2008; Chapter 3, pp.99-143.
- Meor Ayub, M.A. (2006), "Risk management in the banking environment: a rating agency perspective", paper presented at the Seminar on Risk Management in Islamic Financial Services, Marriot Hotel, Kerala, Lumpur, April 25-26.
- Miller, S. and Noulas, A. 1997. Portfolio mix and large-bank profitability in the USA. *Applied Economics* 29, 505-512.
- Moles, P., (2004). Financial Risk Management Course Text, Edinburgh Business School, Heriot-Watt University, Edinburgh.
- Molyneux, P. and Thornton, J. 1992. Determinants of European bank profitability: A note. *Journal of Banking and Finance* 16, 1173-1178.
- Musyoki, D., & Kadubo, A. S. (2012). The impact of credit risk management on the financial performance of Banks in Kenya for the period.
- Newton, I. (2008). Application of Portfolio Approaches. *JOHN B. CAQUETTE EDWARD I. ALTMAN PAUL NARAYANAN ROBERT NIMMO*, 367.
- Ng, T.-H., Chong, L.-L., & Ismail, H. (2013). Is the risk management committee only a procedural compliance? An insight into managing risk taking among insurance companies in Malaysia. *The Journal of Risk Finance Vol. 14 No. 1*, 71-86.
- Nicolo, G. D., Honohan, P., & Ize, A. (2005). Dollarization of bank deposits: Causes and consequences. *Journal of Banking & Finance*, 29(7), 1697-1727.
- Nijskens, R., & Wagner, W. (2011). Credit risk transfer activities and systemic risk: How banks became less risky individually but posed greater risks to the financial system at the same time. *Journal of Banking & Finance*, 35(6), 1391-1398.
- Nikolaou, K. (2009). Liquidity (risk) concepts: definitions and interactions.
- NST (2005), "Bank Islam suffers RM500 m loss: new management takes big hit to move ahead afresh", New Straits Times (Malaysia), October 7.
- Okuda, H., 2000. The production technology of Philippine domestic banks in the pre-Asian crisis period: Estimation of the cost function in the 1990–1996 period. Working Paper, Hitotsubashi University.
- Ongore, V. O., & Kusa, G. B. (2013). Determinants of Financial Performance of Commercial Banks in Kenya. *International Journal of Economics and Financial Issues*, 3(1), 237-252.
- Owojori, A.A., I.R. Akintoye & F.A. Adidu, (2011). The challenge of risk management in Nigerian banks in the post consolidation era. *Journal of Accounting and Taxation*, 3(2): 23-31.
- Pallant, J. (2007). A Step-by-Step Guide to Data Analysis Using SPSS for Windows (Version 15), 3rd Edition. Allen and Unwin, Sydney.
- Pana, E., Park, J., & Query, T. (2010). The impact of bank mergers on liquidity creation. *Journal of Risk Management in Financial Institutions*, 4(1), 74-96.
- Partnerships BC (2005), "An Introduction to Risk Management in a Public Private Partnership." *Partnerships British Columbia*, Retrieved 29 March 2009, from www.partnershipsbc.ca
- Paravisini, D. (2004). "Constrained Banks, Constrained Borrowers: The Effects of Bank

- Liquidity on the Availability of Credit,” MIT mimeo, November.
- Pasiouras, F. (2008). Estimating the technical and scale efficiency of Greek commercial banks: the impact of credit risk, off-balance sheet activities, and international operations. *Research in International Business and Finance*, 22(3), 301-318.
- Pastor, J.M., (1999). Efficiency and risk management in Spanish banking: A method to decompose risk. *Applied Financial Economics*, 9 (4): 371-384.
- Pastor, J.M., (2002). Credit risk and efficiency in the European banking system: A three-stage analysis. *Applied Financial Economics*, 12 (12): 895-911.
- Power, M. (2005). "The invention of operational risk". *Review of International Political Economy* , 12 (4), 577–599.
- Ratnovski, L. (2013). Liquidity and transparency in bank risk management. *Journal of Financial Intermediation*, 22(3), 422-439.
- Ray, D., & Cashman, E. (1999). "Operational risks, bidding strategies and information policies in restructured power markets". *Decision Support Systems* , 24, 175–182.
- Risk Books, (2003). *Modern Risk Management: A History*, London.
- Rochet, J.-C. & Vives, X., (2004). Coordination Failure and the lender of last resort: was Bagehot right after all? *J. Europ. Econ. Assoc.* 2 (6), 1116–1147.
- Rose, P. S. & Hudgins, S. C. (2013). *Bank Management and Financial Services*. 9th ed. McGraw-Hill International Edition. Boston.
- Rosly, S. A., & Bakar, M. A. A. (2003). Performance of Islamic and mainstream banks in Malaysia. *International Journal of Social Economics*, 30(12), 1249-1265.
- SBP (2005), *Risk Management: Guidelines for Commercial Banks & DFIs*, State Bank of Pakistan, Karachi.
- Sackett, M. M., & Shaffer, S. (2006). "Substitutes versus complements among credit risk management tools". *Applied Financial Economics*, 16, 1007–1017.
- Sadaqat, M. S., Akhtar, M. F., & Ali, K. (2011). "An Analysis on the Performance of IPO – A Study on the Karachi Stock Exchange of Pakistan". *International Journal of Business and Social Science*, 2 (6), 275-285.
- Said, R. M., & Tumin, M. H. (2011). Performance and financial ratios of commercial banks in Malaysia and China. *International Review of Business Research Papers*, 7(2), 157-169.
- Sanusi, J., (2002). Central bank and the macroeconomic environment in Nigeria. *Quarterly Review*, 3(3): 25-34.
- Sensarma, R., & Jayadev, M. (2009). "Are bank stocks sensitive to risk management?" *The Journal of Risk Finance*, 10 (1), 7-22.
- Shafiq, A., & Nasr, M. (2010). Risk management practices followed by the commercial banks in Pakistan. *International Review of Business Research Papers*, 6(2), 308-325.
- Shah, S. Q., & Jan, R. (2014). Analysis of Financial Performance of Private Banks in Pakistan. *Procedia-Social and Behavioral Sciences*, 109, 1021-1025.
- Shin, H.S., 2009. Reflections on Northern Rock: the bank run that heralded the global financial crisis. *J. Econ. Perspectives* 23 (1), 101–120.
- Siddiqui, A. (2008). "Financial contracts, risk and performance of Islamic banking". *Managerial Finance*, 34 (10), 680-694.
- Silva, D., (2009). The efficiency of the licensed domestic commercial banks in Sri Lanka. Master thesis, University of Sri Jayewardenepura.

