DOI: 10.7763/IPEDR. 2012. V55. 16

Financial Sector and Economic Growth in Malaysia: Sectoral Shock Analysis

Siti Muliana Samsi [a,b], Zarinah Yusof [a] and Kee-Cheok Cheong [a]

[a] Faculty of Economics and Administration, University Malaya, 50603 Kuala Lumpur, Malaysia

[b] Faculty of Business Management, University Technology MARA, 40450 Shah Alam, Malaysia

Abstract. Findings from the generalized impulse response functions (IRFs) reveal that innovations in the stock market, real estate market and banking sector have significant impacts on economic growth. Further analysis on the variance decompositions (VDC) confirms that variance in economic growth is explained most by innovation in the stock market and the real estate market. This finding suggests that the banking sector is not the major source of output variability.

Keywords: Real Sector, Financial Sector, Impulse Response Function, Variance Decompositions.

1. Introduction

Studies have shown that the financial sector plays an important role in a country's economic growth. It generates spillover effects on other sectors of the economy (UNDP, 2009: p.60). The recent global financial crisis has major impacts on the financial sector and hence on economic growth. For Malaysia, the crisis has driven the economy into a recession. As a highly open economy, Malaysia is not insulated from global economic downturn. Deterioration in the global economy had decreased the economic growth from 6.3 per cent in 2007 to 4.8 per cent in 2008 and -1.5 per cent in 2009. Several measures taken by the government via fiscal stimulus and easing monetary policy had brought about a strong recovery in 2010.

This study analyzes the effects of the financial sector on the real sector. Specifically, it examines the effects of the financial sub-sectors, namely stock market, banks and real estate on the level of real output. Given that some sectors are more vulnerable to financial crises than others, assessing the relationship from sectoral data may give more accurate assessment of the effects of financial sector on the level of real output. This also implies that real output may be more sensitive to certain financial sub-sectors. It can be used to benchmark how far real output is affected by the financial crises as claimed by others (Stiglitz, 1999; Kutan et al., 2012). This study raises two questions. First, do financial sector shocks affect the real sector in Malaysia? Second, is the real sector hit by variable-specific shocks or system-wide shocks? This study attempts to shed some lights on the dynamic relationship of the sectors and thus contributes new knowledge.

2. Literature Review

Understanding the channels that exist between the real and financial sectors in the economy is especially important when assessing financial stability and determining economic performance (Johnston and Pazarbasioglu, 1995). Since the emergence of endogenous growth theory, the importance of financial development has been widely studied (King and Levine, 1993; Denizer et al., 2002). Motivated by the work of King and Levine (1993), Johnston and Pazarbasioglu (1995) tried to examine the importance of the financial sector in determining economic performance. Their studies demonstrate that reforms in financial sector have important structural implications in the way financial sector variables affect the real economy. Although some researchers attempt to examine the causality between the financial and real sectors (Denizer et al., 2002; Ang and McKibbin, 2007; Jaafar and Ismail, 2009; Nidhiprabha, 2011), there is no clear consensus regarding the effects of the financial sector on the real sector or vice versa.

A growing body of literature has developed studying the feedback between the real economy and the financial sector in times of economic shocks. Dovern et al. (2010) noted that the well being of the banking sector can be affected by macroeconomic shocks, but bank lending plays no role in transmitting financial shock to the real sector (Mansor, 2006). In the context of the global financial crisis, Nidhiprabha (2011)

asserts that although the real and financial sectors in Thailand are susceptible to adverse impacts of external shocks, it had little impact on the financial sector. It can be argued that this finding shows the ambiguity of empirical findings in explaining the impact of external shocks on the real sector and the financial sector in Thailand. Even though research on the link between the financial sector and economic growth has been documented by previous studies, there is no conclusive evidence on the dynamic interaction between the financial sector and the real sector. Thus, this study attempts to redress this gap by investigating the effect of financial sector innovation on economic growth in Malaysia over the period 1986 to 2011.

