Savings and bank loans dynamics in implementing the new international accounting standard IFRS-9: Malaysia as a case study

Roslan, Syed and Masih, Mansur

INCEIF, Malaysia, Business School. Universiti Kuala Lumpur, Kuala Lumpur, Malaysia

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Syed Roslan[1] and Mansur Masih[2]

Abstract:

This paper makes an attempt to assess the impact of the implementation of the new Institutional International Financial Reporting Standard 9 (IFRS-9) which started in 2018 i.e. higher allocation for impairment loans to some of the major countries in the world by analysing the long-run relationship of four-variables which are savings, bank loans, economic growth and trade transactions using Malaysia as the case study.

Although we discovered mixed evidence from different methods such as, Engle-Granger, Johansen, ARDL and NARDL cointegration tests due to smaller sample size, we proceeded with our test based on Johansen results to find whether there exists a long-run relationship between all four variables of our interest. We found that bank loans variable is the most leading variable that policymakers can use i.e. set the loans rate as an intermediate target to affect economic growth, savings and trade transactions. The results have strong policy implications for countries like Malaysia.

Keywords: IFRS-9, savings, bank loans, economic growth, trade transactions, NARDL

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[1] INCEIF, Lorong Universiti A, 59100 Kuala Lumpur, Malaysia.

2 **Corresponding author**, Senior Professor, UniKL Business School, 50300, Kuala Lumpur, Malaysia.

Email: mansurmasih@unikl.edu.my

1.0 Introduction

Institutional International Financial Reporting Standard 9 (IFRS-9) or known as the Malaysian Financial Reporting Standard-9 (MRFS 9), is a strict and advanced accounting standard governing the financial tools that replaced the International Accounting Standard 39 (IAS 39) or MRFS 139 starting in 2018. With its introduction, banks will be required to make provisions for expected losses in the future.

The main objective for the London-based International Accounting Standards Board to issue IRFS-9 was to address the "too little too late" challenge following the 2008/2009 global financial crisis whereby at that time, banks were not able (unintentionally or intentionally) to provide provision for losses until they were incurred even when it was obvious that they were coming.

For banks, the most important change caused by the new standard will be their approach to impairment of loans, although asset classification and hedge accounting will also be affected.

Following the implementation of MFRS-9, loans can be in one of any three stages as shown below in Table 1. Loans that were just created and are performing will be categorized under Stage 1, whereby banks are only required to make provisions based on projected losses over 12 months.

However, when there is a deterioration in credit quality that makes the loans fall into Stage 2, then banks are required to provide over the expected lifetime of the loan, like they do for Stage 3, under which non-performing loans fall.

	Stage 1: Performing	Stage 2: Under-performing	Stage 3: Non-performing
Expected credit losses (ECL)	12 months ECL	Lifetime ECL	Lifetime ECL
Criterion	No significant increase in credit risk	Credit risk increased significantly	Credit-impaired assets
Interest revenue based on:	Gross carrying amount	Gross carrying amount	Net carrying amount

Table 1: General model for MFRS 9 impairment

Given the stricter new approach of IFRS 9 on the impairment of loans which will be applied by the major countries in the world, hence it brings us to an important question.

How will this new approach of IFRS-9 help in term of establishing a strong financial institution that will be able to withhold financial crisis impact and at the same time providing growth to the economy of the country by becoming a better intermediary between the people in the county mainly in accepting deposit (savings) and giving out loans.

This intermediary function of bank is very vital given the changes of the global economy for the past few decades, whereby we have witnessed substantial deregulation of the financial market through major abolishment of capital controls as well as advances in technology and communication that made favour for more international trade transactions.

The objective of this paper is to investigate the dynamic relationship between savings, bank loans, economic growth in terms of real output and trade transactions in the implementation of IRFS-9 using Malaysia as a case study.

Generally, savings are good for the economy, however, too much savings can also be harmful since it will slow down the economic growth of the country. Loans on the other hand are the main tool for bank to generate revenue. However, more loans will also mean higher cost to bankruptcy to the financial institution. We would also like to see the relationship between these two variables i.e. savings and loans and how they impact the economic growth and trade transactions of the country.

So, is it savings that drive loans or the other way around? And what will be the impact on these variables given the conditions of the economic growth and trade transactions of the country? Empirically, the issue remains unresolved, i.e. not conclusive. Some papers Nuno Carlos Leitao (2012) and Sara Venancio & Maria Candida Ferreira (2013) support that savings is the drive for economic growth and other paper such as Muhammad Zafar Iqbal, Nisar Ahmad & Zakir Hussain (2012) supports that loans are the main driver for economic growth. Jacob Donkor & Frank Agyemang Duah (2013) on the other hand found that savings are the main driver for loans. In addition, we can also see that the data results found were also not conclusive.

Hence, we would like to make an humble attempt with the help of time series technique found by Engle and Granger, 1987 on the above issue. We used four cointegration techniques namely Engel-Granger, Johansen, ARDL and NARDL in this paper. There were inconsistent results found between these techniques. Saying that, we continued with Johansen in finishing the steps of the time series techniques.

