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Asymmetric Adjustment Between Household Credit and Economic Growth in Malaysia

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ABSTRACT

Past studies have debated whether credit is the main culprit behind the financial crisis, especially household credit. Nonetheless, it is unknown how fast the economy would adjust back to its long run path after a credit shock. Motivated by scant literature in answering this question and the high growth rate of household credit, the objective of this study was to investigate the existence of asymmetric cointegration between household credit and economic growth in Malaysia. Employing quarterly data over the sample period of 2000 to 2014 and using the asymmetric cointegration test introduced by Enders and Siklos (2001), the results showed the existence of asymmetric adjustment between household credit and economic growth in the momentum models. The findings suggest that the economy tends to adjust back to its long run equilibrium path following a negative credit shock (i.e. credit crunch). Conversely, the economy is likely to diverge from its long run equilibrium path after a positive credit shock (i.e. credit boom). The study provides some policy implications for the governments in the monitoring of financial intermediaries, especially banks.

JEL Classification: E44, E51, O40, O53

Keywords: Asymmetric cointegration; Economic growth; Household credit; Malaysia

INTRODUCTION

As proposed by Francois Quesnay, "Society was analogous to the physical organism. The circulation of wealth and goods in the economy was like the circulation of blood in the body, where both conformed to the natural order" (Brue and Grant, 2007, pp. 37). A similar order applies to the financial system, a well-functioning financial system enhances economic growth

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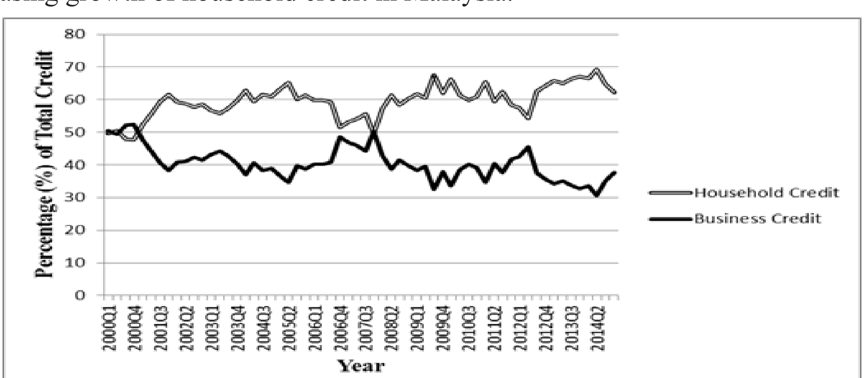
by utilizing socially productive investment opportunities; whereas a malfunctioning financial system deters economic growth through misallocation of scarce resources. In a financial system, financial intermediaries, especially the banks, play a traditional intermediary role by channeling excess funds from savers to households and investors to finance their consumption and promising investments respectively. Therefore, a disruption in the financial system would lead to systemic risk and ultimately economic downturns.

Basically, credits is categorized into two main streams, namely household credit and business credit. In general, whether household or business credit, credit expansion has been claimed to be a potential risk to the financial system as well as to the economy (Terrones, 2004; Kraft and Jankov, 2005; Beck et al., 2006; Bussiere and Fratzscher, 2006; Bernoth and Pick, 2011; Goldstein, 2001; Hume and Sentance, 2009; Lange et al., 2007). In particular, household credit has been found likely to cause financial instability due to the households' lower ability to repay compared to business credit, because businesses have greater ability to generate profit for loan repayments (Buyukkarabacak and Valev, 2010). Similarly, Crowley (2008) found that credit growth has financed household consumption and home ownership instead of investment which is worrying, as business credit, not household credit, is believed to promote long-term growth. Hence, this implies the greater growth of household credit can probably lead to financial disruption or economic downturn.

