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Economic Forces and the Sukuk Market

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Abstract

The aim of this study is to investigate macroeconomic influences on sukuk issuance in Malaysia for the period 1996-2011 at the aggregate level. Based on vector autoregressive models (VARs), variance decomposition (VDC) and impulse response functions (IRF), the results indicate that sukuk Granger-cause GDP while GDP Granger-causes both PPI and CPI. Sukuk are also driven by their own dynamics in the short horizon. The results have important policy implications to the decision-makers. Since sukuk issuance Granger-causes GDP, policy makers should design new policies to modernize the functional aspects of Islamic capital market. A further implication for international institutional investors is that sukuk have the competitive advantage since it targets a segment of the global markets that has not been penetrated by other rivals.

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1. Introduction

A capital market provides alternative funding avenue and wider investor base for corporate entities and the government. Islamic capital market consists of the debt market and the equity market. Sukuk, or Islamic bond, are the most active Islamic debt market financial instrument to date. They are investment certificates with both bond and stock-like features issued to finance trade or the production of tangible assets. Like bonds, sukuk have a maturity date and holders are entitled to a regular stream of income over the life of the sukuk along with a final payment at maturity. It also provides liquidity since sukuk can be traded in secondary market.

Financing decisions, which are to determine how much and what type of debt and equity should be issued to raise capital are among the factors affecting shareholders wealth. Factors that affect shareholders wealth is one of the central issues in finance. The empirical evidence on conventional bond indicates that pure equity offers have a relatively large negative effect while issues of straight debt have a small non-negative wealth effect. On the other hand, convertible securities, having both debt and equity features, have negative wealth effects that lie in between those observed for equity and straight debt (Abhayankar and Dunning, 1999). This paper contributes to the literature by investigating macroeconomic factors influencing sukuk market behaviour since empirical works on this topic are relatively scarce.

The remainder of the paper is organized as follows. Section 2 discusses the related literature and provides a brief background on recent development of sukuk in Malaysia. Section 3 highlights the research method. Section 4 discusses the findings and the final section concludes the paper.

2. Literature Review

There are limited studies that look into the influence of changes in macroeconomic variables on stock and bond markets for Islamic countries. One study found that lagged values of macroeconomic variables such as exchange rates, consumer price index (CPI) and treasury bill rate have a significant influence on the stock market using error corection method (ECM). Another study found that variance decomposition (VCD) and impulse response functions (IRF) analyses show that shocks to economic variables explained only a minority of forecast error of the market index and the effects were not persistence.

The present study adds to the scarce literature on the empirical determinants of corporate and sovereign sukuk issuance. The conventional literature on macroeconomic determinants in bond market varies widely in the choice of variables and methodology. Some papers concentrate on reduced form regressions of spreads on explanatory variables. Examples are Beck (2001), Min (1998) and Eichgreen and Moody (1998). We based our research specification on the work of Hilscher and Nosbuch (2010). These authors depart from previous literature by investigating the volatility of fundamentals instead of estimating the equations based on levels.

Meanwhile, Cakir and Raei (2007) examine the risk-reduction advantages of issuing sovereign sukuk. Using a sample of sovereign sukuk and Euro bonds from the same issuer, the authors estimate and compare value-at-risk (VaR) for a portfolio that includes both instruments to a pure Eurobond portfolio. They find that the VaR is reduced when sukuk are added to the portfolio of fixed-income securities, demonstrating that these investment certificates create diversification benefits for investors. However, Godlewski, Turk-Ariss and Weill (2011) take an opposing view, suggesting that there is no significant market reaction to conventional bond issues, but a significant negative stock market reaction to sukuk issues. The researchers explain the different stock markets reactions to two factors. First, investors expect

that an adverse selection mechanism encourages less-healthy companies to prefer sukuk over conventional bond financing. Second, investors may take the view that even if companies issuing sukuk may have been shut out of the conventional bond market, they can still take advantage of excess demand for sukuk from Islamic banks.

In addition, according to market efficiency literature, unanticipated news about the macroeconomic indicators of a country influences the behaviour of markets and participants (Ameer, 2007). Markets are efficient if changes in prices quickly respond to unanticipated news. Some studies have established that changes in macroeconomic variables contain important information for stock market participants. However, empirical studies on macroeconomic impact on sukuk market behaviour are limited in numbers. Hence, this study contributes to the literature by filling in this gap.

