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Oil Price Shocks and Stock Markets in ASEAN-5

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Abstract

This paper examines the impact of oil price shocks and oil price volatility on real stock prices in Indonesia, Malaysia, Philippines, Singapore and Thailand. Using a monthly structural vector autoregression model estimated separately for each country from 1997:7 to 2013:12, the results show that in response to an oil price shock, real stock prices fall within six months in all the countries as the central banks increase interest rates to reduce inflationary pressures. In contrast to the findings in existing studies on the US and European countries, monetary policy shocks in ASEAN-5 are more important in explaining the variability in real stock returns compared to oil price shocks. The fall in real stock prices is also observed under both positive and negative oil price shocks, suggesting that oil price volatility plays an important role in explaining stock price movements. In response to an increase in oil price volatility, real stock prices are depressed immediately but they gradually recover as the economic situation improves.

Keywords: Oil Price Shock, Oil Price Volatility, Stock Market, ASEAN

Introduction

Since the seminal work of Hamilton (1983, many studies have found significant effects of oil price shocks on the macroeconomy regardless of sample countries, time periods and estimation procedures (e.g. Burbridge and Harrison 1984; Gisser and Goodwin 1986; Cunado and Perez de Garcia 2003; Jimenez-Rodriguez and Sanchez 2005, alternative oil price specifications (e.g. Mork 1989; Lee *et al*. 1995; Hamilton 1996; 2003 or the sources of oil price shocks (e.g. Kilian 2009; Peersman and Van Robays 2012.

Oil prices can also affect asset prices, and there is now a growing literature on the relationship between oil price shocks and stock market returns. The methods employed range from regression analysis (e.g. Nandha and Faff 2008, linear and non-linear time series methods (e.g. Jones and Kaul 1996; Aloui and Jammazi 2009, vector autoregression (VAR models that do not distinguish between oil price shocks caused by oil supply or demand shocks, that is, the oil price shocks are taken to be a weighted average of oil supply and demand shocks (e.g. Huang *et al*. 1996; Sadorsky 1999; Park and Ratti 2008, and VAR models that investigate the responses of stock market returns to different types of oil shocks (e.g. Kilian and Park 2009; Apergis and Miller 2009; Wang *et al*. 2013. While most of the existing papers focus on advanced economies and BRICS, countries in the dynamic ASEAN region have not been given attention[1].

The objective of this paper is to investigate the impact of oil price shocks (linear and asymmetric as well as oil price volatility on real stock prices in ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore, Thailand using a monthly structural VAR model from 1997:7 to 2013:12. However, unlike most existing studies, this paper includes other macroeconomic variables since oil prices also affect stock prices through the effects on the macroeconomy. The direct impact of higher oil prices is an increase in production costs and lower profits for non-oil companies and higher prices for

[1] BRICS refers to the large emerging economies of Brazil, Russia, India, China and South Africa. ASEAN is the Association of South East Asian Nations consisting of 10 countries – Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

final goods and services faced by consumers which can lower consumption and hence output. The expected recessionary conditions tend to depress stock prices. Another important transmission channel is through monetary policy (see Bernanke *et al*. 1997), in which central banks can respond to higher oil prices by increasing interest rates to control inflation. This has an indirect impact on stock prices through the prevailing and expected interest rate used to discount future cash flows. As the focus of this paper is on the responses of the macroeconomic variables in various countries to the same set of oil price shocks over the same time period and not on the effects of specific oil shock episodes per se, no distinction is made with regards to oil supply or demand shocks. Apriori, the oil-exporting countries (Indonesia and Malaysia) are expected to respond differently compared to the oil-importing countries (Philippines, Singapore and Thailand); however, it could also be the case whereby oil-exporting countries behave similarly to oil-importing countries (e.g. Canada and United Kingdom, see Jimenez-Rodriguez and Sanchez 2005). Existing VAR studies that also include macroeconomic variables such as inflation, interest rate and real exchange rate focus mainly on the US and European countries (e.g. Park and Ratti 2008; Bjornland 2009; Cunado and Perez de Garcia 2014). This paper contributes to the literature by examining the effects on the ASEAN region.

Previewing the main results, output increases in the short run in all the five countries in response to an oil price shock but the effects die off within a year. In fact, output falls permanently in Singapore after six months due to the appreciation of the real exchange rate. Other countries fare better as their real exchange rate depreciates. Inflation increases in all countries and the response of the central banks is to raise interest rates. Similar to the responses of output, real stock prices increase in the short run but are permanently lower within six months. The fall in real stock prices is also observed under both positive and negative oil price shocks, suggesting that oil price volatility plays an important role in explaining stock price movements. In response to an increase in oil price volatility, output falls in the short run in all the countries, but the recovery of Singapore is the fastest due to a larger real exchange rate depreciation. Inflation decreases across the board, and central banks react by lowering interest rates. Real stock prices are depressed on impact but gradually recover as the economic situation improves.

In contrast to the findings in existing studies on the US and European countries (e.g. Park and Ratti 2008, oil price shocks are not as important in explaining the variability in real stock returns compared to monetary policy shocks. This suggests that the dynamics of the ASEAN economies and stock markets are different, which reinforces the need to examine the oil price-macroeconomy relationship across different regions and countries.

The remainder of this paper is organised as follows. Section 2 outlines the data and methodology used. Section 3 presents the empirical results for both linear and asymmetric oil price shocks. Section 4 discusses the results on the impact of oil price volatility, and Section 5 concludes.