In the Malaysian credit market prior to the 1997/98 Asian financial crisis, the share of business credit in total outstanding of bank loans was relatively larger than household credit. However, since 2000, the household credit has been increasing substantially and has outpaced the growth of business credit as exhibited in Figure 1. The increasing growth of household credit can be explained by three factors: 1) banks are practicing risk diversification strategy by not focusing solely on business credit, 2) overly optimistic behavior of households in risk taking that was induced by the stability of the macro-economy and 3) the progressive financial liberalization that promotes competition in the financial sector (Endut and Toh, 2009). Furthermore, Tang (2006) justified that bank credit was used to finance demand for imported goods too, other than demand for domestic goods. This is another likely reason for the increasing growth of household credit in Malaysia.



Source: Various issues of Monthly Statistical Bulletin, Central Bank of Malaysia

Figure 1 Trend of loan approved by the banking system in Malaysia from 2000 to 2014.

Past studies have shown that credit expansion is a significant factor in driving economic growth or business cycles. However, no attention has been paid to the asymmetric credit effect on economic growth. Hence, this study proposes to answer the question of how fast does economy can adjust if household credit deviates from its long run equilibrium. Moreover, it is inappropriate to assume the long run relationship between credit and economic growth is symmetric. In sum, this research has two motivations: 1) the growth of household credit has outgrown business credit and past studies have found that household credit is less likely to promote long term growth compared to business credit, and 2) no past studies have examined the asymmetric adjustment of economic growth to rising versus falling household credit volume. Therefore, the research objective is to examine asymmetric adjustment between household credit and economic growth in Malaysia. Lastly, the research is expected to contribute in two ways: 1) to fill a gap in the literature of monetary economics and 2) to provide a reference to policy-makers or academicians pertaining to the adjustments of economic growth towards the deviations of household credit from its long run equilibrium path.

This study is organized in the following sequence: Section 2 provides a brief review of literature pertaining to credits, financial crisis, and economic growth. Section 3 describes the methodology framework for the extended version of the Engle-Granger two-step cointegration test by Enders and Siklos (2001). Section 4 describes the data sources and data transformation as well as the empirical results. Lastly, Section 5 summarizes the results, concludes and provides some important policy implications for the governments.

BRIEF REVIEW OF LITERATURE

Theoretically, credit expansion plays a beneficial role in promoting financial market development. However, rapid credit expansion plays a detrimental role in triggering a financial crisis. Voluminous literature claimed that rapid credit expansion was the main culprit behind the occurrence of financial crises, especially the 2008/09 global financial crisis. This includes one of the prominent works from Kaminsky et al. (1998) who demonstrated that the behavior of domestic credit is particularly useful in forecasting crises using a signal approach. Likewise, Bussiere and Fratzscher (2006) found that domestic credit growth appeared to be a predictive variable in forecasting financial crisis using a new early warning system model. Specific researchers who found credit growth to be a crucial determinant of banking or currency crises were Kraft and Jankov (2005) who identified credit booms as a frequent reason for banking and currency crises; and Beck et al. (2006) who reported that huge changes in money supply implied the existence of problems in the financial system.

In addition, Terrones (2004) concluded that credit booms led to significant risks for emerging economies because they were commonly followed by sharp economic downturns and financial crisis. This was because credit growth leads to a weakening current account and causes vulnerabilities in the financial system. Consistent with the concept of the credit cycle, Terrones described the tendency of banks to increase their credit supply immoderately (i.e. credit boom) during an economic boom phase and to decrease their credit supply drastically (i.e. credit crunch) during an economic recession. A long period of economic boom phase leads market agents, such as households and firms, to take excessive risks. However, this overly-optimistic perception typically ends when the asset price bubble bursts. At this point, banks face large losses due to a huge amount of default loans and realize that the interest rate they charged during the economic boom phase is too low to cover the default risks. Therefore, the normal response of the banks is to cut credit supply in order to avoid default risks. As a result, the occurrence of a credit crunch causes growth-promoting investments to come to a halt and ultimately brings about the beginning of an economic recession.