3. Methodology and Data

This study used quarterly data covering the period 1986:1 to 2011:4. The financial sub-sectors were measured by financial sectoral indices, namely, the Kuala Lumpur Stock Exchange (klse), banks (bnk), and real estate (res). Other macroeconomic variables included in the model are real GDP (y), the money supply (m), the interest rate (r), inflation (p), and the exchange rate (e). All the indicators are treated as exogenous variables except real GDP (y) is an endogenous variable. The data of macroeconomic variables are from the IMF's International Financial Statistics and all the indices are obtained from the Datastream database. All the series are in logarithmic form except for the interest rates and the exchange rate.

The data were analyzed utilizing the cointegration test, vector autoregression (VAR) framework, impulse response functions (IRFs) and variance decompositions (VDC) analysis. Before performing the cointegration test, the properties of the series were checked by the unit root tests. For meaningful results all the series should be stationary. The unit root tests were performed based on the Augmented Dickey and Fuller (ADF) test and Phillips Perron (PP) test. The cointegration test follows Johansen and Juselius (1990) approach. The Johansen and Juselius procedure specifies two likelihood ratio test statistics referred to as λ_{trace} and λ_{max}. The number of lags in the cointegration tests is based on the information provided by the selection of lag length information criteria. The dynamic interactions between the real and financial sectors were analyzed by the IRFs and VDC analysis. The impulse response function for the cointegrating VAR model can be based on the VECM model. The orthogonalized impulse responses for the cointegrating VAR model will be computed in exactly the same way as in the case of stationary VAR models. The difference is that the matrices in the moving-average representation tend to zero when the underlying VAR model is trend-stationary, and non-zero when the underlying VAR model is first-difference stationary.

The estimating model is given as follows,

$$\Delta y_t = \alpha + \sum_{i=1}^{\rho_i} \delta_{1i} \Delta sp_{t-1} + \sum_{i=1}^{\rho_i} \tau_{1i} \Delta m_{t-1} + \sum_{i=1}^{\rho_i} \theta_{1i} \Delta r_{t-1} + \sum_{i=1}^{\rho_i} \eta_{1i} \Delta p_{t-1} + \sum_{i=1}^{\rho_i} \psi_{1i} \Delta e_{t-1} + \gamma ECT + \varepsilon_t$$

Where *sp* are financial sectoral indices namely, Kuala Lumpur Stock Exchange, banks and real estate. Whereas *y*, *m*, *r*, *p*, *e*, and *ECT* are real output, the broad money (M2), the interest rate, inflation, the exchange rate, and the error-correction term. The ECT is obtained from the cointegration equation.

4. Findings

The results of the ADF and PP tests (Table 1) show that all variables in level contain a unit root. The same tests are applied to the first differences and the results show that all the variables are stationary and all the variables are integrated of order one, *I*(1). Therefore, we proceed to the cointegration analysis. This study finds that there are two cointegrating equations in Model A, and C and one in Model B (Table just 2). All the series are cointegrated in the same order.

Table 1: Unit Root Test

	Augmented Dickey Fuller H_0: Unit Root			Phillips Perron H_0: Unit Root		
Series	Level		Difference	Level		Difference
	Tμ	Tτ	Tμ	Tμ	Tτ	Tμ
klse	-2.148[4]	-2.884 [4]	-5.760 [4]^a	-2.372[4]	-2.938[4]	-10.05[4]^a
bnk	-1.560[4]	-2.996 [4]	-5.749 [4]^a	-1.688[4]	-2.990[4]	-9.746[4]^a
res	-2.277[5]	-2.981 [5]	-5.576 [5]^a	-2.402[5]	-3.039[7]	-10.44[5]^a
y	-1.936[4]	-2.666 [4]	-4.792 [4]^a	-1.684[4]	-2.329[4]	-10.95[4]^a
m	-0.618[4]	-1.775 [4]	-3.333 [4]^b	-0.510[4]	-1.407[4]	-7.924[4]^a
r	-2.204[4]	-2.876 [2]	-5.290[4]^a	-2.571[4]	-2.878[4]	-7.684[4]^a

p	-1.134[4]	-1.417 [4]	-4.310[4][a]	-0.611[4]	-1.331[4]	-7.792[4][a]
e	-1.629[4]	-1.460 [4]	-4.680 [4][a]	-1.591[4]	-1.557[4]	-9.824[4][a]

Notes: a and b represents significant level at 1 per cent and 5 per cent respectively. τ_μ represents the model with intercept; and, τ_τ is the model with trend and intercept. Numbers in brackets are number of lags used in the ADF test in order to remove serial correlation in the residuals. At n=103, the ADF critical values are -3.50 (1 per cent), -2.89 (5 per cent), and -2.58 (10 per cent) for intercept (τ_μ); -4.06 (1 per cent), -3.46 (5 per cent), -3.15 (10 per cent) for trend and intercept (τ_τ).

