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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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September 2017**

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ON HOUSEHOLD DEBT AND ITS COMPOSITION IN MALAYSIA**



**Thesis Submitted to  
School of Economics, Finance and Banking  
Universiti Utara Malaysia,  
in Fulfillment of the Requirement for the Degree of Doctor of Philosophy**

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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*

## ACKNOWLEDGEMENT

First and foremost, I would like to express my utmost gratitude to Allah SWT for giving me strength and ideas in completing my thesis. When I was feeling down and felt like there was no hope, His blessing has helped me to go through all the obstacles until I was able to successfully finish writing my thesis. A greatest appreciation also goes to both my first and second supervisors, Associate Professor Dr. Hussin Abdullah and Associate Professor Dr. Shamzaeffa Samsudin for their guidance and continuous supports which have helped me a lot to complete my study. It was a great pleasure to be able to gain valuable knowledge from them in various aspects of life when I was under their supervision and this will become one of the great treasures in my life.

Special and sincere thanks to Dr. Zalina Zainal, Associate Professor Dr. Nor Aznin Abu Bakar and Associate Professor Dr. Azlan Shah Zaidi, for giving me their valuables feedbacks and suggestions during the Proposal Defense and viva session, and those have helped me to improve my research. I would also like to thank Professor Dr. Rushami Zien Yusoff and Associate Professor Dr. Nurwati Ashikkin Ahmad Zaluki for guiding me on research methodology and academic writing which have helped me a lot in doing my research. A great appreciation also goes to Associate Professor Dr. Eng Yoke Kee and Professor Paresk Kumar Narayan for giving me advice and suggestions on issues that I had encountered during the data analysis.

My sincere and unconditional appreciation goes to my family members especially my parents, Azizah Samsudin and Hammad Ahmad Khan for their love, supports and prayers that have given me strength to keep moving. A sincere appreciation also goes to my siblings, Sharifah, Muhamad Azwan and Hazim Ahmad and my nephew Muhammad Harraz for always cheering me up every time I was feeling stressful with my studies. I would also like to convey my appreciation to my best friends, Irwana Nooridayu Muhamad Hakimi, Noorlailahusna Mohd Yusof and Nydia Nadzirah Ahmad for their continuous encouragement. My gratitude also goes to my research buddy, Mahazril 'Aini Yaacob who is also in her postgraduate journey for being very supportive and understanding and always willing to lend her ears every time I need someone to talk to.

Special thanks to Universiti Teknologi MARA and Ministry of Higher Education for providing me with the financial supports to further my studies. Sincere appreciation also goes to Mrs. Zulfa Zakaria for providing her expertise in proofreading this thesis and helped to make my thesis to become well-structured and organized. Last but not least, I would like to thank everyone involved in making this thesis a reality.

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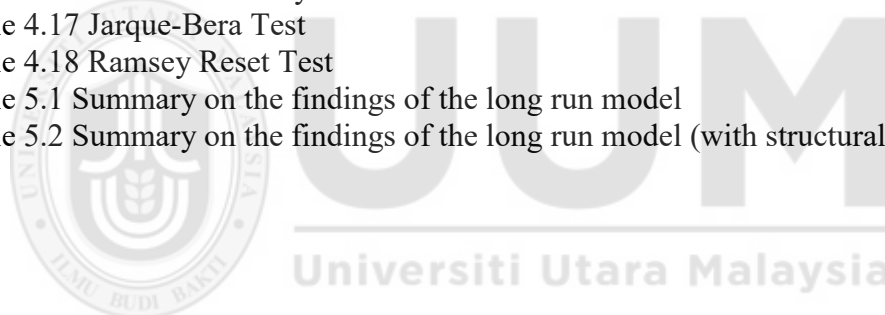
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## LIST OF ABBREVIATIONS

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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## REFERENCES

- Abdul Ghani, N. (2010). Household indebtedness and its implications for financial stability in Malaysia. In *Household Indebtedness and Its Implications for Financial Stability* (pp. 67–88). South-East Asian Central Banks, Research and Training Centre.
- Abid, L., Ouertani, M. N., & Zouari-Ghorbel, S. (2014). Macroeconomic and Bank-specific Determinants of Household's Non-performing Loans in Tunisia: A Dynamic Panel Data. *Procedia Economics and Finance*, 13, 58–68.  
[http://doi.org/10.1016/S2212-5671\(14\)00430-4](http://doi.org/10.1016/S2212-5671(14)00430-4)
- Akaike, H. (1998). Information Theory and an Extension of the Maximum Likelihood Principle. In *Selected Papers of Hirotugu Akaike* (pp. 199–213). Springer New York.
- Akerlof, G. A., & Shiller, R. J. *Animal spirits: How human psychology drives the economy, and why it matters for global capitalism*. Princeton, NJ: Princeton University Press.
- Allen, F., & Giovannetti, G. (2010). *Fragile Countries and the 2008-2009 Crisis* (EUI Working Papers No. 2010/13). European University Institute.
- Andersson, F., & Mayock, T. (2015). The microdynamics of household credit use through a boom-bust cycle. *Journal of Housing Economics*, 27, 22–36.  
<http://doi.org/10.1016/j.jhe.2015.02.004>
- Ando, A., & Modigliani, F. (1963). The “Life Cycle” Hypothesis of Saving: Aggregate Implications and Tests. *The American Economic Review*, 53(1), 55–84.

- Arestis, P., & González, A. R. (2014). Modelling the housing market in OECD countries. *International Review of Applied Economics*, 28(2), 131–153. <http://doi.org/10.2753/PKE0160-3477360304>
- Aristei, D., & Gallo, M. (2016). The Determinants of Households' Repayment Difficulties on Mortgage Loans: Evidence from Italian Microdata. *International Journal of Consumer Studies*, 40(4), 453–465.
- Bank Negara Malaysia. (2011). *Financial Sector Blueprint 2011-2020*. Retrieved from [http://www.bnm.gov.my/files/publication/fsbp/en/BNM\\_FSBP\\_FULL\\_en.pdf](http://www.bnm.gov.my/files/publication/fsbp/en/BNM_FSBP_FULL_en.pdf)
- Bank Negara Malaysia. (2013). *Annual Report 2013*. Retrieved from [http://www.bnm.gov.my/files/publication/ar/en/2013/ar2013\\_book.pdf](http://www.bnm.gov.my/files/publication/ar/en/2013/ar2013_book.pdf)
- Bank Negara Malaysia. (2014). *Financial Stability and Payment Systems Report 2014*. Retrieved from [http://www.bnm.gov.my/files/publication/fsps/en/2014/fs2014\\_book.pdf](http://www.bnm.gov.my/files/publication/fsps/en/2014/fs2014_book.pdf)
- Bank Negara Malaysia. (2015). *Monthly Statistical Bulletin*. Retrieved from [http://www.bnm.gov.my/index.php?csrf=cbbb54396146bb0d2698d6ce04940aef17b2494&ch=en\\_publication&pg=&pub=msbarc&yearfr=2015](http://www.bnm.gov.my/index.php?csrf=cbbb54396146bb0d2698d6ce04940aef17b2494&ch=en_publication&pg=&pub=msbarc&yearfr=2015)
- Banks, J., Blundell, R., & Smith, J. P. (2002). *Wealth Portfolios in the UK and the US* (NBER Working Paper No. 9128). National Bureau of Economic Research.
- Banks, J., & Tanner, S. (2000). *Household portfolios in the UK* (IFS Working Papers No. W00/14). Institute for Fiscal Studies.
- Barba, A., & Pivetti, M. (2008). Rising household debt: Its causes and macroeconomic implications-a long-period analysis. *Cambridge Journal of Economics*, 33(1), 113–137. <http://doi.org/10.1093/cje/ben030>

