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STOCK PRICES AND BANK LOAN DYNAMICS IN A DEVELOPING COUNTRY: THE CASE OF MALAYSIA

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This paper estimates a six-variable VAR model and simulates generalized impulse response functions to assess dynamic interactions between bank loans and stock prices and evaluate whether bank loans play a role in transmitting financial shocks to the real sector. We find evidence that bank loans react positively to the increase in stock prices but there seems to be no influence from bank loans to stock prices. Similarly, bank loans seem to accommodate expansion in real output with, again, no influence of bank loans on real economic activity. Interestingly, despite the noted currency mismatch of bank assets and liabilities as a factor that aggravates the currency crisis, we find no evidence that the exchange rate fluctuations have impact on bank lending. If anything, the exchange rate seems to affect bank lending activities through its effects on real output and stock prices. From the dynamic responses, we tend to conclude that bank loans play no significant role in transmitting stock market shocks to the real sector. An important implication from our analysis is that the health of the banking sector depends crucially on stock market stability and real output stability. Additionally, policy attempts to stimulate bank loans as a way to boost stock market activities as well as to expand real activities may be futile.

JEL classification codes: E44, G21
Key words: bank lending, stock prices, VAR, generalized impulse responses

I. Introduction

The recent 1997/1998 Asian crisis sent virulent vibrations throughout various sectors of crisis-hit economies. The description of the crisis and its dynamics generally starts with the successful speculative attack on the Thai baht and its subsequent devaluation on July 2, 1997. Through "herding" behavior among

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portfolio investors, the episode initiated contagion to other East and Southeast Asian countries and led to reversals of portfolio capitals. As a consequence, their respective stock markets nosedived in magnitudes unanticipated by many. With increasing exposure of bank lending to speculative sectors (i.e. share and property sectors) and inherent fragility of banks in the lead-up years to the crisis, the currency and stock market collapses spread to the banking sector. The collapses of the financial markets shattered investors' confidence and, coupled with contraction in bank loans, vibrated to the real sector.[1] At its depth in 1998, all crisis-hit countries experienced drastic reduction in their economic growth.

The Asian crisis has revived and intensified research on various issues including, among others, causes of the crisis, international financial integration and benefit of international diversification, financial contagion, stock return predictability, and market efficiency hypotheses. While the existing literature casts some light on these various issues, a neglected aspect in this on-going interest in the relations between financial and economic variables is the causal role of stock price disturbances to bank lending behavior. In the context of crisis-hit economies, this aspect of causal linkages is of critical importance given the pressing need for better understanding banking vulnerability and propagation mechanisms of financial shocks. Notably, to the extent that bank loans are collaterized by such assets as real property and shares, falling share prices can expose banks to default risks which, in turn, can adversely affect banks' loan supply behavior (Kim and Moreno 1994).[2] With recent attention given to stock markets in the aftermath of the crisis and their potential effects on banks, the dynamic relations between stock prices and bank lending behavior deserve empirical scrutiny.

Empirically, while the role of banks in the economy has attracted enormous attention especially in assessing monetary transmission mechanisms, their relations to the health of financial markets have received very limited attention. Few studies have incorporated both stock prices and bank loans in their empirical modeling (see, for example, Dale and Haldane 1995). However, given their focus on different issues (i.e., mainly the credit view of the monetary transmission mechanism), dynamic interactions between stock prices and bank loans are not reported or not fully discussed. To the best of our knowledge, Kim and Moreno (1994) is perhaps the only study that explicitly addresses the issue of interactions between bank

[1] Athukorala (2001, chapter 5) provides an excellent description on the dynamics of the currency slide, share market collapse and ensuing economic collapse specifically for the case of Malaysia.

[2] Bacha(1998) further describes various risks faced by banks in their role as financial intermediaries. These include interest rate risk, exchange rate risk, default risk, and asset price risk.

loans and stock prices. In particular, they evaluate the issue for the case of Japan using monthly data from January 1970 to May 1993. Applying a vector autoregressive framework consisting of five variables (bank loans, industrial production, consumer prices, the call market rate, and the Nikkei index), they find evidence for positive influences of stock price changes on bank lending. Moreover, the empirical relation between the two variables has strengthened over the recent years.

The objective of the present paper is to evaluate dynamic linkages between stock prices and bank loans for Malaysia. In addition, it seeks to ascertain whether bank loans play significant roles in transmitting financial shocks to the real sector. Underlying the impressive growth performance of the Malaysian economy prior to the Asian crisis, there has been a rising dominance of bank loans as a source of finance for Malaysian firms. According to a survey conducted in Malaysia by Bank Negara Malaysia among 206 manufacturing companies in 1996, about 67% of them depend on bank loans for their working capital and 44% rely on bank financing for their export activities.[3] Finally, Malaysia is one of several East and Southeast Asian countries severely hit by the Asian crisis. During the course of the crisis, it witnessed a drastic drop in its stock prices followed by contraction in bank loans. Together with the important role of banks to the Malaysian economy, this recent co-variation of bank loans and stock prices is suggestive of their causal linkages and makes Malaysia a worthy case study.