Prior to the 2008/09 global financial crisis, financial deepening was defined as an increase in the size of a financial system. Nevertheless, this recent crisis was triggered by rapid credit growth; what some economists call a financial deepening is now considered by others as a credit buildup or a credit boom. Similar to Terrones (2004), Rousseau and Watchel (2011) found the occurrence of financial crises was related to the dampening effect of financial deepening on growth. Consistent with this, Kim and Rousseau (2012) also suggested that traditional financial deepening has led to strong negative outcomes in Asia countries, namely Indonesia and Korea.

Most of the literature focused on the aggregate level of credit while limited studies focused on the credit composition, such as household credit or business credit. These limited studies included Buyukkarabacak and Valev (2010) who found that the effect of the household credit expansion was stronger and more robust than the enterprise credit expansion in predicting banking crises. This was supported by a study done by Crowley (2008) who believed that business credit could promote long-term growth rather than credit for the purpose of household consumption. In other words, household credit was less likely to generate long-term growth. Similarly, Sassi and Gasmi (2014) found evidence that there is a dampening effect of the household credit on economic growth. Moreover, Jappelli and Pagano (1994) demonstrated that household credit expansion had a negative impact on economic growth through lower saving rate. When saving rate was low, it implied low investment rate that enhanced growth.

On the contrary, Banu (2013) showed that household credits contribute to the formation of the gross domestic product more than credit offered to public administration. However, the study done by De Gregorio (1996) suggested that there was no significant relationship between household credit and economic growth, and Beck et al. (2012) found that household credit had no impact on economic growth. Nevertheless, Galor and Zeira (1993) and De Gregorio (1996) debated that household credit could promote economic growth if the household credit is being used only for the purpose of human capital investments and/ or microenterprises. The literature suggested that there was an ambiguous relationship between household credit and economic growth, which contributed to the puzzle of credit-growth nexus.

METHODOLOGY

The traditional cointegration test, which assumes symmetric adjustment, is Engle and Granger (1987) two-steps cointegration test. In the simplest form, the first step of the test entails using ordinary least squares (OLS) to estimate the long run relationship among the variables; the model can be written as

$$y_t = \beta_0 + \beta_1 x_{1t} + \beta_2 x_{2t} + \cdots + \beta_k x_{kt} + \varepsilon_t \qquad (1)$$

where y_t and x_{it} are I(1) variables, β_i are the estimated parameters and ε_t is the error term that may be serially correlated.

The second step is the OLS estimate of ρ in the following regression equation

$$\Delta\varepsilon_t = \rho\varepsilon_{t-1} + \mu_t \qquad (2)$$

where μ_t is a white-noise error term and ε_t is obtained from Eq. (1) and used to estimate Eq. (2). In other words, the residuals (ε_t) are used to test for its stationarity. The rejection of the null hypothesis of no cointegration implies that the residuals (ε_t) are stationary in level I(0), which suggests the presence of cointegration or long run relationships among the I(1) variables.

However, if the adjustments to the long run equilibrium are asymmetric, the traditional cointegration test and its extensions are misspecified and could lead to bias results. Hence, this research employed the asymmetric cointegration test that is able to capture asymmetric adjustments among the variables; this alternative specification of the error correction model was developed by Enders and Siklos (2001) from the Engle and Granger (1987) framework.

Based on the objective of this study – to examine the asymmetric adjustment between household credit and economic growth, the cointegrating relationship can be written as

$$g_t = \beta_0 + \beta_1 hc_t + \varepsilon_t \qquad (3)$$

where g represents economic growth and hc represents household credit in Malaysia. First, the long run relationship between g and hc (i.e. Eq. (3)) is estimated using OLS. Next, the error terms, ε_t, obtained from Eq. (3) are used in the following equation:

$$\Delta\varepsilon_t = I_t\rho_1\varepsilon_{t-1} + \left(1 - I_t\right)\rho_2\varepsilon_{t-1} + \sum_{i=1}^{p}\delta_i\Delta\varepsilon_{t-i} + \mu_t \qquad (4)$$

where $I_t = \{T_t, M_t\}$, such that:

T_t is the Heaviside indicator function for the threshold autoregressive (TAR) model

$$T_t = \begin{cases} 1 \; if \;\; \varepsilon_{t-1} \geq \tau \\ 0 \; if \;\; \varepsilon_{t-1} < \tau \end{cases} \text{ and} \qquad (5)$$

M_t is the Heaviside indicator function for the momentum-TAR (MTAR) model

$$M_t = \begin{Bmatrix} 1 \ if \ \Delta\varepsilon_{t-1} \geq \tau \\ 0 \ if \ \Delta\varepsilon_{t-1} < \tau \end{Bmatrix} \tag{6}$$

where τ is the value of the threshold and μ_t is a sequence of zero mean, constant variance independent and identically distributed random variables, such that μ_t is independent of ε_j, $j < t$.

Briefly, Eqs. (4) and (5) represent a TAR model, where T_t indicator function depends on the previous period of error term (i.e. ε_t-1), while Eqs. (4) and (6) represent an MTAR model, where M_t indicator function depends on the period of change of error term (i.e. $\Delta\varepsilon_t$-1). Generally, the value of the threshold (τ) is unknown and needs to be estimated along with the values of ρ_1 and ρ_2.

In such circumstance, there are two cases for consideration. Case 1: τ equals zero, in which adjustment is $\rho_1\varepsilon_t$-1 if ε_t-1 falls above its long run equilibrium and $\rho_2\varepsilon_t$-1 if ε_t-1 falls below its long run equilibrium. Case 2: τ is unknown, in which adjustment is $\rho_1\varepsilon_t$-1 if $\Delta\varepsilon_t$-1 falls above its threshold value and $\rho_2\varepsilon_t$-1 if $\Delta\varepsilon_t$-1 falls below its threshold value. In addition, Chan's (1993) methodology [1] is used to determine the consistent estimate of the threshold τ.

By regressing Eq. (4), one can perform the test for cointegration. If the null hypothesis of no cointegration (H0: $\rho_1 = \rho_2 = 0$) can be rejected, it suggests that there is cointegration, where the critical values for the F-statistic (Φ) to test for cointegration can be found in Enders and Siklos (2001). If there is cointegration, one can proceed to test for asymmetry by testing the null hypothesis of symmetric adjustment (H0: $\rho_1 = \rho_2$) using the usual F-statistic. If the null hypothesis of symmetric adjustment can be rejected, it implies that there is asymmetric adjustment among the variables.

Regardless of whether symmetric or asymmetric adjustment is found, the speed of adjustment can be determined by developing a symmetric error correction model or asymmetric error correction model using a general-to-specific approach. The general form of the model is written

$$\Delta g_t = \alpha + \rho_1 I_t \varepsilon_{t-1} + \rho_2 I_t (1 - I_t)\varepsilon_{t-1} + \sum_{i=1}^{k} \lambda_i \Delta g_{t-i} + \sum_{i=1}^{m} \theta_i \Delta h_{t-i} + v_t \tag{7}$$

where ρ_1 and ρ_2 are the speed of adjustment coefficients of Δg_t. Due to the speeds of adjustment in Eq. (7) may be asymmetric, there is no requirement that $\rho_1 = \rho_2$.

To check the robustness of the error correction models, several diagnostic tests were used, namely normality test, Breusch-Godfrey serial correlation LM (BGLM) test, heteroskedasticity ARCH test, Ramsey Reset (RESET) Test for testing misspecification model, and CUSUM of squares (CUSUMSQ) test for testing dynamically stable model.

[1]For further details in determining the consistent estimate of the threshold value, please see Enders and Siklos (2001, pp. 172 – 173), and Chan (1993).