2. Data and methodology

2.1 Variables and data sources

The data period covered in this study is from 1997:7 to 2013:12 as available stock prices for Indonesia and Philippines start from July 1997. In order to capture the dynamic relations between oil prices and the macroeconomy (including the stock market, the variables included are real oil price, output, inflation, short-term interest rate, real exchange rate and real stock price. Since monthly industrial production is not available, quarterly real GDP is temporally disaggregated to monthly frequency using the Boot-Feibes-Lisman method (see Boot *et al*. 1967[2]. The stock price indices used are the Jakarta Stock Exchange Composite Index for Indonesia, Kuala Lumpur Stock Exchange Composite Index for Malaysia, Philippines Stock Exchange Composite Index for Philippines, Straits Times Index for Singapore and Stock Exchange of Thailand Index for Thailand. The variables and data sources are summarised in Table 1, while the descriptive statistics are in Table 2.

[2] Monthly data on industrial production is only available for Malaysia. For consistency reasons, the Boot-Feibes-Lisman method to temporally disaggregate quarterly GDP to monthly frequency is applied to all countries including Malaysia.

Table 1 Definition of variables and data sources

Variables	Definition	Symbol	Source[a]
Real oil price	Log of world crude oil price (US dollars per barrel) converted to national currency and deflated using national CPI	o	IFS
Output	Log of seasonally-adjusted real GDP temporally disaggregated from quarterly to monthly data using the Boot-Feibes-Lisman method	y	IFS
Inflation	First log difference of consumer price index (CPI)	π	IFS
Interest rate	Money market interest rate	i	IFS
Real exchange rate	Log of real effective exchange rate (REER)	q	Darvas (2012)
Real stock price	Log of stock price deflated using national CPI	s	EconStats and country stock exchanges

[a] IFS – IMF International Financial Statistics;
EconStats - http://www.econstats.com/.

Table 2 Descriptive statistics of macroeconomic variables, 1997:7 to 2013:12 (%)

Country	Δo	Δy	π	i	Δq	Δs
Indonesia	1.7 (10.1)	0.3 (0.7)	0.9 (1.5)	13.2 (15.6)	-0.1 (7.2)	0.9 (8.8)
Malaysia	1.0 (8.2)	0.4 (0.7)	0.2 (0.4)	3.3 (1.6)	-0.1 (3.3)	0.3 (7.2)
Philippines	1.1 (8.4)	0.4 (0.4)	0.4 (0.5)	7.4 (3.8)	0.0 (2.1)	0.4 (7.6)
Singapore	0.8 (8.1)	0.4 (1.0)	0.2 (0.5)	1.7 (1.5)	0.0 (0.9)	0.2 (7.3)
Thailand	0.9 (8.5)	0.2 (1.1)	0.2 (0.5)	3.4 (4.2)	0.0 (2.4)	0.3 (9.0)

Notes: Mean and standard deviation (in parenthesis) of variables - Δo (change in real oil price), Δy (output growth), π (inflation), Δq (interest rate), Δs (change in real exchange rate),(change in real stock price).

2.2 Time series properties

Preliminary data analyses are performed to ensure that the variables are specified in accordance with their time series properties, that is, the variables are stationary and their levels are not cointegrated. Inflation and interest rate are stationary variables[3]. The log levels of real oil price, output, real exchange rate and real stock price are non-stationary, but their first log differences are stationary. Therefore the first log differences of these four variables are used in the model described in the next section. The results of the augmented Dickey-Fuller unit root test (see Dickey and Fuller 1979) are shown in Table 3. Johansen's (1988; 1991) trace statistic and maximum eigenvalue likelihood tests indicate that there is no evidence of cointegration among the variables with a unit root except for Singapore. The results are displayed in Table 4. It is generally preferable to run an unrestricted VAR compared to a restricted vector error correction model (VECM) (see e.g. Engle and Yoo 1987; Clements and Hendry 1995); as such, unrestricted VARs are used for all the countries.

Table 3 Augmented Dickey-Fuller unit root tests

	Real oil price				**Output**				**Inflation**	
	Log level		**First log diff.**		**Log level**		**First log diff.**			
Country	**C**	**C&T**	**C**	**C&T**	**C**	**C&T**	**C**	**C&T**	**C**	**C&T**
Indonesia	-1.42	-3.25	-6.26*	-6.27*	0.80	-6.09*	-5.18*	-4.88*	-5.19*	-4.88*
Malaysia	-1.56	-2.83	-6.28*	-6.31*	-0.27	-4.32*	-3.86*	-3.79*	-5.56*	-5.51*
Philippines	-1.67	-2.29	-6.48*	-6.55*	1.46	-3.22	-3.73*	-3.80*	-4.49*	-4.44*
Singapore	-1.64	-2.64	-6.26*	-6.29*	-0.06	-2.64	-3.15*	-3.13	-3.22*	-3.81*
Thailand	-1.46	-2.77	-6.30*	-6.31*	-0.58	-2.84	-4.33*	-4.24*	-5.97*	-5.98*

3 Interest rate for Singapore appears to have a unit root, but from an economic point of view, interest rates should be stationary. The interest rate series for the other countries are stationary based on the ADF tests, and therefore the variable in levels is used in the VAR model for every country.

Table 3 Augmented Dickey-Fuller unit root tests (continued)

	Interest rate		**Real exchange rate**				**Real stock price**			
			Log level		**First log diff.**		**Log level**		**First log diff.**	
Country	**C**	**C&T**	**C**	**C&T**	**C**	**C&T**	**C**	**C&T**	**C**	**C&T**
Indonesia	-4.26*	-3.78*	-3.28*	-4.74*	-6.27*	-6.30*	-0.60	-2.89	-5.32*	-5.31*
Malaysia	-7.09*	-6.37*	-2.86	-3.83*	-5.95*	-5.98*	-0.73	-3.97*	-4.37*	-4.38*
Philippines	-1.84	-3.47*	-0.10	-1.57	-6.17*	-6.48*	-0.40	-2.55	-5.20*	-5.41*
Singapore	-2.80	-2.96	-0.29	-1.67	-3.58*	-4.72*	-1.73	-3.29	-4.62*	-4.61*
Thailand	-6.89*	-6.70*	-0.66	-1.73	-6.06*	-6.07*	-0.83	-3.67*	-4.82*	-4.78*

Notes: C – constant; C&T – constant and time trend; * denotes significance at the 5% level.