The analysis relies on historical data and uses vector autoregressive (VAR) models and associated impulse-response functions. To capture the responses of a variable to innovations in other variables, we employ generalized impulse response analysis as suggested by Pesaran and Shin (1998) to avoid "orthogonality" assumptions that need to be made under the normally used Cholesky decomposition method. In the next section, we provide background information. Section III outlines the empirical approach. Section IV details the data and discusses estimation results. Finally, we conclude in section V with a summary of the main findings and their implications.

II. Background information

Since independence, the Malaysian government has devoted a great deal of attention to develop Malaysian financial markets as a way to enhance resource allocation and facilitate stabilization policies. The early focus has been on the banking sector, which has progressed to play an important role in providing sources

[3] The survey is quoted in the Public Bank *Economic Review* (1998).

of finance for Malaysian firms. The development of the Malaysian stock market, the Kuala Lumpur Stock Exchange (KLSE), has also been promoted especially since late 1980s. Table 1 presents total assets (or liabilities) as well as loans and deposits of all Malaysian commercial banks, the core component of the Malaysian banking sector. Meanwhile, Table 2 presents some key performance indicators of the KLSE.

As may be noted from Table 1, the growth of the banking sector has been remarkable and interrupted only by the Asian crisis. Up until the recent 1997 Asian crisis, the growth rate of commercial banks' assets, loans and deposits was well over the rate of Malaysian economic growth, so the ratios of both loans and deposits to GDP posted an upward trend. However, as a consequence of the Asian crisis, the growth of bank loans slowed down from about 23% in 1997 to only 3.4% in 1998 and contracted by about 0.9% in 1999. Interestingly, total assets and liabilities of the commercial banks declined in 1998.

Table 1. Selected assets and liabilities of Malaysian commercial banks (in RM million)

Year	Total assets = liabilities	Loans/ advances	% of GDP	Deposits	% of GDP
1970	4460.2	2359.6	19.4	3391.8	27.9
1975	10881.2	6468.4	29.0	8099.5	36.3
1980	32186.1	21031.1	39.4	23326.3	43.8
1985	74233.0	48981.7	63.2	45853.2	59.1
1990	129284.6	80758.0	67.8	62259.1	52.3
1995	292211.9	175007.4	78.7	161992.7	72.8
1996	358083.8	217820.5	85.8	203941.5	80.4
1997	481114.1	276116.6	97.9	243810.8	86.5
1998	453492.0	285676.3	100.4	307439.6	108.1
1999	474681.7	283231.0	94.5	332598.6	111.0

Source: *Monthly Statistical Bulletin* (various issues) published by Bank Negara Malaysia.

From Table 2, the number of listed companies on the main board increases at an annual rate of 5.6% over 1981-2001, while the KLSE Composite Index increases at a rate of 3.1% per annum during 1981-2001. Observing across five-year periods, the KLSE suffered a reduction in its index during 1981-1985 due to the 1985/1986 recession experienced by the country. During the period, the index dropped by 9%. Since then and until the recent Asian crisis, the KLSE had witnessed rapid

increase in its composite index, averaging over 14% over ten-year period from 1986 to 1995. This rapid increase was fueled by high economic growth of the country as well as huge portfolio capital inflows especially during the first half of the 1990s. The upward trend of the KLSE composite index, however, was halted by the Asian crisis. In 1997, the year of the eruption of the crisis, the index experienced an unprecedented decline of 73%. The pattern of market turnovers conforms well to that of the KLSE composite index.

Table 2. Key indicators of the Kuala Lumpur Stock Exchange, 1981-2001

Years	No listed	Annual growth rate (%)	Composite index	Annual growth rate (%)	Volume of turnovers (million units)	Annual growth rate (%)	Value of turnovers (RM million)	Annual growth rate (%)
1981-2001	446	5.6	599.9	3.1	32659	16.7	122785	12.9
1981-1985	270	2.6	322.2	-9.0	1939	13.2	6226	1.9
1986-1990	293	0.07	387.8	15.5	6976	30.5	13655	31.3
1991-1995	422	12.4	888.4	13.5	46698	19.0	195551	36.0
1996-2001	738	7.1	767.8	-6.0	67963	6.3	250220	-12.4
1995	529	10.1	995.2	2.4	33979	-57.1	178859	-60.6
1996	621	16.0	1238.0	21.8	66461	67.1	463265	95.2
1997	708	13.1	594.4	-73.4	72799	9.1	408558	-12.6
1998	736	3.9	586.1	-1.4	58287	-22.2	115181	-126.6
1999	757	2.8	812.3	32.6	85157	37.9	185250	47.5
2000	795	4.9	679.6	-17.8	75409	-12.2	244054	27.6
2001	812	2.1	696.1	2.4	49663	-41.8	85012	-105.5

Source: *Monthly Statistical Bulletin* (various issues) published by Bank Negara Malaysia.

The slowdown of stock market activities and the reduction in stock prices during recessions, coupled with the continuing importance of bank loans to Malaysian firms, raise important questions as to whether stock prices have any role in bank lending behavior and whether bank loans play any role in the propagation of financial shocks. These are the main issues that we address in the present paper.

