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What drives banks' willingness to lend to SMEs? An ARDL approach

Azarahiah Lokman¹ and Mansur Masih*

ABSTRACT

SMEs have been recognized as an important engine for driving economic growth and job creation both in developed and developing countries. However, there is concern that financial constraint is impeding growth in these SMEs. Bank is a major source of SME financing in most countries. In Malaysia, banks provide 90% of total financing to SMEs (SME Annual Report, 2014/15). Focusing on three aspects; the macroeconomic environment, demand for large enterprise loans and property prices, this study aims to find out the effect of these factors on banks' willingness to lend to SMEs and which of these three is most influential. Using ARDL approach applied to Malaysian quarterly data for the period from 2003Q2 to 2015Q4, the study finds macroeconomic environment significantly influences banks' willingness to lend to SMEs. Thus, policy makers have a tall order of creating and maintaining a healthy macroeconomic environment in an attempt to improve banks' willingness to lend to SMEs. The finding that property prices also play a role in influencing banks' willingness to lend to SMEs appears to suggest banks' dependency on property as collateral for SME financing. Thus, policy makers should continue to develop and improve SME financing schemes that encourages banks' participation in financing SMEs with potential but lacks collateral.

Keywords: SME lending, SME financing, bank lending, ARDL

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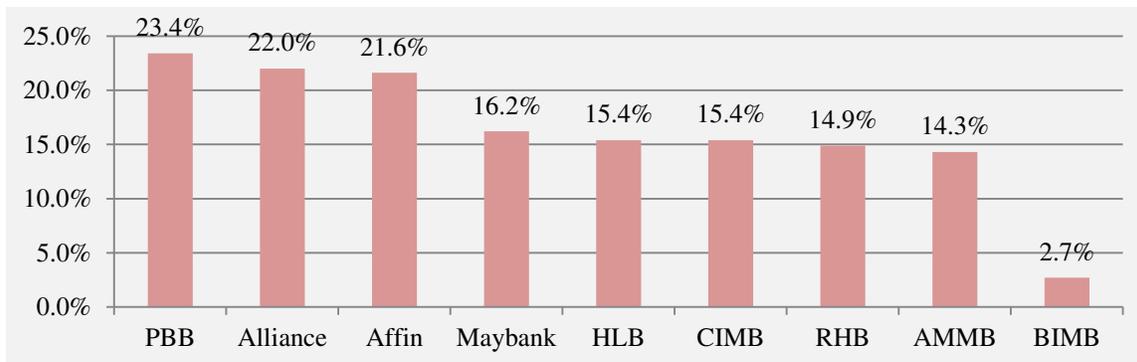
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I. INTRODUCTION

Small and Medium Enterprises (SMEs) are the backbone of many developed economies such as Japan, Germany and South Korea. Many developing economies including Malaysia have recognized SMEs as an engine for economic growth and development. SMEs in Malaysia contribute 35.9% of gross domestic product (GDP) and provide job opportunities to more than six million workers or 65% of total employment (SME Annual Report, 2014/15). Due to this, many initiatives have been directed towards developing these SMEs.

One important area in SME development is access to financing. Due to the nature of the SMEs, banking institutions remain the major provider of financing in many countries. In Malaysia, banking institutions provides 90% of total financing to SMEs (SME Annual Report, 2014/15). Following a seminal study by Fazzari, Hubbard and Petersen, 1988 on financial constraints and corporate investments, a body of literature has emerged to estimate financial constraints of firms including SMEs. Many empirical studies have focused on the issues and factors related to the availability of credit to these SMEs (see for example, Ayyagari et al, 2016, Udell, 2015, Beck et al, 2008, Ackert et al, 2007, Berger et al 2006 and Berger et al 2005). Why is it so important? It is important due to the fact that SMEs are smaller and private in nature as compared to large enterprises. Large enterprises have more options to fund their business operations in contrast to SMEs, which mainly depend on banks for financing.

Figure 1: SME loans as a percentage of total loans for selected commercial banks in Malaysia (as at Dec 15)



Source: Company Reports (as cited in CIMB Research, 2016)

One of the concerns on access to finance for SMEs is its susceptibility to the macroeconomic environment. In examining the economics of financing small business in private equity and debt markets, Berger and Udell, 1998, argue the flow of funds to small business in private equity and debt markets is likely to depend on fluctuations in the macroeconomic environment, such as shocks to the real or financial sectors or changes in government policy. They further argue because of its informational opacity, small business is more likely to bear a disproportionate share of the loss of funding that occurs when there is a market failure. In an empirical study using survey data, Berg and Fuchs, 2013, find macroeconomic factors are indeed the most significant obstacle to SME lending identified by banks in all the five Sub Saharan African countries. This finding is also consistent with Beck et al, 2008, which also find macroeconomic factors the most significant obstacle for developing countries, using survey data from 91 banks and 45 countries.

Nonetheless, does this mean in a conducive macroeconomic environment banks have no qualms in financing SMEs? Banks often perceive SMEs as riskier (compared to large enterprises) due to information asymmetry problem. Many SMEs especially the smaller ones do not have audited accounts and their business dealings are often kept in private unlike large firms. This has made risk assessment more difficult from the lender's point of view. Thus, banks have quite often use collateral to mitigate some of the risks associated with SME financing. This is not surprising as collateral has been regarded as an efficient solution to information asymmetry problem (see Bester, 1987 or Chan and Kanatas, 1985). In fact, using World Business Environment Survey (WBES) to examine financing obstacles, Beck et al, 2006, find collateral requirement as the third most important obstacles. Due to the possible impact on availability of financing for SMEs, there is a

strand of literature studying various aspects of collateral and SME financing (see for example Hanedar et al, 2014, Berger et al, 2011 and Voordeckers & Steijvers, 2006).

On the other hand, are banks shying away from SMEs? Not at all. From a market considered too difficult to serve, SMEs has now become a strategic target of banks worldwide (IFC, 2010). Competition in other markets is often cited by commercial banks moving “downstream” to serve SMEs (IFC, 2010). Using a survey data from 91 banks in 45 countries, Beck et al, 2008, find banks actually perceive the SME segment to be very profitable and some banks indicate thinning margins in other segments as one of the driving factors of their involvement with SMEs.