After running the regression, we found that trade transactions variable is the most endogenous variable followed by savings, economic growth and loans.

$$DTR \leftarrow DSA \leftarrow DGD \leftarrow DLO$$

Hence, this paper supports the implementation of the IFRS- 9 to make a higher and more prudence impairment of loans to ensure that the financial institutions will only give out good loans to good customers. This is very vital since we found that loan is the most exogenous variable in the equation.

Saying that, the rest of the paper will be structured as follows. The third section will briefly review the relevant literature. The fourth section will represent the data and methodology employed in the paper. The fifth section will discuss the results and the final section will conclude the paper.

2.0 Literature Review

There are many studies that have been conducted in the past to see the relationship between savings, loans and economic growth specifically. First, we can see from Pinchawee Rasmidatta & Xiang Lin (2011) whom studied the relationship between domestic savings and economic growth by using Thailand as their case study. They conducted Granger causality test using time series annual data from 1960 to 2010 whereby they found that domestic saving does not play any role to enhance economic growth in Thailand.

Nuno Carlos Leitao (2012) on the other hand investigated the link between bank lending and economic growth for European Union (EU-27) for the period between 1990 and 2010 using dynamic panel data (GMM-System estimator) whereby they found that savings stimulates growth where else domestic credit i.e. loans discourages growth.

Muhammad Zafar Iqbal, Nisar Ahmad & Zakir Hussain (2012) studied the impact of savings and credit on economic growth using Pakistan as the case study by

employing time series data between 1973 to 2007. From their study, they found that both savings and credit give positive impact to economic growth. However, they also found that credit give more impact to economic growth as compared to savings.

On the other hand, Sara Venancio & Maria Candida Ferreira (2013) investigated the relationship between financial development (through domestic credit and savings) and economic growth, using two panel of 17 and 19 developed countries, covering the period from 1980 to 2011 and 2000 to 2011, respectively. They found that domestic credit given by the banking sector to the private sector are negatively correlated with growth while gross domestic savings has the opposite outcome i.e. positive relationship with economic growth.

Lastly, we have Jacob Donkor & Frank Agyemang Duah (2013) whom studied the relationship between savings and credit in rural banks using Ghana as the case study. They conducted the studied for the financial year between 2004 to 2011 whereby both financial and non-financial analysis are being considered. Empirical results from assessing the model between 2004 to 2011 shows that total deposits have increased from GH¢8.692 to GH¢152.65 million during that period. For the same period, credits were also found to increase from GH¢1.559 to GH¢110.42 million. Therefore, they conclude that savings lead to more credits.

Therefore, this paper will try to make an attempt to bring a small contribution to the many literatures by analysing the relationship between savings, bank loans, economic growth and trade transactions by taking Malaysia as the case study and what role will this relationship play in the new implementation of IRFS 9 starting 2018.

3.0 Data and Methodology

All data from this paper are obtained from the World Bank's World Development Indicators[1]. Our analysis will be based on a four-variable framework: savings, bank loans, economic growth i.e. real output and trade transactions. Savings are measured by gross savings in terms of percentage of GDP (SA). We used the domestic credit to private sector by banks in term of percentage of GDP to represent bank loans (LO). Economic growth is represented by Gross Domestic Product (GD) and lastly, we use trade in terms of percentage of GDP as measure of trade transactions. Annual data of

[1] http://databank.worldbank.org

all the variables are available for Malaysia for 43 years starting from 1974. We wish to see the relationship between savings and bank loans and how does it relate to the trade transactions in Malaysia i.e. changes in the degree of openness of international trade and how then this relate to the economic growth in Malaysia.