III. Empirical approach

We employ time-series techniques of cointegration, vector autoregression (VAR)

and impulse response functions to examine the long run relationship and dynamic interactions among the variables of interest. Following standard time series econometric techniques, we proceed in steps. These involve (i) Integration and Cointegration Tests; (ii) VAR Specification and Estimation; and (iii) Impulse-Response Functions. Integration and cointegration tests entail preliminary analyses of data series for proper specification of VAR models. Meanwhile, impulse response functions capture estimation results of the VAR in forms that can be easily interpreted. Since these methods are now well known, we mention only those aspects that are relevant in the present analysis.

We apply the commonly used augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests for determining the variables' orders of integration. To test for cointegration, we employ a VAR-based approach of Johansen (1988) and Johansen and Juselius (1990), henceforth the JJ test. Note that, since results of the JJ test tend to be sensitive to the order of VAR, the proper choice of lag length is crucial. While there are various information criteria that can be employed to determine the lag length, Cheung and Lai (1993) show that the selection of lag length using information criteria may not be adequate in the presence of moving average error terms. Hall (1989) and Johansen (1992) recommend the specification of lag length that renders the VAR residuals serially uncorrelated or Gaussian. Accordingly, in the present analysis, we specify the lag length according to their suggestion. Additionally, with a limited number of observations, the JJ test tends to be biased toward finding evidence for cointegration (Reinsel and Ahn 1992). Following Reinsel and Ahn (1992), we adjust trace and maximal eigenvalue statistics by a factor $(T - np)/T$, where T is the effective number of observations, n is the number of variables and p is the order of VAR.

Having implemented unit root and cointegration tests, we proceed to specification and estimation of a vector autoregressive model. Traditionally, VAR studies such as Sims (1980) employ variables in log levels. The problem is that the results from such a specification may be spurious and misleading if log level variables are non-stationary. Transforming the variables into first differences to render the variables stationary will not solve the problem in the case that the variables under consideration are cointegrated, as it introduces mis-specification problems. For proper specification of the VAR model as to avoid spurious regression or mis-specification problems, integration and cointegration tests are necessary. In particular, the findings that the variables are non-stationary and are not cointegrated suggest the use of VAR model in first differences. However, if they are cointegrated, a vector error correction model needs to be used (Engle and Granger, 1987). Since the vector error correction model can be reparameterized to

form an equivalent VAR model, the validity of non-stationary variables in VAR analysis requires the presence of cointegration (see also Selover and Round 1996).

It needs mentioning that whether a VAR in levels or a VECM for modeling cointegrated series is a better approach remains debatable. While the VECM conveniently combines long run behavior of the variables and their short run interactions and thus can better reflect the relationship among variables, the popularity of VAR in levels lies in its low computational burden. Moreover, it is still unclear whether the VECM outperforms the level VAR at all forecasting horizons (Naka and Tufte 1997). In the literature dealing with short-run dynamic interactions, estimating the level VAR for cointegrated variables seem to be a normal approach. Ramaswamy and Slok (1998) outline several advantages of using the level VAR as opposed to the VECM. The most notable argument in favor of the level VAR is the economic interpretation attached to impulse-response functions. While the impulse-responses from the VECM tend to imply that the impacts of certain shocks are permanent, those from the level VAR allow history to decide whether the effects of shocks are permanent or not.[4] In the present analysis, with the findings of cointegration, we implement a VAR using variables in level. From the estimated VAR, we simulate impulse response functions as a basis for our inferences.

An important aspect that needs to be pointed out, which pertains to the generation of impulse-response functions, is that innovations in VAR equations may be contemporaneously correlated. This means that a shock in one variable may work through the contemporaneous correlation with innovations in other variables. Since isolated shocks to individual variables can not be identified due to contemporaneous correlation, the responses of a variable to innovations in another variable of interest can not be adequately represented (Lutkepohl 1991). The common approach in solving this identification problem is to employ Sims' (1980) empirical strategy by orthogonalizing the innovations using the so-called Cholesky decomposition. The approach, however, requires a pre-specified causal ordering of the variables, which turns out to be its major disadvantage. Namely, results from impulse-response analyses may be sensitive to the ordering of the variables. Recently, Koop et al. (1996) and Pesaran and Shin (1998) develop generalized impulse response functions to circumvent the ordering problem inherent in the orthogonalized impulse responses. In this approach, historical patterns of correlations among different shocks are fully incorporated, making the impulse responses unique and hence invariant to the variable orderings. Since there is no

[4] Ramaswamy and Slok (1998) further note that if there is no a priori theory to suggest the number of cointegrating vectors and how to interpret them, the VAR model in level for cointegrated series is a reasonable approach.

clear guidance as to the causal ordering of the variables, we adopt generalized impulse responses for our dynamic analysis.