In reality, there are many factors associated with banks’ willingness to lend to SMEs. Berger et al, 2006, provide an extension to the conceptual SME financing framework which covers among others, the financial institutions structures, the lending infrastructures of nations and the lending technologies used by banks for SME financing. Berger and Udell, 1998 discuss SME specific factors such as the inherent information opacity problem and size as well as their vulnerability to the macroeconomic environment in relation to SME finance.

Whilst this study does not intend to comprehensively analyse all the drivers, it attempts to study three important aspects of SME financing from the supply side perspective. Specifically, it focuses on the impact of the macroeconomic environment, demand from large enterprise loans and property prices on banks’ willingness to lend to SMEs in Malaysia. Though studies have shown macroeconomic environment as a main obstacle impeding growth in SME financing, these studies utilize survey data. The current study uses time series data to find out if macroeconomic environment is indeed a major factor in driving banks’ willingness to lend to SMEs. Most studies related to SME lending focuses on specific issue such as collateral. To the best of author’s knowledge, there is no study that compares the relative importance of these three driving factors. Thus, this study intends to contribute to the literature by empirically finding out which of these factors are most influential on banks’ willingness to lend to SMEs.

In the following section, the definition and profile of SMEs in Malaysia is introduced.

Thereafter, the theoretical underpinnings in relation to the research questions are discussed. Subsequently, the methodology employed is explained. Next, the data utilized is described and results discussed. The paper ends with some concluding remarks and limitations to research.

II. DEFINITION AND PROFILE OF SMEs IN MALAYSIA

The definition of SMEs vary from country to country and even from bank to bank though commonly defined as registered businesses with less than 250 employees (IFC, 2009). Due to many developments in the economy, Malaysia has revised its SME definition in 2013 as follows; a business will be deemed as an SME if it meets either one of the two specified qualifying criteria, namely sales turnover or full-time employees, whichever is lower (SME Corp, 2013). The definition is simplified as follows:

- Manufacturing: Sales turnover not exceeding RM50 million OR full-time employees not exceeding 200 workers
- Services and other sectors: Sales turnover not exceeding RM20 million OR full-time employees not exceeding 75 workers

Table 1: Definition by size of operation

Category	Small	Medium
Manufacturing	Sales turnover from RM300,000 to less than RM15 million OR full-time employees from 5 to less than 75	Sales turnover from RM15 million to not exceeding RM50 million OR full-time employees from 75 to not exceeding 200
Services & Other Sectors	Sales turnover from RM300,000 to less than RM3 million OR full-time employees from 5 to less than 30	Sales turnover from RM3 million to not exceeding RM20 million OR full-time employees from 30 to not exceeding 75

**firms with sales below RM300,000 OR employees less than 5 are deemed microenterprises*

Source: SME Corp, 2013

As a result of the change in definition, the share of SMEs to total establishments has increased from 97.3% to 98.5% based on the Economic Census 2011 - Profile of Small and Medium Enterprise (BNM, 2013). Most of the SMEs are microenterprises, forming 77% of total SMEs in Malaysia in 2010. Small-sized SMEs accounted for 20%, while medium-sized SMEs constitute the balance 3% (refer to Table 2 and Figure 2).

Microenterprises are predominant in the services sector, accounting for close to 80% of SMEs in the sector. Construction and Mining & Quarrying sectors have a relatively higher percentage of medium enterprises indicating bigger players in the segments.

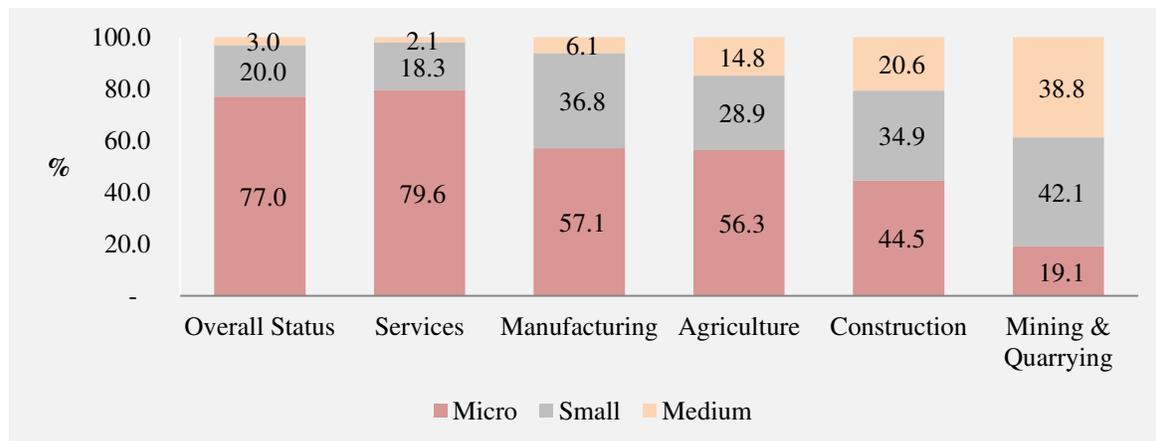
Table 2: Profile of SMEs

Sector	Total Establishments (a)	Total SMEs* (b)	Percentage (%) of SMEs over Total Establishments (b)/(a)*100
Overall Total	662,939	645,136	97.3
Services	591,883	580,985	98.1
Manufacturing	39,669	37,861	95.4
Agriculture	8,829	6,708	76.0
Construction	22,140	19,283	87.1
Mining & Quarrying	418	299	71.5

*includes microenterprises

Source: Department of Statistics (2011)

Figure 2: Distribution of SMEs by Size and Sector



Source: Department of Statistics (2011)

The next section discusses the theoretical underpinnings related to the research questions.

III. THEORETICAL UNDERPINNINGS

This section reviews the related literature and discusses the theoretical underpinnings with regards to the research questions. Berger and Udell, 1998, analyses the vulnerability of small firm finance to the macroeconomic environment. Some of the issues include the fragility of private equity markets and their strong reactions to current events in public equity markets; the effects of monetary policy shifts; bank credit crunches caused by regulatory changes, macroeconomic conditions, or capital problems in the banking industry; credit rationing over the interest rate and credit risk cycles; and the continuing effects of the consolidation of financial institutions (Berger & Udell, 1998). Many empirical studies have indeed found macroeconomic environment as one of the major obstacles impeding growth in SME segment by banks (See for example, Berg & Fuchs, 2013 and Beck et al, 2008). Nonetheless, whilst these studies utilize survey data, using time series data, this current study aims to find out the influence of macroeconomic environment on banks' willingness to lend to SMEs.

