STOCK MARKET AND PRIVATE CONSUMPTION IN MALAYSIA

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Abstract

The paper analyzes the influence of the stock market on aggregate consumption in Malaysia using a battery of time series approaches – the ARDL cointegration test, an error-correction modeling and a vector autoregression (VAR). In the analysis, real consumption is specified to depend linearly on real income and real stock market wealth as measured by real market capitalization. The ARDL cointegration test indicates the presence of a long-run relationship between consumption and its determinants, real income and real stock market wealth. At the same time, we also note positive short-run coefficient of current changes in real stock market wealth in the dynamic equation of real consumption. Finally, the variance decompositions and impulse-response functions simulated from the estimated VAR indicate a causal pattern that runs from real stock market wealth to real activities (consumption and income). Accordingly, based on these findings, the stock market wealth effect is unequivocally supported in Malaysia.

JEL classification: E21; E44.

Keywords: Aggregate Consumption, Stock Market Wealth, Malaysia.

1. INTRODUCTION

The growth of the stock market in Malaysia has been remarkable, and interrupted only by the 1997/1998 Asian financial crisis. Prior to its drastic drop in 1998, the market capitalization increased steadily from RM131.7 billion (USD48.7 billion) in 1990 to RM806.8 billion (USD320.7 billion) in 1996. The value of turnovers also recorded a big jump from only RM29.5 billion

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(USD10.9 billion) to RM463.3 billion (USD184.2 billion) over the same period, making Bursa Malaysia one of the fastest growing markets in the region. According to Demirguc-Kunt and Levine (1996), Malaysia is ranked third in terms of the growth of market capitalization, and in terms of the growth of total value traded to GDP ratio among 44 developed and emerging markets examined during the period. Then, at the peak of the Asian crisis in 1998, the market capitalization and turnover value nosedived to respectively RM374.5 billion (USD95.5 billion) and RM115.2 billion (USD29.4 billion)[1]. Shortly after the crisis, the two stock market performance indicators have again witnessed an upward trend. Indeed, the market capitalization has surpassed its pre-crisis level since 2005. At the same time, typical to any emerging market, the stock market in Malaysia is also characterized by high volatility in comparison with the more advanced markets.

The rapid growth of the market, marked by high volatility and susceptibility to shocks, has made Malaysia the focus of many recent works. Many existing studies on the Malaysian market, and to an even great extent other emerging markets, have focused predominantly on examining the market efficiency, characterizing market volatility, uncovering dynamic interactions between stock prices and fundamental or macroeconomic variables, and looking at its international links with other developed and emerging markets. For instance, Karemera et al. (1999) assessed the market efficiency hypothesis for 15 emerging markets including Malaysia, and found evidence supporting the weak-form market efficiency of most markets. As regards stock market volatility, Chong et al. (1999) apply variants of GARCH-type model to characterize Malaysia's stock market volatility and their ability to forecast out of sample future market volatility. Meanwhile, Law (2006) examines whether the heightened stock market volatility experienced during the Asian crisis has returned to its pre-crisis level in the aftermath of the crisis. Studies on the inter-relations between emerging stock markets and macroeconomic variables and inter-linkages among stock markets are even more extensive. Among them are Habibullah and Baharumshah (1996), Ibrahim (2001), Wongbangpo and Sharma (2002), Ibrahim and Aziz (2003) for the former, and Cha and Oh (2000), Sheng and Tu (2000), Daly (2003), and Ibrahim (2006) for the latter, to name but a few.

While these focuses have added insights and understanding on various aspects of the emerging stock markets, another less thoroughly researched issue, but one that is relevant, especially from theoretical and policy points

[1] The equivalent dollar values are based on the average RM/USD rate over the stated years. The rates for 1990, 1996 and 1998 are respectively 2.7044, 2.5152, and 3.9229.

of view, is the effect of the stock market on private behavior such as household consumption. Theoretically, whether or not the stock market exerts a wealth effect on private consumption is founded on the life-cycle hypothesis of Ando and Modigliani (1963). Therefore, from a policy viewpoint, the presence of the stock market wealth effect can enhance our understanding of monetary transmission mechanism and the effectiveness of monetary policy. In view of these important implications and noted progress of the Malaysian market, the present paper seeks to analyze the stock market wealth effect on private consumption in Malaysia.