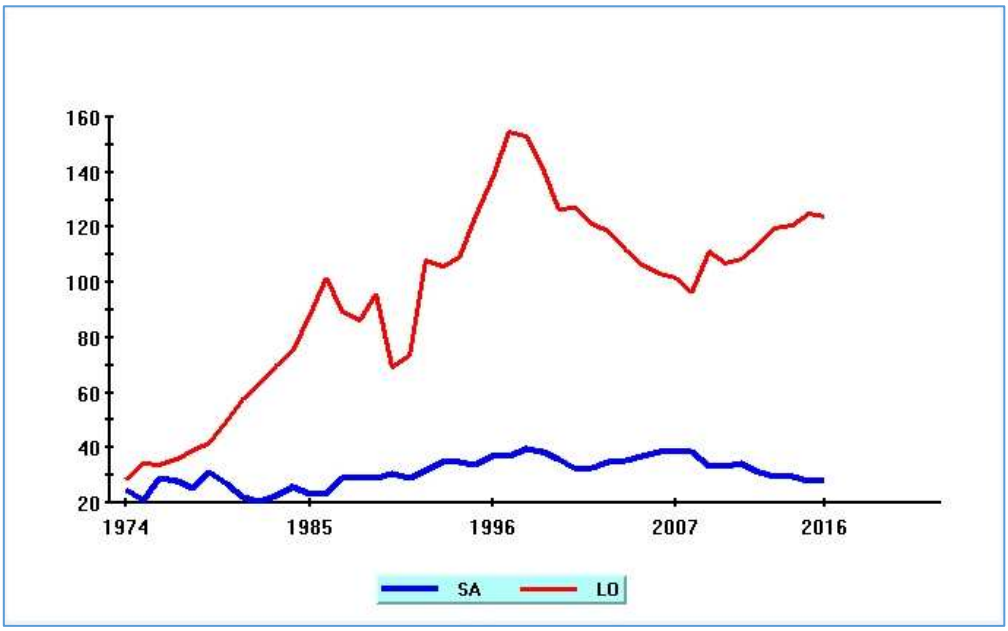

Figure 1: Simple plot of the savings and bank loans variables.

From the above graph, we can see close relationship between the degree of savings (SA) and loans (LO) since 1974 till around 1979. Then, from there we can see the value of loans are on an increasing trend as compared to savings. Every time, there is a financial crisis situation, we can see that LO will reduce, hence, moving closer to SA. This Is true during both the Asian Financial Crisis 1997 and Global Financial Crisis 2008/2009, whereby from the graph we can see the amount of loans are reduced for both crisis periods.

For our further analysis using the four variables data, we will transform them into logarithmic and first difference forms as some of the tests require them to be in those forms.

We will have basically eight steps in performing the standard time series econometrics methodologies. We will start of our first step with the Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests. Then, we will do the test for lag order selection. Third step, we will do the test of

cointegration using four method, i.e. Engle-Granger, Johansen, Autoregressive Distributed Lag (ARDL) and Non-linear Autoregressive Distributed Lag (NARDL).

Then, we will check the Long-run structural modelling (LRSM). Fifth step will be the Vector Error Correction Model (VECM) followed by the Variance Decomposition (VDC) test. Step number seven will be the Impulse Response Function (IRF) test and lastly the Persistence Profile (PP) test.

4.0 Results

5.1 Step 1: Unit Root Tests

In order to determine whether the variables SA, LO, GD and TR are stationary or non-stationary, we use the unit root tests by using Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests.

Non-stationary is the null hypothesis for ADF and PP tests while for KPSS test, the null is stationary. While the ADF test corrects for correlation, the PP test corrects for both autocorrelation and heteroscedasticity.

Table 2a: ADF Tests

	VARIABLE	ORDER	T-STAT.	C.V.	RESULT		VARIABLE	ORDER	T-STAT.	C.V.	RESULT
LOG FORM	LSA	1	- 1.622	-3.527	Non-Stationary	1ST DIFF. FORM	DSA	1	-5.624	-3.472	Stationary
	LLO	1	- 2.712	-3.527	Non-Stationary		DLO	1	-5.020	-3.472	Stationary
	LGD	1	- 2.898	-3.527	Non-Stationary		DGD	1	-4.723	-3.472	Stationary
	LTR	1	- 0.277	-3.527	Non-Stationary		DTR	1	-4.116	-3.472	Stationary

Table 2b: PP Tests

	VARIABLE		T-STAT.	C.V.	RESULT		VARIABLE		T-STAT.	C.V.	RESULT
LOG FORM	LSA		- 1.988	-3.481	Non-Stationary	1ST DIFF. FORM	DSA		-9.437	-3.551	Stationary
	LLO		- 1.943	-3.481	Non-Stationary		DLO		-6.808	-3.551	Stationary
	LGD		- 1.269	-3.481	Non-Stationary		DGD		-5.505	-3.551	Stationary
	LTR		0.066	-3.481	Non-Stationary		DTR		-4.693	-3.551	Stationary

Table 2c: KPSS Tests

	VARIABLE		T-STAT.	C.V.	RESULT		VARIABLE		T-STAT.	C.V.	RESULT
LOG FORM	LSA		0.129	0.200	Stationary	1ST DIFF. FORM	DSA		0.137	0.172	Stationary
	LLO		0.144	0.200	Stationary		DLO		0.159	0.172	Stationary
	LGD		0.190	0.200	Stationary		DGD		0.170	0.172	Stationary
	LTR		0.134	0.200	Stationary		DTR		0.126	0.172	Stationary

Table 2: Unit Root Tests: ADF, PP & KPSS

The results from both ADF, PP and KPSS tests for the four variables are shown in Table 2a, Table 2b and Table 2c above.

For Engle-Granger or Johansen tests, the variables need to be non-stationary while in ARDL, the variables can be stationary or non-stationary. As we can see from the tables, the result for both ADF and PP tests allows us to move forward with the Engle-Granger or Johansen test for cointegration. We can only test for one cointegration if we are using Engle-Granger method while Johansen allows us to test more than one cointegration.