- Beer, C., & Schürz, M. (2007). Characteristics of Household Debt in Austria. *Monetary Policy & the Economy*, (2), 58–79.
- Benjamin, J. D., Chinloy, P., & Jud, G. D. (2004). Real Estate Versus Financial Wealth in Consumption. *The Journal of Real Estate Finance and Economics*, 29(3), 341–354. <http://doi.org/10.1023/B:REAL.0000036677.42950.98>
- Berisha, E., Meszaros, J., & Olson, E. (2015). Income inequality and household debt: a cointegration test. *Applied Economics Letters*, 22(18), 1469–1473. <http://doi.org/10.1080/13504851.2015.1039698>
- Bezemer, D., Grydaki, M., & Zhang, L. (2016). More mortgages, lower growth? *Economic Inquiry*, 54(1), 652–674. <http://doi.org/10.1111/ecin.12254>
- Bhatia, K. B. (1987). Real Estate Assets and Consumer Spending. *The Quarterly Journal of Economics*, 102(2), 437–444.
- Boushey, H., & Weller, C. E. (2008). Has Growing Inequality Contributed to Rising Household Economic Distress? *Review of Political Economy*, 20(1), 1–22. <http://doi.org/10.1080/09538250701661764>
- Brahmbhatt, M., & Christiaensen, L. (2008). *Rising Food Prices in East Asia: Challenges and Policy Options* (No. 19521). World Bank Other Operational Studies, The World Bank.
- Bredeloft, D. J., Mennicke, S. A., Potter, A. M., & Clarke, J. I. (1998). Perceptions Attributed By Adults To Parental Overindulgence During Childhood. *Journal of Family and Consumer Sciences Education*, 16(2), 1–15.
- Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for Testing the Constancy of Regression Relationships Over Time. *Journal of the Royal Statistical Society*, 37(2), 149–192.

- Brown, S., Ghosh, P., Su, L., & Taylor, K. (2015). Modelling household finances: A Bayesian approach to a multivariate two-part model. *Journal of Empirical Finance*, 33, 190–207. <http://doi.org/10.1016/j.jempfin.2015.03.017>
- Brown, S., & Gray, D. (2016). Household Finances and Well-Being in Australia: An Empirical Analysis of Comparison Effects. *Journal of Economic Psychology*, 53, 17–36. <http://doi.org/10.1016/j.joep.2015.12.006>
- Browning, M., Deaton, A., & Irish, M. (1985). A Profitable Approach to Labor Supply and Commodity Demands over the Life-Cycle. *Econometrica*, 53(3), 503–544.
- Bryant, W. K., & Wang, Y. (1990). American Consumption Pattern and the Price of Time : A Time-Series Analysis. *The Journal of Consumer Affairs*, 24(2), 280–306.
- Caju, P. Du, Roelandt, T., Nieuwenhuyze, C. Van, & Zachary, M. D. (2014). Household debt : evolution and distribution. *Economic Review*, (September), 61–80.
- Calza, A., Gartner, C., & Sousa, J. (2003). Modelling the demand for loans to the private sector in the euro area. *Applied Economics*, 35(1), 107–117. <http://doi.org/10.1080/00036840210161837>
- Cambridge City Council. (2013). *Shared Ownership Review 2013*. Retrieved from [http://democracy.cambridge.gov.uk/documents/s22231/Appendix\\_1\\_Shared\\_Ownership\\_Report\\_FINAL.pdf](http://democracy.cambridge.gov.uk/documents/s22231/Appendix_1_Shared_Ownership_Report_FINAL.pdf)
- Cambridge City Council. (2014). *Intermediate Market Housing*. Retrieved from [http://democracy.cambridge.gov.uk/documents/s26303/Intermediate\\_Housing\\_Final\\_AC\\_Revised.pdf](http://democracy.cambridge.gov.uk/documents/s26303/Intermediate_Housing_Final_AC_Revised.pdf)

- Campbell, J. Y., & Cocco, J. F. (2007). How do house prices affect consumption? Evidence from micro data. *Journal of Monetary Economics*, 54(3), 591–621. <http://doi.org/10.1016/j.jmoneco.2005.10.016>
- Canner, G., Dynan, K., & Passmore, W. (2002). Mortgage Refinancing in 2001 and Early 2002. *Federal Reserve Bulletin*, (December), 469–481.
- Carroll, C. D., & Dunn, W. E. (1997). *Unemployment Expectations, Jumping (S,s) Triggers, and Household Balance Sheets* (NBER Working Paper No. 6081). National Bureau of Economic Research.
- Carroll, C. D., Otsuka, M., & Slacalek, J. (2011). How Large Are Housing and Financial Wealth Effects? A New Approach. *Journal of Money, Credit and Banking*, 43(1), 55–79. <http://doi.org/10.1111/j.1538-4616.2010.00365.x>
- Case, K. E., Quigley, J. M., & Shiller, R. J. (2005). Comparing wealth effects: The stock market versus the housing market. *Advances in Macroeconomics*, 5(1).
- Cecchetti, S. G., Mohanty, M. S., & Zampolli, F. (2011). *The real effects of debt* (BIS Working Papers No. 352). Bank for International Settlements.
- Chatterjee, S., & Eyigungor, B. (2015). A quantitative analysis of the U.S. housing and mortgage markets and the foreclosure crisis. *Review of Economic Dynamics*, 18(2), 165–184. <http://doi.org/10.1016/j.red.2015.02.004>
- Chien, Y., & Devaney, S. A. (2001). The Effects of Credit Attitude and Socioeconomic Factors on Credit Card and Installment Debt. *The Journal of Consumer Affairs*, 35(1), 162–179.
- Chmelar, A. (2013). *Household Debt and the European Crisis* (ECRI Research Report No. 13). European Credit Research Institute.
- Chow, G. C. (1960). Tests of Equality Between Sets of Coefficients in Two Linear

- Regressions. *Econometrica*, 28(3), 591–605.
- Christiano, L. J. (1992). Searching for a Break in GNP. *Journal of Business & Economic Statistics*, 10(3), 237–250.
- Clark, W. A. V., Deurloo, M. C., & Dieleman, F. M. (2003). Housing Careers in the United States, 1968–93: Modelling the Sequencing of Housing States. *Urban Studies*, 40(1), 143–160. <http://doi.org/10.1080/00420980220080211>
- Coale, A. J., & Hoover, E. M. (1958). *Population growth and economic development in low-income countries*. Princeton: Princeton University Press.
- Cooper, D., & Dynan, K. (2016). Wealth effects and macroeconomic dynamics. *Journal of Economic Surveys*, 30(1), 34–55. <http://doi.org/10.1111/joes.12090>
- Cosma, S., & Pattarin, F. (2012). *Attitudes, personality factors and household debt decisions: A study of consumer credit* (CEFIN Working Papers No. 31). Centro Studi di Banca e Finanza.
- Cox, D., & Jappelli, T. (1993). The Effect of Borrowing Constraints on Consumer Liabilities. *Journal of Money, Credit and Banking*, 25(2), 197–213.
- Crawford, A., & Faruqui, U. (2011). What Explains Trends in Household Debt in Canada? *Bank of Canada Review*, (Winter 2011-2012), 3–15.
- Crook, J. (2001). The demand for household debt in the USA: evidence from the 1995 Survey of Consumer Finance. *Applied Financial Economics*, 11(1), 83–91. <http://doi.org/10.1080/09603100150210291>
- Cutler, D. M., Poterba, J. M., Sheiner, L. M., Summers, L. H., & Akerlof, G. A. (1990). An Aging Society: Opportunity or Challenge? *Brookings Papers on Economic Activity*, 1990(1), 1–73.

