Finance-growth nexus: insights from an application of threshold regression model to Malaysia's dual financial system

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Abstract

The purpose of this paper is to test the growing converging views regarding the destabilizing and growth-halting impact of interest-based debt financial system. The views are as advocated by the followers of Keynes and Hyman Minsky and those of Islam. Islam discourages interest rate based debt financing as it considers that it is not conducive to productive activities and to human solidarity. Likewise, since the onset of the crisis of 2007/2008, calls by skeptics of mainstream capitalism has been renewed, to reconsider the dynamics of the prevailing financial system with emphasis on its untamed credit-creating capacity and link (or rather delink) to real sector transactions. The paper applies a threshold regression model to Malaysian data and finds that the relationship between growth and financial development is non-linear. A threshold is estimated, after which credit expansion negatively impacts GDP growth. While the post-threshold negative relationship is found to be statistically significant, the estimated positive relationship at lower levels of financial development is insignificant. The findings are hoped to provide insights to monetary authorities for better growth-promoting policy-making..

Key words: Credit, Financialization, Growth, Threshold Regression Model, Islamic Perspective

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1. Introduction and Motivation

For long, the fields of economics and finance have been dominated with a wide-spread belief that a well-functioning financial system is essential to promoting welfare and growth in an economy. Though no causal influence was inferred, such a belief first received empirical support by the work of Goldsmith(1969), who found long-run economic growth to be positively correlated with the size of the financial system. This positive relationship was attributed to improved efficiency in allocating savings to optimal investments, as made possible by financial intermediation. Ever since, researchers have attempted to extend the body of knowledge regarding the finance-growth nexus and provide further evaluation of its causal relationship. Few views have emerged concerning the same; pioneered by Joan Robinson (1952), some economists argued that financial development is but aby-product of the overall process of economic development. While others maintained that there exists a positive causal relationship between financial development and level of economic growth (see, for example, King and Levine (1993);Levine and Zervos (1998)Levine, Loayza, and Beck (2000) and Beck, Levine, and Loayza(2000). However, a growing body of literature is questioning the validity of the finance-growth nexus, more so since the onset of the recent financial crisis with consequences far exceeding costly bailouts to lost economic output and social pain that is expected to plague societies for generations to come. In particular, new emiprical support is found for Keynes and Minsky's views on the destabilizing role of debt-based financing in the emerging research on the impact of financilization in industrialized economies. Current trends in empirical and theoretical research are of utmost relevance to advocates of islamic finance; as they point to the root cause of the crises; interest bearing debt-based finanical system, which is prohibited by Divine prescriptions in Islam;for its destructive effects on human solidarity and productive activities (Askari, et. al., 2012).Such trends promise validation of islamic prinicples and growingconvergence of views regarding the demerits of contemporary market capitalism.

The rest of this paper is organized as follows, beforing introducing the Islamic perspective on the financial system, as essentially serving the real sector of the economy on the basis of risk-

sharing, in Section 3, Section 2 provides a brief summary on the views of Minsky and Tobin regarding financialization and the destaiblising role of debt financing. Section 4 summarizes relevant literature that looks at the relationship between financial development and economic growth. Data, method and regression results are presented and discussed in Section 5, 6 and 7 respectively. Section 8 concludes.

1. The emergence of the "Paper Economy" and Financialization

The rapid growth of finance in industrial economies went hand in hand with the development of the theory of finance in the second half of the 1960s and 1970s, which founded the platform for the introduction of derivatives and securitization. By early 1980s, financial innovations have changed the landscape of finance; replaced traditional banking-centered relationships with more innovative financial arrangements and products that allowed greater access to credit at cheaper rates (Rajan, 2005), such that the financial system threatened to assume a life of its own, overtaking the real sector of the economy. So alarming was this notion that James Tobin proposed a tax to curb expanding financialization and put a limit to the emergence of a "paper economy":

> ... we are throwing more and more of our resources, including the cream of our youth, into financial activities remote from production of goods and services into activities that generate high private rewards disproportionate to their social productivity, a "paper economy" facilitating speculation which is short-sighted and inefficient (Tobin, 1984)

The concepts of "paper economy" and "financialization" are not distinct from one another. In fact, "financialization" is described as the process where growth in the financial sector exceeds the growth in the real sector of the economy by far; it is the "decoupling" of financial activities from production of goods and services, as in Tobin's words (Menkoff and Tolksorf, 2001). It was, indeed, the "paper economy" that collapsed in the recent crisis of 2007/2008.

