DETERMINANTS OF RETURN ON ASSET: THE CASE OF LOCAL CONVENTIONAL BANKS IN MALAYSIA

By

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Thesis Submitted to

Othman Yeop Abdullah Graduate School of Business,

Universiti Utara Malaysia,

in Partial Fulfillment of the Requirement for the Master of Sciences (Banking)

Pusat Pengajian Ekonomi,
Kewangan dan Perbankan
SCHOOL OF ECONOMICS, FINANCE, AND BANKING
Universiti Utara Malaysia

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ABSTRACT

The topic of what factor determines financial performance of bank has always gain interest from many parties such as investor, central bank regulator and among bankers itself. Figures from financial statement not only contain bank's information from the past but also could provide hint on their likely future performance hence the purpose of this study is to identify the determinants of the financial performance of local banks in Malaysia where financial performance is measured by using return on asset. Independent variables included in this study are non-interest expense to total asset ratio (expense management), impairment ratio, risk appetite, gross domestic product, and inflation. By employing fixed effect panel data regression on data period of year 2002 – 2016, the results suggested that non-interest expense to total asset ratio, impairment ratio, and risk appetite have significant relationship with return on asset. This therefore indicates that the impact of external determinants such as gross domestic product and inflation on return on asset is not as great as the impact of internal determinants such as expense management, impairment ratio, and risk appetite. In line with initiative of Financial Sector Blue Print 2011 – 2020 issued by Bank Negara Malaysia, this study helps to strengthen the stability of financial institution by identifying key risk factor that would cause deterioration of financial performance together with mitigation plan of such risk.

Key Words: Financial Performance, Fixed Effect Panel Data Regression, Impairment Ratio, Risk Appetite, Non-Interest Expense to Total Asset Ratio

ABSTRAK

Faktor yang menentukan prestasi kewangan institutsi perbankan selalu mendapat perhatian daripada banyak pihak terutamanya pihak pelabur, bank pusat, dan jurubank. Penyata kewangan bank bukan sahaja mengandungi informasi lampau tetapi juga mengandungi petunjuk-petunjuk untuk kebarangkalian prestasi masa depan. Oleh itu, tujuan kajian ini adalah untuk mencari faktor-faktor yang menentukan prestasi kewangan bagi bank-bank tempatan di Malaysia. Kadar pulangan aset digunakan untuk mengukur prestasi kewangan bank dalam kajian ini. Pembolehubah bebas yang diambil kira termasuk nisbah perbelanjaan bukan faedah kepada jumlah asset (pengurusan perbelanjaan), nisbah hutang lapuk, kadar kecenderungan risiko, keluaran dalam negara kasar, dan kadar inflasi. *Fixed Effect Panel Data Regression* telah digunakan pada data bagi tempoh 2002 hingga 2016. Keputusan regresi menunjukan bahawa kemampuan pengurusan perbelanjaan, nisbah hutang lapuk, dan kadar kecenderungan risiko adalah signifikan dengan kadar pulangan aset. Keputusan ini juga menunjukan bahawa impak daripada faktor luar kawalan bank seperti faktor ekonomi adalah tidak sebesar impak daripada nisbah hutang lapuk, pengurusan perbelanjaan, dan kadar kecenderungan risiko. Selari dengan initiatif Pelan Induk Sektor Kewangan keluaran Bank Negara Malaysia, keputusan kajian ini membantu dalam transformasi sektor kewangan melalui langkah-langkah seperti mengenal pasti faktor yang menyebabkan kemerosotan prestasi kewangan institusi perbankan dan cara pengurusan risiko ini.