DATA AND EMPIRICAL RESULTS

The aim of the study was to investigate the asymmetric adjustment between the household credit and economic growth in Malaysia. GDP and household credit (HC) series are naturally expressed in real terms (i.e. both series have been deflated by consumer price index (CPI)) and transformed into logarithm terms. The sample period spanned from 2000:Q1 to 2014:Q1. Data were obtained from various issues of the Monthly Statistical Bulletin published by *Bank Negara Malaysia.*

The standard unit root tests were applied to each individual series that is Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test. The results are reported in Table 1. Both series, g and hc were stationary at first difference – I(1) – at 1% significance level. Following the procedure of the Engle-Granger (EG) two-step cointegration test, the long run relationship between g and hc was regressed using OLS and the results are shown in Table 2. Based on the results, hc explained g positively and significantly at 1% significance level. However, this was not the final result.

From the OLS regression, the residual of the long run model was generated and examined for its stationarity. Results are exhibited in Table 3. By adopting the standard unit root tests (i.e. ADF and PP tests), the residual was stationary at level – I(0) at 5% and 10% significance level respectively. This result suggested that economic growth and household credit shared a long run relationship, or they were cointegrated.

Table 1 Unit root tests on individual series

Variables	Level			
	ADF test		PP test	
	Without trend	With trend	Without trend	With trend
g	-1.131 (5)	-1.241 (5)	-0.877 (17)	-1.957 (7)
hc	-1.063 (7)	-2.241 (8)	-1.565 (55)	-4.742 (5) ***
	First difference			
	ADF test		PP test	
	Without trend	With trend	Without trend	With trend
g	-4.230 (4) ***	-2.160 (10)	-7.665 (54) ***	-8.056 (54) ***
hc	-5.745 (6) ***	-5.796 (6) ***	-21.555 (51) ***	-22.672 (48) ***

Lag lengths are reported in parentheses and *** represents 1% significance level.

Table 2 OLS estimation

Dependent variable: g	
Independent variable	Coefficient (t-statistic)
hc	0.642 (25.171) ***
c	5.926 (24.603) ***
R-squared = 0.920	

*** represents 1% significance level.

Table 3: Unit root tests on residual series

	ADF test	PP test
RES (ε_t)	-2.289 (8) **	-4.314 (4) ***

Lag length is reported in parentheses, ** and *** represents 5% and 1% significance level.

The generated residual is subsequently used to construct the Heaviside indicator function for TAR (T_t) and MTAR (M_t) models. Before proceeding to the test for cointegration and asymmetry, an optimal lag length for TAR and MTAR model was determined by choosing the minimum value of Schwarz Information Criterion (SIC). Based on SIC, the optimal lag length for both TAR and MTAR models was lag 1.

Using the optimal lag, Eq. (4) was regressed to determine the existence of cointegration and asymmetry in both TAR and MTAR models when τ equals zero (Case 1) as well as when τ = -0.066 [2] (Case 2). The results are shown in Table 4. Based on the test for cointegration, the results implied that the null hypothesis of no cointegration (H0: $\rho_1 = \rho_2 = 0$) could be rejected at 5%, 1% and 1% significance level for TAR model, and MTAR and consistent MTAR models respectively, which suggested that g and hc shared a long run relationship in all models. According to the test for asymmetric adjustment, the results in Table 4 indicated that the null hypothesis of symmetric adjustment (H0: $\rho_1 = \rho_2$) can be rejected at 10% and 1% significance level in MTAR model and consistent MTAR[3] model, but cannot be rejected in TAR model. This result indicated that the asymmetric adjustment was captured by the accumulation of changes in the disequilibrium relationship between g and hc below and above the threshold level, whereas the symmetric adjustment was captured in the disequilibrium relationship between the two variables of interest below and above the threshold level.

Table 4 Test for cointegration and asymmetry

Test	*F*-statistic		
	TAR (τ = 0)	MTAR (τ = 0)	Consistent MTAR (τ = - 0.066)
Cointegration	8.628 **	10.055 ***	22.284***
Asymmetry	0.644	2.813 *	21.404***

Test for cointegration: H0: $\rho_1 = \rho_2 = 0$. Test for asymmetry: H0: $\rho_1 = \rho_2$.