One inherent problem with SMEs is information asymmetry. Many SMEs especially the smaller ones do not have audited accounts and their business dealings are often kept in private unlike large firms. This has made risk assessment more difficult from the lender's point of view. Therefore, lenders have used various tools at the beginning of the relationship to mitigate their risk in SME lending. One way is the requirement for collateral. In analysing the structure of credit market equilibrium under imperfect information, Bester, 1987, shows lenders may use collateral as a self-selection and incentive mechanism. Rationing occurs if borrowers' collateralization wealth is too small to allow perfect sorting or to create sufficiently strong incentives (Bester, 1987). If this is so, we would expect bank's willingness to lend to SMEs to move with property prices. Higher property prices would give more room for banks to lend more. Thus, this study attempts to examine the influence of property prices on banks' willingness to lend to SMEs.

Unlike SMEs which has fewer options for external financing and mainly dependent on bank financing, large enterprises have greater options. In addition to bank lending, they

are also able to source financing through capital market, private equity and others. This makes the large enterprise segment more competitive. Thus, according to this theory, banks' willingness to lend would depend on the demand for large loans. On the other hand, is it demand from large loans that is driving the demand for SME loans which subsequently drives banks' willingness to lend to SMEs? This is due to the fact that many SMEs support the business of large enterprises. Thus, based on this theory, demand for large loans would drive the demand for SME loans and naturally drives banks' willingness to lend to SMEs.

In addition to the above, the study also intends to find out the relative importance of each factor discussed. In other words, this study attempts to examine which of the three aspects is most influential on banks' willingness to lend to SMEs.

The next section discusses how the research questions are going to be addressed.

IV. METHODOLOGY

This study employs ARDL or also known as bounds testing approach suggested by Pesaran et al, 2001 to carry out the cointegration analysis which is appropriate for the current data set utilized (as shown in the next section). There are several advantages of using ARDL compared to other cointegration techniques. It can be applied irrespective of whether the variables are stationary or non stationary and also has better small sample properties (Narayan & Smyth, 2005). In addition, a simple linear transformation allows a dynamic error correction model (ECM) to be derived from ARDL (Banerjee et al, 1993). The ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information (Pesaran & Chin, 1999).

Prior to applying ARDL, stationarity of variables is investigated. Whilst the ARDL testing approach does not require unit root tests, it is crucial to do so to ensure no variable is integrated at order two or higher. This is a precondition for ARDL to be carried out as it assumes all variables are either $I(0)$ or $I(1)$. Otherwise, the computed F-statistics generated by Pesaran et al, 2001 is invalid. In this study, three unit root tests are carried out i.e. the Augmented Dickey Fuller (ADF) test, the Phillip Perron (PP) test and KPSS test.

There are two stages involved in ARDL. The first stage involves investigating the existence of the long run relationship between the variables by computing the F-statistic to test the significance of the lagged levels of the variables in the error correction form of the underlying ARDL model. Pesaran et al, 2001, present two sets of asymptotic critical values for testing cointegration for a given significance level. The set with lower value is computed assuming that the regressors are $I(0)$ and the other set with upper value is computed assuming that the regressors are $I(1)$. If the computed F statistics exceeds the upper critical value, the null hypothesis of no cointegration can be rejected. If it falls below the lower critical value the null hypothesis cannot be rejected. Finally, if the F statistics value falls between the lower and upper critical values the result is inconclusive.

The second stage is pursued only if the first stage is satisfied i.e. that there is long run relationship between the variables. The second stage in this study involves estimating the long run model by selecting the orders of ARDL model using AIC and estimating an Error Correction Model (ECM) using the long run estimates. This enables the speed of adjustment of the dependent variable to independent variables to be estimated. A value of zero indicates non-existence of long run relationships whilst a value of between -1 and 0 indicates existence of partial adjustment. A value smaller than -1 indicates the model over adjusts in the current period and a positive value indicates the system moves away from equilibrium in the long run.

The next section describes the data that is utilized in this study and discusses the results.

V. DATA, RESULTS AND DISCUSSION

This study employs quarter time series data from 2003Q2-2015Q4. All data are extracted from BNM Quarterly Bulletin, BNM Monthly Bulletin and IFS. The period for the empirical analysis is dictated by data availability for bank lending to SMEs, which is on quarterly basis. The definition of the variables is tabulated in Table 3:

Table 3: Definition of Variables

Variable	Definition
SME loans approval rates (S)	SME loans approvals / SME loans application to banks during the period (in RM)
Large loan applications (D)	Large loan applications during the period (in RM)
Property Price (H)	House Price Index
Lending Rate (I)	Average lending rate in the banking system
Consumer Price Index (C)	CPI
Exchange Rate (X)	Real Effective Exchange Rate based on CPI (2010=100)
GDP (G)	Real Gross Domestic Product, Index (2010=100)

SME loans approval rates represent banks' willingness to lend to SMEs as compared to demand. Large loan applications represent the demand for large loans during the period. House Price Index is utilized instead of property price index due to data unavailability. Lending rate, CPI, exchange rate and GDP represent macroeconomic environment indicators. All variables except lending rate are transformed into natural logs.

Before applying the ARDL, we test the stationarity of all the variables to determine their order of integration using three unit root tests i.e. the ADF test, PP test and KPSS test. The unit root test results are indicated in Table 4 below.