"Financialization" is characterized by the following: (i) the rapid expansion of the offering and forms of financial intermediaries and financial transactions; (ii) the significant growth of the

financial sector in comparison with the real sector of the economy; (iii) the harming rather than benefiting of the long-term economic growth (Askari, et. al., 2012).

As expected, the above characteristics are in line with those of the "paper economy", which are: (i) speculative rather than productive finance; (ii) short-termism, as manifested in the rapid turnover of paper securities' trade[3]; (iii) decoupling of finance from real sector activities; (iv) extracting, rather than adding, value from the real sector of the economy; (v) lack of anchor in real assets. It is, therefore, of no surprise that "financialization" and the "paper economy" are, in general, associated with a decline in the fixed capital formation in the real sector of the economy; low economic growth; widespread speculation in a ferocious search for yield; heightened uncertainty and increased social injustices, among others (Askari, et. al., 2012).

The aforementioned form of financing, i.e. speculative finance is central in Minsky's "financial instability hypothesis" (see Minsky, 1984; Mirakhor, 1985).According to Minsky, there are two financing structures: one promotes stability while the other sows the seeds of instability the more a financial structure tilts toward debt. The two phenomena are not disconnected, but rather connected as "stability is destabilizing" in Minsky's words.

Minsky holds that, in times of prosperity, businesses finance their activities using internal funds and other sources of equity finance. Borrowing is minimal, if any, and is validated by an underlying income stream sufficient to meet obligatory payment of principal and interest, accrued over the term of finance. This, Minsky refers to as "hedge finance". A system dominated by hedge finance is perceived to be stable. As profit opportunities increase during prosperity and equity funds are exhausted, reward to borrowing increases by undertaking riskier investments. Resultantly, more and more debt is incurred by enterprises, to the point where realized income stream falls short of paying the principal due and it is rolled over. Only interest payments are met. This is termed "speculative finance".

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[3] In light of this, the author has applied similar Hansen threshold regression analysis to a measure of stock market development, namely value of stocks traded, and found a threshold after which the GDP is negatively affected by increase in the trade of stocks. Results can be provided upon request.

Debt-burdened firms continue to borrow to the point where their debt commitments can only be honored by more borrowing to pay both principal and interest. Minsky referred to this financing as "Ponzi finance" and warned that massive debt build up in the household and business sectors as well as unchecked securitization; debt globalization; and financial liberalization were but processes of forming bubbles in assets' markets that threatened stability, fair distribution and structural employment in the debt-dominated financial system of today.

The credit and debt creation process is facilitated by the fractional reserve banking system and innovative financial engineering, through the dynamics of credit multiplier and leverage ratios that ensure exponential growth of credit during the upswing phase of business cycle, creating asset bubbles that inevitably burst during the downswing phase. A number of Minsky's colleagues and students view the credit crisis of 2007/2008as a manifestation of a burst of a long-forming bubble.

The above mentioned view regarding the social and economic ills of debt–credit–interest rate trinity echoes a number of arguments from the Islamic perspective against interest and rampant speculation. Next is a discussion of the same.

2. Islamic View of Finance

Islam is a rule-based system that prescribes ways and means of human conduct in all spheres of life, with the objective of serving the fundamental proposition of Islam, the unity of creation–itself a corollary of the axiom of the oneness and uniqueness of the Creator. Rules are prescribed in the primary sources of Islam: the holy Qur'an and Sunnah. As far as the sphere of economic and finance is concerned, Islamic rules require risk-reward sharing between economic agents, which ultimately brings humans together. Other modes of economic and finance, i.e., risk transfer or risk shifting do not achieve this objective (Mirakhor and Askari, 2010).

The foundation for the principle of risk sharing is laid in the verse 275 of chapter 2 of the holy Qur'an, it declares that real sector transactions must be based on exchange contracts and their financing must avoid interest-based debt (Askari, et. al., 2012). While the former promotes risk sharing, the latter reduces it. It is this attribute of interest-based debt that renders the same

prohibited from Islamic perspective. In a lending transaction, an amount of money is lent in return for rent, accrued over a specific time period, and repayment of principal, at maturity, without the commensurate transfer of property rights over the money lent. This unjustly shifts the entire risk of the transaction to the borrower. In exchange contracts, however, parties exchange property rights and share the risks of their economic activities. Sharing of risks reduce income volatility and achieve consumption smoothing, thus improving parties' overall welfare.