On the other hand, results from KPSS shown in Table 2c suggests that the variable are stationary which are in contrast to the results we got from ADF and PP tests. Since ADF and PP are subject to asymptotic properties, hence, they need a large sample size. This criterion may not be satisfied with the annual data that we are working with, as it only covers from 1974 to 2016 spanning at most 43 observations. Since there are conflict results between ADF and PP tests with the KPSS test, hence we cannot be 100% sure that the variables are non-stationary. Hence, once we find cointegration in Engle-Granger or Johansen tests, we will proceed with the ARDL and NARDL test.

5.2 Step 2: Test for Lag Order Selection

The ARDL econometric specification depend on the assumption that the error term is serially uncorrelated. Therefore, it is vital to select a suitable lag order of p that is high enough to eliminate issues of serial correlation. However, since we have relatively small sample size, we should avoid over-parameterization and be cautious not to take in too many lags.

A conditional error correction model (ECM) is estimated by ordinary least squares (OLS). The optimal lag length is steered by the highest value of the Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC) as shown in Table 3 below. Details of the result test is attached in Appendix.

AIC focuses on a large value of log-likelihood, and hence inclines to select a higher order of lags, whereas SBC is concerned with over-parameterization, and hence inclines to select a lower order of lags.

Order	AIC	SBC	p-Value	C.V.
1	149.333	133.498	[.997]	5%

Table 3: Test Statistics and Choice Criteria for Selecting the Order of the VAR Model

5.3 Step 3: Approach to Cointegration

We start off with the Engle-Granger test and then we proceed with Johansen test to find that there exist two cointegration as per Table 4 below.

Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix					
Null	**Alternative**	**Statistic**	**95% Critical Value**	**90% Critical Value**	**Result**
r = 0	r = 1	29.646	31.790	29.130	2 cointegration
r<= 1	r = 2	27.678	25.420	23.100	
Cointegration LR Test Based on Trace of the Stochastic Matrix					
Null	**Alternative**	**Statistic**	**95% Critical Value**	**90% Critical Value**	**Result**
r = 0	r>= 1	79.902	63.000	59.160	2 cointegration
r<= 1	r>= 2	50.256	42.340	39.340	

Table 4: Johansen Cointegration test

There are two stages involved in the ARDL bounds testing. The first stage is to test whether there exists a long-run relationship between the variables that we are testing i.e. SA, LO, GD and TR. This is computed by testing the F-statistic for testing the significance of the lagged levels of the variables in the error correction form of the underlying ARDL model. The null hypothesis of this test is that there exists no long-run relationship between the variables.

The second stage of the analysis is to estimate the coefficients of the long-run relations and make interpretations about their figures.

In the first stage, if we find that the computed F-test is above the upper bound, then we have sufficient evidence of cointegration i.e. reject the null hypothesis of no long-run relationship between the variables. On the other hand, if the computed F-test is less than the lower bound, then we have insufficient evidence of cointegration. If the computed F-value falls in between the upper and lower bounds, then the result is inconclusive.

However, this test is only reliable for sufficiently large samples and this might not be the case for smaller samples. From our result as attached in Appendix, we can see that our computed F-test is less than the lower bound hence, we could not reject the null hypothesis of no long-run relationship between the variables.

Before concluding that this result might be due to the smaller sample size that we have, we proceed to run the NARDL test to find out if there is long-run relationship between the variables in a non-linear model. As per the result in Table 5 below, we

can see that the F-test is still below the lower bound which support the conclusion of no long-run relationship available between these variables.

Asymmetry statistics:

Exog. var.	Long-run effect [+] coef.	F-stat	P>F	Long-run effect [-] coef.	F-stat	P>F
lo	0.068	.5084	0.481	-0.079	.2435	0.625
gd	0.000	.	.	0.000	.	.
tr	0.000	.	.	0.000	.	.

	Long-run asymmetry F-stat	P>F	Short-run asymmetry F-stat	P>F
lo	.01774	0.895	.01489	0.904
gd	.	.	.	.
tr	.	.	.	.

Note: Long-run effect [-] refers to a permanent change in exog. var. by -1

Cointegration test statistics: t_BDM = -1.7130
F_PSS = 1.3676

Model diagnostics	stat.	p-value
Portmanteau test up to lag 18 (chi2)	12.63	0.8130
Breusch/Pagan heteroskedasticity test (chi2)	.	.
Ramsey RESET test (F)	.	.
Jarque-Bera test on normality (chi2)	.8717	0.6467

Table 5: Test for non-linear ARDL cointegration

With the NARDL test, we can safely conclude that these results we found in ARDL and NARDL are in contrast with the result we got from Johansen test which support the existence of two cointegration among the variables of our study. Therefore, we will proceed with the remaining tests using our Johansen result.

5.4 Step 4: Long-run structural modelling (LRSM)

For the long-run structural modelling (LRSM), there are two tests involved. First is the exact identification. From Table 6 below (full results are attached in Appendix), we divide the coefficient by standard error to find the t-statistic. If the t-statistic is greater than two, then that variable has significant impact on our dependent variable.