Table 4: Unit Root Test Results

The Augmented Dickey-Fuller (ADF) Unit Root test						
	Variables in Level Form			Variables in Differenced Form		
	Test Statistic	Critical Value	Implication	Test Statistic	Critical Value	Implication
S	-5.2673	-3.5112	Stationary	-5.7212	-2.9287	Stationary
D	-3.5918	-3.5112	Stationary	-6.3194	-2.9287	Stationary
H	-1.8646	-3.5136	Non Stationary	-2.7297	-2.9303	Non Stationary
I	-2.1815	-3.5112	Non Stationary	-3.3189	-2.9287	Stationary
C	-3.3222	-3.5112	Non Stationary	-5.3201	-2.9287	Stationary
X	.052219	-3.5112	Non Stationary	-3.2442	-2.9287	Stationary
G	-2.1599	-3.5112	Non Stationary	-4.2698	-2.9287	Stationary
Phillips-Perron Unit Root test						
	Variables in Level Form			Variables in Differenced Form		
	Test Statistic	Critical Value	Implication	Test Statistic	Critical Value	Implication
S	-6.7862	-3.5005	Stationary	-17.2375	-2.9215	Stationary
D	-4.3182	-3.5005	Stationary	-10.1740	-2.9215	Stationary
H	-3.1646	-3.5025	Non Stationary	-10.0830	-2.9228	Stationary
I	-1.8726	-3.5005	Non Stationary	-4.4659	-2.9215	Stationary
C	-2.6428	-3.5005	Non Stationary	-6.3061	-2.9215	Stationary
X	-.41820	-3.5005	Non Stationary	-5.6909	-2.9215	Stationary
G	-4.8077	-3.5005	Stationary	-8.5926	-2.9215	Stationary
KPSS Stationarity Test						
	Variables in Level Form			Variables in Differenced Form		
	Test Statistic	Critical Value	Implication	Test Statistic	Critical Value	Implication
S	.086183	.14043	Stationary	.060627	.41138	Stationary
D	.10323	.14043	Stationary	.057414	.41138	Stationary
H	.097775	.14043	Stationary	.088353	.41138	Stationary
I	.099078	.14043	Stationary	.081590	.41138	Stationary
C	.15522	.14043	Non Stationary	.061748	.41138	Stationary
X	.15028	.14043	Non Stationary	.25885	.41138	Stationary
G	.092699	.14043	Stationary	.061883	.41138	Stationary

The unit root tests indicate mixed results in terms of stationary and non stationary variables. This creates an appropriate environment for applying ARDL as explained in the earlier

section. In other cointegration techniques, all variables are required to be non stationary in the level form but ARDL is able to be applied irrespective of whether the variables are stationary or non stationary in the level form. In addition, ARDL is appropriate for our small sample size.

Next we conduct the bounds test for the null hypothesis of no cointegration. The results are depicted in Table 5. The results indicates cointegration is present when average lending rate (I) is taken as the dependent variable evidenced by the F-statistics being higher than the upper bound of the critical value at 5% level. This implies that there is long run relationship between banks' willingness to lend to SMEs, demand for large loans, house price, average lending rate and macroeconomic environment.

Table 5: Bounds Test Statistics For Cointegration

F-Statistics	
F(LS LD, LH, LI, LC, LX, LG) =	1.8630
F(LD LS, LH, LI, LC, LX, LG) =	0.64019
F(LH LS, LD, LI, LC, LX, LG) =	1.8254
F(LI LS, LD, LH, LC, LX, LG) =	5.1665(**)
F(LC LS, LD, LH, LI, LX, LG) =	1.5605
F(LX LS, LD, LH, LI, LC, LG) =	2.1886
F(LG LS, LD, LH, LI, LC, LX) =	2.5700

*Note: Bounds test statistics are compared with critical values tabulated in Pesaran et al. (2001, p. 300, p. 303). The symbols (**) indicate rejection of the null hypothesis at 5% level.*

Now that cointegration is proven, the next step involves estimating the coefficients from the selected ARDL specification to model the long run relationship. The results are tabulated in Table 6. The ARDL model selected by AIC is chosen due to better coefficient estimates and also because the model selected by SBC indicated problems in the diagnostic tests.

Table 6: Estimates of the long run coefficients based on ARDL (3,4,3,4,1,4,3) selected by Akaike Information Criterion (AIC)

Dependent Variable: LS		
Variable	Coefficient	T-ratio
LD	.24672	4.0614[.001]*
LH	.054413	1.2800[.218]
I	.13918	5.1098[.000]*
LC	-1.4346	-1.1873[.251]
LX	-1.2497	-1.4827[.156]
LG	-.20384	-.39788[.696]
INPT	15.3682	7.2747[.000]*

*significance at 1% level (p-value in parentheses)

The error correction representation of the selected ARDL models is now estimated. The results are indicated in Table 7. The results indicate seven error correction models with SME loans approval rate, demand from large loans, property prices, lending rate, CPI, exchange rate and GDP as dependent variables. The T-ratios are significant at 1% level for all dependent variables except for exchange rate, which is significant at 5% level and GDP, which is not significant. This indicates GDP is an exogenous variable and the others endogenous. This implies GDP is the leading variable whilst the others are followers.

Table 7: Error Correction Representations for the selected ARDL models (based on AIC)

Dependent Variable	Model	Regressor	Coefficient	Standard Error	T-ratio
dLS	ARDL(3,4,3,4,1,4,3)	ecm(-1)	-2.6501	.46871	-5.6541[.000]*
dLD	ARDL(3,4,3,3,4,0,1)	ecm(-1)	-.79539	.22578	-3.5229[.002]*
dI	ARDL(4,0,0,1,2,1,4)	ecm(-1)	-.20049	.049734	-4.0314[.000]*
dLC	ARDL(3,3,4,0,4,4,1)	ecm(-1)	-.71812	.097715	-7.3491[.000]*
dLX	ARDL(3,0,0,1,2,3,3)	ecm(-1)	-.53426	.19596	-
dLG	ARDL(4,0,4,1,4,4,1)	ecm(-1)	-.061780	.12426	-

*significance at 1% level (p-value in parentheses) **significance at 5% level (p-value in parentheses)

Whilst the error correction representations enable the identification of endogenous and exogenous variables, it is unable to determine relative endogeneity or exogeneity. However, Variance Decomposition (VDCs) enables the degree of exogeneity or endogeneity amongst the variables to be gauged beyond the sample period. VDCs are also known as out-of-sample causality tests. VDCs decompose the variance of forecast error of each variable into proportions attributable to shocks from each variable in the system, including its own. The variable that is mostly explained by its own shocks (and not by other variables) is deemed to be the most exogenous of all.

There are two ways of conducting VDCs: orthogonalized and generalized VDCs. In this current study, generalized VDCs are employed. Whilst both types have their own strengths and weaknesses, this study uses generalized VDCs due to the following reasons. There are two important limitations of orthogonalized VDCs. One is that it assumes when a particular variable is shocked, all the other variables are switched off. Another limitation is it does not generate a unique solution. The numbers produced are dependent on the ordering of the variables in the VAR. Thus, the first variable would report the highest percentage and most likely to be specified as the most exogenous variable. On the other hand, generalized VDCs have a different problem of its own. The generated numbers do not add up to 1. Thus, to interpret the results, one needs to do additional computations to normalize the numbers.