- Danes, S. M., & Hira, T. K. (1990). Knowledge, Beliefs, and Practices in the Use of Credit Cards. *Home Economics Research Journal*, 18(3), 223–235.
- Deaton, A. (1997). *The Analysis of Household Surveys: A Microeconomic Approach to Development Policy*. Baltimore: Johns Hopkins University Press.
- Debelle, G. (2004a). Household debt and the macroeconomy. *BIS Quarterly Review*, (March), 51–64.
- Debelle, G. (2004b). *Macroeconomic implications of rising household debt* (BIS Working Papers No. 153). Bank for International Settlements.
- del Río, A., & Young, G. (2006). The determinants of unsecured borrowing: evidence from the BHPS. *Applied Financial Economics*, 16(15), 1119–1144.  
<http://doi.org/10.1080/09603100500438791>
- Department of Statistics Malaysia. (2013). *Malaysia Economic Statistics - Time Series*. Retrieved from [https://www.dosm.gov.my/v1/uploads/files/3\\_Time\\_Series/Malaysia Time Series 2013/Penerbitan\\_Time\\_Series\\_2013.pdf](https://www.dosm.gov.my/v1/uploads/files/3_Time_Series/Malaysia_Time_Series_2013/Penerbitan_Time_Series_2013.pdf)
- Department of Statistics Malaysia. (2014a). *Household Income and Basic Amenities Survey Report*. Retrieved from <http://ongkianming.com/wp-content/uploads/2016/09/Household-and-Income-Survey-2014.pdf>
- Department of Statistics Malaysia. (2014b). *Malaysia Consumer Price Index*.
- Department of Statistics Malaysia. (2014c). *Report on Household Expenditure Survey*. Retrieved from <https://newss.statistics.gov.my/newss-portalx/ep/epFreeDownloadContentSearch.seam?cid=19945>
- Department of Statistics Malaysia. (2016). *Population Statistics*. Retrieved from [https://www.dosm.gov.my/v1/uploads/files/3\\_Time\\_Series/Malaysia\\_Time\\_Series\\_2015/22Perangkaan\\_Penduduk.pdf](https://www.dosm.gov.my/v1/uploads/files/3_Time_Series/Malaysia_Time_Series_2015/22Perangkaan_Penduduk.pdf)

- Duca, J. V., & Rosenthal, S. S. (1993). Borrowing constraints, household debt, and racial discrimination in loan markets. *Journal of Financial Intermediation*, 3(1), 77–103.
- Dunn, L. F., & Mirzaie, I. A. (2016). Consumer debt stress, changes in household debt, and the great recession. *Economic Inquiry*, 54(1), 201–214. <http://doi.org/10.1111/ecin.12218>
- Durkin, T. A. (2000). Credit Cards: Use and Consumer Attitudes, 1970-2000. *Federal Reserve Bulletin*, (September), 623–634.
- Dynan, K. E., & Kohn, D. L. (2007). *The Rise in U.S. Household Indebtedness: Causes and Consequences* (Finance and Economics Discussion Series No. 2007-37). Federal Reserve Board.
- Economic Planning Unit. (2010). *New Economic Model for Malaysia*. Retrieved from <http://www.epu.gov.my/sites/default/files/nem.pdf>
- Employees Provident Fund. (2015). *EPF Savings and Your Retirement*. Retrieved from [http://www.kwsp.gov.my/portal/documents/10180/4459038/BOOK\\_-\\_EPF\\_Saving\\_and\\_Your\\_Retirement\\_\\_CS5\\_.pdf](http://www.kwsp.gov.my/portal/documents/10180/4459038/BOOK_-_EPF_Saving_and_Your_Retirement__CS5_.pdf)
- Endut, N., & Hua, T. G. (2009). Household debt in Malaysia. *BIS Papers*, (46), 107–116.
- Enthoven, A. (1957). The Growth of Instalment Credit and the Future of Prosperity. *The American Economic Review*, 47(6), 913–929.
- Fan, J. X., Chang, Y. R., & Sherman, H. (1993). Real Income Growth and Optimal Credit Use. *Financial Services Review*, 3(1), 45–58.
- Filoso, V., & Papagni, E. (2015). Fertility choice and financial development. *European Journal of Political Economy*, 37, 160–177.



<http://doi.org/10.1016/j.ejpoleco.2014.11.004>

Fisher, F. M., & Shell, K. (1972). *The Economic Theory of Price Indices: Two Essays on the Effects of Taste, Quality, and Technological Change*. New York and London: Academic Press.

Food and Agriculture Organization of the United Nations. (2015). *FAO Food Price Index*. Retrieved from <http://www.fao.org/worldfoodsituation/foodpricesindex/en/>

Friedman, M. (1957). The Permanent Income Hypothesis. In *A Theory of the Consumption Function* (pp. 20–37). Princeton University Press. Retrieved from <http://www.nber.org/chapters/c4405>

Fry, M. J., & Mason, A. (1982). The Variable Rate-of-Growth Effect in the Life-Cycle Saving Model. *Economic Inquiry*, 20(3), 426–442. <http://doi.org/10.1111/j.1465-7295.1982.tb00359.x>

Gartner, K. (2013). *Household Debt and Economic Recovery Evidence from the U.S. Great Depression* (EHES Working Papers in Economic History No. 36). European Historical Economics Society.

Gillingham, R. (1983). Measuring the Cost of Shelter for Homeowners: Theoretical and Empirical Considerations. *The Review of Economics and Statistics*, 65(2), 254–265.

Glynn, J., Perera, N., & Verma, R. (2007). Unit root tests and structural breaks: a survey with applications. *Revista de Métodos Cuantitativos Para La Economía Y La Empresa*, 3(1), 63–79.

Green, R., & Hendershott, P. H. (1996). Age, housing demand, and real house prices. *Regional Science and Urban Economics*, 26(5), 465–480.

[http://doi.org/10.1016/0166-0462\(96\)02128-X](http://doi.org/10.1016/0166-0462(96)02128-X)

Greenhalgh-Stanley, N., & Rohlin, S. (2013). How Does Bankruptcy Law Impact the Elderly's Business and Housing Decisions? *Journal of Law and Economics*, 56(2), 417–451. <http://doi.org/10.1086/670911>

Gujarati, D. N. (2003). *Basic Econometrics* (4th ed.). New York: McGraw-Hill Higher Education.

Hamid, A. J. (2016, January 10). Reining in our food prices. *New Straits Times*. Retrieved from <https://www.nst.com.my/news/2016/01/121441/reining-our-food-prices>

Hamilton, R. (2003). Trends in households' aggregate secured debt. *Bank of England Quarterly Bulletin*, (Autumn), 271–280.

Hansen, B. E. (2001). The New Econometrics of Structural Change: Dating Breaks in U.S. Labor Productivity. *Journal of Economic Perspectives*, 15(4), 117–128. <http://doi.org/10.1257/jep.15.4.117>

Hartropp, A. (1992). Demand for consumer borrowing in the UK, 1969–90. *Applied Financial Economics*, 2(1), 11–20. <http://doi.org/10.1080/758527542>

Higgins, M., & Williamson, J. G. (1997). Age Structure Dynamics in Asia and Dependence on Foreign Capital. *Population and Development Review*, 23(2), 261–293.