From the table we can see that only LTR is a significant variable and the rest are insignificant.

VRBL	Coefficient	Standard Error	T-test
LSA	1.000	(*NONE*)	N/A
LLO	.29341	.35839	0.81869
LGD	.13134	.40458	0.32463
LTR	-.70033	.27363	2.55941
Trend	-.023690	.032296	0.73353

Table 6: LRSM – Exact Identification

Next step is to do the over identification test to the other four variables, LLO, LGD, LTR and Trend. As per Table 7 (full results are attached in Appendix), we can see that the results of the over identification tests are in line with the exact identification test except for the variable LTR. In exact identification test, we found that the variable LTR is significant, however, in over identification test, the variable is found to be insignificant.

VRBL	PANEL A	PANEL B	PANEL C	PANEL D	PANEL E	PANEL F
LSA	1.000	1.0000	1.0000	1.0000	1.0000	1.0000
	(*NONE*)	(*NONE*)	(*NONE*)	(*NONE*)	(*NONE*)	(*NONE*)
LLO	.29341	0.00	.39279	-6.8866	.52416	0.00
	(.35839)	(*NONE*)	(.20335)	(.40290)	(.25719)	(*NONE*)
LGD	.13134	.43844	0.00	1.2465	-.17103	0.00
	(.40458)	(.30143)	(*NONE*)	(.86107)	(.066636)	(*NONE*)
LTR	-.70033	-.49782	-.76608	-.0000	-.85649	-.44839
	(.27363)	(.13701)	(.19079)	(*NONE*)	(0.22005)	(.11448)
Trend	-.023690	-.046939	-.013458	-11073	-.0000	-.0088837
	(.032296)	(.028092)	(.0049395)	(.073922)	(*NONE*)	(.0040923)
CHSQ(1)	NONE	.45227[.501]	.11163[.738]	1.3561[.244]	.54407[.461]	
CHSQ(2)						4.4244[.109]

Table 7: LRSM – Exact and Over Identification

Hence, should be drop the LLO and LGD variables due to their insignificant determinant of the dependent variable? Statistically yes but economically we should not drop it since these variables might be the one that bring all the variables together. Plus, our result might have been bias due to the smaller sample that we have.

5.5 Step 5: Vector Error Correction Model (VECM)

Even though from Johansen test, we found that there exist cointegration i.e. long-run relationship between the variables savings (SA), bank loans (LO), economic growth (GD) and trade transactions (TR), it does not tell us about the short-run adjustment that takes place in order to bring about the long-run equilibrium which will be tested and interpreted from our next time Vector Error Correction Model (VECM).

VECM test helps us to find out which variable is exogenous (strong) and which variable is endogenous (weak), whereby the coefficient of ecm(-1) is taken as the speed of adjustment. If the figure is zero, then there exists no long-run relationship. If the speed of adjustment figure is between -1 and 0, then there exists partial adjustment. A value which is smaller than -1 indicates that the model over adjusts in the current period.

From Table 8 below (full results are attached in Appendix), we found that all variable is exogenous (leader) except for LTR.

We do expect for TR to be an endogenous variable, however, we also expect DSA to also be an endogenous variable. Saying that, we will further investigate the relative exogeneity and endogeneity of all the variables using Variance Decomposition (VDC) test.

ecm1(-1)	Coefficient	Standard Error	T-Ratio [Prob.]	C.V.	Result
dLSA	-.18453	.12073	-1.5285[.134]	5%	Exogenous
dLLO	.20079	.13465	1.4913[.144]	5%	Exogenous
dLGD	.14631	.13974	1.0470[.301]	5%	Exogenous
dLTR	.20021	.066556	3.0081[.005]	5%	Endogenous

Table 8: VECM – Test to determine Exogenous and Endogenous variables

5.6 Step 6: Variance Decomposition (VDC)

Different from VECM, VDC tells us information about the relative endogeneity or exogeneity of the variables of our interest. The VDC test disintegrate the variance of the predicted error of each variable into proportions attributable to shocks from each variable in the system together with its own. Exogenous variables are the one that

depends most on its own past. With this information, policymakers can control the endogenous variable by setting the exogenous variable as an intermediate target.

There are two forms of VDCs: orthogonalized and generalized. Generalized VDCs are more informative for two reasons. Firstly, orthogonalized VDCs are not exclusive and depend on the exact ordering of the variables in the VAR, whereas generalized VDCs are does not depend on the ordering of the variables. Secondly, the orthogonalized VDCs assumes that when a particular variable is shocked, all other variables in the model are switched off, but the generalized VDCs do not make such assumption.

The results for the generalized and orthogonalized VDCs are displayed in Table 9 below. The variable that is ranked higher is the leading variable, and therefore should be set as the intermediate goal by policymakers. We include five-time horizons, 2, 4, 6, 8 and 10, to depict the short-term, the medium-term and the long-term impact of shocks, respectively.