IV. Data and results

A. Data preliminaries

In the paper, the focal variables are bank loans and stock prices. However, focusing on these two variables in a bivariate context may not be satisfactory since they may be driven by common factors. In other words, their causal relations may reflect their responses to the common factors and, accordingly, results from bivariate analysis will be misleading. This means that other control variables need to be added. Although the general approach we employ permits the inclusion of any macroeconomic variables deemed relevant in influencing or being influenced by bank loans and stock prices, its implementation is limited by sample size, which is finite. In the paper, we follow Kim and Moreno (1994) by incorporating real output, the price level, and the interest rate into the analysis. As noted by Kim and Moreno (1994), these variables are added to capture cyclical factors that might influence bank lending behavior. These variables may also exert influences on stock prices through their effects on expected future cash flows and/or discount factor. In the present context, the inclusion of real output is particularly important as it allows us to assess the potential role of banks in propagating financial shocks to the real sector. In addition to these variables, we also include the exchange rate as an additional variable. Exchange rate depreciation seems to be an initiating factor that contributes to a drastic drop in share prices and subsequently in bank loans. Accordingly, the effects of fluctuations in the exchange rate on the two variables need to be controlled. Furthermore, being a small open economy, Malaysia is likely to be affected by changes in its currency value.

Thus, our analysis is based on a six-variable framework: bank loans, stock prices, real output, the price level, the interest rate, and the exchange rate. Bank loans are measured by total bank loans to the private sectors (LOAN). We use the Kuala Stock Exchange Composite Index (KLCI) to represent stock prices. Real output and the price level are respectively represented by real gross domestic products (GDP) and the consumer price index (CPI). The interest rate is the overnight interbank rate (INT). Lastly, we use the bilateral Ringgit rate vis-à-vis the US dollar (EXC) as a measure of the exchange rate. Both the interest rate and the exchange rate are in nominal terms. Since policy-induced changes involve shocks to nominal variables, the use of nominal interest rates and exchange rates may furnish information on the effectiveness of government policies involving the two variables.

Moreover, with the inclusion of the price variable, we can assess whether nominal changes lead to real changes while, at the same time, disentangling sources of real changes – whether from changes in the interest rate and the exchange rate or in the price level – and their effects on other variables.

Except the interest rate, all variables are expressed in natural logarithms. The data are quarterly, covering the period from 1978.Q1 to 1998.Q2. We end the data in 1998.Q2 due to capital controls and the fixed Ringgit-USD rate implemented by the Malaysian government in September 1998. Note that our sample runs through the Asian crisis, which might pose a problem if the observations from the crisis period are outliers. Accordingly, we also estimate the model by shortening the sample to 1997.Q2. The main sources of the data are the *International Financial Statistics* (CD-ROM version) of the IMF and the *Statistical Bulletin* (various issues) published by Bank Negara. The data are seasonally unadjusted.[5]

Table 3 provides results from unit root tests for each variable. In implementing the tests, we first evaluate the presence of deterministic trend and, since the data are not seasonally adjusted, of seasonal patterns in the data. The trend term and seasonal dummies are included in the tests where relevant. The ADF and PP tests indicate non-stationarity in levels but stationarity in first differences for all variables except GDP. In other words, these variables are integrated of order 1 or I(1). For GDP, the results from the two unit root tests are conflicting. Using the ADF test, we find that GDP is non-stationary even in its first difference. However, the PP test provides evidence that the variable requires first differencing to achieve stationarity. Taken together, these results allow us to proceed to the JJ cointegration test. The trace and maximal eigenvalue statistics of the test adjusted for finite sample bias are given in Table 4. They suggest the presence of a unique cointegrating vector among the six variables. According to Granger (1988), cointegration between two or more variables suggests the presence of causality in at least one direction. Additionally, given shocks, some variables will adjust to correct any deviations from the long run equilibrium path. The dynamic responses of the variables to shocks are our main theme, to which we now turn to.

B. Results

The finding of cointegration leads us to estimate VAR models in levels and

[5] We do not make any seasonal adjustment to the data prior to empirical implementation using existing standard methods of de-seasonalization. As has been noted by Papadopoulos and Zis (1997), the use of seasonally unadjusted data has an advantage in that the dynamic properties of the model are not distorted.

Table 3. Unit root tests

Variable	ADF test		PP test	
	Z	ΔZ	Z	ΔZ
KLCI	-1.937	-8.667 *	-1.973	-8.670 *
LOAN	-3.095	-4.453 *	-2.322	-4.474 *
GDP	-2.260	-2.040	-1.712	-8.786 *
CPI	-3.061	-5.581 *	-1.782	-6.450 *
INT	-3.054	-6.959 *	-2.526	-7.306 *
EXC	-0.189	-6.943 *	-0.619	-6.606 *

Note: the test statistics are compared to the critical values from Mackinnon (1991). * and ** indicate significance at 1% and 5% respectively.

Table 4. Cointegration tests

Null hypothesis	Test statistics		5% critical value	
	Trace	Max	Trace	Max
r = 0	101.98	48.22	94.15	39.37
r ≤ 1	53.75	22.86	68.52	33.46
r ≤ 2	30.90	13.72	47.21	27.07
r ≤ 3	17.18	10.88	29.68	20.97
r ≤ 4	6.30	5.84	15.41	14.07
r ≤ 5	0.46	0.46	3.76	3.76

Notes: the tests include the exchange rate. The critical values are from Osterwald-Lenum (1992).

simulate generalized impulse-response functions to capture dynamic responses of a variable of interest to innovations in other variables in the system. The lag length of the VAR is set to 4, which we find sufficient to render the error terms serially uncorrelated. Given our focus, we leave aside other interesting results and report only the responses of the key variables - bank loans, stock prices and real output - to shocks in other variables. We also plot selected impulse responses from the VAR estimation using a shortened sample, which excludes the crisis years. These plots are given together with two standard deviation bands. Generally, if the zero line is not within the bands, then the responses are significantly different from zero.