In line with existing studies (e.g. Starr-McCluer, 2002; Funke, 2004; and Abizadeh and Ng, 2009), we adopt the life-cycle hypothesis (LCH) of consumption developed by Ando and Modigliani (1963) as a basis for empirical specification. As will be delineated later, the LCH relates planned private consumption to both human wealth (i.e. household income) and such financial wealth as stock market wealth. The purportedly long-run relationship between private consumption, income and stock market wealth, and their possible dynamic interactions are examined by means of time series econometrics of cointegration and vector autoregression (VAR). The rest of the paper is organized as follows. In the next section, we briefly review related literature. Then, section 3 outlines the empirical methods. Section 4 describes the data used and presents expected results. Finally, section 5 summarizes the main findings and provides concluding remarks.

2. RELATED LITERATURE

The increasing importance of stock market investments and wide stock market fluctuations over recent decades, coupled with their implications on monetary transmission mechanism, has heightened interest in the relationship between stock markets and private consumption behavior. The theoretical basis that links stock markets to private consumption can be traced back to the life-cycle model of consumption developed by Ando and Modigliani (1963), which attributes an important role to household wealth in influencing consumption behavior. According to the model, stock market increases make consumers wealthier, the so-called wealth effect. Thus, as consumers attempt to smooth their consumption, positive changes in the stock markets, to the extent they are perceived to be permanent, lead consumers to revise their consumption upward. In addition, increasing wealth due to stock price increase also allows consumers to have better access to borrowing. Finally, Poterba (2000) further notes that stock market fluctuations may also exert in-

direct effect on consumption by influencing consumers' confidence and expectations of future economic conditions.

The presence of the stock market wealth effect in developed markets, particularly the US market, has received some empirical support. While the consumption-wealth effect of stock prices is noted to be small, it is significant. According to Ludvigson and Steindel (1999), a dollar increase in wealth tends to be associated with the increase in consumption of about 3 to 4 cents for the United States (see also Poterba, 2000). However, they caution that the effect of the market gains is likely to be unstable over time. Likewise, the estimates from other studies are also small but significant, ranging from 4-7 cents increase in spending following a one dollar increase in stock market wealth (see, for instance, Davis and Palumbo, 2001). Starr-McCluer (2002) also reports modest wealth effect of stock prices using Michigan SRC survey of consumers. Boone et al. (1998) further note that the stock market wealth effect tends to be weaker in other advanced markets, which may be due to their thinner markets as compared to the United States. Most recently, Abizadeh and Ng (2009) further proclaim that the stock market wealth effect is alive and well for the United States. However, it is uncertain for the Canadian case.

Recently, some studies have also focused on emerging stock markets and advanced Asian markets. Notable among them are Funke (2004), Liu and Shu (2004a, 2004b) and Cutler (2005). Funke (2004) extends the analysis to 16 emerging markets consisting of eight Asian, six Latin American and two African markets using fixed-effect panel models. His estimates of the relationship between consumption and stock market wealth in the emerging markets are close to estimates documented for the European markets but less than those for the United States. More specifically, a 1% increase in the stock market prices is related to a 0.02% increase in private consumption over a 3-year period for these economies as a group. This suggests the marginal propensity to consume out of financial wealth to be around 0.04. Cutler (2005) also reports a similar estimate for Hong Kong. More precisely, he estimates the marginal propensity to consume out of financial wealth for Hong Kong to be around 0.02 to 0.04.

Noting that the interactions between stock market and consumption can be bidirectional, Liu and Shu (2004a) examine their causal directions in five advanced Asian markets, namely, Hong Kong, Japan, Singapore, South Korea and Taiwan. Except in South Korea, real stock prices and real consumption are cointegrated in these countries. Moreover, while the patterns of causality differ across countries, the influences of the stock markets on consumption tend to be more visible in the short run than in the long run. In a

separate but similar study, Liu and Shu (2004b) evaluate the issue for Greater China, namely, Hong Kong, Taiwan and Mainland China by means of cointegration and Granger causality tests. In the long run, they note the presence of a long-run relationship between stock prices and consumption in these economies. In terms of short-run dynamics, they document a bi-directional causality between the two variables for Hong Kong and Taiwan. However, for Mainland China, the causality tends to be uni-directional running from consumption to stock prices. The present analysis seeks to add further empirical evidence from an emerging market, i.e. Malaysia, which has witnessed rapid stock market development and exhibited large stock market swings in recent years.

