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**THE EFFECTS OF COST OF LIVING AND  
HOUSEHOLD DEPENDENCY ON HOUSEHOLD DEBT  
AND ITS COMPOSITION IN MALAYSIA**



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ON HOUSEHOLD DEBT AND ITS COMPOSITION IN MALAYSIA**



**Thesis Submitted to  
School of Economics, Finance and Banking  
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## ABSTRACT

The past decade has witnessed a notable increase in household debt across countries, which raises concerns on its impact on social and economic aspects. Although household debt plays an important role in supporting the economy to grow, a continuous rise in the debt level may bring serious economic consequences. Hence, understanding the potential factors that contribute towards the significant rise in the debt level is useful for policy implications. The main objective of this study was to investigate the effects of the cost of living and household dependency on household debt and its composition in Malaysia where the roles of income level, interest rates and housing prices are the control variables. By using the Autoregressive Distributed Lag (ARDL) modelling approach, this study revealed that in the long run, income level, housing prices and old age dependency have positive influences on both total household debt and mortgage debt while an inverse relationship was observed on the effects of interest rates, cost of living and young age dependency on both types of debt. This finding is also similar to the case of consumer debt except for the role of housing prices which exhibit a negative relationship. This study also discovered that in the event of any short-term deviation in the household debt model the mortgage debt will adjust faster compared to the consumer debt, which may be due to risks associated with mortgage debt which is typically lower since it is secured with assets and thereby any short-term deviation will be easily adjusted. Finally, the inclusion of the structural break in the debt model revealed that the break effects are significant in all the models and thereby support the importance of considering their presence in the analysis to prevent biased estimation.

**Keywords:** household debt, mortgage debt, consumer debt, ARDL, structural breaks

## ABSTRAK

Sejak sedekad yang lalu, jumlah hutang isi rumah di semua negara telah meningkat dengan mendadak sehingga menimbulkan kebimbangan kesannya ke atas aspek sosial dan ekonomi sesebuah negara. Walaupun hutang isi rumah memainkan peranan penting dalam membantu pertumbuhan ekonomi negara namun, peningkatan hutang isi rumah yang berterusan boleh memberi kesan buruk kepada ekonomi sesebuah negara. Oleh itu, adalah penting untuk memahami faktor-faktor yang menyumbang ke arah peningkatan mendadak jumlah hutang isi rumah bagi tujuan implikasi polisi. Objektif utama kajian ini adalah untuk menyiasat kesan kenaikan kos sara hidup dan kadar kebergantungan isi rumah terhadap jumlah hutang isi rumah dan komposisinya di Malaysia apabila tingkat pendapatan, kadar pinjaman dan harga rumah telah diambil kira sebagai pemboleh ubah kawalan. Kaedah analisa *Autoregressive Distributed Lag* telah digunakan dalam kajian ini dan didapati bahawa di dalam jangka masa panjang, tingkat pendapatan, harga rumah dan kadar kebergantungan golongan tua mempunyai kesan positif terhadap jumlah hutang isi rumah dan hutang bercagar. Sementara itu, kadar pinjaman, kos sara hidup dan kadar kebergantungan golongan muda memberi kesan negatif. Dapatan yang sama diperolehi bagi kesan ke atas hutang tidak bercagar kecuali kesan harga rumah yang didapati memberi impak negatif terhadap jenis hutang ini. Hasil kajian ini juga mendapati bahawa sekiranya sebarang ketidakseimbangan berlaku dalam jangka masa pendek di dalam model hutang isi rumah, ketidakseimbangan di dalam hutang bercagar akan dapat diseimbangkan dengan lebih cepat berbanding ketidakseimbangan yang berlaku bagi hutang tidak bercagar. Ini kerana hutang yang bercagar kebiasaannya mempunyai risiko yang rendah. Akhir sekali, setelah mengambil kira kewujudan '*structural breaks*' di dalam model hutang isi rumah, kajian ini mendapati bahawa hal ini adalah signifikan. Ini menyokong kepentingan untuk mempertimbangkan kewujudannya di dalam analisa kajian bagi mengelakkan daripada masalah bias.

**Kata kunci:** hutang isirumah, hutang bercagar, hutang tidak bercagar, ARDL, *structural breaks*

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## TABLE OF CONTENTS

<b>TITLE PAGE</b>	<b>i</b>
<b>CERTIFICATION OF THESIS WORK</b>	<b>ii</b>
<b>PERMISSION TO USE</b>	<b>iv</b>
<b>ABSTRACT</b>	<b>v</b>
<b>ABSTRAK</b>	<b>vi</b>
<b>ACKNOWLEDGEMENT</b>	<b>vii</b>
<b>TABLE OF CONTENTS</b>	<b>viii</b>
<b>LIST OF TABLES</b>	<b>xii</b>
<b>LIST OF FIGURES</b>	<b>xiii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>xiv</b>
<b>CHAPTER ONE INTRODUCTION</b>	<b>1</b>
1.1 Introduction	1
1.2 Background of the Study	3
1.2.1 The trend in Malaysians' income level	11
1.2.2 Borrowing cost in Malaysia	14
1.2.3 Development in the housing market	16
1.2.4 Cost of living in Malaysia	21
1.2.5 Demographic transition in Malaysia	24
1.2.6 Structural breaks in Malaysia	29
1.3 Problem Statement	30
1.4 Research Questions	33
1.5 Research Objectives	34
1.6 Significance of the Study	35
1.7 Scope and Limitations of the Study	36
1.8 Organization of the Thesis	39
<b>CHAPTER TWO LITERATURE REVIEW</b>	<b>40</b>
2.1 Introduction	40
2.2 Theoretical Underpinnings	40
2.3 Empirical Studies of Household Debt	44
2.4 Determinants of Household Debt	52
2.4.1 Income	52
2.4.2 Interest Rates	60
2.4.3 Housing Prices	67