3. Research Method

The study employs aggregate quarterly data of sukuk issuance in Malaysia for the period 1996:Q1–2011:Q2. Data are sourced from the Bloomberg Database and Datastream. We examine the effect of macroeconomic conditions on total sukuk issuance at the aggregate level. Specifically, the variables used are the influence of Producer Price Index (PPI) as a proxy of business cycle (instead of using interest rate to proxy for business cycle), inflation rate, measured using CPI, and Gross Domestic Product (GDP) to represent economic growth.

The four variables vector auto-regressive (VAR) model is based on the cointegration and stationarity property of each variable. The VAR methodology is used to investigate the dynamic of the market and to estimate the responses of each variable to innovations in other variables in the system. Each endogenous variable in VAR is explained by its lagged values and the lagged values of all other endogenous variables in the model (Gujarati, 1995). We use Augmented Dickey-Fuller (ADF) tests to investigate the stationary properties of each variable. Table 1 presents the results which indicates that all variables are I(1).

Table 1: Unit Root Statistics

Variable	ADF statistics with intercept and trend	
	Level	First Difference
Sukuk	-2.084 (0.538)	-11.416*** (0.000)
PPI	-1.231 (0.891)	-4.916*** (0.000)
CPI	-2.332 (0.411)	-5.791*** (0.001)
GDP	-1.365 (0.853)	-3.313* (0.081)

Notes: ***, **, * denotes significant at 1%, 5% and 10% level of significance, respectively. Figures in brackets are p-values. Tests include both trend and intercept. The null for PP tests are the hypothesis of a unit root is tested against the alternative of stationarity.

Next, we perform Johansen co-integration tests to determine whether there are stable relationships between the measure of economic activities and the aggregate sukuk issuance. The Trace test and maximum Eigenvalue indicates one co-integrating vector for the period under study. The presence of cointegration implies that the variables are tied together in the long run and their deviations from long run equilibrium path will be corrected. Next, the residuals correlation and covariance matrix are examined to detect autocorrelation problems. The covariance results show no significant figures, meaning that no

remaining autocorrelations are being ignored by the model. Thus, the orderings are maintained. Table 2 presents the relationships for the variables and identify at least one co-integration vector for the sample.

Table 2: The Johansen Co-integration Tests

Null Hypothesis	Test Statistics		Critical Values (0.05)	
	Trace	Max-Eigen	Trace	Max-Eigen
$r = 0$	81.94*	58.54727	47.85*	27.58434
$r = 1$	23.39	13.91670	29.79	21.13162
$r = 2$	9.47	6.961824	15.49	14.26460
$r = 3$	2.52	2.515296	3.84	3.841466

Notes: The lag order specified is 5. Effective number of observations is 39. Trace test indicates 1 co-integrating at the 0.05 level. Max-Eigenvalue test indicates 1 cointegrating at the 0.05 level.

Next, we perform VAR methodology to investigate the dynamics of the sukuk market. The VAR model is explained below:

$$x_{1,t} = a_{1,0} + \sum_i^k a_{1,i} x_{1,t-1} + \sum_i^k b_{1,i} x_{2,t-1} + \sum_i^k c_{1,i} x_{3,t-1} + \sum_i^k d_{1,i} x_{4,t-1} + \varepsilon_{1,t} \tag{1}$$

$$x_{2,t} = a_{2,0} + \sum_i^k a_{2,i} x_{1,t-1} + \sum_i^k b_{2,i} x_{2,t-1} + \sum_i^k c_{2,i} x_{3,t-1} + \sum_i^k d_{2,i} x_{4,t-1} + \varepsilon_{2,t} \tag{2}$$

$$x_{3,t} = a_{3,0} + \sum_i^k a_{3,i} x_{1,t-1} + \sum_i^k b_{3,i} x_{2,t-1} + \sum_i^k c_{3,i} x_{3,t-1} + \sum_i^k d_{3,i} x_{4,t-1} + \varepsilon_{3,t} \tag{3}$$

$$x_{4,t} = a_{4,0} + \sum_i^k a_{4,i} x_{1,t-1} + \sum_i^k b_{4,i} x_{2,t-1} + \sum_i^k c_{4,i} x_{3,t-1} + \sum_i^k d_{4,i} x_{4,t-1} + \varepsilon_{4,t} \tag{4}$$

where $x_{1,t}$ is PPI, $x_{2,t}$ denotes CPI, $x_{3,t}$ denotes GDP and $x_{4,t}$ is the aggregate sukuk issuance. For the purpose of the analysis, we focus on equation (4) which represents aggregate sukuk issuance. We used $k=5$ for the VAR model based on the AIC criteria selection. The ordering of the variables follows Ameer (2007). For the ordering, variables that are used as a policy instrument is ordered first, followed by the variables connected within transmission mechanism and ended by the real sector. According to the author, it is reasonable to expect a lagged effect in the study since market is not efficient and they respond to changes with a time lag. In addition, investors may wait for the real effect of the macroeconomic changes to understand whether the changes are permanent or temporary.