In the system envisaged by Islam, risk sharing operates through three main venues: (i) risk sharing-based contracts of exchange and finance; (ii) redistribution and transfer payment programs allowing risk-sharing between the economically better off and the less economically able; and (iii) risk sharing with future generations via Islam's rules governing inheritance. The range of instruments serving such a financial system is expected to run the gamut from short-term, liquid, and low-risk financing of trade contracts to long-term financing of real sector investments. At the lower end, the financial system would provide financing for sales and purchases of goods and services to allow aggregate demand stimuli and production expansion, thus, higher employment of resources. At the higher end, it would provide financing for capital formation; all financed through risk sharing assuring the stability of the overall economic system.

For the system envisaged by Islam to be operational, certain institutional scaffolding and rules of behavior must be in place. These include property rights rules, faithfulness to the terms and conditions of contracts and promises, transparency, truthfulness, trust, rules governing the behavior of market participants, and rules governing distribution and redistribution (for more details see Askari, et. al, 2012; Mirakhor and Askari, 2010).

Unlike risk sharing, other modalities of financing, i.e., risk transfer and risk shifting, produce financial systems that are inherently unstable and susceptible to cyclicality. Risk transfer leads to banking crises that destabilize the financial system and risk shifting creates massive public and private debt that exhaust the ability of consumers and producers to sustain levels of aggregate demand and hence GDP needed to validate debt claims. Up until the middle of twentieth century, financial intermediation was essentially involved in the transfer of risk originating from finance (Rajan, 2005). Consequently, all institutional arrangements within the financial sector, including

the factional reserve banking system and central banks' deposits' insurance scheme, were meant to facilitate this function.

In summary, a financial system operating in accordance to Islamic principles is characterized with: (i) property rights, (ii) transparency, trust and faithfulness to terms and conditions of contracts; (iii) close relationship between the real and the financial sectors of the economy. (iv) asset-liability risk matching; and (v) asset-liability value matching, such that revaluation of both sides of the balance sheet occurs simultaneously and in the same direction as changes in asset prices. In such a system, credit expansion and leverage will be restricted to the potential and expected growth of the real sector of the economy. There will be no room for pure finance and speculative trade in paper instruments[4].

3. Literature Review

The relationship between financial development and economic growth has been the subject of considerable debate throughout the literature.

King and Levine (1993) were amongst the first researchers who attributed a positive causal impact of financial development on the level of economic growth, using a cross-country analysis of 80 countries over the period of 1960-1989.They used four indicators as measures of financial development; namely: the ratio of liquid liabilities to GDP, the ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank's domestic assets, credit issued to non-financial private firms divided by total credit and credit issued to non-financial private firms divided by GDP.

While the former study concentrated on financial development arising from the banking sector, Levine and Zervos (1998) advanced the research by considering both a measure of banking development as well as measures of stock market development. Their results showed that bank credit and stock market liquidity positively predict economic growth on the back of reduced

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[4]Mirakhor (1990) have made a case that such a system would be capable of generating high employment, income and economic growth along with stable equilibrium.

transaction costs and information asymmetries that improve resource allocation and capital accumulation.

Additional evidence for a causal link going from financial to economic development was provided by Rajan and Zingales (1998)[5], who showed that technology-driven capital-intensive industrial sectors grow relatively more in countries with a larger financial sector.

Similar positive relationship was suggested by Levine, Loayza, and Beck (2000),who used traditional cross-section, instrumental variable procedures and dynamic panel techniques in their analysis. Their findings also suggested that strong legal and accounting systems are favorable for financial development and economic growth.

Arestis, Luintel, and Luintel (2005) investigated the finance-growth nexus using time-series technique and dynamic heterogeneous panel estimator. They warned against pooling cross-sectional data together, as this risk concealing important cross-country differences, and showed that finance has a significant effect on growth – contradicting, at the time, insignificant effect of financial structure on growth suggested by Beck and Levine (2002) using GMM techniques for dynamic panels.