2.4.4	Consumer Prices	76
2.4.5	Demographic changes	82
2.4.6	Structural breaks	90
2.5	Research Gap	93
2.6	Conclusion	96
<b>CHAPTER THREE METHODOLOGY</b>		<b>98</b>
3.1	Introduction	98
3.2	Theoretical Framework	98
3.2.1	The Life Cycle Model	99
3.2.2	Permanent Income Hypothesis	103
3.2.3	Theory of the Cost-of-Living Index	104
3.2.4	Theory of Demographic Transition	108
3.3	Research Framework	112
3.4	Model Specification	126
3.5	Justification of Variables	128
3.5.1	Household debt	128
3.5.2	Income level	129
3.5.3	Interest rate	130
3.5.4	Housing prices	131
3.5.5	Food prices	131
3.5.6	Young and old age dependency	132
3.5.7	Structural break	134
3.6	Econometric Procedure	134
3.6.1	Unit root test	135
3.6.1.1	Traditional unit root test	135
3.6.1.2	Unit root test in the presence of structural breaks	137
3.6.2	Auto-regressive Distributed Lag (ARDL) modelling approach	140
3.6.3	The effects of structural break	144
3.6.3.1	ARDL modelling approach.	145
3.6.4	Diagnostic test	149
3.6.4.1	ARCH test	149
3.6.4.2	Lagrange Multiplier (LM) test	150
3.6.4.3	Normality test	150
3.6.4.4	Ramsey RESET Test	151
3.6.4.5	Stability test	151

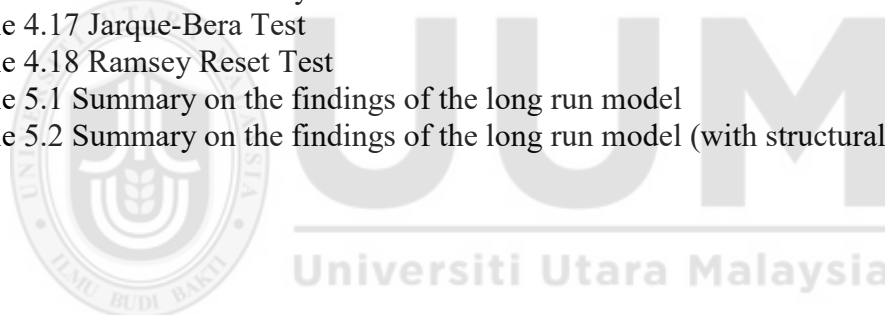
3.7	Data Collection	152
3.8	Conclusion	152
<b>CHAPTER FOUR RESULTS AND DISCUSSION</b>		<b>154</b>
4.1	Introduction	154
4.2	Descriptive analysis	155
4.3	Unit root test	159
4.3.1	Augmented-Dickey Fuller (ADF) Test	159
4.3.2	Unit root test in the presence of structural breaks	161
4.4	Determinants of household debt and its composition	163
4.4.1	Bound test for cointegration	164
4.4.2	ARDL Estimations - Long run model	165
4.4.3	ARDL Estimations - Short run model	178
4.4.4	Diagnostic test	183
4.4.4.1	ARCH Test	183
4.4.4.2	Serial correlation LM Test	184
4.4.4.3	Normality test	185
4.4.4.4	Ramsey RESET Test	185
4.4.4.5	Stability test	186
4.5	The effects of structural breaks	190
4.5.1	Bound test for cointegration with structural breaks	193
4.5.2	ARDL Estimations - Long run model with structural breaks	195
4.5.3	ARDL Estimations - Short run model with structural breaks	205
4.5.4	Diagnostic test	210
4.5.4.1	ARCH Test	210
4.5.4.2	Serial correlation LM Test	211
4.5.4.3	Normality test	212
4.5.4.4	Ramsey RESET Test	213
4.5.4.5	Stability test	213
4.6	Conclusion	217
<b>CHAPTER FIVE CONCLUSION AND RECOMMENDATION</b>		<b>219</b>
5.1	Introduction	219
5.2	Conclusions	219
5.3	Policy recommendations	223
5.3.1	Cost of living	224
5.3.2	Household dependency	225

5.3.3	Income level	227
5.3.4	Interest rates	228
5.3.5	Housing prices	229
5.4	Recommendation for future studies	232
<b>REFERENCES</b>		234
<b>APPENDICES</b>		257



## LIST OF TABLES

Table 1.1 Percentage of distribution of households by type of housing	16
Table 3.1 Determinants of household debt	127
Table 4.1 Descriptive statistics	155
Table 4.2 Augmented Dicky-Fuller (ADF) unit root test	160
Table 4.3 Narayan and Popp unit root test	162
Table 4.4 Bound test for cointegration	165
Table 4.5 Results of the Long Run Coefficient Estimates	166
Table 4.6 Results of the Short Run Coefficient Estimates	179
Table 4.7 ARCH Test	183
Table 4.8 Breusch-Godfrey Serial Correlation LM Test	184
Table 4.9 Jarque-Bera Test	185
Table 4.10 Ramsey Reset Test	186
Table 4.11 Result of Chow test	191
Table 4.12 Bound test for cointegration with structural breaks	194
Table 4.13 Results of Long Run Coefficients for Model with Structural Breaks	196
Table 4.14 Results of Short Run Model with Structural Breaks	206
Table 4.15 ARCH Test	210
Table 4.16 Breusch-Godfrey Serial Correlation LM Test	211
Table 4.17 Jarque-Bera Test	212
Table 4.18 Ramsey Reset Test	213
Table 5.1 Summary on the findings of the long run model	221
Table 5.2 Summary on the findings of the long run model (with structural breaks)	221