Figures 1 to 3 present generalized responses of, respectively, bank loans, stock

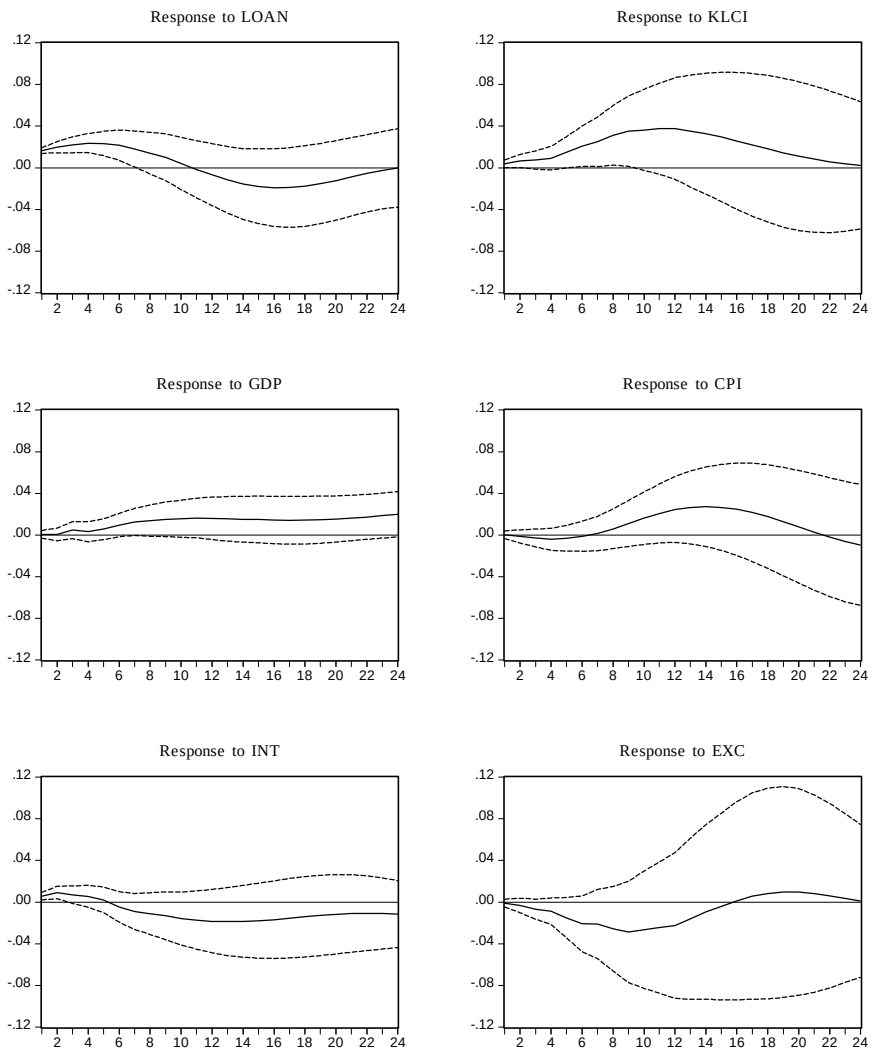
prices and real output to shocks in other variables using the full sample (i.e., 1978.Q1 – 1998.Q2). The results are generally intuitive. From Figure 1, we note that bank loans respond positively and significantly to KLCI, GDP and INT innovations. The positive response of bank loans to a stock price increase is in line with Kim and Moreno (1994) for the case of Japan. It is also consistent with our observation during the crisis period that a drastic fall in share prices precedes contraction in bank lending activities. The precipitous fall in share prices may expose banks to substantial default risk, reflected during the financial crisis by a significant rise in non-performing loans. Facing this risk, banks were not likely to extend further loans.[6] Following the drop in the stock market, the growth rate of bank loans slowed down from 23% in 1997 to only 3.4% in 1998 and recorded a negative growth of 0.9% in 1999.

The positive response of bank loans to GDP shocks is as expected since an increase in GDP raises both supply and demand for loans. An increase in GDP means that more funds are available for banks to make loans since deposits are more likely to increase. Moreover, the standard investment theory suggests the importance of the level of output and its growth on investment. Expansion of real output tends to motivate investments and, accordingly, loan demand. Note that an increase in the interest rate raises bank loans significantly and immediately. This seems to reflect the increase in loan supply in response to the increase in the interest rate. Interestingly, despite much discussion on mis-matching in the currency-denomination of bank assets and liabilities as a contributing factor to the banking problem during the recent Asian crisis, we do not find any significant influence of the exchange rate on bank loans. Lastly, bank loans also do not seem to respond significantly to shocks in the price level.