Kata Kunci: Prestasi Kewangan Bank, Pelan Induk Sektor Kewangan, Nisbah Hutang Lapuk, Kadar Kecenderungan Risiko, Pengurusan Perbelanjaan

ACKNOWLEDGEMENT

I would like to take this opportunity to thanks all parties that has assisted me in completing the thesis especially my supervisor, Prof. Dr. Rosylin Binti Mohd Yusof for her continuous guidance and contribution throughout this project paper. Without her knowledgeable supervision, it would be almost impossible for me able to complete this paper. Those who had also given support and help in this paper, I would like to thank you for your helping hands.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE
INTRODUCTION

1.0 Introduction

As early as 1994, the famous Bill Gates quotes “Banking is necessary, banks are not” raised the question on whether brick and mortar bank would continue to exist in the future. In Malaysia, local conventional banks continue to suffer from low net interest spreads while facing stiff competition from competitors and also from non-banking institutions which many affect the sustainability of local banking institutions. Recently, conventional banks are focusing more on digital innovation in order to cut cost on human resources. This is not just because slow evolving bank would be easily discarded by tech-savvy customers but also because further digitalization would give advantage in long term cost saving. Besides, banks are burdened by more stringent regulation taken into place which increased compliance cost. For instance, under Personal Data Protection Act (PDPA), banks are required to perform verification before releasing customer information to legitimate third party or referring the case back to the customer itself. This act indirectly creates extra administrative cost to the bank. Banks need to be particularly careful in compliance requirements as non-compliance action would lead to heavy penalty from regulator and compromising on the reputation of the bank. In addition, with the implementation of Malaysia financial reporting standards 9 which took effect in Jan2018, Malaysian banks are very likely required to provide higher impairment provision which would further decrease the bank’s earning. With such challenging and highly regulated banking environment, it is imperative to study the main determinants of financial performance of these local banks under the new environment

The contents of the thesis is for internal user only

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7.0 Appendix

7.1 Appendix 1

Appendix 1: Pooled OLS Model

Regression results of Pooled OLS Model:

Dependent Variable: RETURN_ON_ASSET
Method: Panel Least Squares
Date: 11/05/17 Time: 19:07
Sample (adjusted): 2002 2015
Periods included: 14
Cross-sections included: 8
Total panel (unbalanced) observations: 82

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012872	0.001560	8.250466	0.0000
GROSS_DOMESTIC_PRODUCT_G	0.000137	0.000177	0.778498	0.4387
IMPAIRMENT_RATIO	-0.034317	0.006352	-5.402485	0.0000
INFLATION	0.000112	0.000102	1.096458	0.2763
NON_INTEREST_EXPENSE_TO_	0.000262	0.000107	2.452636	0.0165
RISK_APPETITE	-0.003129	0.001679	-1.863995	0.0662

R-squared	0.323217	Mean dependent var	0.010047
Adjusted R-squared	0.278692	S.D. dependent var	0.003783
S.E. of regression	0.003213	Akaike info criterion	-8.572754
Sum squared resid	0.000785	Schwarz criterion	-8.396652
Log likelihood	357.4829	Hannan-Quinn criter.	-8.502052
F-statistic	7.259189	Durbin-Watson stat	0.990455
Prob(F-statistic)	0.000013		

Results of Autocorrelation Test using Durbin-Watson stat after running pooled OLS Model: 0.99

7.2 Appendix 2

Appendix 2: Panel Unit Root Test

Results of Unit Root Test at Level for Return on Asset (Dependent Variable):

Panel unit root test: Summary
Series: RETURN_ON_ASSET
Date: 06/18/17 Time: 21:06
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.39664	0.0000	8	110
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.61357	0.0045	8	110
ADF - Fisher Chi-square	30.2199	0.0169	8	110
PP - Fisher Chi-square	29.0706	0.0235	8	110

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at First Difference for Return on Asset (Dependent Variable):

Panel unit root test: Summary
Series: D(RETURN_ON_ASSET)
Date: 06/18/17 Time: 21:06
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-11.7643	0.0000	8	101
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.48998	0.0000	8	101
ADF - Fisher Chi-square	85.1341	0.0000	8	101
PP - Fisher Chi-square	109.993	0.0000	8	102

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at Level for Gross Domestic Product Growth:

Panel unit root test: Summary
Series: GROSS_DOMESTIC_PRODUCT_G
Date: 06/18/17 Time: 16:27
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.74441	0.0000	8	102
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.54940	0.0000	8	102
ADF - Fisher Chi-square	57.0209	0.0000	8	102
PP - Fisher Chi-square	87.5038	0.0000	8	102