HM Revenue and Customs. (2014). *Rent-a-Room for traders*. Retrieved from [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/323577/hs223.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/323577/hs223.pdf)

Hock, H., & Weil, D. N. (2012). On the dynamics of the age structure, dependency, and consumption. *Journal of Population Economics*, 25(3), 1019–1043.

<http://doi.org/10.1007/s00148-011-0372-x>

Hofmann, B. (2004). The Determinants of Bank Credit in Industrialized Countries : Do Property Prices Matter? *International Finance*, 7(2), 203–234.

Homes and Communities Agency. (2016). *Shared Ownership and Affordable Homes Programme 2016 to 2021*. Retrieved from [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/517678/SO\\_and\\_AHP\\_prospectus\\_13\\_04\\_16.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/517678/SO_and_AHP_prospectus_13_04_16.pdf)

Iacoviello, M. (2004). Consumption, house prices, and collateral constraints: A structural econometric analysis. *Journal of Housing Economics*, 13(4), 304–320. <http://doi.org/10.1016/j.jhe.2004.09.004>

Iacoviello, M. (2008). Household Debt and Income Inequality, 1963–2003. *Journal of Money, Credit and Banking*, 40(5), 929–965. <http://doi.org/10.1111/j.1538-4616.2008.00142.x>

International Monetary Fund. (2014). *Financial Soundness Indicators*. Retrieved from <https://www.imf.org/external/np/sta/fsi/eng/fsi.htm>

Jacobsen, D. H., & Naug, B. E. (2004). What influences the growth of household debt? *Economic Bulletin*, 75(3), 103–111.

Jappelli, T. (2005). The Life-Cycle Hypothesis, Fiscal Policy, and Social Security. *Banca Nazionale Del Lavoro Quarterly Review*, 58(233-234), 173–186.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration – with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52(2), 169–210.

Johnson, K. W., & Li, G. (2007). *Do High Debt Payments Hinder Household Consumption Smoothing?* (Finance and Economics Discussion Series No. 52).

Federal Reserve Board.

Justiniano, A., Primiceri, G. E., & Tambalotti, A. (2015). Household leveraging and deleveraging. *Review of Economic Dynamics*, 18(1), 3–20.

<http://doi.org/10.1016/j.red.2014.10.003>

Kapetanios, G. (2005). Unit-root testing against the alternative hypothesis of up to m structural breaks. *Journal of Time Series Analysis*, 26(1), 123–133.

<http://doi.org/10.1111/j.1467-9892.2005.00393.x>

Karacimen, E. (2014). Financialization in Turkey: The Case of Consumer Debt. *Journal of Balkan and Near Eastern Studies*, 16(2), 161–180.

<http://doi.org/10.1080/19448953.2014.910393>

Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*. London: Macmillan.

Khazanah Research Institute. (2016). *The State of Households II*. Retrieved from

[http://ongkianming.com/wp-content/uploads/2016/09/KRI\\_State\\_of\\_Households\\_II\\_280816.pdf](http://ongkianming.com/wp-content/uploads/2016/09/KRI_State_of_Households_II_280816.pdf)

Kim, H. J., Lee, D., Son, J. C., & Son, M. K. (2014). Household indebtedness in Korea: Its causes and sustainability. *Japan and the World Economy*, 29, 59–76.

<http://doi.org/10.1016/j.japwor.2013.12.001>

Kim, J. (2015). Household's optimal mortgage and unsecured loan default decision.

*Journal of Macroeconomics*, 45, 222–244.

<http://doi.org/10.1016/j.jmacro.2015.05.002>

Kim, Y. K. (2011). *The Macroeconomic Implications of Household Debt: An*

*Empirical Analysis* (Working Paper No. 11-03). Trinity College Department of Economics.

- Kirk, D. (1996). Demographic Transition Theory. *Population Studies: A Journal of Demography*, 50(3), 361–387. <http://doi.org/10.1080/0032472031000149536>
- Konüs, A. A. (1939). The Problem of the True Index of the Cost of Living. *Econometrica*, 7(1), 10–29.
- Lavender, B., & Parent, N. (2013). The U.S. Recovery from the Great Recession : A Story of Debt and Deleveraging. *Bank of Canada Review*, (Winter 2012-2013), 13–26.
- Lea, S. E. G., Webley, P., & Levine, R. M. (1993). The economic psychology of consumer debt. *Journal of Economic Psychology*, 14, 85–119.
- Lee, J., & Strazicich, M. C. (2003). Minimum lagrange multiplier unit root test with two structural breaks. *The Review of Economics and Statistics*, 85(4), 1082–1089.
- Leff, N. H. (1969). Dependency Rates and Savings Rates. *The American Economic Review*, 59(5), 886–896. <http://doi.org/10.1126/science.151.3712.867-a>
- Li, H., Zhang, J., & Zhang, J. (2007). Effects of longevity and dependency rates on saving and growth: Evidence from a panel of cross countries. *Journal of Development Economics*, 84(1), 138–154. <http://doi.org/10.1016/j.jdeveco.2006.10.002>
- Livingstone, S. M., & Lunt, P. K. (1992). Predicting personal debt and debt repayment: Psychological, social and economic determinants. *Journal of Economic Psychology*, 13(1), 111–134. [http://doi.org/10.1016/0167-4870\(92\)90055-C](http://doi.org/10.1016/0167-4870(92)90055-C)
- Livshits, I. (2015). Recent developments in consumer credit and default literature. *Journal of Economic Surveys*, 29(4), 594–613. <http://doi.org/10.1111/joes.12119>

- Lotz, S., & Zhang, C. (2015). Money and credit as means of payment: A new monetarist approach. *Journal of Economic Theory*, 164, 68–100. <http://doi.org/10.1016/j.jet.2015.08.003>
- Lunt, P. K., & Livingstone, S. M. (1991). Psychological, social and economic determinants of saving: Comparing recurrent and total savings. *Journal of Economic Psychology*, 12, 621–641.
- Magri, S. (2007). Italian households' debt: the participation to the debt market and the size of the loan. *Empirical Economics*, 33(3), 401–426. <http://doi.org/10.1007/s00181-006-0107-0>
- Mahima, S. T., & Puja, K. (2008). Relationship between Parental Overindulgence and Buying Behavior in the Context of Invasive Marketing: A Comparative Study of Two Cultures. *Seoul Journal of Business*, 14(1), 31–53.
- Malaysia Department of Insolvency. (2013). *Bankruptcy Statistic*. Retrieved from [http://www.mdi.gov.my/images/documents/Statistics/Bankruptcy/Bankruptcy\\_Statistic.pdf](http://www.mdi.gov.my/images/documents/Statistics/Bankruptcy/Bankruptcy_Statistic.pdf)
- Mankiw, N. G., & Weil, D. N. (1989). The Baby Boom, The Baby Bust, and The Housing Market. *Regional Science and Urban Economics*, 19(2), 235–258.
- Mason, A. (1988). Saving, Economic Growth, and Demographic Change. *Population and Development Review*, 14(1), 113–144.
- McCarthy, Y., & McQuinn, K. (2017). Deleveraging in a Highly Indebted Property Market: Who does it and are there Implications for Household Consumption? *Review of Income and Wealth*, 63(1), 95–117. <http://doi.org/10.1111/roiw.12208>
- McQuinn, K., & O'Reilly, G. (2008). Assessing the role of income and interest rates in determining house prices. *Economic Modelling*, 25(3), 377–390.