Table 4 Johansen's cointegration tests

Country	**Hypothesis**	$r = 0$	$r \leq 1$	$r \leq 2$
Indonesia	λ_{trace} test	25.74	6.74	0.39
	λ_{max} test	19.00	6.35	0.39
Malaysia	λ_{trace} test	29.84*	9.06	0.20
	λ_{max} test	20.78	8.86	0.20
Philippines	λ_{trace} test	22.65	8.08	0.15
	λ_{max} test	14.57	7.93	0.15
Singapore	λ_{trace} test	36.58*	13.64	0.86
	λ_{max} test	22.94*	12.78	0.86
Thailand	λ_{trace} test	18.25	4.81	0.45
	λ_{max} test	13.44	4.36	0.45

Notes: 6 lags are used; * denotes significance at the 5% level.

2.3 The structural VAR approach and identification of shocks

The empirical framework used is based on the structural VAR approach, which is frequently used in the literature to study the impact of oil price shocks. The choice of macroeconomic variables reflects the theoretical set-up of New Keynesian open economy models which allows monetary policy responses to shocks. Therefore, in addition to the oil price and stock price variables, there is also a monetary policy instrument (short-term interest rate), monetary target variables (inflation and/or output) and the exchange rate. The VAR model of order (i.e. p number of lags) has the following specification:

$$Z_t = A_0 + \sum_{j=1}^{p} A_j Z_{t-j} + e_t \qquad (1)$$

where $Z_t = (\Delta o_t, \Delta y_t, \pi_t, i_t, \Delta q_t, Ds_t)'$ is the vector of stationary endogenous variables, A_0 is the intercept vector A_j, is the j^{th} matrix of autoregressive coefficients for $j = 1, ..., p$, and e_t is a vector of reduced-form residuals with the properties $E(e_t) = 0$ and $E(e_t e_u') = \Omega$ if $t = u$ and $E(e_t e_u') = 0$ if $t \neq u$. Ω is the variance-covariance matrix with non-zero off-diagonal elements.

The optimal lag length is determined using the sequential log likelihood (LR) test and Akaike information criteria (AIC), and the most common lag order across the five countries is six. Therefore, six lags are used for each of the country's VAR model.

Since the reduced-form residuals are correlated and thus cannot be interpreted as structural shocks, a recursive ordering based on the Cholesky decomposition is used to orthogonalise the shocks. The ordering of the variables in the system is such that a variable in the system does not react contemporaneously to other variables below it but reacts to those above it. After one month, all variables react to all the shocks. The identification approach taken in this paper is similar to Bjornland (2009).

Real oil price change is treated as the most exogenous variable, which is indeed a plausible small country assumption such that domestic variables do not have a contemporaneous influence on the real oil price. Output growth and inflation are placed before interest rate so that monetary policy can immediately respond to oil price, output and inflation shocks. The change in the real exchange rate and real stock returns are ordered last so they can react immediately to monetary policy surprises, consistent with the quick adjustment in asset prices (see Rigobon and Sack 2004. This ordering of variables is not without its criticism; for example, there is no reason to assume that central banks do not respond contemporaneously to asset price shocks (exchange rate and stock price. However, as Bjornland (2009 argues, this assumption is only problematic with quarterly data but is not as severe with monthly data. Robustness checks using alternative orderings, for instance, by placing interest rate last, do not change the main results of this paper.

3. The impact of oil price shocks

3.1 Linear oil price shocks

The impulse responses of the variables (cumulative for variables in first log differences to an oil price shock normalised to 10 per cent (approximately one standard deviation are shown in Figure 1. There is a small increase in output in the short run in all the countries with a peak between 0.1 per cent and 0.6 per cent, but the effect becomes statistically insignificant after about three to nine months, except for Indonesia and Singapore, whereby output is permanently lower by 0.2 per cent and 0.4 per cent respectively. The finding for Indonesia is perhaps unexpected as it is an oil-exporting country; however, similar results are also documented for other oil-exporting countries such as Canada and United Kingdom (see Jimenez-Rodriguez and Sanchez 2005. Malaysia, Philippines and Thailand fare much better as the real exchange rate depreciates in response to an oil price shock.

As expected, inflation is permanently higher in all the countries by about 0.2 per cent to 0.5 per cent. In response to oil price shocks which cause output changes and inflation, central banks increase the interest rate with a peak at around six months. The highest interest rate hike is in Indonesia, which operates under an inflation targeting framework; the result is expected since it also experiences the highest increase in inflation (despite large oil subsidies. The responses of real stock prices in the short run vary across the countries. In Philippines and Singapore, there is a small statistically significant increase, but the overall medium- to long-run picture is such that real stock prices are permanently lower. This is in line with the negative relationship found in several existing studies. The overall responses of Indonesia and Malaysia show more resemblance to those of oil-importing countries, in contrast to the findings for Norway (see Bjornland 2009 in which stock prices increase in response to an oil price shock. A likely explanation is the continual reduction in net oil exports, from around 665 thousand barrels per days (tbpd) in 1990 to -50 tbpd in 2010 for Indonesia, and from 420 tbpd to 85 tbpd over the same period for Malaysia.