Furthermore, the variance decomposition (VDC) of the n -step ahead forecast errors captures the percentage of unexpected variation in sukuk return accounted for by shocks from other macroeconomic variables. Meanwhile, the impulse response functions (IRF) captures the speed of adjustment of each variable to a shock of another variable. If the responses subside towards zero quickly, then the transmission of information among the variables is relatively efficient.

4. Results

To ensure that the orderings in the VAR model is correct and to determine the direction of causality among the variables, the Granger-causality tests are conducted. The results are presented in Table 3. The findings indicate that we do not reject the hypothesis that GDP Granger-cause both PPI and CPI. In addition, we can reject the hypothesis that sukuk issue do not Granger-cause GDP. Therefore, the results suggest that sukuk issuance have an impact on GDP.

Table 3: Granger Causality Tests

Dependent Variable	F-statistics of lagged first differenced terms			
	PPI	CPI	GDP	Sukuk
PPI	-	1.96 [0.37]	8.69** [0.01]	0.15 [.92]
CPI	0.92 [0.63]	-	5.39* [0.06]	3.49 [0.17]
GDP	0.38 [0.82]	1.09 [0.57]	-	19.24*** [0.00]
Sukuk	1.51 [0.46]	0.34 [0.84]	2.00 [0.36]	-

Notes: Figures in (.) and [.] represent t-ratios and p-values, respectively. ***, **, * denotes significant at 1%, 5% and 10% level, respectively.

In order to examine the dynamics of endogenous variables and their impact, the study employs impulse response function (IRF) to illustrate the dynamic patterns of sukuk issuance. The IRF are calculated over a 10-quarter time horizon. The initial shock in a variable is set to be equal to one standard error of innovation; the vertical axis in the figures reports the approximate percentage change in other variables in response to a one-percentage shock in sukuk issue. The two dashed lines show two standard deviation band for the impulse responses which are calculated using Monte Carlo simulations (with 1,000 repetitions) or asymptotically. The results are shown in Figure 1.