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at First Difference for Gross Domestic Product Growth:

Panel unit root test: Summary
Series: D(GROSS_DOMESTIC_PRODUCT_G)
Date: 06/18/17 Time: 16:23
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-11.6437	0.0000	8	86
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.58676	0.0000	8	86
ADF - Fisher Chi-square	80.0663	0.0000	8	86
PP - Fisher Chi-square	166.729	0.0000	8	94

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at Level for Impairment Ratio:

Panel unit root test: Summary
Series: IMPAIRMENT_RATIO
Date: 06/18/17 Time: 17:02
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.55700	0.0000	8	104
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.89656	0.0000	8	104
ADF - Fisher Chi-square	51.8952	0.0000	8	104
PP - Fisher Chi-square	80.4029	0.0000	8	107

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at First Difference for Impairment Ratio:

Panel unit root test: Summary
Series: D(IMPAIRMENT_RATIO)
Date: 06/18/17 Time: 17:03
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-11.4988	0.0000	8	95
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.70244	0.0000	8	95
ADF - Fisher Chi-square	60.4316	0.0000	8	95
PP - Fisher Chi-square	76.8045	0.0000	8	99

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at Level for Inflation:

Panel unit root test: Summary
Series: INFLATION
Date: 06/18/17 Time: 17:58
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-13.4585	0.0000	8	102
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-9.52551	0.0000	8	102
ADF - Fisher Chi-square	94.4495	0.0000	8	102
PP - Fisher Chi-square	93.9805	0.0000	8	102

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at First Difference for Inflation:

Panel unit root test: Summary
Series: D(INFLATION)
Date: 06/18/17 Time: 17:58
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-15.4585	0.0000	8	86
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-11.2539	0.0000	8	86
ADF - Fisher Chi-square	111.536	0.0000	8	86
PP - Fisher Chi-square	196.563	0.0000	8	94

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at Level for Non-Interest Expense to Income Ratio:

Panel unit root test: Summary
Series: NON_INTEREST_EXPENSE_TO_
Date: 06/18/17 Time: 18:01
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.03987	0.0000	8	106
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.57437	0.0000	8	106
ADF - Fisher Chi-square	51.5897	0.0000	8	106
PP - Fisher Chi-square	67.2617	0.0000	8	108

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at First Difference for Non-Interest Expense to Income Ratio:

Panel unit root test: Summary
Series: D(NON_INTEREST_EXPENSE_TO_)
Date: 06/18/17 Time: 18:01
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-10.1001	0.0000	8	98
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.57552	0.0000	8	98
ADF - Fisher Chi-square	90.0194	0.0000	8	98
PP - Fisher Chi-square	125.743	0.0000	8	99

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at Level for Risk Appetite:

Panel unit root test: Summary
Series: RISK_APPETITE
Date: 06/18/17 Time: 18:01
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.19404	0.0000	8	78
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.24540	0.0006	8	78
ADF - Fisher Chi-square	29.0522	0.0236	8	78
PP - Fisher Chi-square	31.3734	0.0121	8	78

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Results of Unit Root Test at First Difference for Risk Appetite:

Panel unit root test: Summary
Series: D(RISK_APPETITE)
Date: 06/18/17 Time: 18:02
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.17446	0.0000	7	62
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.67999	0.0000	6	59
ADF - Fisher Chi-square	53.7184	0.0000	7	62
PP - Fisher Chi-square	59.8499	0.0000	7	64

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

7.3 Appendix 3

Appendix 3: Hausman Test

Regression results of Hausman Test:

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	21.481626	5	0.0007

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
GROSS_DOMESTIC_PRODUCT_G	0.000237	0.000137	0.000000	0.0012
IMPAIRMENT_RATIO	-0.024479	-0.034317	0.000009	0.0012
INFLATION	0.000049	0.000112	0.000000	0.0021
NON_INTEREST_EXPENSE_TO_	0.000278	0.000262	0.000000	0.5470
RISK_APPETITE	-0.005066	-0.003129	0.000001	0.0459