The forecast error variance decompositions (FEVD) of real stock returns due to oil price shocks and monetary policy shocks are displayed in Table 5. FEVDs give the proportion of the variance of the forecast error attributed to each of the structural shocks at various horizons (i.e. the relative importance of each shock in the variability of real stock returns). On average, oil price shocks account for about 5 per cent of the variability in real stock returns, while monetary policy shocks explain about 8 per cent. This is in contrast to the findings documented in Sadorsky (1999) and Park and Ratti (2008) for the US and European countries, whereby oil price shocks are more important than monetary policy shocks. This suggests that the dynamics of the ASEAN stock markets are different from the advanced economies, which reinforces the necessity of examining the oil price-macroeconomy relationship in different regions and countries.

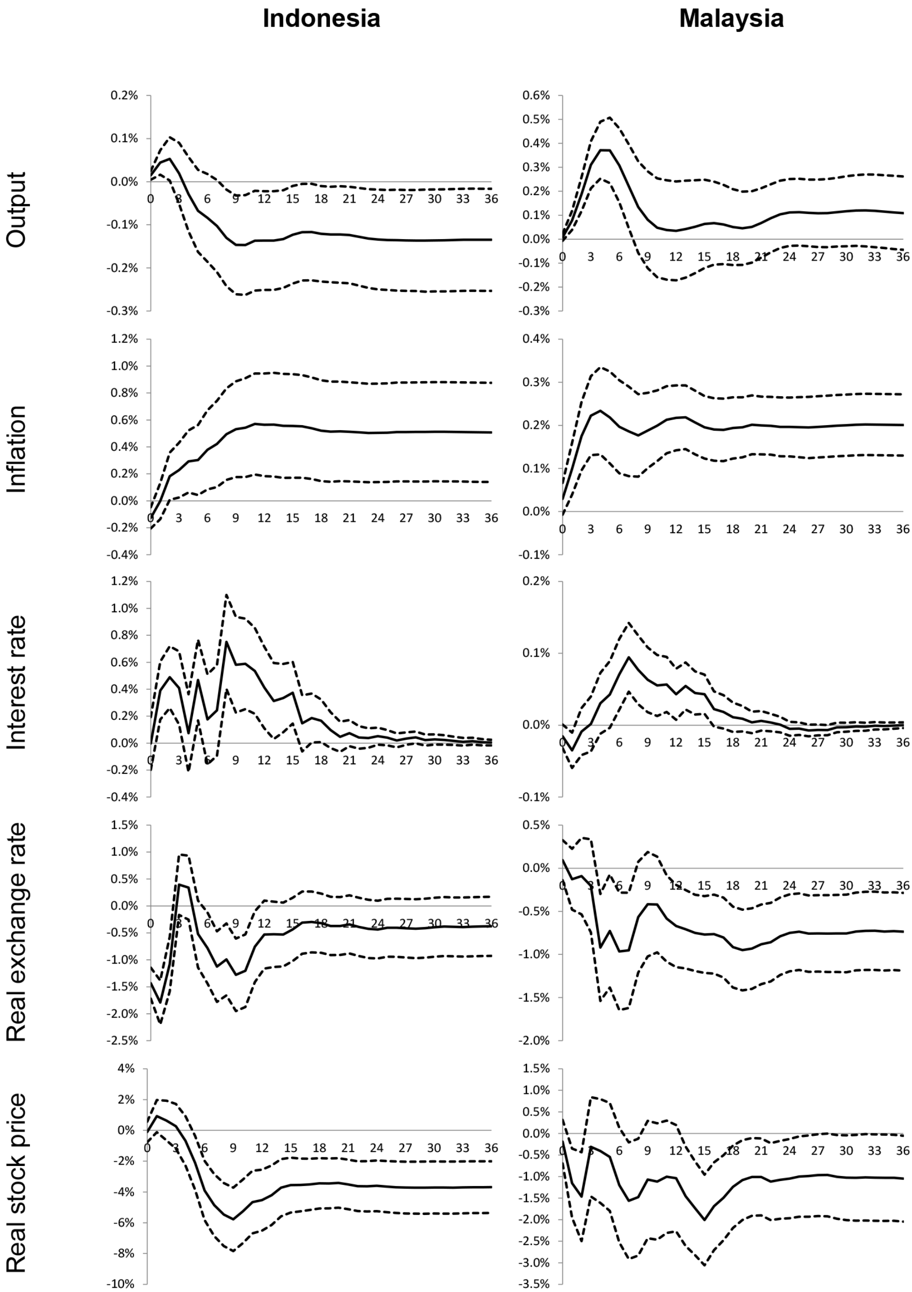
Table 5 Forecast error variance decompositions of real stock returns (%)

Months	Indonesia		Malaysia		Philippines	
	OP	MP	OP	MP	OP	MP
1	0.0	0.6	0.1	0.0	1.0	12.5
6	4.0	1.3	3.2	4.7	3.2	14.0
12	7.9	2.5	3.6	8.9	3.2	13.7
24	8.1	2.7	4.1	9.5	3.2	13.8
48	8.1	2.7	4.1	9.5	3.2	13.8

Months	Singapore		Thailand	
	OP	MP	OP	MP
1	0.4	8.0	0.0	0.3
6	3.5	8.9	2.8	4.7
12	5.5	9.1	4.3	4.8
24	5.7	9.0	4.3	4.8
48	5.7	9.0	4.3	4.8