3. EMPIRICAL METHODS

3.1 Theoretical Foundation

In assessing the impact of stock market wealth on private consumption, we adopt the life-cycle hypothesis of Ando and Modigliani (1963) as a basis for empirical specification. More specifically, following Starr-McCluer (2002) and others, we posit that consumers seek to maximize a time-separable logarithmic utility function subject to lifetime budget constraint with no bequest. Thus the problem facing the consumers is:

$$Max \quad U\,(C_0, C_1, \ldots C_T) = \sum_{t=0}^{T} \rho^t \ln(C_t)$$

$$s.t. \sum_{t=0}^{T} \left[\frac{1}{(1+\mathrm{r})^{\mathrm{t}}}\right] C_t = A_0 + \sum_{t=0}^{T} \left[\frac{1}{(1+\mathrm{r})^{\mathrm{t}}}\right] Y_t \qquad (1)$$

where C_t is consumption at time t, A_0 is initial wealth, Y_t household income at time t, r is the interest rate or return on savings and ρ is the discount rate.

From (1), it can be shown that the consumers' planned consumption is a linear function of the sum of initial wealth and discounted lifetime income. Then, specifying the lifetime income to be a function of current household income (Byrne and Davis, 2003), we can express the following relationship between planned aggregate consumption, household income and initial wealth:

$$C_t^* = m\,[kY_t + A_0] \qquad (2)$$

Then, as equities are a part of wealth, the link between consumption and the stock market wealth can thus be established. In the context of the above life-cycle hypothesis, transitory changes in current income and wealth exert only minimal impacts on planned consumption as consumers attempt to smooth their consumption by allocating the transitory increase in income and wealth throughout their lifetime. However, the long-run formulation of (2) presumes trend relation between the variables and thus sidelines the need to separately pin down transitory changes in both income and wealth. Moreover, it should be noted that current consumption may still be sensitive to current income and wealth due to liquidity constraints, which can be pertinent in an emerging market.

3.2 Empirical Framework

To formalize (2) into an estimable form, we express the variables in (2) in natural logarithm (*Ln*). Namely,

$$LnC_t = \alpha + \beta_1 LnY_t + \beta_2 LnS_t + \varepsilon_t \tag{3}$$

where *C*, *Y*, and *S* denote real private consumption, real household income, and real stock market wealth respectively. As noted by Campbell and Deaton (1989), the first-differenced income level may exhibit non-stationary. In other words, the income expressed in level form may not be difference stationary. Due to this reason, the natural logarithmic approximation of (2) in normally employed to ensure non-spurious long-run relationship among the variables (see, for instances, Byrne and Davis, 2003 and Abizadeh and Ng, 2009). The slope coefficients, β_1 and β_2, measure respectively the income and stock market wealth elasticities of consumption, and thus are expected to be positive. From (3), the marginal propensity to consume out of stock market wealth is $dC/dS = \beta_2 \cdot \mathrm{C/S}$, where *C* and *S* can be evaluated at their sample means.

Equation (1) can be viewed as a long run consumption function. In establishing the presence of this long-run relationship between consumption and its determinants, we employ the ARDL-based bounds testing procedure suggested by Pesaran et al. (2001). The ARDL model expressed in an unrestricted error correction form is stated below:

$$\Delta LnC_t = \theta_0 + \theta_1 LnC_{t\text{-}1} + \theta_2 LnY_{t\text{-}1} + \theta_3 LnS_{t\text{-}1} + \sum_{i=1}^{k} \phi_{1i} \Delta LnC_{t\text{-}1} + \sum_{i=0}^{k} \phi_{2i} \Delta LnT_{t\text{-}1} + \sum_{i=0}^{k} \phi_{3i} \Delta LnS_{t\text{-}1} + u_t \tag{4}$$