## LIST OF FIGURES

Figure 1.1 Household debt in Malaysia (Percentage of GDP)	4
Figure 1.2 Composition of household debt (2005-2014)	5
Figure 1.3 Composition of mortgage and consumer debt (% of total household debt)	6
Figure 1.4 Comparison of household debt (% of GDP) between countries in 2014	7
Figure 1.5 Household debt-income ratio and debt service ratio in 2014	8
Figure 1.6 The growth in household debt and real GDP from 2004 to 2013	9
Figure 1.7 Personal bankruptcies in Malaysia	10
Figure 1.8 The mean of monthly household gross income (1995- 2014)	12
Figure 1.9 Income share of Malaysian households (1995-2014)	13
Figure 1.10 Poverty rate in Malaysia (1995-2014)	14
Figure 1.11 Malaysia average lending rates	16
Figure 1.12 Malaysia housing price index and percentage change	19
Figure 1.13 Growth of housing prices in big cities in Malaysia	20
Figure 1.14 Malaysia Price Index (2005-2014)	22
Figure 1.15 Weightage of Malaysia Consumer Price Index (2011-2014)	23
Figure 1.16 Global food price index	23
Figure 1.17 Average household monthly expenditure based on the household size	28
Figure 3.1 The Life Cycle Model	100
Figure 3.2 Modified Life Cycle Model based on four periods of household	121
Figure 3.3 Conceptual framework on the determinants of household debt	125
Figure 3.4 Summary of the econometric procedure	153
Figure 4.1 Trend analysis	158
Figure 4.2 CUSUM Test for Model 1	187
Figure 4.3 CUSUMSQ Test for Model 1	187
Figure 4.4 CUSUM Test for Model 2	188
Figure 4.5 CUSUMSQ Test for Model 2	188
Figure 4.6 CUSUM Test for Model 3	189
Figure 4.7 CUSUMSQ Test for Model 3	189
Figure 4.8 CUSUM Test for Model 1 (with structural breaks)	214
Figure 4.9 CUSUMSQ Test for Model 1 (with structural breaks)	214
Figure 4.10 CUSUM Test for Model 2 (with structural breaks)	215
Figure 4.11 CUSUMSQ Test for Model 2 (with structural breaks)	215
Figure 4.12 CUSUM Test for Model 3 (with structural breaks)	216
Figure 4.13 CUSUMSQ Test for Model 3 (with structural breaks)	216
Figure 5.1 Speed of adjustment of the debt model	223

## LIST OF ABBREVIATIONS

ADF	Augmented Dicky-Fuller
AIC	Akaike Information Criterion
ANOVA	Analysis of variance
ARCH	Auto-Regressive Conditional Heteroskedasticity
ARDL	Auto-Regressive Distributed Lag modelling
BNM	Bank Negara Malaysia
CPI	Consumer Price Index
CUSUM	Cumulative Sum of the Residuals
CUSUMSQ	Cumulative Sum of the Residuals Squared
ECM	Error Correction Model
EPU	Economic Planning Unit
GDP	Gross Domestic Product
GMM	Generalized method of moments
GST	Good and Services Tax
LCM	Life Cycle Model
LM	Lagrange Multiplier
NAPIC	National Property Information Centre
OLS	Ordinary Least Squares
PIH	Permanent Income Hypothesis
RESET	Regression Specification Error Test
VAR	Vector Autoregressive



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# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction

Household debt plays an important role in the household balance sheet since households usually use credit facilities to finance their consumption especially on durable goods. As a result, household debt will exert a positive influence on the aggregate demand and indirectly can help to enhance the nation economic growth. However, a rising demand for loans together with the greediness of the financial intermediaries in making profit by giving out loans excessively has contributed to large debt accumulation and may bring towards serious economic consequences (Karacimen, 2014; Moroke, 2014; Zakaria, Abdul Kader, Mohd Jaafar, & Marican, 2012).

Recent data shows that the level of household debt is growing in both developed and developing countries which raises concerns of the economists on the risk of financial instability (World Bank, 2014). Even though household debt can boost the nation economic growth, excessive debt level may eventually bring negative effects on the economic performances of a country (Cecchetti, Mohanty, & Zampolli, 2011). This is due to the fact that continuous increment in household debt may lead to financial crisis and slowing down the economic recovery process (Chmelar, 2013; Gartner, 2013).

Apart from that, an increase in the household financial commitment will also cause the households to be more sensitive to negative shock in the economy such as in

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## APPENDICES

Appendix 1. Zivot-Andrews unit root test

Variables	t-statistics (Intercept)	Break date	t-statistics (Both)	Break date
LHD	-2.242183[0]	2002Q2	-4.264895[0]	2007Q1
LMD	-3.722229[0]	2006Q2	-4.350909[0]	2008Q1
LCD	-0.452139 [0]	2001Q3	-2.828744[0]	2005Q2
LY	-5.554456***[4]	2005Q1	-5.305605**[4]	2005Q1
IR	-3.444789[1]	2009Q1	-3.733902[1]	2009Q1
LHP	-3.106281[0]	2011Q2	-4.795213[0]	2008Q4
LFP	-3.593904[1]	2008Q1	-4.064556[1]	2007Q4
LYA	-2.395033[4]	2007Q1	-4.165868[4]	2010Q3
LOA	-0.082575[3]	2012Q2	-2.369974[3]	2009Q2

The value in parentheses indicates the optimal number of lag, k. The critical values at 1, 5 and 10% for break in intercept are -5.34, -4.93 and -4.58 respectively while the critical values for variable with break in both intercept and trend are -5.57, -5.08 and -4.82 respectively. \*\*\*,\*\* indicate the significant at 1% and 5% respectively.