Table 8 indicates at the end of the forecast horizon period i.e. horizon 20, GDP is the most exogenous variable; it is able to explain 41% of its own variance. This strengthens the earlier finding on the exogeneity of GDP. The result also indicates exchange rates have impact on SME loan approval rates. These findings validate the influence of macroeconomic environment on banks' willingness to lend to SMEs.

Property prices as well as demand from large loans are also relatively more exogenous than SME loans approval rates. This may indicate SME loans approval rate to a certain extent is influenced by property prices. This is because banks often require some collateral to be pledged for SME financing and property is one of the most common collaterals. Thus, a booming property market would provide additional room for banks to approve higher /

more loans. Table 9 provides change in relative endogeneity / exogeneity among the variables over time.

Table 8: Variance Decompositions (VDCS)

HORIZON 4 (quarters)	DS	DD	DH	DI	DC	DX	DG
DS	56%	5%	6%	4%	19%	2%	8%
DD	6%	40%	19%	6%	19%	6%	4%
DH	3%	13%	46%	5%	15%	10%	6%
DI	6%	1%	4%	52%	10%	15%	13%
DC	11%	19%	8%	2%	41%	9%	11%
DX	0%	2%	21%	10%	6%	47%	13%
DG	7%	2%	6%	12%	24%	11%	38%

HORIZON 8 (quarters)	DS	DD	DH	DI	DC	DX	DG
DS	37%	7%	13%	7%	17%	11%	7%
DD	6%	36%	19%	6%	17%	10%	6%
DH	5%	16%	40%	7%	17%	9%	6%
DI	4%	4%	8%	35%	7%	27%	15%
DC	8%	16%	12%	5%	34%	13%	12%
DX	1%	3%	18%	16%	6%	43%	13%
DG	6%	8%	7%	9%	18%	14%	39%

HORIZON 12 (quarters)	DS	DD	DH	DI	DC	DX	DG
DS	34%	7%	14%	7%	16%	16%	7%
DD	6%	37%	19%	6%	18%	9%	5%
DH	5%	15%	39%	8%	17%	9%	6%
DI	4%	5%	9%	33%	6%	26%	15%
DC	9%	15%	14%	6%	31%	14%	11%
DX	1%	4%	18%	16%	7%	41%	13%
DG	6%	7%	7%	12%	15%	14%	39%

HORIZON 16 (quarters)	DS	DD	DH	DI	DC	DX	DG
DS	32%	8%	14%	7%	16%	16%	7%
DD	6%	35%	19%	7%	17%	10%	7%
DH	5%	15%	39%	8%	17%	11%	6%
DI	4%	6%	11%	31%	6%	26%	16%

DC	9%	15%	15%	6%	30%	14%	12%
DX	1%	4%	19%	15%	7%	40%	14%
DG	6%	7%	7%	12%	13%	15%	40%

Table 8: Variance Decompositions (VDCs) continued

HORIZON 20 (quarters)	DS	DD	DH	DI	DC	DX	DG
DS	32%	8%	14%	7%	16%	16%	8%
DD	6%	34%	19%	7%	17%	10%	7%
DH	5%	15%	39%	8%	16%	11%	6%
DI	4%	6%	11%	30%	6%	26%	16%
DC	8%	15%	15%	6%	29%	14%	12%
DX	2%	4%	18%	15%	7%	39%	14%
DG	6%	6%	7%	11%	12%	16%	41%

Table 9: Ranking of Relative Endogeneity / Exogeneity Among Variables Over Time

HORIZON (quarters)	DS	DD	DH	DI	DC	DX	DG
4	1	6	4	2	5	3	7
8	4	5	2	6	7	1	3
12	5	4	2	6	7	1	3
16	5	4	3	6	7	2	1
20	5	4	3	6	7	2	1

The findings from VDCs are further confirmed by Impulse Response Functions (IRFs) analysis. IRFs can be seen as the visual version of VDCs. Figure 3 to Figure 9 below indicates the exogeneity of GDP in graphical forms when shocked by each variable. Figure 10 and Figure 11 provides a clearer visual indicating exogeneity of GDP.

Figure 3: Variable – SME loans approval rate (DS)

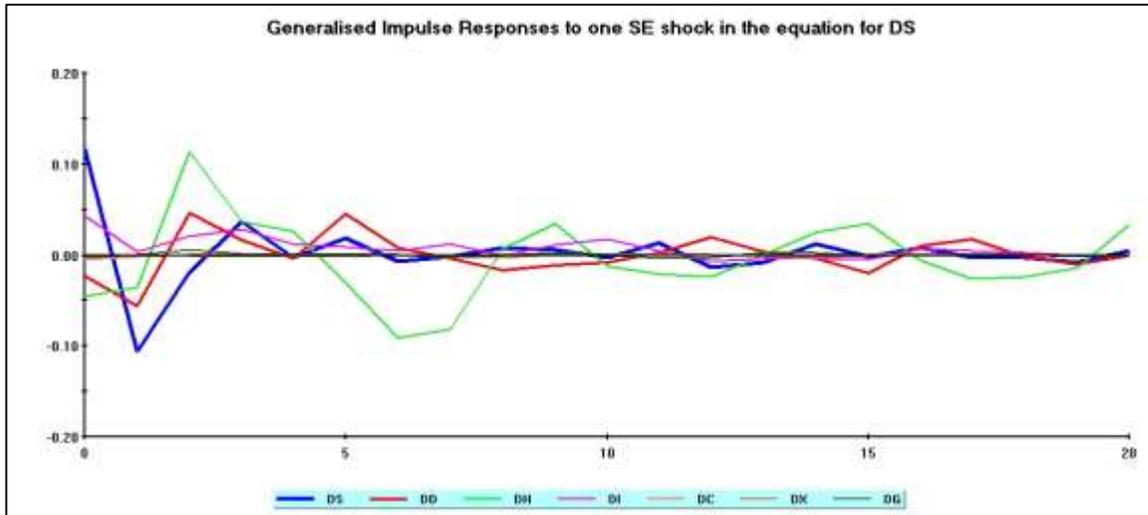


Figure 4: Variable – Demand for large loans (DD)