In both generalized and orthogonalized VDC models, we found that trade transactions (DTR) is the weakest variables throughout all the time horizons. In the generalized VDC model, we found that bank loans (DLO) is the strongest variable, followed by economic growth (DGD) and savings (DSA). However, in the orthogonalized VDC model, we found that savings (DSA) is the strongest variable, followed by bank loans (DLO) and finally economic growth (DGD).

GENERALIZED APPROACH

Horizon	Variable	DSA	DLO	DGD	DTR
2 years	DSA	71.13%	4.85%	9.01%	15.01%
	DLO	2.18%	86.56%	1.95%	9.31%
	DGD	16.43%	3.48%	80.04%	0.04%
	DTR	30.33%	8.69%	1.20%	59.78%
	Exogeneity	71.13%	86.56%	80.04%	59.78%
	Ranking	3	1	2	4
4 years	DSA	69.63%	5.07%	8.56%	16.74%
	DLO	2.20%	87.82%	1.29%	8.69%
	DGD	19.85%	3.55%	76.51%	0.10%
	DTR	39.11%	8.16%	2.29%	50.45%
	Exogeneity	69.63%	87.82%	76.51%	50.45%
	Ranking	3	1	2	4
6 years	DSA	68.33%	5.25%	8.20%	18.22%
	DLO	3.18%	87.72%	0.95%	8.15%
	DGD	22.08%	3.58%	74.20%	0.14%
	DTR	43.93%	7.81%	2.99%	45.27%
	Exogeneity	68.33%	87.72%	74.20%	45.27%
	Ranking	3	1	2	4
8 years	DSA	67.21%	5.40%	7.89%	19.50%
	DLO	4.29%	87.22%	0.76%	7.73%
	DGD	23.59%	3.60%	72.64%	0.17%
	DTR	46.81%	7.59%	3.44%	42.16%
	Exogeneity	67.21%	87.22%	72.64%	42.16%
	Ranking	3	1	2	4
10 years	DSA	66.24%	5.53%	7.64%	20.59%
	DLO	5.29%	86.66%	0.64%	7.41%
	DGD	24.64%	3.61%	71.55%	0.19%
	DTR	48.66%	7.44%	3.74%	40.16%
	Exogeneity	66.24%	86.66%	71.55%	40.16%
	Ranking	3	1	2	4

ORTHOGONOLIZED APPROACH

Horizon	Variable	DSA	DLO	DGD	DTR
2 years	DSA	99.69%	0.02%	0.01%	0.27%
	DLO	2.43%	97.37%	0.01%	0.19%
	DGD	20.25%	0.98%	78.69%	0.08%
	DTR	44.98%	4.16%	2.62%	48.24%
	Exogeneity	99.69%	97.37%	78.69%	48.24%
	Ranking	1	2	3	4
4 years	DSA	99.07%	0.07%	0.04%	0.81%
	DLO	2.30%	97.22%	0.02%	0.46%
	DGD	25.13%	0.83%	73.85%	0.19%
	DTR	60.23%	3.00%	1.90%	34.87%
	Exogeneity	99.07%	97.22%	73.85%	34.87%
	Ranking	1	2	3	4
6 years	DSA	98.32%	0.13%	0.08%	1.47%
	DLO	3.16%	96.12%	0.04%	0.68%
	DGD	28.42%	0.74%	70.57%	0.28%
	DTR	68.49%	2.38%	1.50%	27.63%
	Exogeneity	98.32%	96.12%	70.57%	27.63%
	Ranking	1	2	3	4
8 years	DSA	97.56%	0.18%	0.12%	2.14%
	DLO	4.13%	94.96%	0.05%	0.86%
	DGD	30.67%	0.68%	68.32%	0.34%
	DTR	73.31%	2.02%	1.27%	23.40%
	Exogeneity	97.56%	94.96%	68.32%	23.40%
	Ranking	1	2	3	4
10 years	DSA	96.84%	0.24%	0.15%	2.77%
	DLO	4.98%	93.99%	0.05%	0.99%
	DGD	32.26%	0.63%	66.72%	0.39%
	DTR	76.35%	1.79%	1.13%	20.73%
	Exogeneity	96.84%	93.99%	66.72%	20.73%
	Ranking	1	2	3	4

Table 9: Variance Decomposition

Nevertheless, as mentioned before, the advantages of using the generalized VDC model as compared to the orthogonalized VDC model, we will stick with the results of the generalized VDC model. Given the results produced from the generalized VDC model, it means policymakers can set bank loans as the intermediate target to influence economic growth, which will further influence savings and trade transactions.

5.7 Step 7: Impulse Response Function (IRF)

Next will be the impulse response function (IRF) test whereby it shows the impact of a shock of one variable on others, their degree of response and how long it would take to normalize. We assume that if a leading variable is shocked, the response of the weak variables will be significant.