Having said that, the literature on the finance-growth nexus is not free from contentions; as a growing body of literature is questioning the validity of the same. De Gregorio and Guidotti (1995), for example, find output growth to be positively correlated with financial development in high-income countries, over the 1960-1985 period, but negatively so over the sub-period 1970-85. They argued negativity may have been caused by reaching a point at which financial development no longer improves the efficiency of investment. Furthermore, Demetriades and Hussein (1996) find no evidence of a causal relationship going from finance to growth, using a

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[5] It is worthwhile to bear in mind that such earlier results may be attributed to the time period used in the respective study, as financializtion and dominance of the financial sector has especially picked momentum with the beginning of millennium. In 1985, for example, there were only three countries in which credit to the private sector was greater than 100% of GDP, namely: Singapore, Switzerland, and Japan. The US was closely following with a ratio of 99%. By 1995 there were 14countries in which credit to the private sector was larger than GDP. Ever since, financial systems have experienced substantial growth (Arcand, Berkes, and Panizza, 2012).

sample of 16 countries and applying time series techniques. Demetriades and Law (2006) show that relationship between finance and growth may be affected by institutional factors, such that growth in countries with poor institutions may not be affected by finance. Likewise, Rousseau and Wachtel (2002) find that finance has no effect on growth in countries with double digit inflation. Similarly, Rousseau and Wachtel (2011) report a diminishing effect of credit to the private sectoron GDP growth over the 1965-2004 period.

Rajan is another skeptic of the cost-benefit of financial development. In his 2005 paper, he explores the potential downsides associated with the development of the financial system over the last 30 years and warns of an increasing probability of a "catastrophic meltdown", on the back of distorted incentives' structure and riskier appetite of financial intermediaries. More recently, Gennaioli, Shleifer, and Vishny (2010) show that in the presence of some neglected low-probability tail risk, financial innovation can increase financial fragility even in the absence of leverage, due to the sheer excessive volume of new claims. Such implications of the finance-induced volatility were earlier asserted by Easterly, Islam, and Stiglitz (2000), who empirically show that there is a convex and non-monotone relationship between the financial sector and growth volatility. In particular, their point estimates imply that output volatility starts increasing when credit to theprivate sector reaches 100% of GDP.

In conformity with Tobin's (1984) view, Deidda (2006) develops a model in which the financial sector can have a negative effect on growth as it leads to a suboptimal re-allocation of talents away from the productive sectors of the economy towards the seemingly lucrative financial sector. Applying a threshold regression model to King and Levine's (1993) cross-country data set, Deidda and Fattouh (2002) show that financial development has non-monotonic relationship with economic growth, where it is positive but statistically insignificant in low-income countries, with lower level of financial development, and statistically positively significant in high-income countries, where higher levels of financial development is recorded.

Similarly, Rioja and Valev (2004) suggest that the relationship between financial development and growth may not be homogeneous, but varies according to the level of financial development. Using GMM dynamic panel techniques, a panel of 74 countries is split into three regions to show

that, in countries with low levels of financial development, financial markets have no certain effect on growth; that there is a strong and positive relationship at intermediate levels of financial development, that weakens as the country develops further financially.

More recently and contrary to Rioja and Valev (2004)[6] finding of a positive, albeit small, effect of high financial development on economic growth, Arcand, Berkes, and Panizza (2012) show that the marginal effect of financial development on economic growth becomes negative when credit to the private sector reaches 80-100% of GDP. Using country-level and industry-level data, their findings were consistent across different types of estimators, namely: simple cross-sectional, panel regressions and semi-parametric estimators. Robustness has been tested after controlling for macroeconomic volatility, banking crises, and institutional quality.

Therefore, the finance-growth nexus remains unresolved.

4. **Data**

Various measures of financial development are used in the vast literature on the finance-growth nexus. One common measure is that of credit extended by financial intermediaries. In particular, we are to use the net domestic credit as a ratio of GDP, in line with our interest to substantiate the impact of financialization on economic growth. Net domestic credit is the sum of net claims on the central government and claims on other sectors of the domestic economy, where claims on other sectors of the domestic economy include gross credit from the financial system to households, nonprofit institutions serving households, nonfinancial corporations, state and local governments, and social security funds[7].Our measure is therefore comprehensive of credit extended to the private sector as well as to government and state-owned enterprises. It is worth nothing that credit to the private sector alone has been preferred by some researchers as opposed to credit to government and state-owned enterprises, as the former is argued to be more likely to spur economic growth through its risk assessment and corporate control capacities. It is also

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[6]Arcand, Berkes, and Panizza (2012) argued such a difference may have arisen from the fact that Rioja and Valev (2004) set their threshold for the "high region" at a level of financial depth which is much lower than the level for which the former start to observe a negative effect of finance on growth.