where Δ is the first difference operator, k is the optimal lag length, and all variables are as defined above. The bounds testing procedure has several advantages. First, it requires no knowledge of the variables' unit root property and, therefore, circumvents the problem of pre-test bias inherent in such standard cointegration tests as the residual-based test of Engle and Granger (1987) and the VAR-based test of Johansen (1988) and Johansen and Juselius (1990). To add to the above point, the preliminary standard unit root tests are noted to lack power and have poor size property especially in small samples (Harris, 1995). Second, the test is applicable irrespective of whether the variables are I(0), I(1) or mutually cointegrated. Briefly stated, a variable is said to be I(d) if it requires differencing d times to achieve stationarity. The variable is said to be non-stationary if it is integrated of order 1, stated I(1), or higher. Normally, the long-run relationship is restricted to the case of a set of non-stationary variables. The ARDL cointegration test extends the analysis to a set of variables that have mixed integration properties. Lastly, while the Engle-Granger procedure suffers from considerable small sample bias and the Johansen-Juselius test is not appropriate for small size samples, the bounds test has better small sample properties. These advantages of the test seem to fit our case well.

In the bounds testing procedure, the null hypothesis that there is no cointegration or long-run relationship between consumption and its determinants is based on the joint significance of the lagged level variables in (2), i.e. H_0: $\theta_1 = \theta_2 = \theta_3 = 0$. The test statistics are then compared to two critical value bounds with the lower value when the regressors are I(0) and upper value when they are I(1). The null hypothesis is rejected in favor of cointegration among the variables if the test statistics exceeds the upper critical value bound. Meanwhile, if it is below the lower critical value bound, no long run relationship among the variables exists. Finally, the test is inconclusive when the test statistics are within the bounds. In this case, prior knowledge of the variables' unit root property is needed. It should be noted that, being a single equation-based test, the bounds testing result may be sensitive to which variable is specified as the dependent variable. In the empirical literature, it seems to be a common practice to specify alternatively different variables in the model as the dependent variable (Liu and Shu, 2004a and Liang and Cao, 2007). We follow this practice in our case. Once the long-run relationship between the variables is established, we may uncover the long-run income and stock market coefficients in (1), namely, $\beta_1 = -\theta_2/\theta_1$ and $\beta_2 = -\theta_3/\theta_1$. The short-run dynamics of private consumption behavior can then be modeled using a restricted error correction model.

As a further analysis, we also evaluate dynamic interactions among the

variables via a vector autoregressive (VAR) framework. The VAR framework consists of a system of equations expressing each variable as a function of its own lags and lags of other variables in the system. Accordingly, treating each variable as being potentially endogenous, it allows for potential feedback from consumption to the stock market. As noted by Liu and Shu (2004a), failure to take into consideration this feedback effect may have overstated the stock market wealth effect on consumption. Denote Z = [*LnC, LnY, LnS*], the VAR model in its level form is written as:

$$Z_t = \Gamma_0 + \sum_{i=1}^{k} \Gamma_i Z_{t-i} + \upsilon_t \qquad (5)$$

where, again, k is the optimal lag order, Γ_0 is a 3×1 vector of constant terms, and Γ_I is a 3×3 matrix of coefficients. It must be emphasised that the above level VAR model is valid for cointegrated series. Otherwise, the model should utilize the variables in their stationary form, normally in first difference.

Given the difficulty in interpreting the VAR coefficients, the VAR results are normally summarized using variance decompositions (VDC) and impulse response functions (IRF). Essentially, both variance decompositions and impulse-response functions capture the out-of-sample predictability of a variable of interest using the lagged information of all variables in the system. As the name implies, the VDC measures the proportion of a variable's forecast error variance (say consumption) attributable to shocks in all variables in the system. In other words, it measures the relative importance of various shocks in accounting for variations in the variable concerned. Meanwhile, the impulse-response functions trace the response of the concerned variable to a one standard deviation shock in other variables. The functions indicate the direction, magnitude, as well as persistence of the impacts of shocks to the variable of interest. Based on these innovation accounting measures, we may readily assess the causal directions among consumption, income and stock market wealth.

4. DATA AND RESULTS

The data are quarterly spanning from 1991.Q1 to 2006.Q4. We use the final consumption of the private sector deflated by the consumer price index to represent real private consumption (*C*). Real gross domestic products are used to proxy household income (*Y*). In the analysis, we employ market cap-

italization (S) deflated by the consumer price index as a measure of stock market wealth. The data are from the publication of Malaysia's Central Bank, *Monthly Statistical Bulletin* (various issues). Given that the time period covers the crisis period, we incorporate the crisis dummy variable in all calculations performed. The crisis dummy takes the value of 1 for 1997.Q3 to 1998.Q4 and 0 otherwise. In addition, since our data are seasonally unadjusted, we also include seasonal dummies to account for seasonal variations, especially in private consumption and real output.