<http://doi.org/10.1016/j.econmod.2007.06.010>

Meng, X., Hoang, N. T., & Siriwardana, M. (2013). The determinants of Australian household debt: A macro level study. *Journal of Asian Economics*, 29, 80–90.

<http://doi.org/10.1016/j.asieco.2013.08.008>

Meniago, C., Mukuddem-Petersen, J., Petersen, M. A., & Mongale, I. P. (2013). What causes household debt to increase in South Africa? *Economic Modelling*, 33,

482–492. <http://doi.org/10.1016/j.econmod.2013.04.028>

Mian, A., & Sufi, A. (2011). House prices, home equity-based borrowing, and the US household leverage crisis. *American Economic Review*, 101(5), 2132–2156.

<http://doi.org/10.1257/aer.101.5.2132>

Mian, A., & Sufi, A. (2014). *House of Debt*. The University of Chicago Press.

Minsky, H. P. (1992). *The Financial Instability Hypothesis* (Working Paper No. 74). Annandale-on-Hudson, NY: Levy Economics Institute.

Modigliani, F. (1986). Life Cycle, Individual Thrift, and the Wealth of Nations. *The American Economic Review*, 76(3), 297–313.

Modigliani, F., & Brumberg, R. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. In K. K. Kurihara (Ed.), *Post-Keynesian Economics*. New Brunswick: Rutgers University Press.

Mok, T. Y., Gan, C., & Sanyal, A. (2007). The Determinants of Urban Household Poverty in Malaysia. *Journal of Social Sciences*, 3(4), 190–196.

<http://doi.org/10.3844/jssp.2007.190.196>

Mokhtar, M., & Ismail, A. (2013). Shariah Issues in Managing Household Debt: The Case of Malaysia. *Jurnal Pengurusan*, 37, 63–76.

- Moroke, N. D. (2014). Household Debts-and Macroeconomic factors Nexus in the United States : A Cointegration and Vector Error Correction Approach. *Journal of Economics and Behavioral Studies*, 6(6), 452–465.
- Muellbauer, J. (1994). The Assessment : Consumer Expenditure. *Oxford Review of Economic Policy*, 10(2), 1–41.
- Mutezo, A. (2014). Household debt and consumption spending in South Africa: An ARDL-bounds testing approach. *Bank and Bank Systems*, 9(4), 73–81.
- Narayan, P. K. (2005). The saving and investment nexus for China: evidence from cointegration tests. *Applied Economics*, 37(17), 1979–1990. <http://doi.org/10.1080/00036840500278103>
- Narayan, P. K., & Popp, S. (2010). A new unit root test with two structural breaks in level and slope at unknown time. *Journal of Applied Statistics*, 37(9), 1425–1438. <http://doi.org/10.1080/02664760903039883>
- Narayan, P. K., & Popp, S. (2013). Size and power properties of structural break unit root tests. *Applied Economics*, 45(6), 721–728. <http://doi.org/10.1080/00036846.2011.610752>
- National Property Information Centre. (2014). *The Malaysian House Price Index*. Retrieved from [http://napic.jpph.gov.my/portal/publication?p\\_p\\_id=ViewPublishings\\_WAR\\_ViewPublishingsportlet&p\\_p\\_lifecycle=0&p\\_p\\_state=normal&p\\_p\\_mode=view&p\\_p\\_col\\_id=column-1&p\\_p\\_col\\_count=1&\\_ViewPublishings\\_WAR\\_ViewPublishingsportlet\\_action=renderReportPeriodScreenArc&publishingId=444&pageno=1](http://napic.jpph.gov.my/portal/publication?p_p_id=ViewPublishings_WAR_ViewPublishingsportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_count=1&_ViewPublishings_WAR_ViewPublishingsportlet_action=renderReportPeriodScreenArc&publishingId=444&pageno=1)
- Nau, M., Dwyer, R. E., & Hodson, R. (2015). Can't afford a baby? Debt and young



- Americans. *Research in Social Stratification and Mobility*, 42, 114–122.  
<http://doi.org/10.1016/j.rssm.2015.05.003>
- Nizar, N., & Karim, Z. A. (2016). Determinants of Malaysia Household Debt: Macroeconomic Perspective. *Journal of Business and Economics*, 7(8), 1234–1245. [http://doi.org/10.15341/jbe\(2155-7950\)/08.07.2016/005](http://doi.org/10.15341/jbe(2155-7950)/08.07.2016/005)
- Ortalo-magné, F., & Rady, S. (2006). Housing Market Dynamics: On the Contribution of Income Shocks and Credit Constraints. *Review of Economic Studies*, 73(2), 459–485.
- Ozturk, S., & Sozdemir, A. (2015). Effects of Global Financial Crisis on Greece Economy. *Procedia Economics and Finance*, 23, 568–575.  
[http://doi.org/10.1016/S2212-5671\(15\)00441-4](http://doi.org/10.1016/S2212-5671(15)00441-4)
- Paiella, M. (2009). The stock market, housing and consumer spending: A survey of the evidence on wealth effects. *Journal of Economic Surveys*, 23(5), 947–973.  
<http://doi.org/10.1111/j.1467-6419.2009.00595.x>
- Paradiso, A., Kumar, S., & Lucchetta, M. (2014). Investigating the US consumer credit determinants using linear and non-linear cointegration techniques. *Economic Modelling*, 42, 20–28.  
<http://doi.org/http://dx.doi.org/10.1016/j.econmod.2014.05.023>
- Pearce, D. K. (1985). Rising Household Debt in Perspective. *Federal Reserve Bank of Kansas City Economic Review*, (July/August), 3–17.
- Perron, P. (1989). The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis. *Econometrica*, 57(6), 1361–1401.
- Perron, P. (1997). Further evidence on breaking trend functions in macroeconomic variables. *Journal of Econometrics*, 80(2), 355–385.

<http://doi.org/10.1080/00036849400000073>

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326.

<http://doi.org/10.1002/jae.616>

Pollak, R. A. (1989). *The Theory of the Cost-of-Living Index*. New York: Oxford University Press.

Pollin, R. (1988). The growth of U.S. household debt: Demand-side influences.

*Journal of Macroeconomics*, 10(2), 231–248.

[http://doi.org/http://dx.doi.org/10.1016/0164-0704\(88\)90060-2](http://doi.org/http://dx.doi.org/10.1016/0164-0704(88)90060-2)

Puente-Ajovín, M., & Sanso-Navarro, M. (2015). Granger causality between debt and growth: Evidence from OECD countries. *International Review of Economics &*

*Finance*, 35, 66–77. <http://doi.org/10.1016/j.iref.2014.09.007>

Rahman, S., & Masih, M. (2014). *Increasing household debts and its relation to*

*GDP, interest rate and house price: Malaysia'a perspective* (MPRA Working

Paper No. 62365). University Library of Munich, Germany.

Ram, R. (1982). Dependency Rates and Aggregate Savings: A New International Cross-Section Study. *The American Economic Review*, 72(3), 537–544.

Ramsey, J. B. (1969). Tests for Specification Errors in Classical Linear Least-Squares Regression Analysis. *Journal of the Royal Statistical Society. Series B*

*(Methodological)*, 31(2), 350–371. <http://doi.org/10.2307/2984219>

Robertson, T. S., Ward, S., Gatignon, H., & Klees, D. M. (1989). Advertising and Children. *Communication Research*, 16(4), 459–485.

Rossi, N. (1989). Dependency Rates and Private Savings Behavior in Developing Countries. *Staff Papers (International Monetary Fund)*, 36(1), 166–181.