[7] The above definition is as per suggested by the World Bank database.

commendable to consider credit extended by the financial sector as a whole, including deposit-taking institutions and non-deposit taking institutions, as the role of the latter has increased significantly since the beginning of the new millennium (Arcand et. al., 2012)[8].

Despite its potential limitation, in face of increasing complex innovations in the financial sector, credit remains one of the consistent indicators of financial development.

Malaysian data are considered for our study, as the country enjoys a dual financial system, where conventional and Islamic financial institutions operate in parallel. It is hoped that the findings of this study would provide insights for a new growth-promoting direction of central bank's policy. Annual time-series of GDP growth and net domestic credit are sourced from the World Development Indicators, World Databank, covering the period from 1961 to 2011. The ratio ofnet domestic credit is calculated by dividing the value of net domestic credit by the value of GDP. Table 1 shows descriptive statistics of the variables of interest. The average GDP growth is estimated to be 9.35% over the sample period, while the more volatile domestic credit averages 86.5% over the same period. Figure 1 is a graphical representation of the data. As expected, the Malaysian financial sector, as all financial sectors around the globe, witnessed rapid growth over the years. The ratio of net domestic credit to GDP increased from 6% in 1960 to almost 130% % in 2011, having reached a peak of 163% in 1997. Of interest is the seeming divergence in the trends of domestic credit versus GDP growth in 1971-1972, where thereafter peaks of domestic credit seem to coincide with troughs of GDP growth and vice versa.[9]Over the examined period, the ratio of net domestic credit to GDP exceeded 100% half the time. As such, the study includes 26 observations (50%of the total) for which net domestic credit is greater than 100% of GDP).

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[8] In fact, the same study gives the example of the United States, where the emergence of a "shadow banking system" has resulted in total credit to the private sector being almost four times larger than credit extended by deposit-taking institutions.

[9] This is later confirmed by the threshold regression model that finds a domestic credit threshold of 24.45%, after which the impact of expansion in domestic credit is negative on the GDP growth. The estimated threshold matches the observed level of credit in 1971.

	GDP	DOMCRDT
Mean	9.35	86.50
Median	10.74	101.69
Maximum	41.83	163.35
Minimum	-32.78	8.44
Std. Dev.	10.99	50.09
Skewness	-0.91	-0.27
Kurtosis	7.03	1.63
Jarque-Bera	41.53	4.63
Probability	0.000	0.099
Sum	477.03	4411.51
Sum Sq. Dev.	6042.99	125463.20
Observations	51	51