Both tests are performed using Wald test by regressing Eq. (4), where lag length is 1 for both TAR and MTAR models using Schwarz Info Criterion (SIC). Refer to Appendix Table A.1 for lag length selection.

F-statistics are compared to critical values (Φ) obtained from Table 1 (τ = 0) and Table 5 (τ ≠ 0) in Enders and Siklos (2001).

*, ** and *** represents 10%, 5% and 1% significance level.

[2] The consistent estimate of the threshold value of -0.066 results in smallest residual sum of squares was found using Chan's (1993) methodology and estimated using EViews 8.

[3] Consistent MTAR represents the MTAR model with the consistent estimate of the threshold value (τ) using Chan's (1993) approach.

The results of estimated error correction models are presented in Panel A of Table 5. For the TAR model, the results suggested that the adjustment back to the long run equilibrium path following a negative credit shock was symmetric, in which the speed of adjustment was found to be 18.1% per quarter, suggesting that the economy would take approximately seventeen months to be fully adjusted back to its long run path.

On the contrary, for the MTAR model, the results implied that the adjustment back to the long run equilibrium path following a negative credit shock was asymmetric, in which the speed of adjustment was found to be 14.8% per quarter, suggesting that the economy would take approximately twenty months to be fully adjusted back to its long run path. Meanwhile, it showed a divergence from the long run equilibrium path following a positive credit shock (as reflected in the positive sign of ρ_2 in the third column of Panel A in Table 5). Unfortunately, there was insufficient evidence to support the divergence from long run equilibrium as the result was insignificant.

For consistent MTAR model with threshold value equals –0.066, the results were largely similar to the MTAR model with threshold value equals zero. The results indicated the existence of asymmetric adjustment following a negative credit shock, in which the speed of adjustment was found to be 35.9% per quarter, suggesting that the economy would take approximately eight months to be fully adjusted and close the positive discrepancies from $\tau = -0.066$. Likewise, the results showed a divergence adjustment following a positive credit shock (as indicated in the positive sign of ρ_2 in the last column of Panel A of Table 5). However, the result was insignificant.

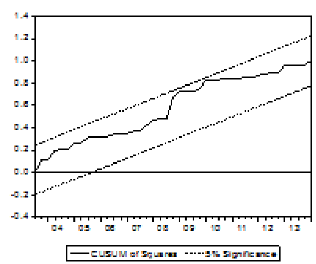
To check the robustness of the estimated models, diagnostic tests were performed and are reported in Panel B of Table 5. The diagnostic tests indicated that the models were free from the problem of serial correlation and heteroscedasticity, dynamically stable, with normally distributed residuals and no misspecification in the models at 5% significance level.

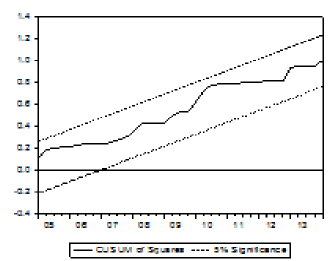
In summary, the results demonstrated that household credit and economic growth shared a long run relationship. Furthermore, the adjustment between the two important macroeconomic variables appeared to be asymmetric, in which the adjustment of economic growth to falling (rising) household credit volume was converging (diverging).

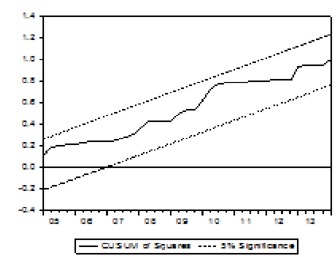
Table 5 Asymmetric and symmetric error correction models