4.1 Long-run Relation and Dynamics of Consumption

Table 1 presents the bounds testing result for the presence of a long-run relationship between private consumption, real income, and real stock market wealth. We employ the Akaike Information criterion (AIC) to select the optimal lag, which we also find sufficient to render the error term serially uncorrelated. While the basic test equation includes crisis and seasonal dummies, we also exclude these dummies for robustness check. As may be observed from the Table, the results indicate the presence of a long-run relationship among the variables when private consumption is the dependent variable regardless of whether the dummy variables are included or not. The test statistics for both cases exceed the upper critical value bound at 5% significance level. We also document supportive evidence for cointegration in the real market capitalization equation. However, the finding for cointegra-

Table 1: Bounds Testing for Cointegration

Dependent Variables	Lags	F-Statistics (with dummies)	F-Statistics (without dummies)	Conclusion
ΔLnC	4	5.870	5.421	Cointegration
ΔLnY	2	1.239	3.021	No Cointegration
ΔLnS	4	3.712	7.262	Cointegration
Critical Values				
		Lower	Upper	
	10%	3.270	4.260	
	5%	4.000	5.057	
	1%	5.697	6.987	

Note: the critical values are from Narayan (2005), Case III: unrestricted intercepts and no trend with n = 60.

tion is evident only when the crisis and seasonal dummies are excluded. Based on these results, the long-run consumption equation as in (1) is statistically validated.

Using the specified ARDL model with crisis and seasonal dummy variables and lag order of 4, we obtain the following long-run coefficients (number in parentheses are p-values):

$$LnC_t = \underset{(0.000)}{0.8905LnY_t} + \underset{(0.012)}{0.1761LnS_t}$$

From the equation, the long run stock market wealth elasticity of consumption is 0.176. Evaluating the mean values of consumption and stock market wealth at respectively RM36.6 billion and RM590.78 billion, we obtain the marginal propensity to consume out of stock market wealth to be 0.011. Thus, the increase in the stock market wealth by RM1 is associated with an increase in private consumption by 1.1 cents. This estimate is much lower than those for the advanced markets of the United States. As noted by Funke (2004), given the smaller market size, the relation between consumption and stock market may be weaker. Moreover, the smaller marginal propensity to consume may also be due to lower proportion of equities held by Malaysian households.

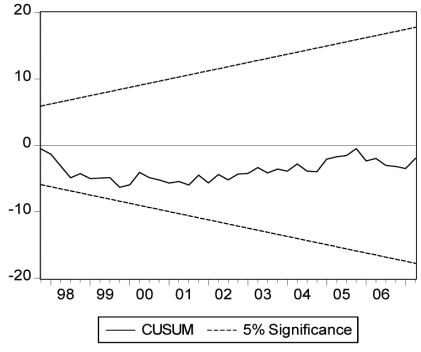
Table 2 presents the short-run dynamics of private consumption behavior where the error correction term represents deviation from the long run relation, namely, $ECT_t = LnC_t - 0.8905LnY_t - 0.1761LnS_t$. In the estimation, we set the model's maximum lag order to 4 and then apply the general-to-specific procedure to trim down the lags until the last lag is significant at 10% significant level. In our final specification, the error term is found to be non-normally distributed due to the outlying residual in 1995.Q1. Accordingly, to account for this outlying observation, we add an impulse dummy variable for 1995.Q1, denoted I_{1995}. In a single-equation context, adding the impulse variable to address an outlying observation is supported and noted to be harmless (Hendry and Santos, 2005). To add credence to our error correction model, we also report several diagnostic statistics. These include the Jarque-Bera test for error term normality, Ramsey's RESET test for model mis-specification, Breusch-Godfrey's LM test for serial correlation, Engle's ARCH test for autoregressive conditional heteroskedasticity and CUSUM and CUSUMSQ plots for structural stability. It is pleasing to note from these statistics that the model passes all diagnostic tests.