Table 2: Johansen Cointegration Test (multivariate analysis)

Trace Statistic (λ_{trace})							
	k	r = 0	r ≤ 1	r ≤ 2	r ≤ 3	r ≤ 4	r ≤ 5
Vector : [y, klse, m, r, p, e]							
Model A	5	133.7634[b]	80.4856[b]	46.1190	27.2135	10.9492	0.70541
Vector : [y, bnk, m, r, p, e]							
Model B	5	123.2488[b]	65.4377	31.8436	18.2721	6.7207	0.000093
Vector : [y, res, m, r, p, e]							
Model C	5	139.0924[b]	80.0108[b]	43.6098	25.2432	11.7040	0.019848
Max Eigenvalue Statistic (λ_{max})							
		r = 0	r ≤ 1	r ≤ 2	r ≤ 3	r ≤ 4	r ≤ 5
Vector : [y, klse, m, r, p, e]							
Model A	5	53.2778[b]	34.3666[b]	18.9055	16.2642	10.2438	.70541
Vector : [y, bnk, m, r, p, e]							
Model B	5	57.8111[b]	33.5941	13.5715	11.5514	6.7206	0.000093
Vector : [y, res, m, r, p, e]							
Model C	5	59.0817[b]	36.4009[b]	18.3666	13.5392	11.6842	0.019848

Note: [b] denote significant at 5 per cent levels respectively. λ_{trace} and λ_{max} are the likelihood ratio statistics for the number of cointegrating vectors. The lag length (k) was selected based on Akaike Information Criteria (AIC).

Figure 1 shows that there is contemporaneous effect on real output to shocks in the banking sector (BNK), the real estate (RES) sector and the stock market (KLSE). However, this study finds that innovations in the real estate (RES) and the banks (BNK) have more effects on real output.

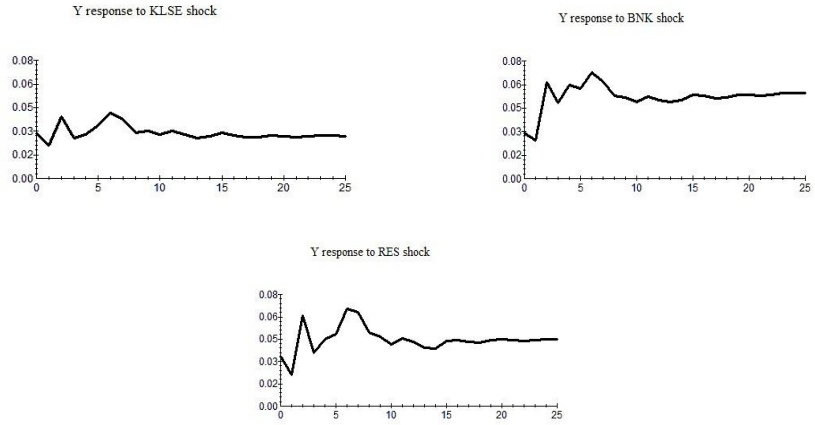

Fig. 1: Generalized Impulse Response Function of Growth

The results of variance decompositions (Table 3) show that nearly 0.73 to 0.90 per cent of the forecast error variance of the financial indices is explained by its own shock. Among the financial indices, it is shock in the stock market that has the largest effect on real output and the effect remain strong until the period 20. In fact, the effect on real output is the largest compared to other macroeconomic variables in the system. This suggests that the stock market is more dynamic, creating more movements in the level of real output. The real estate comes second and the effect is permanent. It is worth nothing that almost 90 per cent of the forecast error variance of the banking sector is explained by its own shock. This implies that shocks in the banking sector do not fully transmit to the system. Real output is less responsive to the movement in the banking sector. But this not the case for the interest rate variable as it response to the shock is the largest.