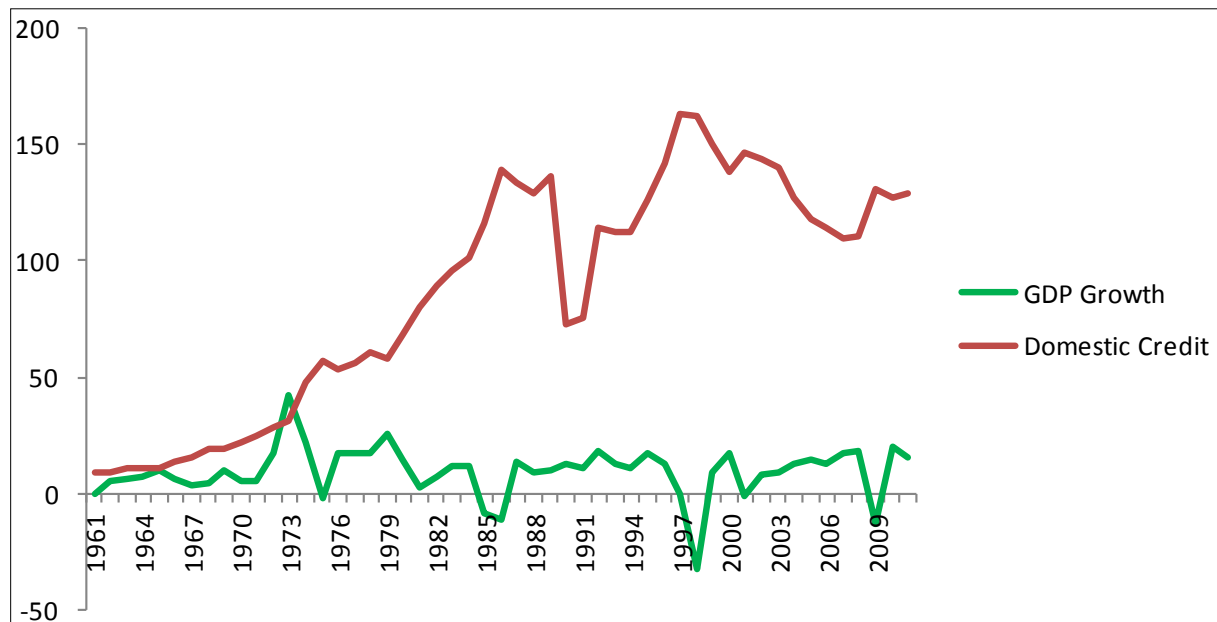Table 1. Descriptive Statistics

Figure 1. Malaysia's Finance-Growth Depiction

5. Methodology[10]

This paper tests the presence of a limit to the widely claimed growth-promoting property of financial development, which may result in threshold effect and asymmetrical responses of the GDP growth to the domestic credit ratio. The investigation has been performed using threshold regression model. The primary contribution of using this method is that data, and not the researcher, chooses the threshold value.

Hansen (2000) proposed to use two-stage OLS method to estimate threshold model. The model takes the following form:

$$y_i = \theta'_1 x_i + e_i \text{ for } q_i \leq \gamma$$

$$y_i = \theta'_2 x_i + e_i \text{ for } q_i > \gamma,$$

Where q is the threshold variable used to split the sample into different regimes or groups; y is the dependent variable; x is an m-vector of regressors and e is the error term.

On the first stage, the sum of square errors (SSE) is to be computed for a given threshold. On the second stage, the estimation of (γ) is to be made by minimizing the sum of squares.

Therefore, an F test is used, first, to determine if there exists a threshold effect and to test the null hypothesis, such that:

$$F(\gamma) = \frac{(SSE_0 - SSE_1(\hat{\gamma}))/1}{SSE_1(\hat{\gamma})/n(T-1)} = \frac{SSE_0 - SSE_1(\hat{\gamma})}{\hat{\sigma}^2}$$

If the null hypothesis is rejected, there exists a threshold effect. Though, the existence of nuisance will result in the F testing statistic to follow non-standard distribution, Hansen (1999,2000) suggested a "bootstrap" method to compute the asymptotic distribution of testing

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[10] The description of the threshold regression model is largely drawn from Hansen (1999),Hansen (2000), Deidda and Fattouh (2002) and Lin (2007).

statistics using likelihood ratio test in order to test the significance of threshold effect. A bootstrap procedure attains the first-order asymptotic distribution, so p-values constructed from the bootstrap are asymptotically valid.

Furthermore, Hansen (1999) argued that the best way to form confidence intervals for γ is to form 'no-rejection region' using the likelihood ratio statistic for tests on γ. Hence, to test the hypothesis

$$\begin{cases} H_0 : \gamma = \gamma_0 \\ H_1 : \gamma \neq \gamma_0 \end{cases}$$

We calculate the following test statistic[11]:

$$LR_1(\gamma) = \frac{SSE_1(\gamma) - SSE_1(\hat{\gamma})}{\hat{\sigma}^2}$$

Once again, the null hypothesis is rejected when $LR_1(\gamma_0)$ is too large and the p-value is less than the significance level.

6. Empirical Results

As far as our data are concerned, we use the heteroskedasticity-consistent Lagrange multiplier LM test for a threshold of Hansen 2000, to show that there is indeed evidence for a threshold effect. The method allows one threshold and one threshold variable, as such the ratio of domestic credit to GDP is chosen to be the threshold variable. Furthermore, the p-values are computed by a bootstrap analog since the threshold γ is not identified under the null hypothesis of no threshold effect. Using 1000 bootstrap replications, the p-value for the threshold model was found to be statistically significant at 0.005. This suggests that there might be a sample split based on the ratio of domestic credit to GDP. The test is depicted in Figure 1.