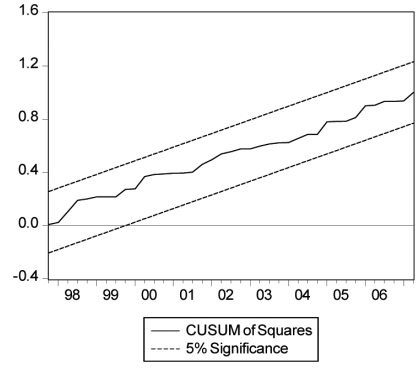
From the dynamic model, the error correction coefficient is negative as should be expected and significant at even 1% significant level. The result

Table 2: Short-run Dynamics of Private Consumption

$$\Delta LnC_t = -0.201 - 0.059Q2 + 0.106I_{1995} - 0.045Crisis - 0.343ECT_{t-1} - 0.085\Delta LnC_{t-1} - 0.195\Delta LnC_{t-2}$$
$$(0.000)\ (0.000)\quad (0.000)\quad (0.002)\quad (0.000)\quad (0.298)\quad (0.016)$$
$$- 0.147\Delta LnC_{t-3} + 0.270\Delta LnC_{t-4} + 0.430\Delta LnY_t - 0.372\Delta LnY_{t-1} + 0.065\Delta LnS_t$$
$$(0.105)\quad (0.002)\quad (0.001)\quad (0.011)\quad (0.008)$$

Adjusted-R^2 = 0.8398	AIC = –4.494	SC = –4.0762
JB = 3.367 (0.186)	LM(1) = 1.305 (0.253)	ARCH(1) = 0.104 (0.747)
RESET = 2.290 (0.112)	LM(3) = 1.349 (0.717)	ARCH(3) = 1.424 (0.700)





thus reaffirms the presence of cointegration among the variables. The speed of adjustment is estimated to be reasonably fast: roughly 34% of the past disequilibrium is corrected by changes in private consumption. Accordingly, any shocks in labor or financial wealth that throw real consumption out of its long run value will be corrected by changes in the consumption. In other words, both real income and stock market wealth do exert positive impacts on private consumption. We receive further confirmation of the important roles of income and stock market wealth in the private consumption behavior through the statistical significance of changes in real GDP and in stock market wealth in the dynamic equation, normally coined in terms of the short-run relations between the variables. Amgain, both are positively related to consumption. Note that the consumption response to changes in income tends to subside in the next quarter. In the context of our main theme, the result suggests contemporaneous response in consumption to changes in stock market wealth. In short, in line with the long run equation, the wealth effect seems to be operative in the case of Malaysia.

4.2 Further Analysis

We implement a VAR model and simulate variance decompositions and impulse-response functions using Cholesky factorization to further analyze dynamic interactions and potential feedback effects among the three variables considered – real consumption, real output, and real market capitalization. These variables are specified in their level form. As mentioned, we also incorporate crisis dummy and seasonal dummies to account for the independent effect of the Asian crisis and for seasonal pattern in the data. The VAR order is set to 4, which we find sufficient to render the error terms to be serially uncorrelated. In simulating VDC and IRF, the order of the variables can be important. It is well noted that the VDC and IRF results based on Cholesky factorization may be dependent on the ordering unless the off-diagonal elements of the error correlation matrix are small or close to zero. Normally, the variable that is deemed exogenous or that responds to other

Table 3: Variance Decompositions

Horizons	Proportion attributable to		
	LC	LY	LS
Variance Decomposition of LC			
1	86.090	13.909	0.000
4	54.489	15.529	29.981
8	39.716	10.924	49.360
12	36.805	10.288	52.907
20	33.763	11.497	54.740
Variance Decomposition of LY			
1	0.000	100.00	0.000
4	0.316	79.965	19.719
8	0.436	64.092	35.472
12	2.146	60.452	37.402
20	6.215	53.562	40.224
Variance Decomposition of LS			
1	0.880	0.223	98.89648
4	4.746	6.334	88.92083
8	4.077	13.091	82.83204
12	5.552	13.662	80.78501
20	7.438	13.378	79.18398