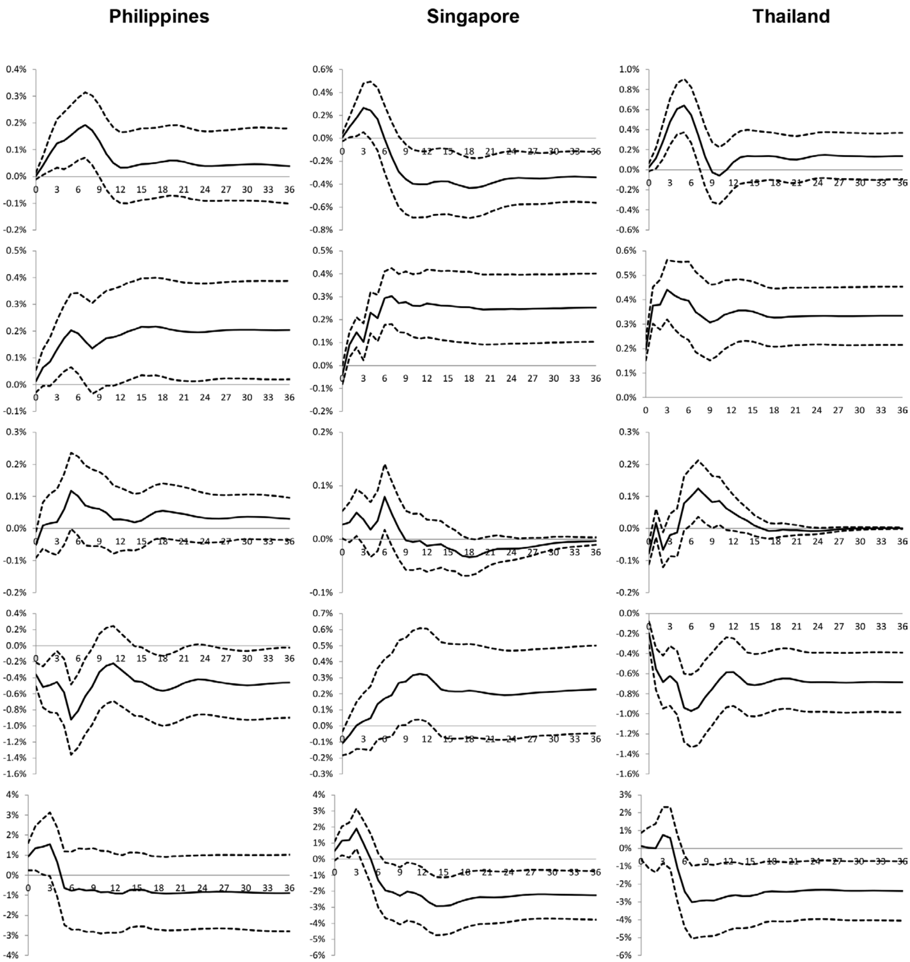
Notes: OP – oil price shock; MP – monetary policy shock.

Figure 1 Impulse responses to a 10% oil price shock



Note: Dotted lines are two standard deviation error bands.

Figure 1 Impulse responses to a 10% oil price shock (continued)



Note: Dotted lines are two standard deviation error bands.

3.2 Asymmetric oil price shocks

Following a series of oil price declines in the 1980s (in particular the 1986 OPEC collapse), the oil price-macroeconomy relationship was found to have smaller effects than predicted by linear models. This led to the development of alternative oil price specifications (see Mork 1989; Lee *et al*. 1995; Hamilton 1996). In this section, the effects of asymmetric oil price shocks are investigated. Mork (1989) defines positive and negative oil price shocks as:

$$\Delta o_t^{+} = \max(0, \Delta o_t) \tag{2}$$

$$\Delta o_t^{-} = \min(0, \Delta o_t) \tag{3}$$

Equations (2) and (3) consider oil price increases and decreases respectively, in which a positive oil price shock can have a different magnitude compared to a negative oil price shock. This differs from the linear model specification in equation (1) whereby a positive or negative oil price has an equal but opposite impact.

The impulse responses of the variables to both positive and negative oil price shocks normalised to 10 per cent are shown in Figure 2. In all the countries, the short-run response of output to an oil price decline is more positive compared to that of an oil price increase. This is in contrast to the findings on advanced economies in Jimenez-Rodriguez and Sanchez (2005). In Malaysia and Thailand, output is permanently higher under both shocks, while in Philippines output is higher under a negative shock and lower under a positive shock, but all the magnitudes are small at around 0.1 per cent only. In Indonesia and Singapore, output is permanently lower under both shocks, with Singapore suffering a relatively high output fall of about 0.6 per cent. The output responses can be explained by the responses of the real exchange rate. In Singapore, the real exchange rate appreciates by 0.8 per cent in response to a negative oil price shock, while in all the other countries the real exchange rate depreciates under both shocks.

Inflation increases under both oil price shocks, with the effects generally higher for a negative shock, which is expected given that output is also higher. In response to higher output and inflation, central banks raise interest rates under negative oil price shocks in Malaysia, Philippines and Thailand. However, in Indonesia and Singapore whereby output falls, interest rates are lower under negative oil price shocks in order to stimulate the economy. Interestingly, the short-run behaviour of real stock prices are mixed, but the medium- to long-run effects are such that real stock prices are permanently depressed, with Indonesia's stock market experiencing the biggest decline. This finding suggests that oil price volatility, and not positive or negative oil price shocks per se, is important in explaining stock price movements.