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[11] Kindly note that this statistic is testing a different hypothesis from the F statistic introduced above.
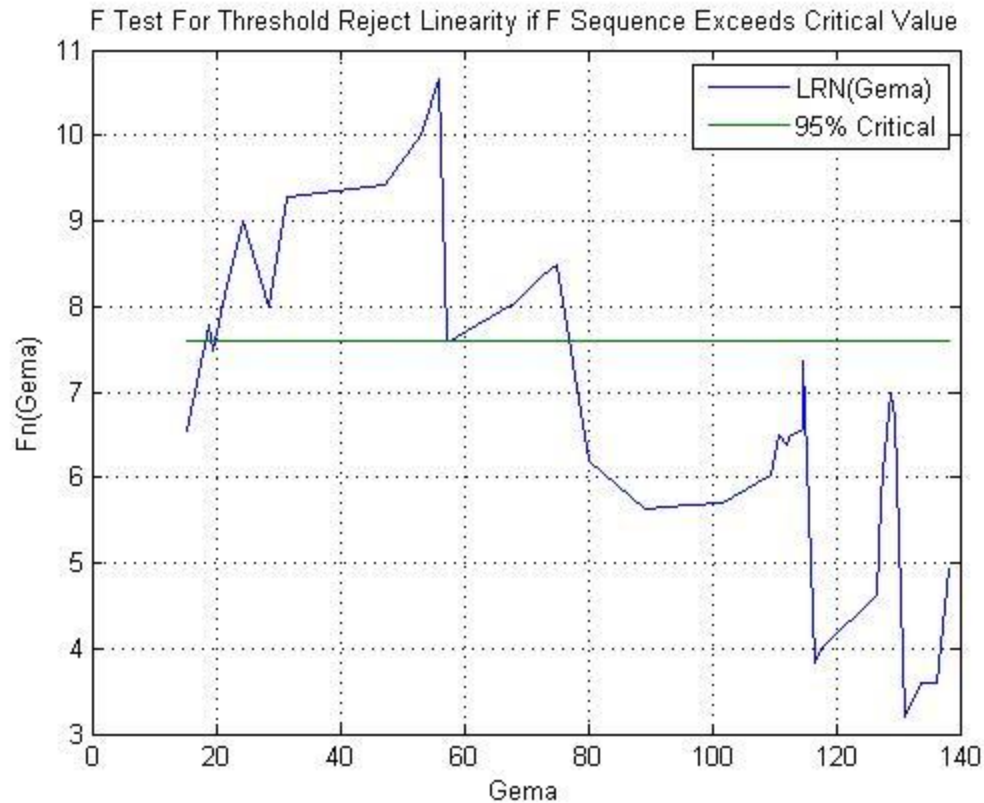
Figure 1. F-Test for Threshold

Next, we estimate the model's threshold. Figure 2 displays a graph of the normalized likelihood ratio sequence LR γ as a function of the threshold in the ratio of domestic credit to GDP. The Least Squares estimate of γ is the value that minimizes this graph, which corresponds toγ 24.45%. The 95% critical value is also plotted, so we can read off the asymptotic 95% confidence set Γ*18.79% , 143.64%, where LR γ crosses the critical value line. These results show that there is reasonable evidence for a two-regime specification, but there is considerable uncertainty about the value of the threshold. By viewing Figure 2, the confidence interval for γ seems rather wide. In fact, 78% of the observations fall in the 95% confidence interval, and may not be decisively classified into the first or second regime
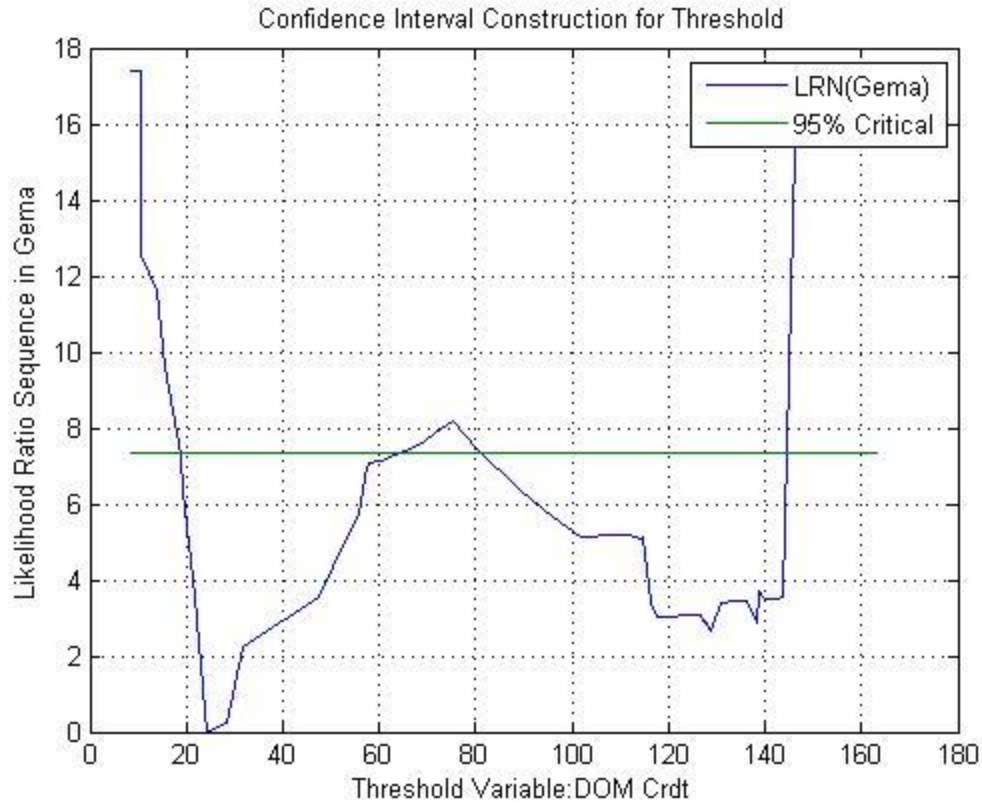
Figure 2. Confidence Interval for Threshold