Appendix 2. Perron (1997) unit root test

Variables	t-statistics (Intercept)	Break date	t-statistics (Both)	Break date
LHD	-2.274712[0]	2002Q2	-4.228988[0]	2006Q4
LMD	-3.776585[0]	2006Q3	-4.494751[0]	2007Q4
LCD	-0.348336[0]	2001Q3	-2.805681[0]	2005Q1
LY	-5.482534**[4]	2004Q4	-5.116200[4]	2004Q4
IR	-3.416268[1]	2008Q4	-3.715258[1]	2008Q4
LHP	-3.041981[4]	2011Q1	-5.126682[4]	2008Q3
LFP	-3.522619[1]	2007Q4	-4.262038[1]	2007Q4
LYA	-3.061526[3]	2013Q2	-4.321113[3]	2010Q2
LOA	-0.671693[2]	2012Q1	-2.946449[2]	2009Q1

The value in parentheses indicates the optimal number of lag, k. The critical values at 1, 5 & 10% are -5.92, -5.23, -4.92 for intercept & -6.32, -5.59 and -5.29 respectively for intercept & trend. \*\* indicates the significant at 5% significance level.

Appendix 3. Long run coefficients of household debt model, ARDL (1, 4, 2, 0, 0, 0, 1)

Variables	Coefficient	Std. error	t-statistics	Prob
C	24.720037	1.763130	14.020538	0.0000
LY	0.306296	0.064701	4.734001	0.0000
IR	-0.050672	0.009041	-5.604805	0.0000
LHP	0.221392	0.064638	3.425092	0.0013
LFP	-1.351883	0.117866	-11.469687	0.0000



Appendix 3. (Continued)

Variables	Coefficient	Std. error	t-statistics	Prob
LYA	-2.853552	0.239735	-11.902966	0.0000
LOA	0.989210	0.215306	4.594440	0.0000

Appendix 4. Long run coefficients of mortgage debt model, ARDL (1, 4, 2, 3, 0, 1, 1)

Variables	Coefficient	Std. error	t-statistics	Prob
C	21.978302	1.513091	14.525437	0.0000
LY	0.110492	0.049877	2.215270	0.0318
IR	-0.037142	0.006553	-5.667639	0.0000
LHP	0.553476	0.061289	9.030543	0.0000
LFP	-0.995103	0.100327	-9.918605	0.0000
LYA	-2.609043	0.198839	-13.121378	0.0000
LOA	0.793363	0.214260	3.702805	0.0006

Appendix 5. Long run coefficients of consumer debt model, ARDL (1, 4, 2, 0, 0, 0, 0)

Variables	Coefficient	Std. error	t-statistics	Prob
C	26.768653	6.239628	4.290104	0.0001
LY	0.887393	0.234014	3.792057	0.0004
IR	-0.128012	0.035218	-3.634871	0.0007
LHP	-0.238063	0.195003	-1.220818	0.2279
LFP	-2.123362	0.369275	-5.750091	0.0000
LYA	-2.884080	0.894914	-3.222744	0.0022
LOA	0.275959	0.636304	0.433691	0.6664

Appendix 6. Short run estimates of household debt model, ARDL (1, 4, 2, 0, 0, 0, 1)

Variables	Coefficient	Std. error	t-statistics	Prob
D(LY)	-0.113769	0.024504	-4.642976	0.0000
D(LY(-1))	-0.190725	0.036807	-5.181699	0.0000
D(LY(-2))	-0.148739	0.027557	-5.397463	0.0000
D(LY(-3))	-0.149839	0.029256	-5.121712	0.0000
D(IR)	0.013934	0.008021	1.737065	0.0887
D(IR(-1))	0.025232	0.008720	2.893646	0.0057
D(LHP)	0.134750	0.071790	1.877000	0.0665
D(LFP)	-0.705972	0.117656	-6.000318	0.0000
D(LYA)	-1.241006	0.286294	-4.334727	0.0001
D(LOA)	0.195834	0.139195	1.406904	0.1658
ECT(-1)	-0.541736	0.049755	-10.888150	0.0000

Appendix 7. Short run estimates of mortgage debt model, ARDL (1, 4, 2, 3, 0, 1, 1)

Variables	Coefficient	Std. error	t-statistics	Prob
D(LY)	-0.128181	0.022659	-5.656853	0.0000
D(LY(-1))	-0.133270	0.030839	-4.321509	0.0001
D(LY(-2))	-0.099345	0.023651	-4.200501	0.0001
D(LY(-3))	-0.106268	0.026247	-4.048719	0.0002
D(IR)	0.006930	0.007567	0.915771	0.3647
D(IR(-1))	0.032291	0.008431	3.829842	0.0004
D(LHP)	0.195805	0.073912	2.649151	0.0111
D(LHP(-1))	-0.043205	0.078876	-0.547759	0.5866
D(LHP(-2))	-0.184354	0.077688	-2.373017	0.0220
D(LFP)	-0.596331	0.112729	-5.289947	0.0000
D(LYA)	0.990083	0.441740	2.241326	0.0300
D(LOA)	0.056458	0.131017	0.430925	0.6686
ECT(-1)	-0.643111	0.063697	-10.096449	0.0000