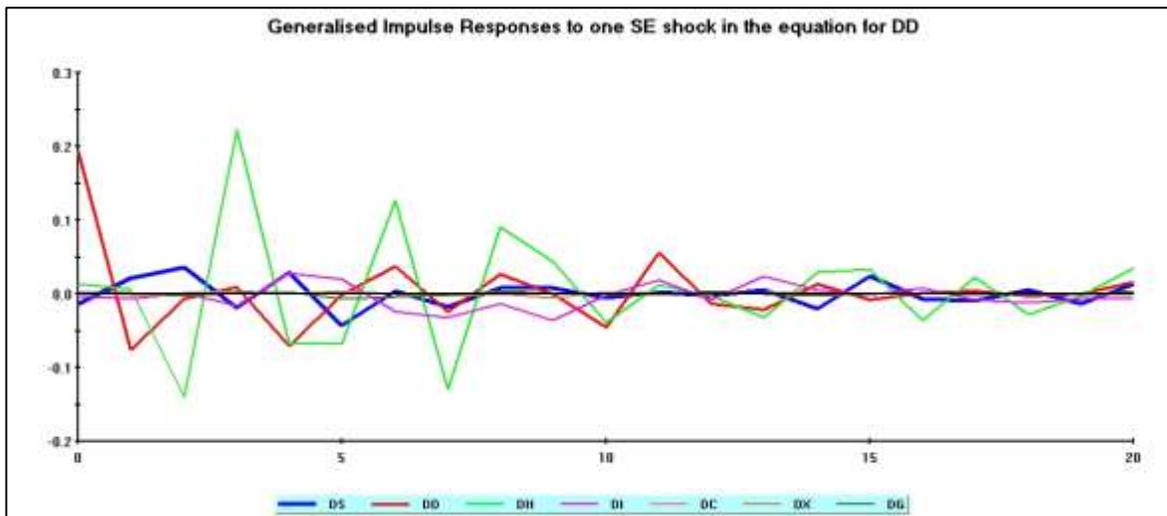


Figure 5: Variable – Property price (DH)

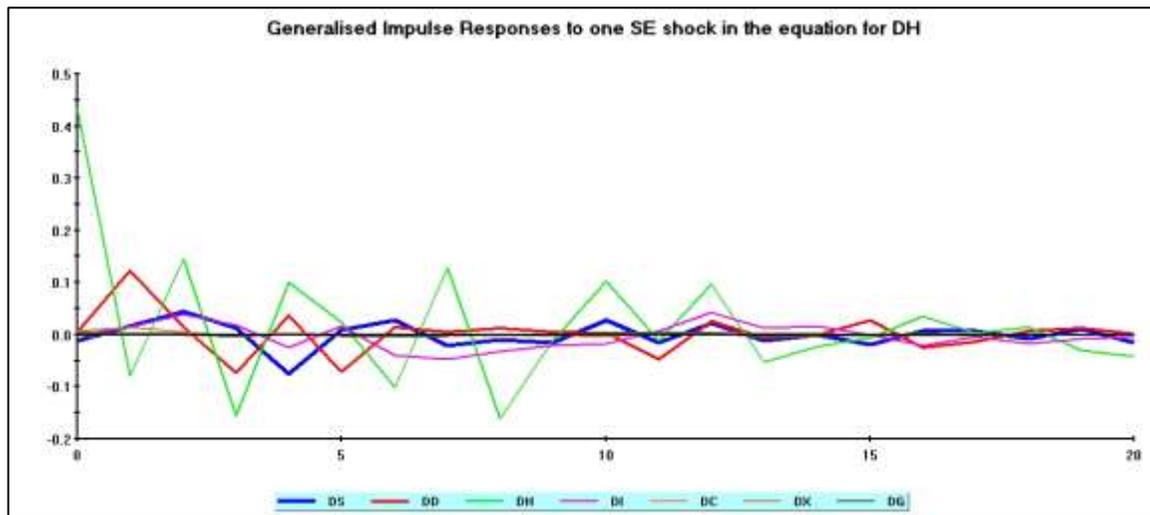


Figure 6: Variable – Lending rate (DI)

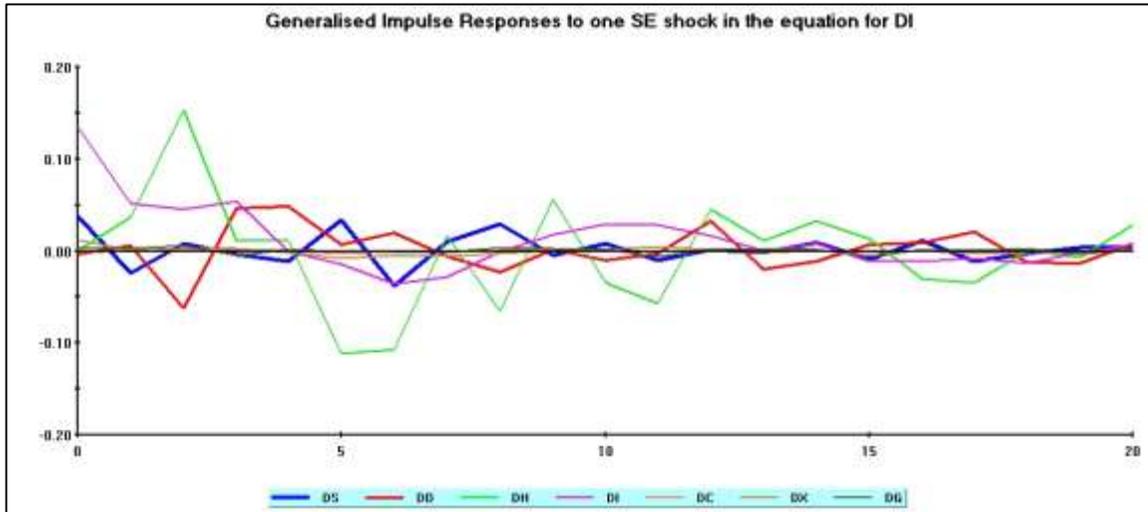


Figure 7: Variable – CPI (DC)