Figure 2 Impulse responses to 10% asymmetric oil price shocks

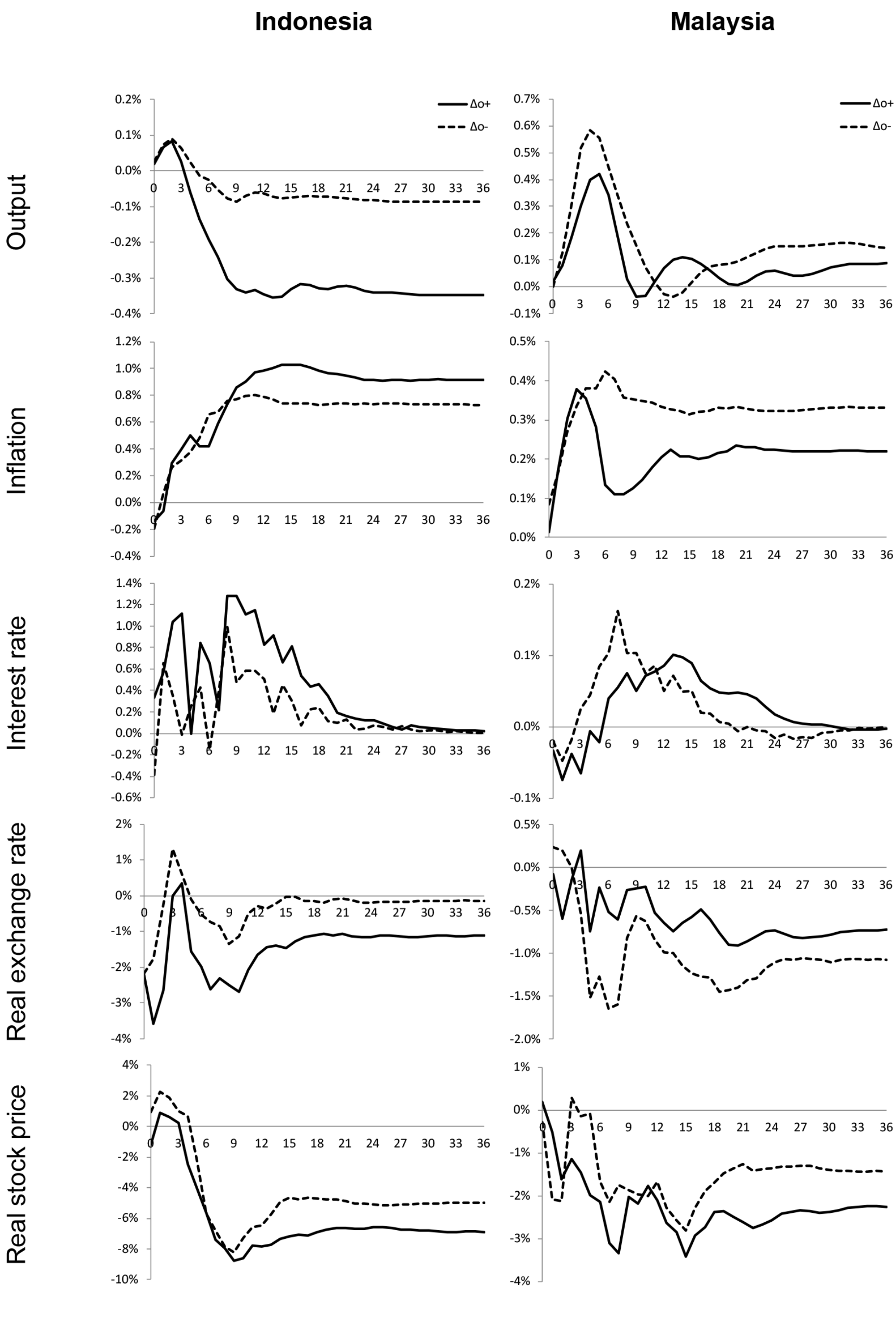
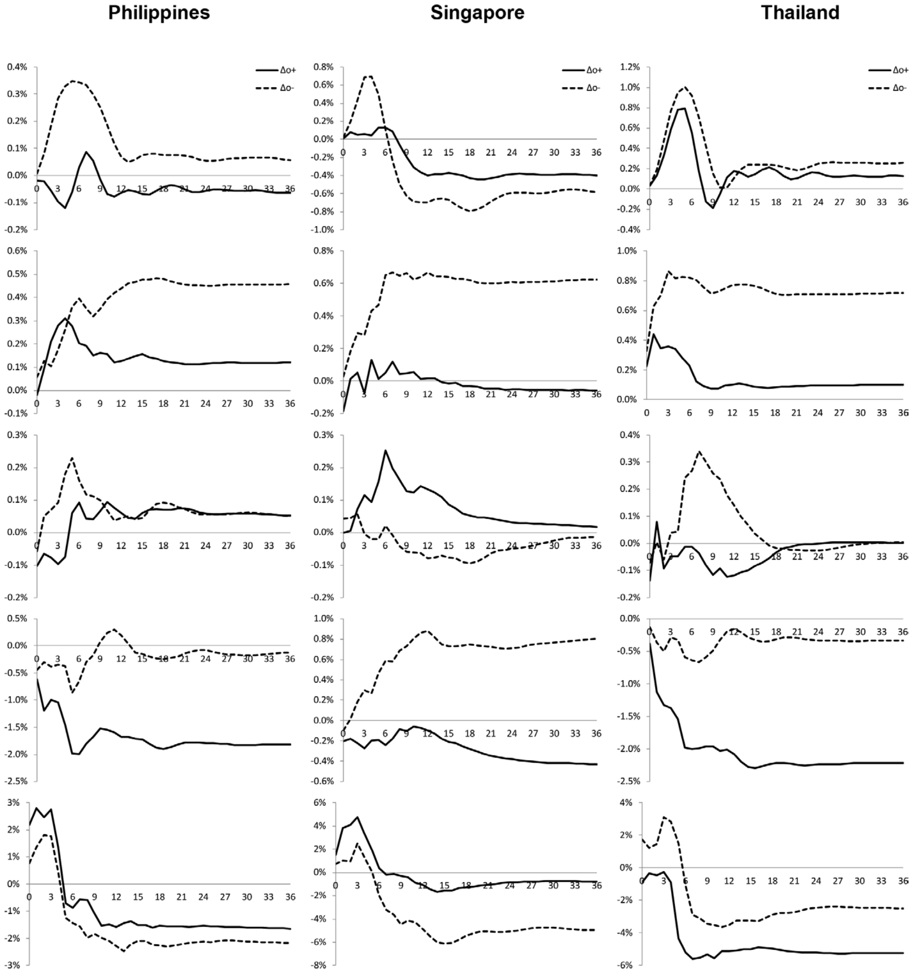