Appendix 8. Short run estimates of consumer debt model, ARDL (1, 4, 2, 0, 0, 0, 0)

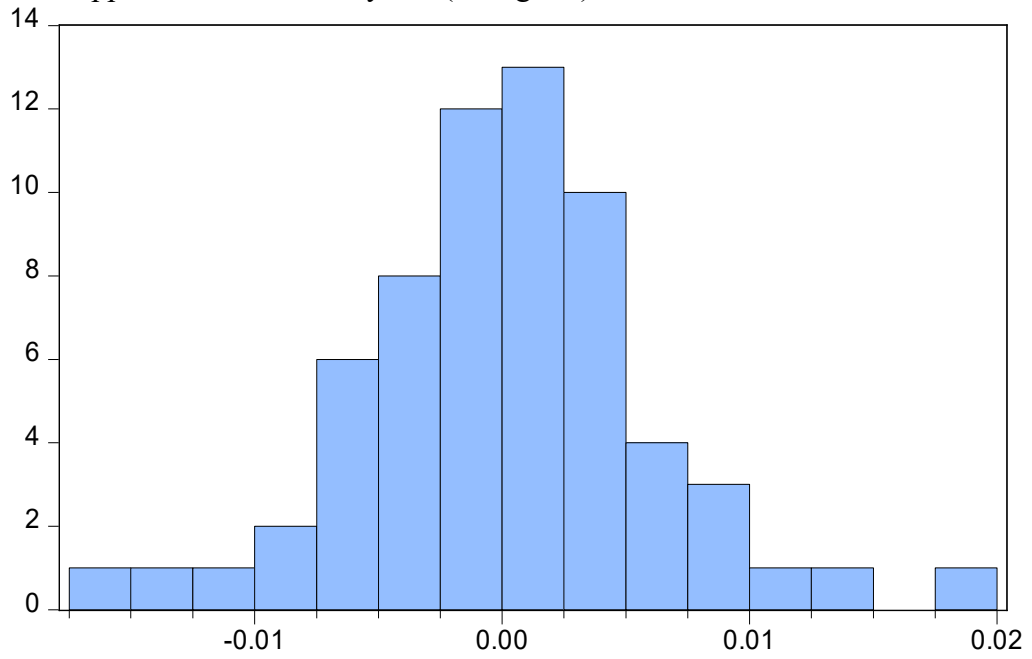
Variables	Coefficient	Std. error	t-statistics	Prob
D(LY)	-0.035716	0.034396	-1.038399	0.3041
D(LY(-1))	-0.201927	0.050508	-3.997890	0.0002
D(LY(-2))	-0.127902	0.038351	-3.335013	0.0016
D(LY(-3))	-0.145334	0.041172	-3.529942	0.0009
D(IR)	0.011680	0.011590	1.007774	0.3184
D(IR(-1))	0.016325	0.012141	1.344626	0.1848
D(LHP)	0.052097	0.104516	0.498462	0.6203
D(LFP)	-0.510439	0.173016	-2.950238	0.0048
D(LYA)	-0.535154	0.406693	-1.315865	0.1942
D(LOA)	-0.188091	0.201299	-0.934386	0.3546
ECT(-1)	-0.241456	0.024279	-9.945198	0.0000

Appendix 9. Wald test of the lagged variables

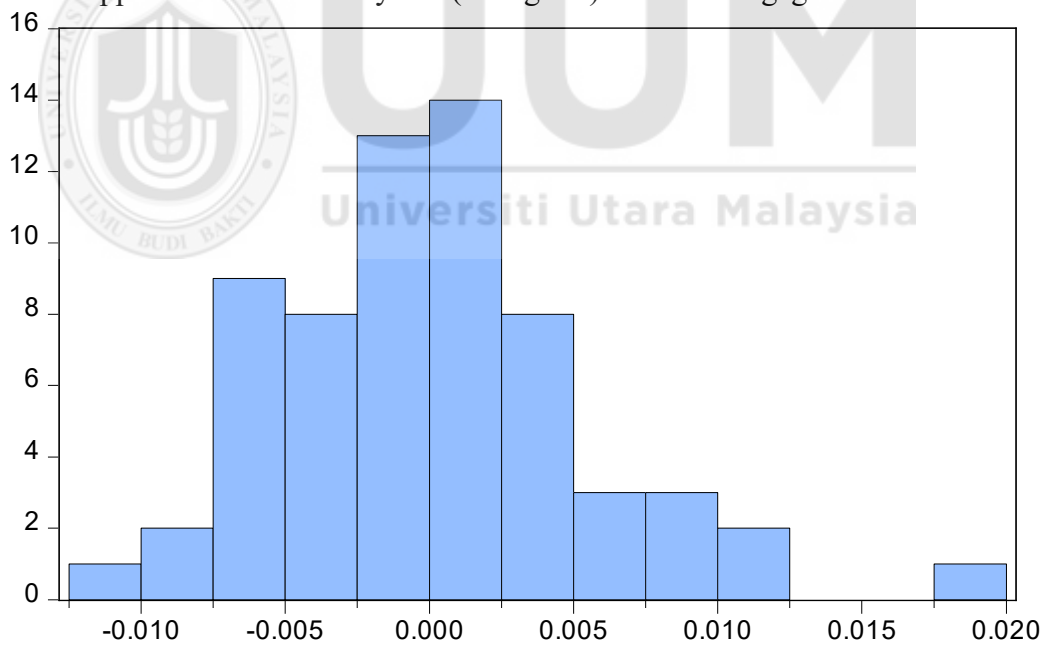
Variable	LHD	LMD	LCD
Income	5.236*** (0.003)	3.899** (0.014)	1.888 (0.143)
Housing price	-	0.912 (0.409)	-

Notes: The figures in table represent the F-test with the value in parentheses represents the p-value of the test. \*\*\*,\*\* indicates that the variable is significant at 1% and 5% respectively.