- Sau, R. (1987). Household debt and national income: A simple short-run model. *Journal of Macroeconomics*, 9(1), 127–137. [http://doi.org/http://dx.doi.org/10.1016/S0164-0704\(87\)80011-3](http://doi.org/http://dx.doi.org/10.1016/S0164-0704(87)80011-3)
- Schooley, D. K., & Worden, D. D. (2010). Fueling the Credit Crisis: Who Uses Consumer Credit and What Drives Debt Burden? *Business Economics*, 45(4), 266–276. <http://doi.org/10.1057/be.2010.25>
- Setterfield, M., & Kim, Y. K. (2016). Debt servicing, aggregate consumption, and growth. *Structural Change and Economic Dynamics*, 36, 22–33. <http://doi.org/10.1016/j.strueco.2015.10.002>
- Sime Darby Property. (2014). *Housing-Income Index*. Retrieved from <https://prezi.com/dbnv2iqgtf3t/copy-of-housing-income-index-2014/>
- Sinai, T., & Souleles, N. S. (2005). Owner-occupied housing as a hedge against rent risk\* t. *The Quarterly Journal of Economics*, (May), 763–789.
- Soman, D., & Cheema, A. (2002). The Effect of Credit on Spending Decisions : The Role of the Credit Limit and Credibility. *Marketing Science*, 21(1), 32–53.
- Stephens, M., & Unayama, T. (2015). Child Benefit Payments and Household Wealth Accumulation. *The Japanese Economic Review*, 66(4), 447–465. <http://doi.org/10.1111/jere.12078>
- Stone, B., & Maury, R. V. (2006). Indicators of personal financial debt using a multi-disciplinary behavioral model. *Journal of Economic Psychology*, 27(4), 543–556. <http://doi.org/10.1016/j.joep.2005.11.002>
- Sullivan, A. C., & Worden, D. D. (1986). *Economic and demographic factors associated with consumer debt use* (Working Paper No. 52). Purdue University: Credit Research Center.

- Sullivan, T. A., Warren, E., & Westbrook, J. L. (1989). *As We Forgive Our Debtors : Bankruptcy and Consumer Credit*. New York: Oxford University Press.
- Sullivan, T. A., Warren, E., & Westbrook, J. L. (2000). *The Fragile Middle Class: Americans in Debt*. New Haven and London: Yale University Press.  
<http://doi.org/10.1017/CBO9781107415324.004>
- Tang, T. C. (2004). Demand for broad money and expenditure components in Japan: An empirical study. *Japan and the World Economy*, 16(4), 487–502.  
[http://doi.org/10.1016/S0922-1425\(03\)00037-9](http://doi.org/10.1016/S0922-1425(03)00037-9)
- Tobin, J. (1957). *Consumer Debt and Spending: Some Evidence from Analysis of a Survey* (Cowles Foundation Discussion Paper No. 24). Cowles Foundation for Research in Economics, Yale University.
- Tobin, J. (1967). Life Cycle Saving and Balanced Growth. In *Ten economic studies in the tradition of Irving Fisher* (pp. 231–256). New York: Wiley.
- Triplett, J. E. (2001). Should the Cost-of-Living Index Provide the Conceptual Framework for a Consumer Price Index? *The Economic Journal*, 111(472), F311–F334.
- Tung, L. C., & Comeau, J. D. (2014). Demographic Transformation in Defining Malaysian Generations : The Seekers (Pencari), The Builders (Pembina), The Developers (Pemaju), and Generation Z (Generasi Z). *International Journal of Academic Research in Business and Social Sciences*, 4(4), 383–403.  
<http://doi.org/10.6007/IJARBSS/v4-i4/809>
- Turinetti, E., & Zhuang, H. (2011). Exploring Determinants Of U.S. Household Debt. *Journal of Applied Business Research*, 27(6), 85–91.
- Verter, N., & Osakwe, C. N. (2014). A Time Series Analysis of Macroeconomic

- Determinants of Household Spending in the Era of Cross-cultural Dynamics: Czech Republic as a Case Study. *Procedia Economics and Finance*, 12(March), 733–742. [http://doi.org/10.1016/S2212-5671\(14\)00400-6](http://doi.org/10.1016/S2212-5671(14)00400-6)
- Waldron, M., & Zampolli, F. (2010). *Household debt, house prices and consumption in the United Kingdom : A quantitative theoretical analysis* (Working Paper No. 379). Bank of England.
- Wasberg, C. A., Hira, T. K., & Fanslow, A. M. (1992). Credit card usage and consumer debt burden of households. *Journal of Consumer Studies and Home Economics*, 16(1), 19–32.
- Weil, D. N. (1994). The Saving of the Elderly in Micro and Macro Data. *The Quarterly Journal of Economics*, 109(1), 55–81.
- Weller, C. E. (2007). Need or Want: What Explains the Run-Up in Consumer Debt? *Journal of Economic Issues*, XLI(2), 583–591.
- Wessels, W. J. (2006). *Economics* (4th ed.). Hauppauge, NY: Barron's Educational Series Inc.
- Wimalasiri, J. S. (2004). A cross-national study on children's purchasing behavior and parental response. *Journal of Consumer Marketing*, 21(4), 274–284. <http://doi.org/10.1108/07363760410542183>
- Wolswijk, G. (2006). Determinants of Mortgage Debt Growth in EU Countries. *International Journal of Housing Policy*, 6(2), 131–149. <http://doi.org/10.1080/14616710600787627>
- World Bank. (2014). *World Development Indicators*. Retrieved from <http://data.worldbank.org/data-catalog/world-development-indicators>
- Xu, S. (2013). *An Equilibrium Analysis of the Rise in House Prices and Mortgage*

- Debt* (Bank of Canada Working Paper No. 2013-9). Canadian Economic Analysis Department.
- Yilmazer, T., & Devaney, S. A. (2005). Household debt over the life cycle. *Financial Services Review*, 14(4), 285–304.
- Yu, H. (2003). Economic threat to human security: Household debt problem in Korea. *Global Economic Review*, 32(3), 67–83.  
<http://doi.org/10.1080/12265080308422925>
- Zakaria, R. H., Abdul Kader, R., Mohd Jaafar, N. I., & Marican, S. (2012). Burgeoning Household Debt: An Islamic Economic Perspective. *Middle-East Journal of Scientific Research*, 12(9), 1182–1189.  
<http://doi.org/10.5829/idosi.mejsr.2012.12.9.267>
- Zeldin, C., & Rukavina, M. (2007). *Borrowing to Stay Healthy: How Credit Care Debt Is Related to Medical Expenses. The Access Project: Borrowing to Make Ends Meet Series*. New York, NY: Demos.
- Zhu, L. Y., & Meeks, C. B. (1994). Effects of Low Income Families' Ability and Willingness to Use consumer Credit on Subsequent Outstanding Credit Balances. *Journal of Consumer Affairs*, 28(2), 403–422. <http://doi.org/10.1111/j.1745-6606.1994.tb00859.x>
- Zimunya, F. M., & Raboloko, M. (2015). Determinants of Household Debt in Botswana: 1994-2012. *Journal of Economics and Public Finance*, 1(1), 14–36.  
 Retrieved from <http://www.scholink.org/ojs/index.php/jepf/article/view/366>
- Zivot, E., & Andrews, D. W. K. (1992). Further Evidence on the Great Crash, the Oil-Price Shock, and the Unit-Root Hypothesis. *Journal of Business & Economic Statistics*, 10(3), 251–270. <http://doi.org/10.1080/07350015.1992.10509904>



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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)