- Shen, C. H., Chen, Y. K., Kao, L. F., & Yeh, C. Y. (2009). Bank liquidity risk and performance. *Department of Finance: National University of Kaohsiung*.
- Spathis, C., Koasmidou, K., & Doumpos, M. (2002). Assessing Profitability Factors in the Greek Banking System: A multicriteria methodology. *International Transactions in Operational Research*, 517-530.
- Sufian, F. (2009). Determinants of bank efficiency during unstable macroeconomic environment: Empirical evidence from Malaysia. *Research in International Business and Finance*, 23(1), 54-77.
- Sufian, F., & Chong, R. R. (2008). Determinants of Bank profitability in a developing economy: Empirical evidence from the Philippines. *Asian academy of management journal of accounting and finance*, 4(2), 91-112.
- Suna, L., & Changb, T. P. A. (2010). Comprehensive analysis of the effects of risk measures on bank efficiency: Evidence.
- Tabachnik, B. G., & Fidell, L. S. (2007). Using Multivariate Statistics. 5th Ed. Pearson International Edition, USA.
- Tafri, F. H., Rahman, R. A., & Omar, N. (2011). Empirical evidence on the risk management tools practised in Islamic and conventional banks. *Qualitative Research in Financial Markets*, 3(2), 86-104.
- Tai, C. S. (2005). Asymmetric Currency Exposure of US Bank Stock Returns.
- Tandelilin, E., Kaaro, H., & Mahadwartha, P. A. (2007). Corporate governance, risk management and bank performance: Does type of ownership matter. *EADN individual research grant project*, (34).
- Tarawneh, M. (2006). A comparison of financial performance in the banking sector: Some evidence from Omani commercial banks. *International Research Journal of Finance and Economics*, 3, 101-112.
- Umoh, P.N., (2002). Bank loans, recovery: The roles of the regulatory/supervisory authorities. *Judiciary Law Enforcement Agencies and the Press*. NDIC Quarterly, 4(3): 8.
- Van den Brink, G. J. (2002). *Operational risk: the new challenge for banks*. Macmillan.
- Vong, P. I., & Chan, H. S. (2009). Determinants of bank profitability in Macao. *Macao Monetary Research Bulletin*, 12(6), 93-113.
- Wagner, W, (2010), "Diversification at Financial Institutions and Systemic Crises," *Journal of Financial Intermediation* 19, 373-386.
- Wiseman, R. M., & Catanach, A. H. (1997). "A longitudinal disaggregation of operational risk under changing regulations: evidence from the savings and loan industry". *The Academy of Management Journal* , 40 (4), 799-830.
- Wu, F., & Guan, Z. (2008). Farm capital structure choice under credit constraint: theory and application. In *2008 Annual Meeting, July 27-29, 2008, Orlando, Florida* (No. 6130). American Agricultural Economics Association (New Name 2008: Agricultural and Applied Economics Association).
- Yasuda, A. (2005). Do Bank-Firm Relationships Affect Bank Competition in the Corporate Bond Underwriting Market?. *RODNEY L WHITE CENTER FOR FINANCIAL RESEARCH-WORKING PAPERS*-.
- Yin, H. Y., Wu, S., & Chen, D. Y. (2002). The impact of regulatory changes on banks' risks and returns in Taiwan. *Research in Finance*, 19, 173-198.
- Zheng, H., & Shen, Y. (2008). "Jump liquidity risk and its impact on CVaR". *The Journal*

of Risk Finance , 477- 491.