Estimates	TAR [a] ($\tau = 0$)	MTAR [b] ($\tau = 0$)	Consistent MTAR ($\tau = -0.066$) [c]
		Panel A	
ρ_1	-0.181 (-1.895)*	-0.148 (-1.888)*	-0.359 (-3.130)***
ρ_2	0.180 (1.288)	0.031 (0.351)	0.116 (0.637)
Adjusted R^2	0.445	0.637	0.586
Adjustment	Symmetric	Asymmetric	Asymmetric
		Panel B	
Diagnostic tests			
Jarque-Bera statistic	0.399 [0.819]	4.451 [0.108]	0.958 [0.619]
BGLM(2) statistic	4.580 [0.101]	1.037 [0.595]	0.110 [0.896]
BGLM(4) statistic	5.159 [0.271]	1.670 [0.796]	0.077 [0.988]
ARCH(1) statistic	0.588 [0.443]	0.026 [0.872]	2.394 [0.122]
ARCH(3) statistic	1.327 [0.723]	0.471 [0.925]	3.812 [0.283]
ARCH(6) statistic	1.572 [0.954]	2.286 [0.892]	4.999 [0.544]
RESET(2) statistic	0.801 [0.456]	1.547 [0.227]	2.743 [0.083]*

CUSUMSQ test







t–statistics are reported in parentheses and *p*-values are reported in squared bracket.

*** and * represents 1% and 10% significance level.

General-to-specific approach is used to identify the lag length for all error correction models.

[a] Symmetric error correction model: $\Delta g_t = \alpha + \rho_1 T_t \varepsilon_{t-1} + \rho_2 (1 - T_t) \varepsilon_{t-1} + \sum_{i=1}^{2} \lambda_i \Delta g_{t-i} + \sum_{i=1}^{4} \theta_i \Delta hc_{t-i} + v_t$

[b] Asymmetric error correction model: $\Delta g_t = \alpha + \rho_1 M_t \varepsilon_{t-1} + \rho_2 (1 - M_t) \varepsilon_{t-1} + \sum_{i=1}^{2} \lambda_i \Delta g_{t-i} + \sum_{i=1}^{7} \theta_i \Delta hc_{t-i} + v_t$

[c] Asymmetric error correction model: $\Delta g_t = \alpha + \rho_1 M_t \varepsilon_{t-1} + \rho_2 (1 - M_t) \varepsilon_{t-1} + \sum_{i=1}^{1} \lambda_i \Delta g_{t-i} + \sum_{i=1}^{3} \theta_i \Delta h_{t-i} + v_t$

CONCLUSIONS AND POLICY IMPLICATIONS

This study investigated the asymmetric effect between household credit and economic growth in Malaysia. Using the asymmetric cointegration test introduced by Enders and Siklos (2001) over a sample period of 2000:Q1 to 2014:Q1, the results indicated that household credit and economic growth were cointegrated as well as the existence of asymmetric adjustment in both MTAR models. In conclusion, the economy tended to converge to its long run equilibrium after a negative credit shock (e.g. credit crunch) with the speed of 14.8% and 35.9% per quarter for MTAR and consistent MTAR models respectively. The bad news is the economy tended to diverge from its long run equilibrium after a positive credit shock (e.g. credit boom) though the result was insignificant. In other words, the results implied that household credit crunch does not appear to be a threat to economic growth; whereas a household credit boom is likely to be detrimental to economic growth in Malaysia. Based on the conclusions, it is safe for the Malaysian governments to allow financial intermediaries, especially the banks to suddenly reduce their credit supply to the household sector. Yet, to be cautious, it is not recommended for the governments to encourage financial intermediaries, especially the banks to loosen their credit requirements in approving loans to the household sector regardless of their purposes as a credit boom is more likely to play a negative role in economic growth in Malaysia compared to a credit crunch.

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Appendix

Table A.1: Lag Length Selection for TAR and MTAR using Schwarz Information Criterion

Lag	1	2	3	4	5	6
TAR	-2.28	-2.19	-2.13	-2.14	-2.05	-2.19
MTAR	-2.32	-2.24	-2.18	-2.19	-2.10	-2.25
Lag	7	8	9	10	11	12
TAR	-2.11	-2.17	-2.11	-1.99	-1.88	-1.80
MTAR	-2.16	-2.20	-2.14	-2.03	-1.91	-1.83