Figure 2 Impulse responses to 10% asymmetric oil price shocks (continued)



4. The impact of oil price volatility

An increase in oil price volatility can also affect stock prices due to higher uncertainty about the future return on investment as well as the effects on the macroeconomy. Following Andersen *et al*. (2003, a measure of oil price volatility is constructed using the sum of squared first log differences in the daily spot crude oil price:

$$Vol_t = \sum_{d=1}^{n} (\log\left(\frac{P_{t+1,d}}{P_{t,d}}\right)/\sqrt{n_t})^2 \tag{4}$$

where Vol_t is the monthly oil price volatility, $P_{t,d}$ is the spot price of crude oil on day of month t, and n_t is the number of trading days in month t. The data for daily spot crude oil price is based on the Europe Brent, sourced from the US Energy Information Agency (EIA).

The constructed measure of the oil price volatility[4] is used in place of the real oil price in each country's structural VAR model, and the impulse responses to an increase in monthly volatility of one standard deviation (normalisation is not necessary as all countries face the same shock and magnitude) are shown in Figure 3.

In the short run, output falls in all countries in response to an increase in oil price volatility. The recoveries in Indonesia and Singapore are much faster due to the relatively larger real exchange rate depreciations. In particular, output in Singapore is permanently higher by about 0.3 per cent after six months as the real exchange rate depreciates by 0.5 per cent. In Malaysia, Philippines and Thailand, output gradually recovers but is still lower after three years. An increase in oil price volatility also depresses consumer prices, as inflation falls across the board, possibly due to lower aggregate demand caused by the heightened uncertainty. In a horizon of about three to six months, interest rates are lower as central banks aim to stimulate the economy. In Singapore in which recovery is fastest, the lower interest rate prevails for about eight months, whereas in the other countries, interest rates are still lower after one and a half years. The oil price uncertainty also leads to an immediate fall in real stock prices in all the countries, but they gradually recover as the economic situation improves.