From Figure 2, we do not find a feedback effect from bank loans to stock prices. In response to the Asian crisis, the Malaysian government has adopted selective capital controls accompanied by expansionary monetary policy as a way to encourage lending and, accordingly, boost confidence in the financial markets. Our finding of no causal relation from bank loans to stock prices suggests that this policy may not be effective. Looking at only significant responses, we may observe from the figure that stock prices increase in response to positive shocks in the price level. This means that, for the case of Malaysia, the stock market provides a good hedge against inflation. However, currency depreciation shocks result in a

[6] Note stock prices can also affect bank loans by influencing loan demand. As is well known in finance theory, stock prices reflect investors' expectations of future real activity. Accordingly changes in share prices signal changes in future real activity. Accordingly, loan demand can be affected (Kim and Moreno, 1994).

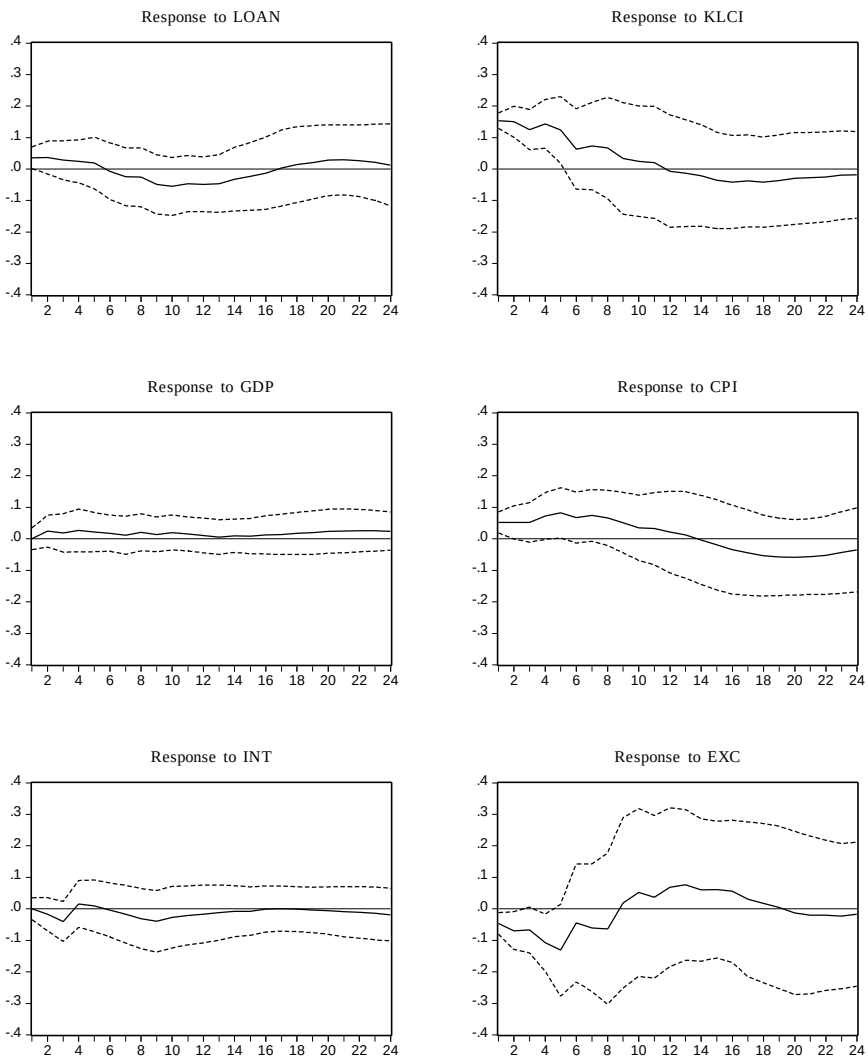
Figure 1. Generalized responses of bank loans (LOAN)



drop in share prices. A plausible explanation is that, for a country like Malaysia that pegs its currency to other currencies, currency depreciation is likely to lead to anticipation of further depreciation and, thus, drive out investments from the stock market. Moreover, the negative responses of share prices may reflect contractionary effects of currency depreciation since share prices, as mentioned in footnote 6, anticipate future real economic activity. Lastly, depreciation could hurt the value of firms by raising foreign debt burden of the Malaysian firms. Total foreign debts