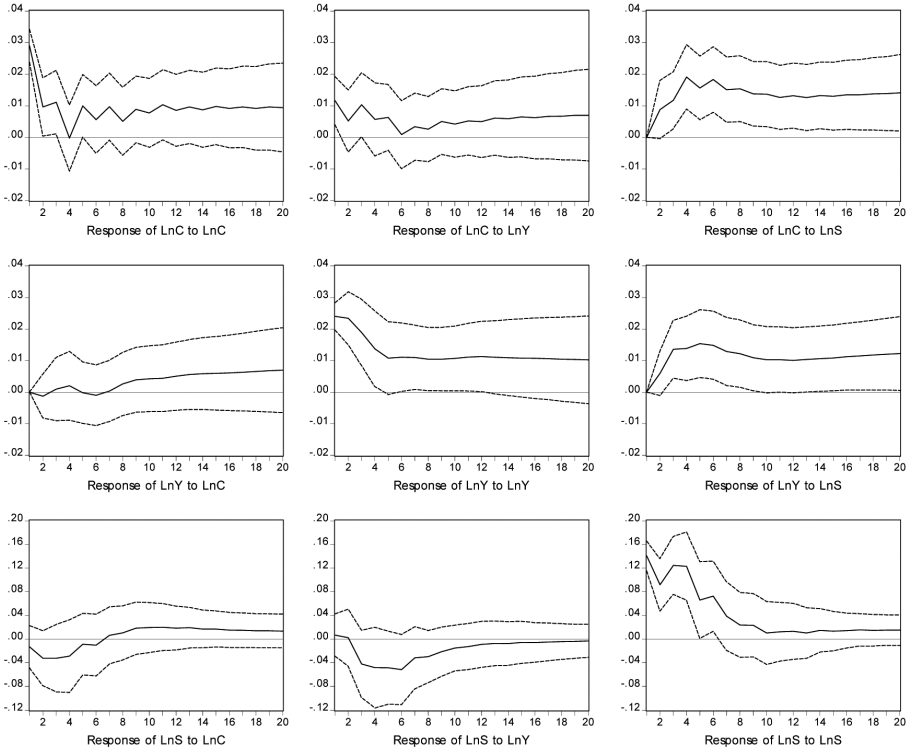
variables with lags should be placed first in the ordering. Meanwhile, the variable that reacts contemporaneously to changes in other variables should be ordered last. Based on this principle, we place real income first, followed by real consumption and then real market capitalization.

At the same time, we examine the VAR error correlation matrix and find quite high correlation between income and consumption, i.e. 0.354. The correlations between real stock market wealth and real activities (consumption and output), however, are less than 0.10. Thus, the dynamic interactions between income and consumption may be sensitive to which of the two we place first in the ordering. However, our focal analysis on dynamic interactions between real consumption and stock market wealth may be only marginally affected by the variables' ordering. We also experiment with the generalized impulse-response functions, which are noted to be insensitive to the variables' ordering. Given our interest, we report the results based on our preferred ordering using the Cholesky factorization and mention briefly the results obtained by ordering real consumption before real income, and from generalized impulse-response functions. Table 3 provides the VDC results while Figure 1 plots the corresponding IRFs.

As may be noted from Table 3 and Figure 1, the variance decompositions and impulse-response functions lead essentially to the same conclusions on dynamic interactions between consumption and stock market wealth. Namely, they indicate a unidirectional causality that runs from real stock market wealth to real consumption, reaffirming the stock market wealth effect noted earlier. After 4 quarters or 1 year, roughly 30% of consumption forecast error variance is attributable to shocks in stock market wealth. This proportion increases to roughly 50% after 8 quarters. Likewise, real consumption responds directly and significantly to a one standard deviation shock in real market capitalization. The response tends to be persistent. The results, however, suggest no causation from real consumption to the stock market variable. The percentage of the variations in stock market wealth attributable to consumption shock is low and, similarly, stock market wealth does not respond to the increase in consumption. Interestingly, real market capitalization also anticipates future variations in the real income as suggested by both the variance decompositions and impulse-response functions. However, while the response function of real market capitalization to shocks in real income is insignificant, we note more than 13% of the variations in the stock market is due to real income shocks after 2-year horizons. Thus, there seems to be an indication of bi-directional causality between market capitalization and income.