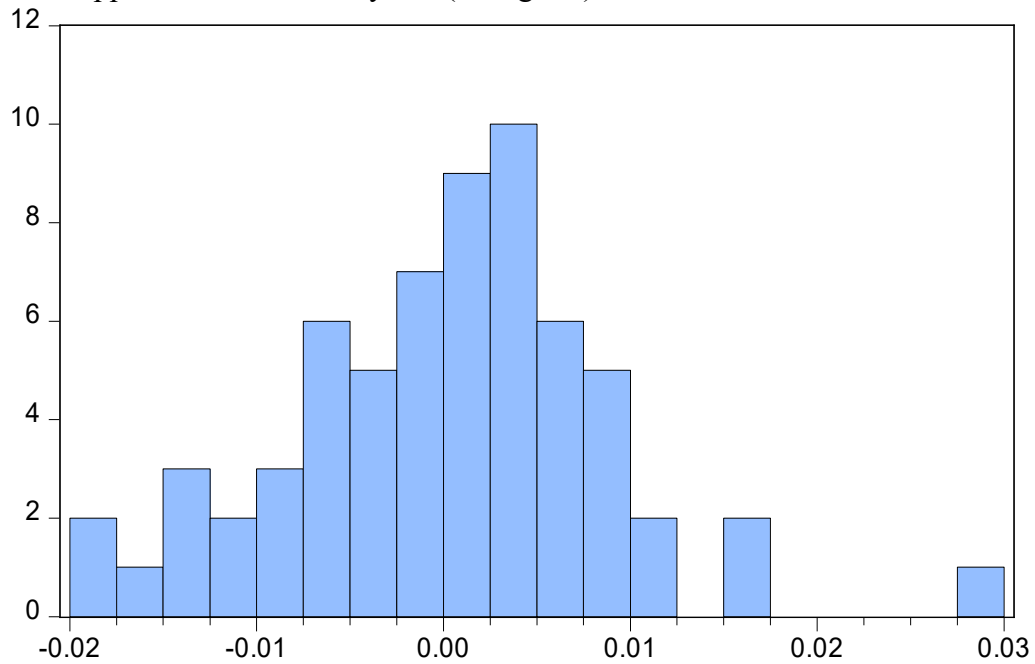
Appendix 10. Normality test (histogram) for the household debt model



Appendix 11. Normality test (histogram) for the mortgage debt model



Appendix 12. Normality test (histogram) for the consumer debt model



Appendix 13. Long run coefficients of household debt model with breaks, ARDL (1, 4, 3, 0, 0, 0, 0)

Variables	Coefficient	Std. error	t-statistics	Prob
C	22.916846	1.651150	13.879323	0.0000
LY	0.273063	0.056913	4.797907	0.0000
IR	-0.058291	0.008464	-6.887312	0.0000
LHP	0.127488	0.061815	2.062408	0.0447
LFP	-0.909337	0.191867	-4.739413	0.0000
LYA	-2.683159	0.214263	-12.522743	0.0000
LOA	0.900702	0.170156	5.293382	0.0000
D2005Q4	-0.013458	0.012076	-1.114468	0.2707
D2008Q3	-0.044009	0.016714	-2.632966	0.0114

Appendix 14. Long run coefficients of mortgage debt model with breaks, ARDL (1, 3, 2, 3, 1, 1, 2)

Variables	Coefficient	Std. error	t-statistics	Prob
C	21.502082	1.824540	11.784936	0.0000
LY	0.093257	0.056823	1.641181	0.1079
IR	-0.032877	0.006699	-4.907940	0.0000
LHP	0.511332	0.073581	6.949260	0.0000
LFP	-0.909724	0.120241	-7.565851	0.0000
LYA	-2.581478	0.234646	-11.001587	0.0000
LOA	0.941058	0.271375	3.467741	0.0012
D2001Q4	0.034165	0.012418	2.751131	0.0086

Appendix 15. Long run coefficients of consumer debt model with breaks,  
ARDL (1, 4, 2, 0, 0, 0, 0)

Variables	Coefficient	Std. error	t-statistics	Prob
C	23.318210	7.157513	3.257865	0.0021
LY	0.844692	0.233190	3.622337	0.0007
IR	-0.146382	0.040428	-3.620821	0.0007
LHP	-0.384556	0.218507	-1.759930	0.0848
LFP	-1.391714	0.718434	-1.937150	0.0586
LYA	-2.530195	0.977842	-2.587528	0.0128
LOA	0.179451	0.638905	0.280873	0.7800
D2005Q4	-0.010906	0.045463	-0.239881	0.8114
D2008Q3	-0.077079	0.062934	-1.224751	0.2266

Appendix 16. Short run estimates of household debt model with breaks,  
ARDL (1, 4, 3, 0, 0, 0, 0)