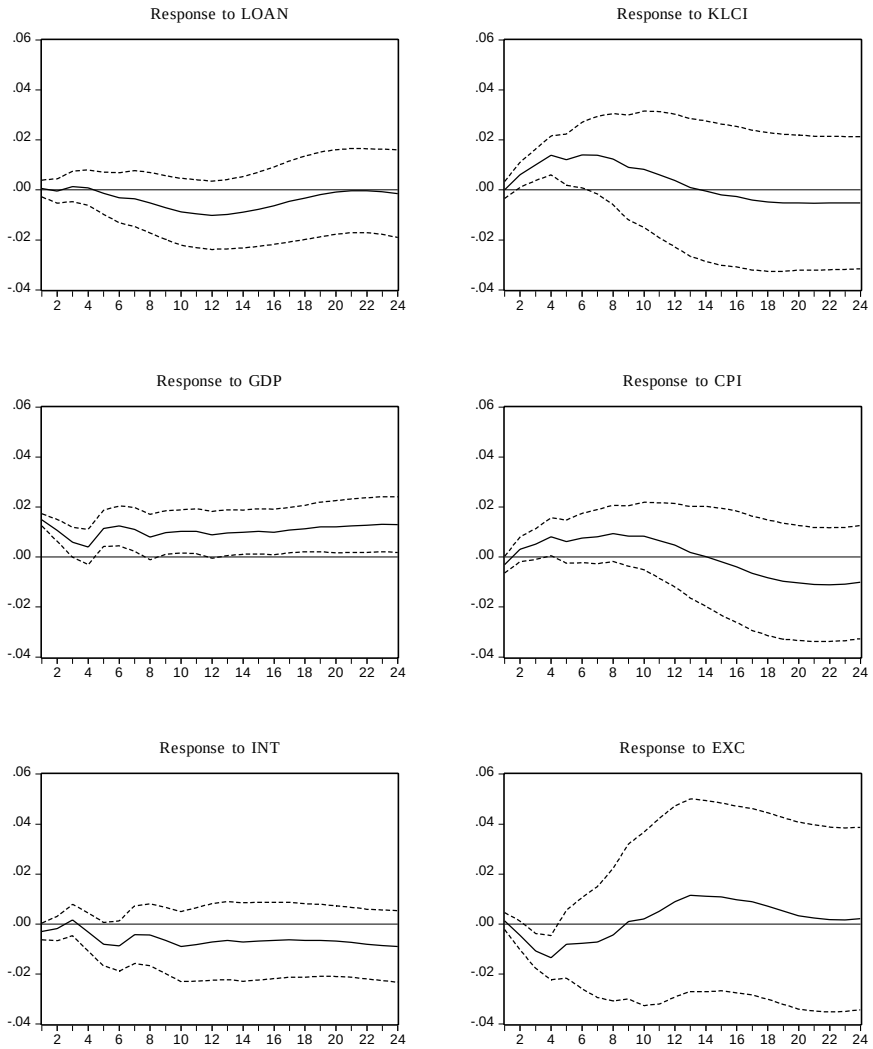
of Malaysia's private sector has been sizable and witnessed a rising trend. As noted by Narayanan et al. (1997), the ratio of total foreign debt of the private sector to GDP was 23.6% in 1992 and increased to 35% in 1996 and to more than 55% in 1997. The drastic increase in 1997 clearly reflects the rising debt burden due to currency depreciation. Furthermore, the majority of total foreign loans is short term in nature (Bacha 1997), which may further exacerbate balance sheet positions of the firms.

Figure 2. Generalized responses of stock prices (KLCI)



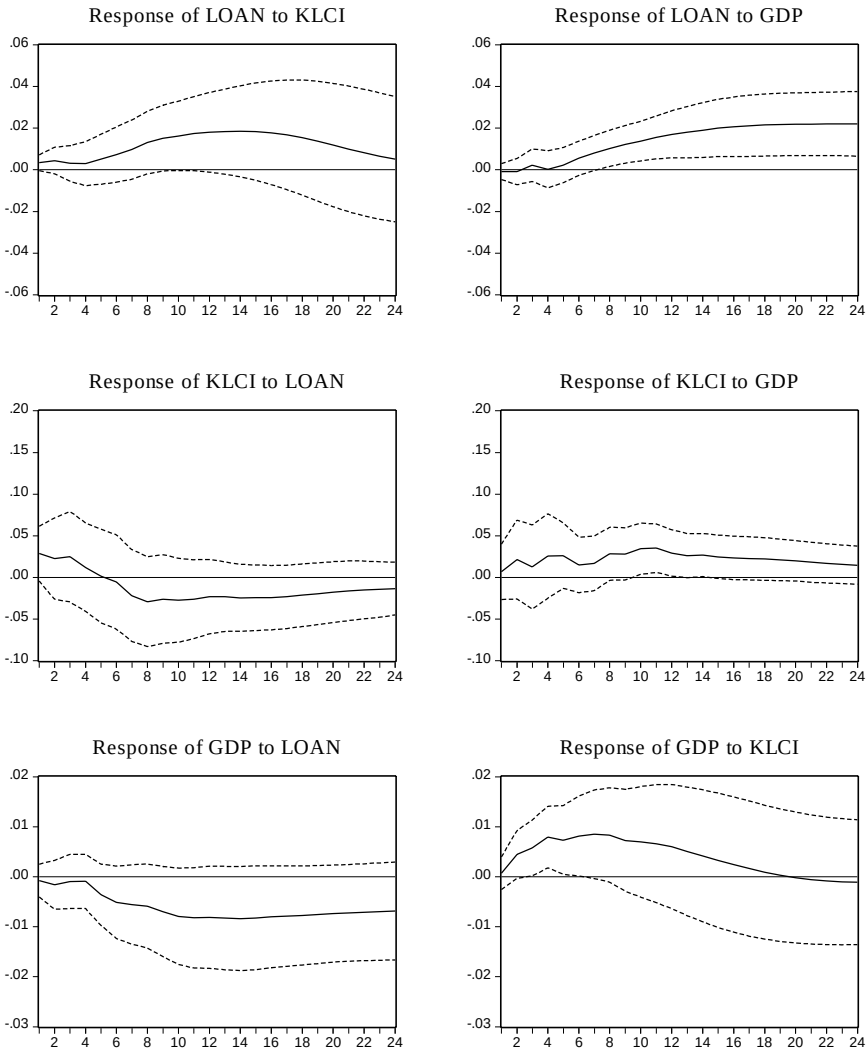
We also find no significant feedback effect from bank loans to real output (Figure 3). This means that there exists only a uni-directional causality from real output to bank loans. In other words, it seems that the expansion in bank loans is to accommodate real expansion. Other interesting results that we may note from Figure 3, which are as expected, are positive responses of GDP to innovations in KLCI and CPI and its negative response to depreciation shocks. The latter lends support to the case of contractionary devaluation, which is in line with negative responses of stock prices to EXC shocks noted earlier. That is, instead of improving