Table 3: Forecast Error Variance Decomposition of Economic Growth in VAR

Panel A [Vector: y, klse, m, r, p, e]

Period	ΔY	ΔKLSE	ΔM	ΔR	ΔP	ΔE
1	.08440	.91557	.08036	.03432	.00287	.02640
5	.13560	.76673	.18383	.06859	.03824	.02867
10	.17758	.76419	.14400	.05051	.03006	.02727
20	.17309	.74646	.10884	.04925	.01904	.01971

Panel B [Vector: y, bnk, m, r, p, e]

Period	ΔY	ΔBNK	ΔM	ΔR	ΔP	ΔE
1	.01734	.89564	.05712	.19703	.00120	.05204
5	.04386	.89069	.10173	.29167	.01841	.02239
10	.08075	.89114	.09958	.27888	.01958	.01672
20	.10431	.89566	.09768	.26613	.01702	.00951

Panel C [Vector: y, res, m, r, p, e]

Period	ΔY	ΔRES	ΔM	ΔR	ΔP	ΔE
1	.03643	.95260	.00548	.01894	.02939	.02275
5	.10563	.84200	.03174	.03347	.03204	.02568
10	.16306	.74189	.02666	.06189	.02768	.02340
20	.17328	.70391	.01662	.08686	.02104	.02011

5. Conclusions

This study examines the effect of financial sector innovation on economic growth. It analyzes three financial sub-sectors to access the dynamic interaction between the financial sector and economic growth. Findings from IRFs show that the financial sector has contemporaneous effect on the real sector. Interestingly, the result from the VDCs find that real output is more affected by movement in the stock market and the real estate. The banking sector has little role in transmitting shocks to the real sector. Output variability is mainly caused by the stock market and the real estate market.

6. References

[1] J. B. Ang, & W. J. McKibbin. Financial liberalization, financial sector development and growth: evidence from Malaysia. *Journal of Development Economics.* 2007, **84**(1): 215-233.

[2] Denizer, C. A., Iyigun, M. F., & Owen, A. Finance and macroeconomic volatility. *The BE Journal of Macroeconomics*. 2002, **2**(1): 1-30.

[3] Dovern, J., Meier, C. P., & Vilsmeier, J. How resilient is the German banking system to macroeconomic shocks? *Journal of Banking & Finance*. 2010, **34**(8): 1839-1848.

[4] Jaafar, P., & Ismail, A. Dynamic relationship between sector-specific indices and macroeconomic fundamentals. *Malaysian Accounting Review*. 2009, **8**(1): 81-100.

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

[6] Johnston, R. B., & Pazarbasioglu, C. Linkages between financial variables, financial sector reform and economic growth and efficiency. *IMF Working Paper*. 1995, No. 95/103.

[7] King, R. G., & Levine, R. Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*. 1993, **108**(3): 717-737.

[8] Kutan, A. M., Muradoglu, G., & Sudjana, B. G. IMF programs, financial and real sector performance, and the Asian crisis. *Journal of Banking & Finance*. 2012, **36**(1): 164-182.

[9] Mansor, H. I. Stock prices and bank loan dynamics in a developing country: the case of Malaysia. *Journal of Applied Economics*. 2006, **9**(1): 71-89.

[10] Muhammad, I. Impact of the global crisis on Malaysia's financial system. *Bank for International Settlements*. 2010, No. 54.

[11] Nidhiprabha, B. The global financial crisis and resilience of the Thai banking sector. *Asian Development Review*. 2011, **28**(2): 110-132.

[12] Stiglitz, J. E.. Reforming the global economic architecture: lessons from recent crises. *The Journal of Finance*. 1999, **54**(4): 1508-1522.

[13] Tan, S. H., Habibullah, M. S., Baharumshah, A. Z., & Azali, M. On engine of growth in Malaysia: export-led, financial-led or investment-led? *International Journal of Business and Society*. 2007, **8**(1): 74-88.

[14] United Nations Development Programme. The global financial crisis and the Malaysian economy: impact and responses. *A joint ISIS and UM report commissioned by the UNDP*. 2009.