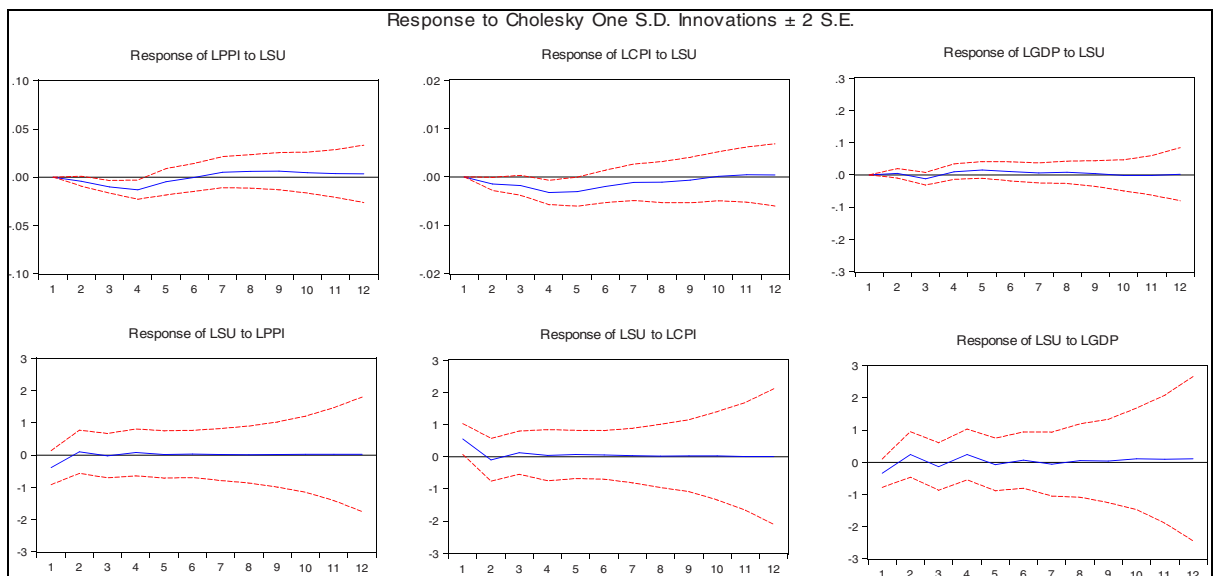


Figure 1: Response of Sukuk to PPI, CPI and GDP

Based on Figure 1, sukuk respond negatively to the shocks in PPI and positively to CPI in the first 2 quarters and return to equilibrium in the long run. The responses of sukuk to shocks in GDP for the first two years fluctuate around the mean and are positive in the long horizon. Both CPI and PPI respond negatively to the shocks in sukuk but stabilize and return to the mean values in the long run. The results of VAR analysis based on the LM diagnostic test for residual serial correlation and VAR stability test produce stable results since no roots fall outside the unit circle as shown in Figure 2. In addition, the covariance results (not shown here) show no significant figures that are more than 0.2, meaning that no remaining autocorrelations are being ignored by the model. The results are also robust to different lag length, ordering and other selected macroeconomic indicators.

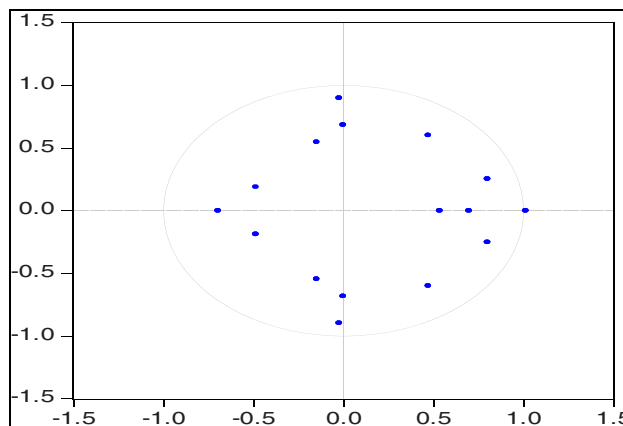


Figure 2: Stability of VAR Model

The variance decomposition analysis (VDC) analysis provides information on the percentage contribution of various shocks to the variance of *k*-step ahead forecast errors of the respective variable. Table 4 shows variance decomposition PPI, CPI, GDP and Sukuk. The results indicate that sukuk are largely driven by their own dynamics in the first two years. In addition, after two years, CPI and GDP explained about 10% of variation in sukuk. Sukuk explained more than 20% of the variances to the shocks in both PPI and CPI during the first year. After two years, sukuk contributed more than 10% to the variance in PPI and GDP.

Table 4: Sukuk issue Variance Decomposition Analysis

Forecast Horizon	Variance decomposition of PPI				Variance decomposition of CPI			
	PPI	CPI	GDP	Sukuk	PPI	CPI	GDP	Sukuk
2	79.45	0.11	13.93	6.48	7.98	25.28	51.81	14.91
4	22.56	0.12	54.04	23.26	7.70	56.09	10.16	26.02
8	15.34	0.499	67.20	16.94	8.89	33.07	37.03	20.99
10	12.76	0.46	70.88	15.88	3.28	89.15	0.279	7.285
	Variance decomposition of GDP				Variance decomposition of Sukuk			
	PPI	CPI	GDP	Sukuk	PPI	CPI	GDP	Sukuk
2	3.83	8.94	86.45	0.75	7.04	13.60	7.57	71.77
4	3.02	8.01	83.15	5.80	6.57	12.87	9.74	70.79
8	2.47	7.98	78.97	10.56	6.52	12.93	10.50	70.03
10	2.29	8.61	77.82	11.25	6.51	12.95	10.09	70.43

5. Conclusion

The paper concludes that the selected macroeconomic factors do influence sukuk issuance. Specifically, sukuk Granger-causes GDP while GDP Granger-causes both PPI and CPI. The results have important policy implications to the decision-makers. First, since sukuk issuance Granger-cause GDP, policy makers should design new policies to modernize the functional aspects of Islamic capital market. Second, sukuk are largely driven by their own dynamics in the short horizon. The future research work in these areas can explore the idiosyncratic momentum effects for corporate, sovereign and quasi-sovereign sukuk markets. In addition, it would be interesting to know whether the same macroeconomic factors attract domestic, international and high net-worth investors and whether sukuk prices are better proxy for fundamental news.

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