Figure 3. Generalized responses of real GDP (GDP)



economic performance of a nation as conventionally viewed, a drop in the currency value may retard real activities. This seems plausible in the Malaysian context since Malaysia depends heavily on imports of investment goods and intermediate goods for its development process. Depreciation shocks thus increase costs of production and shift aggregate supply backwards. As noted above, the depreciation shocks adversely affect the firms' balance sheet and, thus, contribute to the contractionary effects in output, the so-called real balance effect (Edwards 1986).

Figure 4. Selected generalized responses – shortened sample



It may be argued that these results may be disproportionately influenced by several observations from the crisis period or, in other words, by outliers. Accordingly, we shorten the sample to 1997.Q2 and re-estimate the VAR model. The results are qualitatively similar to the full sample. Figure 4 graphs the temporal responses that are central to our analysis. These responses lead to similar conclusions regarding dynamic interactions between bank loans, stock prices and real output. Indeed, bank loans seem to respond more strongly to innovations in GDP. The only difference that we find in this shortened sample is that KLCI responds positively and significantly to GDP innovations, suggesting the presence of feedback effects between GDP and KLCI.

We reiterate here the empirical support for positive responses of both bank loans and real output to fluctuations in share prices. Having noted this, we now turn to the question as to whether bank loans play a role in transmitting financial shock to the real sector. The answer to this question seems negative. Since bank loans exert no significant influences on real GDP, it can not serve as a channel through which financial disturbances are transmitted to the real sector. That is, although stock prices do anticipate real activities, reduction in bank loans following a stock price fall does not contribute to output contraction. Quite contrarily, it seems that the reduction in real activities in response to stock price collapses further contributes to a drop in bank lending. To ascertain this, we may refer back to the responses of bank loans to KLCI shocks in Figure 1 and Figure 4 and the responses of real GDP to KLCI shocks in Figure 3 and Figure 4. Comparatively, the responses of bank loans are more pronounced, with the peak effects at longer horizons. For example, the responses of bank loans reach its peak after 12 quarters (Figure 1) while those of GDP reach its peak after only 6 quarters (Figure 3). This is suggestive of our contention in attributing no significant role to bank loans in transmitting financial shocks.

V. Conclusion

Given the recent crisis experience that witnessed banking problems subsequent to adverse financial (exchange rate and stock price) shocks, the issue of banking vulnerability in an environment of increasing financial liberalization captured wide attention. In this study, we examine dynamic interactions between bank loans and stock prices for the case of Malaysia. Since banks are generally viewed to play a very crucial role in crystallizing Malaysian economic performance, we also investigate the role of bank loans in transmitting stock market shocks to the real sector. In the analysis, we estimate a six-variable VAR model consisting of bank loans, stock prices, real output, the price level, the interest rate, and the exchange

rate. Then, we simulate generalized impulse responses to assess dynamic interactions among the variables in the system.

We find supportive evidence for significant influences of stock price fluctuations on bank loans with no reverse effects. This means that bank health may depend crucially on stock market stability. During the crisis, an attempt was made to stem stock market decline through the promotion of bank lending activities. Our analysis suggests that this attempt is futile since there is no evidence of feedback effects from bank loans to stock prices. In other words, it will be more cost effective for the authority to direct attention to some other measures to instill confidence in the stock market. Apart from stock prices, we also uncover evidence that bank loans react to changes in real output and interest rates. However, despite much hype on the currency mismatching of bank assets and liabilities, there seems to be no effect of the exchange rate on bank loans. The exchange rate may only indirectly affect bank loans through its effects on stock prices and real output; both react negatively to currency depreciation shocks.

More interestingly, we find no evidence that the increase in bank loans anticipate expansion in real activities. Over the recent years, much research is conducted to evaluate the finance-growth causal nexus with a specific focus on whether finance leads growth or vice versa. In this literature, a measure of financial intermediation such as bank loans is used to proxy financial development. If the present finding is viewed in light of this literature, our study tends to lend support to the hypothesis that finance tends to follow growth. That is, the increase in bank loans is to accommodate real expansion. Returning to our focus, we find no evidence that bank loans act as a channel through which financial shocks are transmitted to the real sectors. Conversely, our evidence tends to show that contraction in real activities following financial shocks tend to lead to further deterioration of bank lending activities. In sum, rather than focusing on bank loans as a way to promote growth, the government should stabilize real output through other measures such as fiscal stabilization policies in order to restore the health of the banking sector when faced with stock market decline.

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