Apart from the above main results, quite a sizable proportion of the vari-

Figure 1: Impulse-Response Functions



ations in real consumption is explained by changes in current real income. We also observe significant immediate response of consumption to real income shocks. However, these results are not robust to the alternative ordering of the variables. More specifically, when we place real consumption first in the ordering, the causality pattern between income and consumption is reversed with income being the leading variable. It should be noted that when the generalized impulse-response function is applied the two variables exhibit bi-directional causality. However, their significant responses to the other variable's shock are reflected only at 1-quarter horizon. Meanwhile, it is pleased to note that the pattern of causality between real stock market wealth and real activities remain robust.

In short, the stock market wealth effect is further reaffirmed by the VAR analysis. The stock market wealth does anticipate future variations in consumption and, as should be expected, future variations in real income. This

suggests that the stock market does contribute positively to real activities, in line with many existing studies on the relationship between stock market development and economic growth.

5. CONCLUSION

Progress in the emerging stock markets peppered by their high variations has attracted substantial interest in their relations to real activities. In this paper, we focus on the stock market wealth effect on consumption for a fast-growing emerging market, Malaysia, using quarterly data from 1991 to 2006. To this end, a battery of econometric approaches is employed. These include cointegration test, error correction modeling, and VAR analysis. The results we obtain unequivocally suggest the presence of stock market wealth effect for Malaysia. Documenting evidence for cointegration among the variables considered, we note positive long-run relation between real consumption and real market capitalization. The implied marginal propensity out of stock market wealth, however, is substantially lower than that estimated for the developed markets. The short-run dynamics of consumption framed in an error-correction modeling also indicate positive short-run influences of stock market wealth. Additionally, estimating a level VAR for the cointegrated series, we note from simulated variance decompositions and impulse-response functions significant explanatory power of real stock market wealth in accounting for variations in real consumption. Likewise, changes in stock market wealth anticipate future variations in real output. The evidence for the feedback effect of real activities to real market capitalization, however, is virtually absent.

Our results, then, hint at the role of consumption as a mechanism through which the stock market influences real income. This has important policy implications: to the extent that monetary policy has a bearing on financial markets, the presence of the wealth effect suggests the potential efficacy of monetary policy during times of recession that is normally seen to place the money market under the liquidity trap. Indeed, stock market developments may have generated expectations of an increase in permanent income, which translates into a persistent impact on consumption. Interestingly, the causal impact of current real income on real consumption is noted to be transitory, in line with the life-cycle permanent income hypothesis.

Having reached these conclusions, we should note that the present paper only considers stock market wealth effect on aggregate consumption and ignores other types of wealth such as physical wealth or housing wealth. The

data on housing prices have only become available very recently and, as such, are inadequate for analysis. Moreover, the short span of the data does not allow us to thoroughly look into possible changes in the consumption behavior post-Asian crisis beyond adding the intercept dummy in the analysis. We believe that in order to be more concrete, the wealth measures should encompass other forms of wealth, and possible changes of consumption behavior amidst changing financial environments need to be considered. These can be important avenues for future research, awaiting data availability.

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Résumé

Cette étude analyse l'influence de la Bourse sur l'ensemble de la consommation en Malaise, s'appuyant sur une suite chronologique d'approches: le *ARDL cointegration test,* un modèle autorégressif à retard échelonné à correction d'erreurs, et sur le VAR (*vector autoregression*), un modèle autorégressif multivarié.

Dans cette analyse, il ressort que la consommation réelle dépend fortement de revenu réel et de la richesse réelle du marché actionnaire, mesurée par la capitalisation boursière réelle.

Le *ARDL cointegration test* montre la présence d'une relation à longue terme entre la consommation et ses déterminants, le revenu réel et la richesse réelle du marché boursier. En même temps, l'on peut noter à court terme un coefficient positif de changement concernant la richesse réelle du marché boursier, dans l'équation dynamique de la consommation réelle.

A la fin, la variation des décompositions et des I.R. fonctions (fonctions d'impulsion immédiate), simulées par le modèle VAR, montre un type de comportement casuel qui met en relation les effets de richesse avec les activités réelles (consommation et revenu). Par conséquent, sur la base de ces données, l'on peut affirmer que l'effet de richesse est explicitement commandité en Malaise.

Mots-clés: Aggregate Consumption, Stock Market Wealth, Malaise