Variables	Coefficient	Std. error	t-statistics	Prob
D(LY)	-0.128600	0.025375	-5.068016	0.0000
D(LY(-1))	-0.184310	0.038410	-4.798518	0.0000
D(LY(-2))	-0.190216	0.028710	-6.625385	0.0000
D(LY(-3))	-0.161127	0.031501	-5.114962	0.0000
D(IR)	0.010287	0.007900	1.302235	0.1992
D(IR(-1))	0.023591	0.009090	2.595285	0.0126
D(IR(-2))	0.017195	0.006640	2.589664	0.0128
D(LHP)	0.103363	0.069700	1.482972	0.1448
D(LFP)	-0.545851	0.126381	-4.319084	0.0001
D(LYA)	-1.597281	0.254052	-6.287224	0.0000
D(LOA)	0.462300	0.139882	3.304940	0.0018
D(D2005Q4)	-0.015079	0.004807	-3.136961	0.0029
D(D2008Q3)	-0.034654	0.007530	-4.601848	0.0000
ECT(-1)	-0.627428	0.061099	-10.268963	0.0000

Appendix 17. Short run estimates of mortgage debt model with breaks,  
ARDL (1, 3, 2, 3, 1, 1, 2)

Variables	Coefficient	Std. error	t-statistics	Prob
D(LY)	-0.105076	0.022665	-4.636058	0.0000
D(LY(-1))	-0.049445	0.023539	-2.100557	0.0414
D(LY(-2))	-0.065479	0.020666	-3.168482	0.0028
D(IR)	0.010248	0.007722	1.327094	0.1913
D(IR(-1))	0.015099	0.007115	2.121984	0.0395
D(LHP)	0.171507	0.072428	2.367982	0.0223
D(LHP(-1))	-0.007335	0.079556	-0.092204	0.9270
D(LHP(-2))	-0.165779	0.079174	-2.093852	0.0421

Appendix 17. (Continued)

Variables	Coefficient	Std. error	t-statistics	Prob
D(LFP)	-0.804059	0.104224	-7.714706	0.0000
D(LYA)	0.503331	0.443324	1.135357	0.2624
D(LOA)	0.085059	0.139220	0.610967	0.5444
D(LOA(-1))	-0.209892	0.145314	-1.444399	0.1557
D(D2001Q4)	0.024840	0.004598	5.402154	0.0000
ECT(-1)	-0.561365	0.063534	-8.835716	0.0000

Appendix 18. Short run estimates of consumer debt model with breaks  
[ARDL (1, 4, 2, 0, 0, 0, 0)]

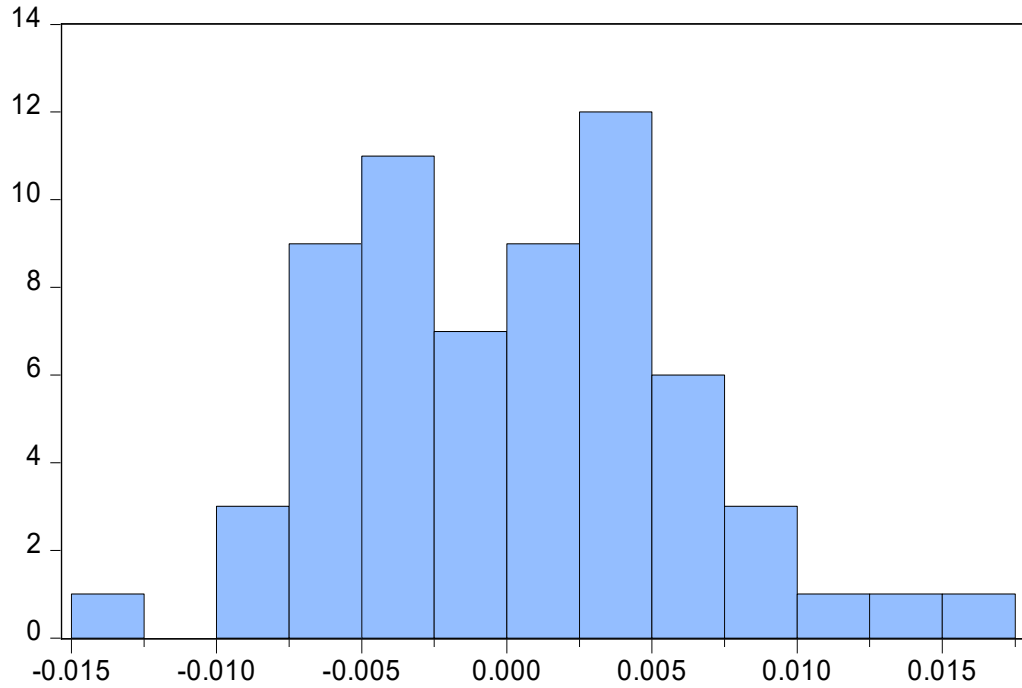
Variables	Coefficient	Std. error	t-statistics	Prob
D(LY)	-0.027221	0.033594	-0.810290	0.4218
D(LY(-1))	-0.162617	0.049062	-3.314542	0.0018
D(LY(-2))	-0.146205	0.037442	-3.904827	0.0003
D(LY(-3))	-0.119607	0.040462	-2.955996	0.0048
D(IR)	0.002714	0.011197	0.242390	0.8095
D(IR(-1))	0.016913	0.011776	1.436152	0.1574
D(LHP)	-0.018525	0.100369	-0.184567	0.8543
D(LFP)	-0.362791	0.182570	-1.987132	0.0526
D(LYA)	-0.427518	0.388181	-1.101336	0.2762
D(LOA)	0.001707	0.199478	0.008557	0.9932
D(D2005Q4)	-0.017981	0.006776	-2.653737	0.0108
D(D2008Q3)	-0.032151	0.010616	-3.028557	0.0039
ECT(-1)	-0.238574	0.024030	-9.928092	0.0000