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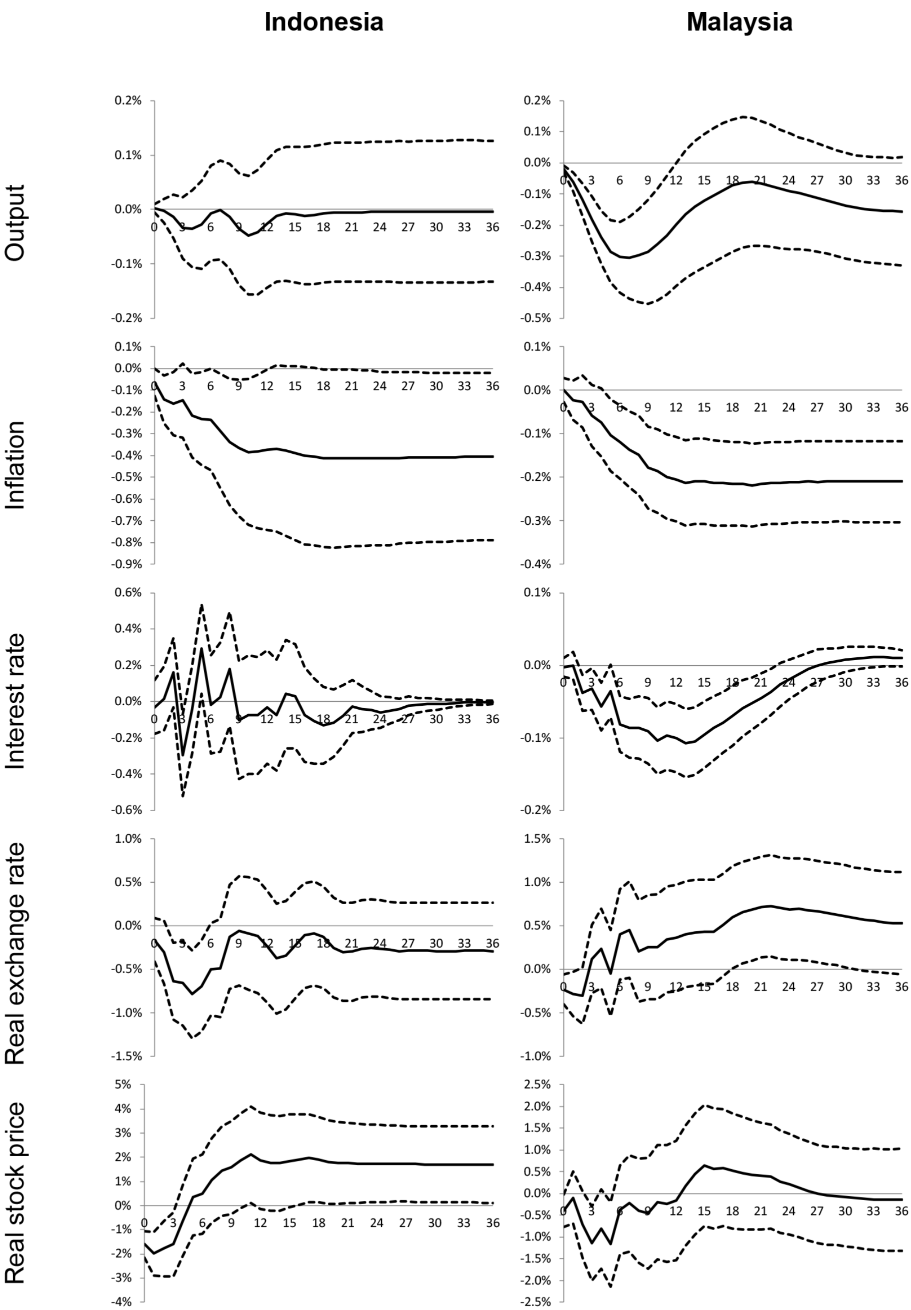
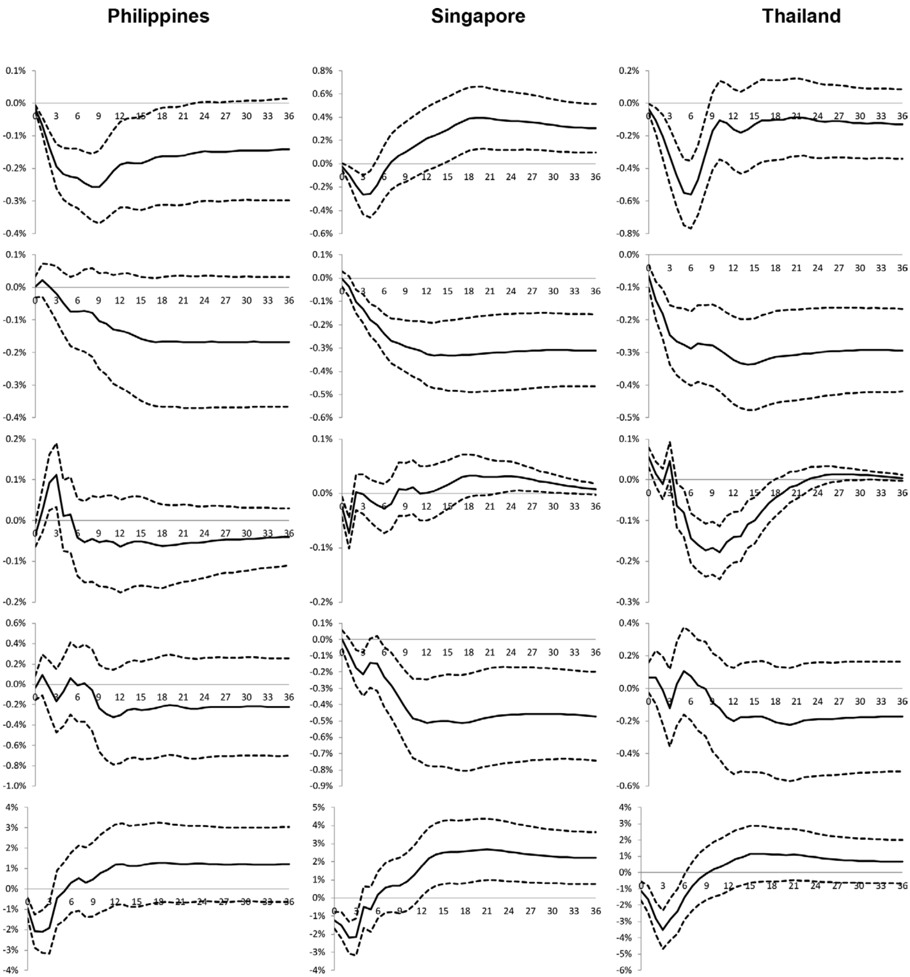
[4] ADF unit root tests show that oil price volatility is stationary. The results are not reported here.

Figure 3 Impulse responses to a standard deviation oil price volatility shock



Note: Dotted lines are two standard deviation error bands.

Figure 3 Impulse responses to a standard deviation oil price volatility shock (continued)



Note: Dotted lines are two standard deviation error bands.

5. Conclusion

This paper examines the effects of oil price shocks and oil price volatility on the macroeconomy, focusing on real stock prices, in ASEAN-5 using the structural vector autoregression approach. The results show that output in Singapore is the most adversely affected in response to an oil price shock as the real exchange rate appreciation is highest. Inflation increases as expected in all the countries, and central banks react by lowering interest rates. Real stock prices increase in the short run but then gradually die off and are permanently lower within six months. This negative relationship is also found is several existing studies. However, monetary policy shocks are more important in explaining the variability in real stock returns compared to oil price shocks, which is in contrast to the findings in the studies on the US and European countries.

In response to a negative oil price shock, output increases in the short run in all the countries, but the effects are much lower after a year. In Singapore, output is actually lower after six months, again due to the relatively larger real exchange rate appreciation. The responses to a positive oil price shock are more muted in all the countries, in contrast to the findings in existing studies on advanced economies. Inflation increases under both oil price shocks, and central banks in general increase interest rates. Real stock prices are also permanently lower after about six months under both shocks, suggesting that oil price volatility is an important factor in explaining stock price movements.

An increase in oil price volatility leads to a short-run fall in output. However, Singapore recovers quickly and output is permanently higher after six months, again due to the response of the real exchange rate, which depreciates relatively more. Inflation declines in all countries and central banks react by lowering interest rates to stimulate the economy. Real stock prices fall immediately in response to an increase in uncertainty, but they gradually recover as the economic situation improves.

The findings in this paper also show that the responses of Indonesia and Malaysia display more resemblance to that of oil-importing countries. But more importantly, the main results point to different behavioural responses of the macroeconomic variables in the ASEAN economies to oil price shocks compared to existing studies on advanced economies. Therefore it is difficult to generalise results which emphasises the need to examine the complex oil price-macroeconomy relationship across different regions and countries as the dynamics can vary significantly. Studies on other regions, especially smaller developing countries, are also not given sufficient attention in the literature.

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