$\hat{\gamma}$ splits the observations into two regimes depending on whether the threshold variable is smaller or larger than the threshold value ($\hat{\gamma}$).The regimes are distinguished by different regression slopes. In regime 1, where the domestic credit ratio is below 24.45%, the estimate of DOMCrdt coefficient is positive (0.093), but insignificant. In regime 2, where the ratio of domestic credit is above24.45%, the coefficient's estimate is a negative -0.168 that is statistically significant at the 1% level, which implies that a 1% increase in the domestic credit ratio will lead to a 0.168% decline in the gross domestic product.

Table 1 represents the regression slope estimates together with the White-corrected standard errors for the two regimes.

	Regime 1	Regime 2
Constant	4.215	28.204
	(8.528)	(4.696)
DOM Crdt	0.093	-0.168
	(0.544)	(0.042)
Observations	11	40
Degrees of Freedom	9	38
R-squared	0.033	0.258

Table 1. Estimates of the Threshold Model

Hence, our estimated model is as follows:

$$GDP_t = \begin{cases} 4.215 + 0.093DOMCrdt_t + \varepsilon_t & if \quad DOMCrdt_t \leq 24.45 \\ \\ 28.204 - 0.168DOMCrdt_t + \varepsilon_t & if \quad DOMCrdt_t > 24.45 \end{cases}$$

We thus find that levels of domestic credit corresponding to 24.45% of the GDP and above are damaging to the economy, whereas any suggested positive relationship at lower levels is not statistically significant.

7. Conclusion

Ever since the crisis began, various explanations have been put forward as to its causes. Of utmost interest to researchers in Islamic finance is the converging propositions that the debt-based financial system potentially diverge resources away from productive activities, even in good times, and that itis inherently destructive to long-term economic growth. In particualr, rapid credit growth is cited to increase macroeconomic volatility or lead to financial and banking crises (Kaminsky andReinhart, 1999) which ultimately negativelyimpact growth. Using Hansen threshold model, this paper was able to quantify such a negative effect and show that, in the case of Malaysia, the finance-growth nexus, indeed, experiences threshold effects and asymmetries once the level of domestic credit reaches 24.45% of the GDP. Our threshold estimate is considerably lower than the 80-100% range projected by Arcand, Berkes, and Panizza (2012).

We believe that our results have potentially important implications for financial regulation and direction of central-banking, especially in a dual-banking system, as in Malaysia. It provides a platform for pushing forward Islamic financial reforms. Moreover, wide-spread arguments against capital requirements and lending restrictions, based on potential harm to the economy, are no longer validated nor claims of positive impact of financial development on growth; as we find the latter statistically insignificant.

In contrast, an Islamic financial system, implemented in accordance to the archetype model of the Holy Quran and Prophetic Sunnah and one which is founded on the principles of risk-sharing will be immune to such detriment. With this regards, future research may extend knowledge frontiers by examining non-linearity and asymmetry in the relationship between GDP growth and

market capitalization of Shari'ah compliant stocks, as a measure of risk-sharing based Islamic finance. Moreover, future studies may wish to also consider wavelet analysis in their research to assess the changes, if any, in estimated thresholds over different time periods and horizons.

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