From our analysis of the VDC earlier, we have seen that bank loans variable is our leading variable. Below in Figure 2 are the graphs for the generalized IRF when each of the variables are shocked separately. We also attached the graphs for the generalized IRF using the ADRL model in Figure 3 for comparison.

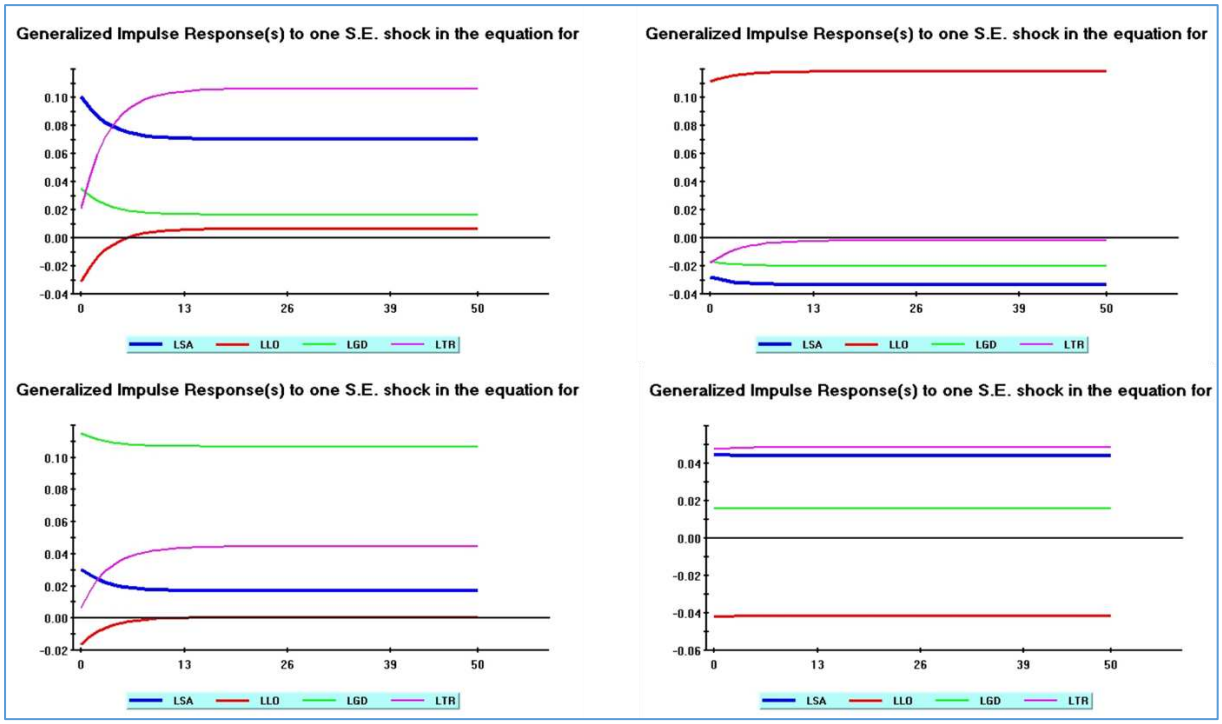

Figure 2: Generalized Impulse Response Function model from 8 Steps

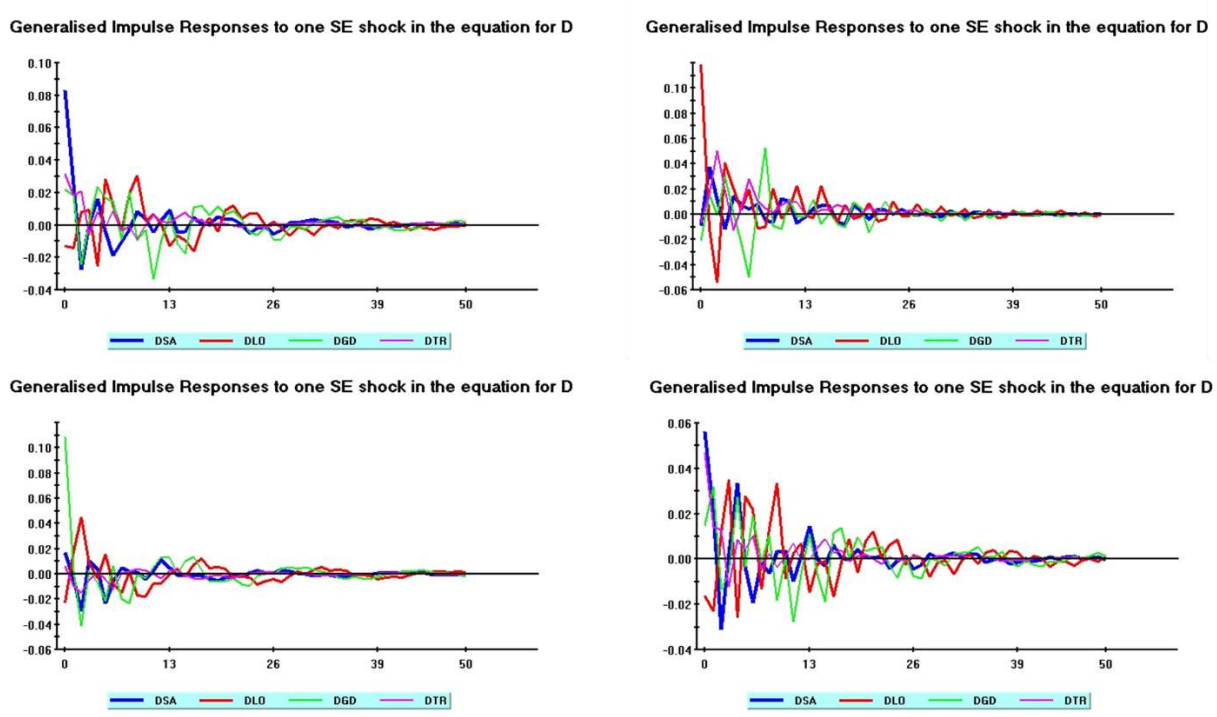

Figure 3: Generalized Impulse Response Function model from ARDL

Consistent with our predictions, we observe that if the bank loans variable is shocked, the response from the other variables appears to be significant and takes much longer to normalize than when other variables are shocked.

5.8 Step 8: Persistence Profile (PP)

Last and final step will be the Persistence Profile (PP) test. As we can see from the below graph in Figure 4. The PP determines how long it would take for the whole system to stabilize if all the variables are shocked by some external factors, for example global financial crisis and so on

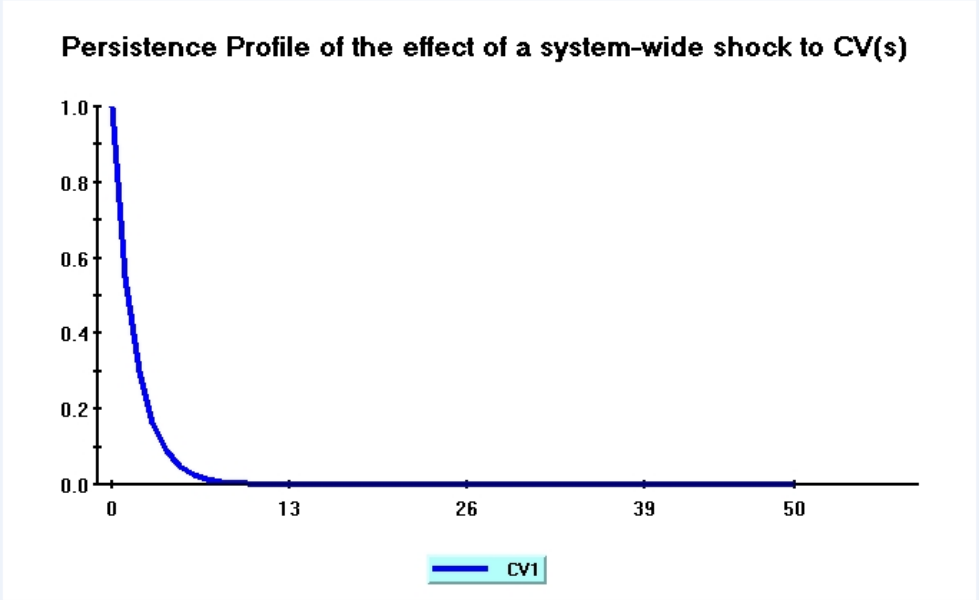

Figure 4: Persistence Profile (PP) test

6.0 Conclusion

We conduct a time series analysis involving four-variables which are savings, bank loans, economic growth and trade transactions using Malaysia as the case study in order to better understand the effect of the new implementation of IFRS 9 starting 2018. With the new implementation of IRFS 9, banks might need to revamp their policy in giving out loans to customers since there exists the possibility for them to do a lifetime allocation for impairment of loans once their loans fall into Stage 2.

Overall, we found mixed evidence from our Engle-Granger, Johansen, ARDL and NARDL cointegration tests due to smaller sample size. Saying that, we continue our test based on Johansen results whereby we found strong evidence of cointegration for the four variables of our interest.

Specifically, we found that bank loans variable to be the most exogenous (leading) variable followed by economic growth, savings and trade transactions. Hence, from here, policymakers can set bank loans rate as an intermediate target to affect economic growth, savings and trade transactions.

In addition, our findings are in line with the initiative of London-based International Accounting Standard Board to issue IRFS 9 which was to address the problem of under allocation of impairment of loans that possibly partly brought about the 2008/2009 global financial crisis. The issue of under allocation might be due to lower standard that exists before the introduction of IRFS 9. Also, it might be due to

the cheap credit that banks were giving out to maximise their profit. The IFRS 9 introduction is to ensure that banks give serious attention to the way they managed their loans.

In conclusion, from our various tests above, we found that there exists a long-run relationship between bank loans being the leader followed by economic growth, savings and trade.

7.0 References

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