Appendix 19. Wald test of the lagged variables for model with break

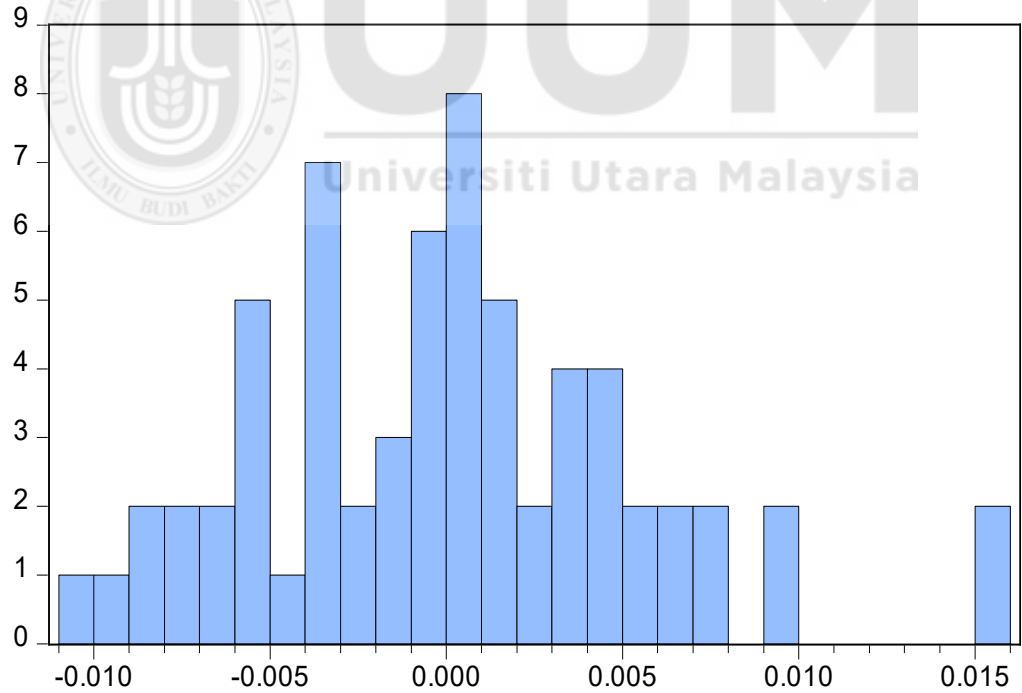
Variable	LHD	LMD	LCD
Income	4.911*** (0.004)	4.930** (0.011)	1.433 (0.244)
Interest rate	4.605** (0.014)	-	-
Housing price	-	1.099 (0.342)	-

Notes: The figures in table represent the F-test with the value in parentheses represents the p-value of the test. \*\*\*,\*\* indicates that the variable is significant at 1% and 5% respectively.

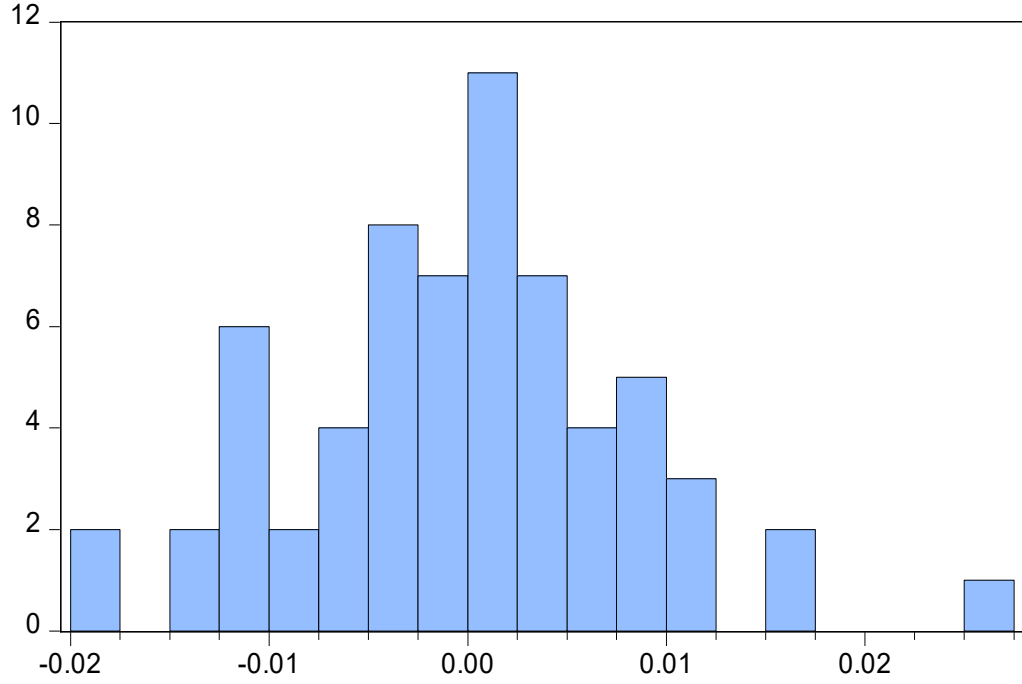
Appendix 20. Normality test (histogram) for the household debt model with breaks



Appendix 21. Normality test (histogram) for the mortgage debt model with breaks



Appendix 22. Normality test (histogram) for the consumer debt model with breaks



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