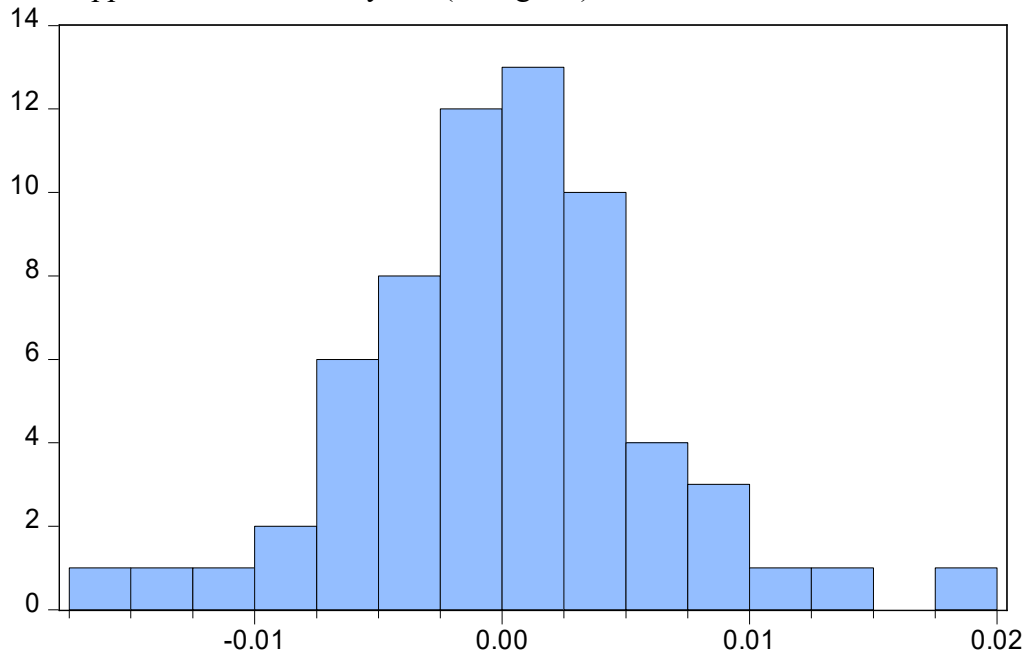
Variables	Coefficient	Std. error	t-statistics	Prob
D(LY)	-0.035716	0.034396	-1.038399	0.3041
D(LY(-1))	-0.201927	0.050508	-3.997890	0.0002
D(LY(-2))	-0.127902	0.038351	-3.335013	0.0016
D(LY(-3))	-0.145334	0.041172	-3.529942	0.0009
D(IR)	0.011680	0.011590	1.007774	0.3184
D(IR(-1))	0.016325	0.012141	1.344626	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

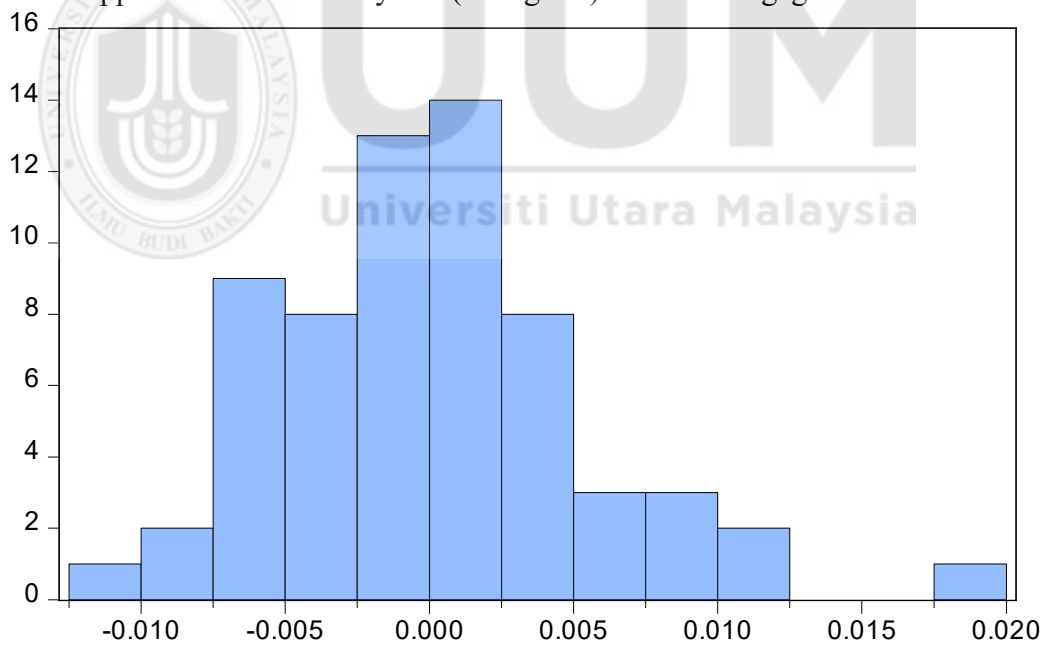
Variable	LHD	LMD	LCD
Income	5.236*** (0.003)	3.899** (0.014)	1.888 (0.143)
Housing price	-	0.912 (0.409)	-

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.

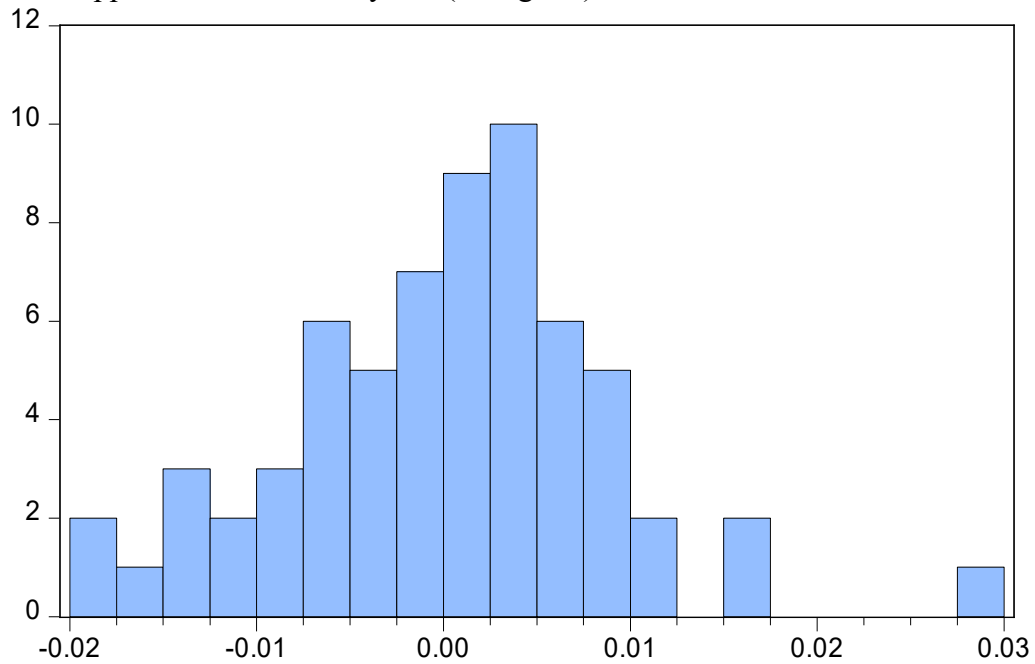
Appendix 10. Normality test (histogram) for the household debt model



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)]