Cross-section random effects test equation:
Dependent Variable: RETURN_ON_ASSET
Method: Panel Least Squares
Date: 11/05/17 Time: 21:47
Sample (adjusted): 2002 2015
Periods included: 14
Cross-sections included: 8
Total panel (unbalanced) observations: 82

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013439	0.001618	8.307353	0.0000
GROSS_DOMESTIC_PRODUCT_G	0.000237	0.000164	1.445644	0.1528
IMPAIRMENT_RATIO	-0.024479	0.006549	-3.737609	0.0004
INFLATION	4.90E-05	9.54E-05	0.513309	0.6094
NON_INTEREST_EXPENSE_TO_	0.000278	0.000101	2.750968	0.0076
RISK_APPETITE	-0.005066	0.001813	-2.793586	0.0067

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.488147	Mean dependent var	0.010047
Adjusted R-squared	0.399129	S.D. dependent var	0.003783
S.E. of regression	0.002933	Akaike info criterion	-8.681336
Sum squared resid	0.000593	Schwarz criterion	-8.299783
Log likelihood	368.9348	Hannan-Quinn criter.	-8.528148
F-statistic	5.483701	Durbin-Watson stat	1.347689
Prob(F-statistic)	0.000002		

7.4 Appendix 4

Appendix 4: Fixed Effect Model

Regression results of Fixed Effect Model:

Dependent Variable: RETURN_ON_ASSET
Method: Panel Least Squares
Date: 11/12/17 Time: 17:02
Sample (adjusted): 2002 2015
Periods included: 14
Cross-sections included: 8
Total panel (unbalanced) observations: 82

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013439	0.001618	8.307353	0.0000
GROSS_DOMESTIC_PRODUCT_G	0.000237	0.000164	1.445644	0.1528
IMPAIRMENT_RATIO	-0.024479	0.006549	-3.737609	0.0004
INFLATION	4.90E-05	9.54E-05	0.513309	0.6094
NON_INTEREST_EXPENSE_TO_	0.000278	0.000101	2.750968	0.0076
RISK_APPETITE	-0.005066	0.001813	-2.793586	0.0067

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.488147	Mean dependent var	0.010047
Adjusted R-squared	0.399129	S.D. dependent var	0.003783
S.E. of regression	0.002933	Akaike info criterion	-8.681336
Sum squared resid	0.000593	Schwarz criterion	-8.299783
Log likelihood	368.9348	Hannan-Quinn criter.	-8.528148
F-statistic	5.483701	Durbin-Watson stat	1.347689
Prob(F-statistic)	0.000002		

7.5 Appendix 5

Appendix 5: Random Effect Model

Regression results of Random Effect Model:

Dependent Variable: RETURN_ON_ASSET
Method: Panel EGLS (Cross-section random effects)
Date: 11/05/17 Time: 21:46
Sample (adjusted): 2002 2015
Periods included: 14
Cross-sections included: 8
Total panel (unbalanced) observations: 82
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012872	0.001424	9.039585	0.0000
GROSS_DOMESTIC_PRODUCT_G	0.000137	0.000161	0.852957	0.3964
IMPAIRMENT_RATIO	-0.034317	0.005798	-5.919208	0.0000
INFLATION	0.000112	9.32E-05	1.201329	0.2334
NON_INTEREST_EXPENSE_TO_	0.000262	9.74E-05	2.687219	0.0088
RISK_APPETITE	-0.003129	0.001532	-2.042277	0.0446

Effects Specification	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.002933	1.0000

Weighted Statistics			
R-squared	0.323217	Mean dependent var	0.010047
Adjusted R-squared	0.278692	S.D. dependent var	0.003783
S.E. of regression	0.003213	Sum squared resid	0.000785
F-statistic	7.259189	Durbin-Watson stat	0.990455
Prob(F-statistic)	0.000013		

Unweighted Statistics			
R-squared	0.323217	Mean dependent var	0.010047
Sum squared resid	0.000785	Durbin-Watson stat	0.990455