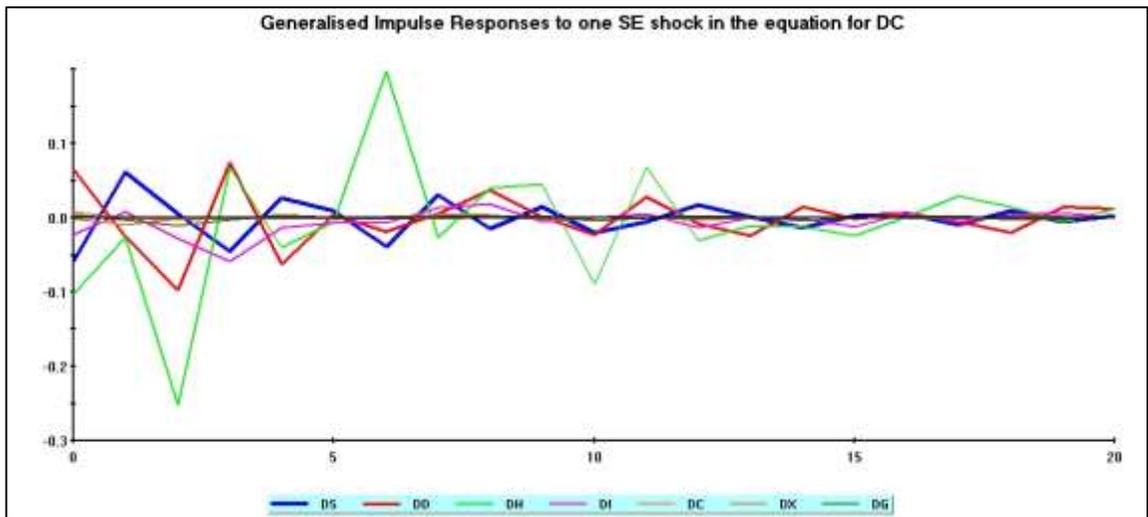


Figure 8: Variable – Exchange rate (DX)

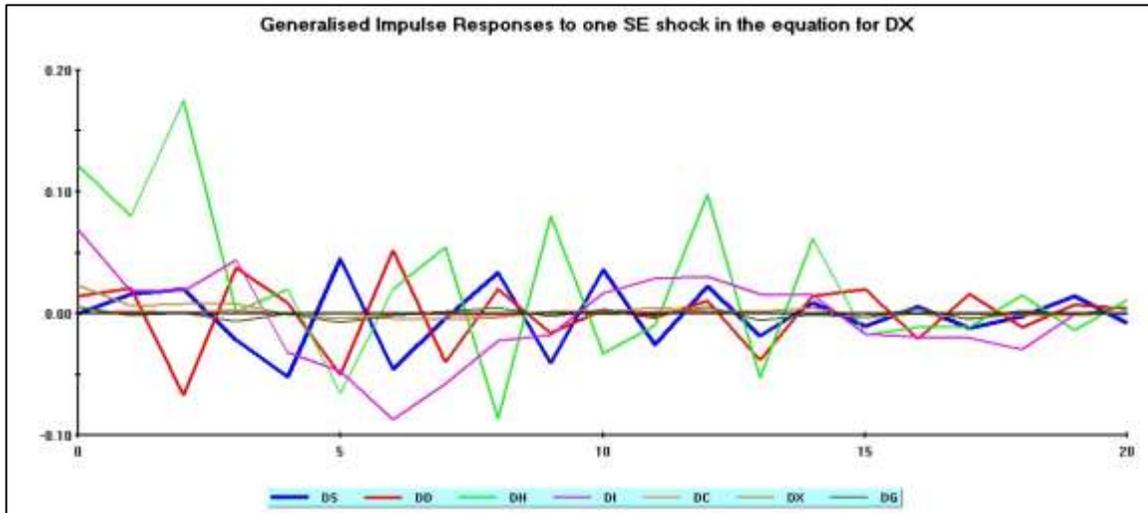


Figure 9: Variable – GDP (DG)

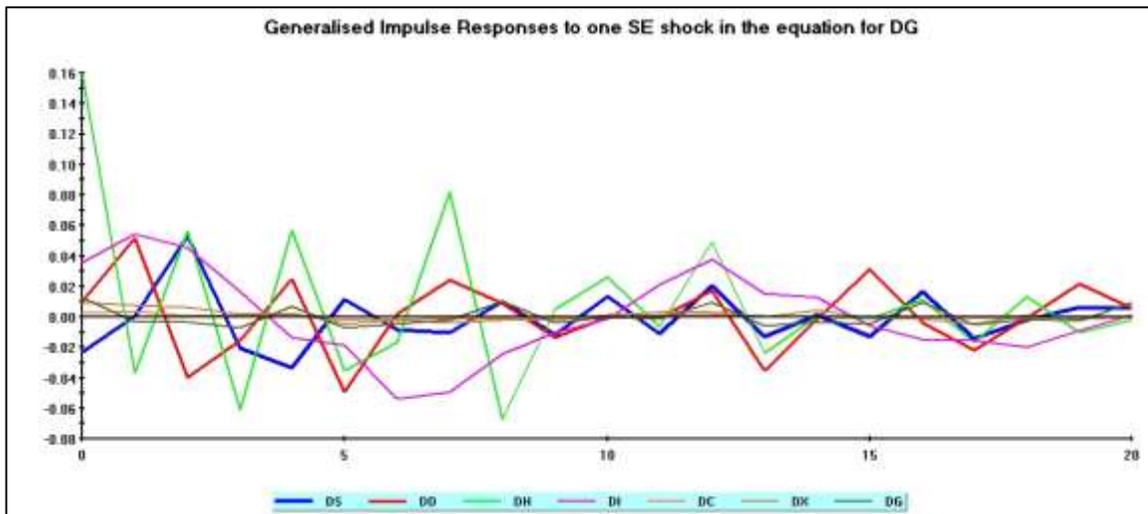


Figure 10: Variable – GDP (DG)