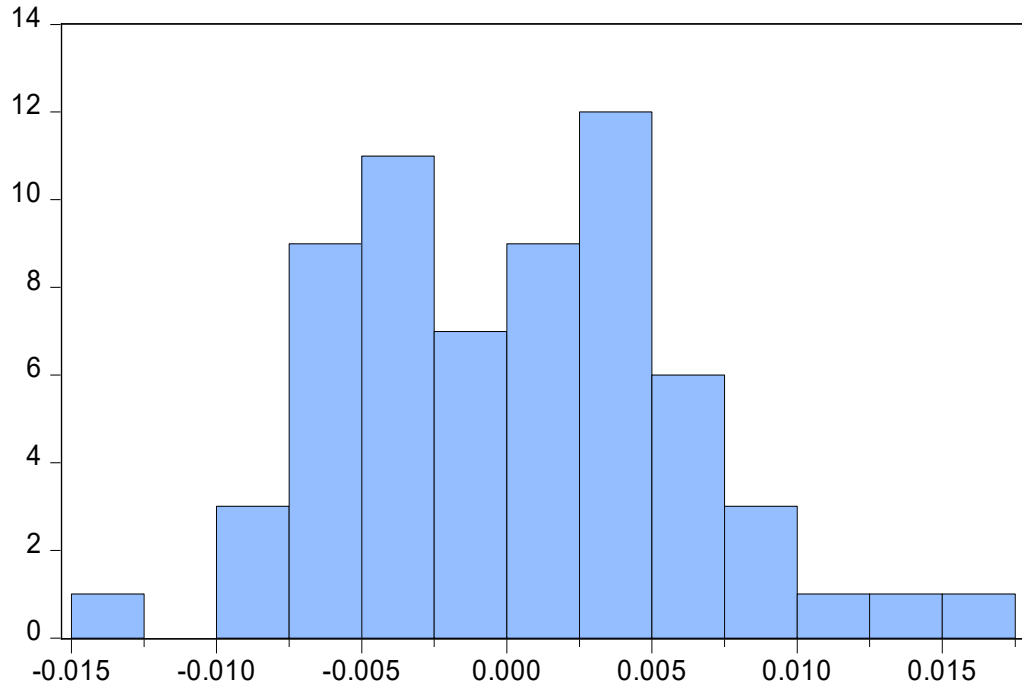
Variables	Coefficient	Std. error	t-statistics	Prob
D(LY)	-0.027221	0.033594	-0.810290	0.4218
D(LY(-1))	-0.162617	0.049062	-3.314542	0.0018
D(LY(-2))	-0.146205	0.037442	-3.904827	0.0003
D(LY(-3))	-0.119607	0.040462	-2.955996	0.0048
D(IR)	0.002714	0.011197	0.242390	0.8095
D(IR(-1))	0.016913	0.011776	1.436152	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

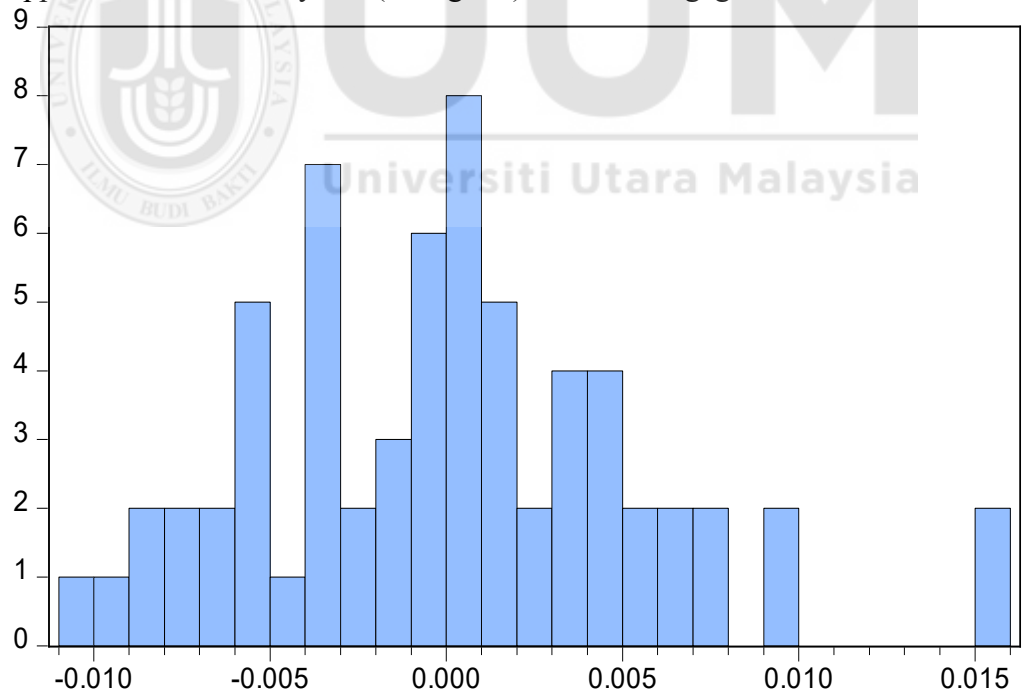
Variable	LHD	LMD	LCD
Income	4.911*** (0.004)	4.930** (0.011)	1.433 (0.244)
Interest rate	4.605** (0.014)	-	-
Housing price	-	1.099 (0.342)	-

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.

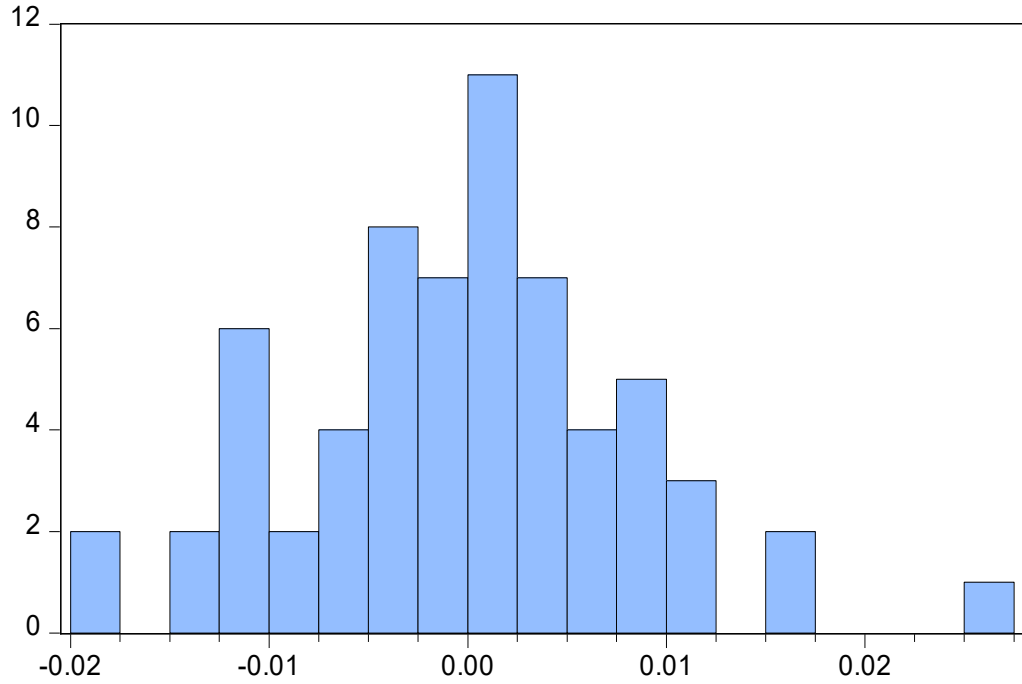
Appendix 20. Normality test (histogram) for the household debt model with breaks



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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