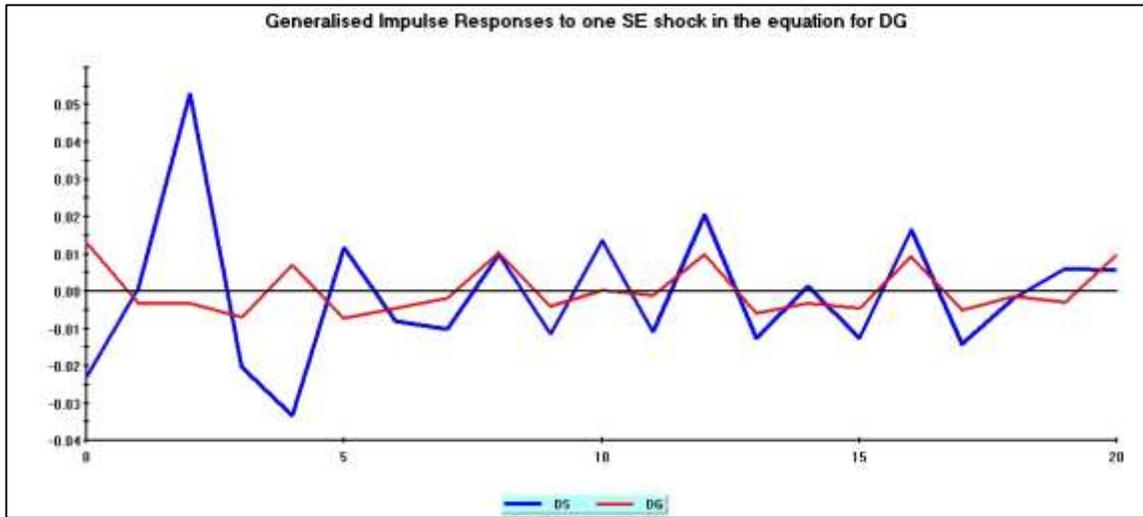
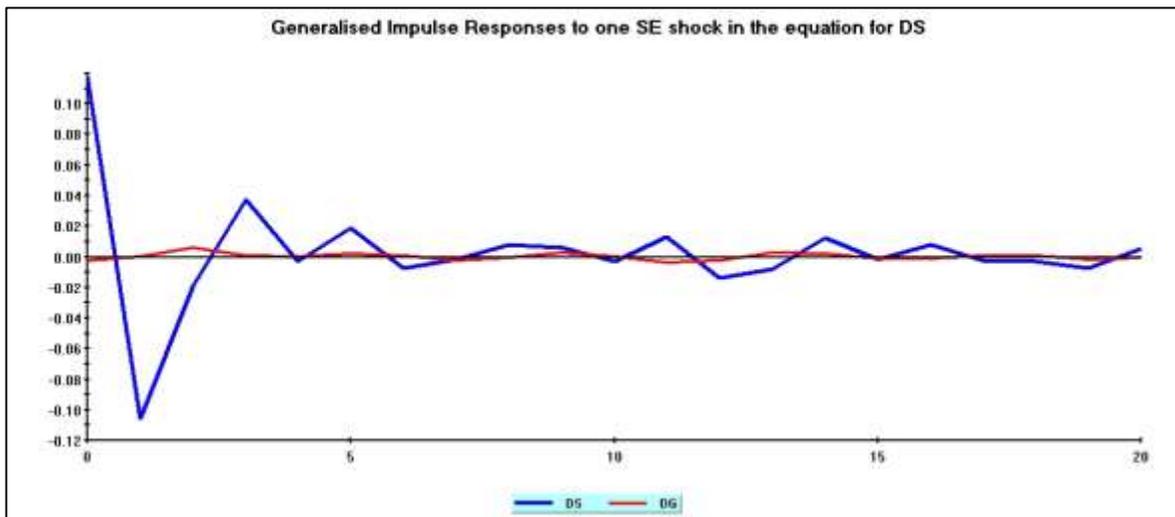


Figure 11: Variable – SME loans approval rate (DS)



VI. CONCLUSIONS

Access to financing for small and medium-sized enterprises (SMEs) has been a subject of great interest both to policymakers and researchers because of the significance of SMEs in private sectors around the world and the perception that these firms are financially constrained (Beck et al, 2011). SMEs especially the smaller ones find it difficult to obtain commercial bank financing, especially long-term loans, for a number of reasons, including lack of collateral, difficulties in proving creditworthiness, small cash flows, inadequate credit history, high risk premiums, underdeveloped bank-borrower relationships and high transaction costs (IFC, 2009). Nevertheless, bank financing is a major source of SME financing in many countries. In Malaysia, banks provide 90% of total SME financing (SME Annual Report, 2014/15).

Thus, this study attempts to investigate what drives banks' willingness to lend to SMEs. Specifically, the research focuses on evaluating the influence of macroeconomic environment, demand for large enterprise loans, and property prices on banks' willingness to lend to SMEs. The research also aims to find out which of these factors influence banks' willingness to lend to SMEs most.

Utilizing GDP, exchange rates, CPI and lending rates as indicators for macroeconomic variables, the study finds the former two as most influential on SME loans approval rate. This indicates macroeconomic environment greatly affects banks' willingness to lend to SMEs. In addition, the study finds property prices also influence SME loans approval rates. This shows property prices do affect banks' willingness to lend to SMEs to a certain extent.

Thus, policy makers have a tall order of creating and maintaining a healthy macroeconomic environment in an attempt to improve banks' willingness to lend to SMEs. The finding that property prices also play a role in influencing banks' willingness to lend to SMEs appears to suggest banks dependency on property as collateral for SME financing. Thus, policy makers should continue to develop and improve SME financing schemes that encourage banks' participation in financing SMEs with potential but lacks collateral. Malaysia, through various agencies, has been active in developing such financing

programs. For example, Credit Enhancer Program which is partly guaranteed by the Credit Guarantee Corporation (CGC) and Working Capital Guarantee Scheme (WCGS) which is guaranteed by Syarikat Jaminan Pembiayaan Perniagaan Berhad (SJPP). Whilst many government guarantee schemes are being offered, there is a need for continued assessment on the effectiveness of these schemes and improvise where necessary.

Limitations of Research

The study utilizes SME approval rate as a proxy for banks' willingness to lend to SMEs. Whilst this is considered reasonable, there are other factors that may lead to the rejection of the application for financing by banks. SME specific factors is also one of the major obstacles for banks in SME lending (Berg & Fuchs, 2013). This includes SME financial performance, size, sector and others. Bank specific factors also influence willingness to lend to SMEs. Different bank has different risk appetite and bank size also may play a role. In addition, there are many qualitative factors that influence banks' willingness to lend to SMEs, for instance, legal and regulatory framework, the information environment, the state of financial sector infrastructure and others. Thus, one needs to be mindful of these factors when interpreting the results.

As a suggestion, since banks is a major source of SME financing, future research may consider the impact of SME lending on SME contribution to GDP.

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