

## SUMMARY

MOHAMMAD ARIEF DHARMAWAN. Impacts of Oil Price Shock on Sectors Returns in Indonesian Stock Market. Supervised by D. S. PRIYARSONO and BAGUS SARTONO.

This study investigates the impacts of an oil price shock on sector returns in the Indonesian stock market. Oil prices and the stock market are both important elements of the Indonesian economy. This research attempts to characterize the impacts and causality relationship between oil price shocks and sector returns, with time segmentation based on structural breaks in oil price data during 1996–2016.

We applied structural-break analysis to oil prices using the Bai-Perron procedure and identified three break points, thereby dividing the data set into four regimes. We analyzed the impacts of oil price shocks and sector returns using an unrestricted Vector Autoregression (VAR) model. The findings indicated that impacts of the oil price shocks on sector returns vary depending on the regime wherein the shocks occurred. Generally, during low and stable oil price regimes, oil price shocks do not impact sector returns significantly, whereas for high oil price and high volatility regimes, oil price shocks affected some sectors significantly.

The oil price is determined by the supply and demand mechanism. The supply of crude oil is relatively inelastic with respect to prices because the discovery of reserves and its development takes a long time, whereas the demand for crude oil is also relatively inelastic as petroleum has only few direct substitution products. Oil price shock is a significant fluctuation of petroleum prices. Fluctuations in the oil price can be driven by aggregate demand, precautionary demand, and supply side (Kilian 2009). The combination of these factors is referred to as a "regime", in this study the prevailing regimes are identified by structural breaks analysis.

Structural breaks analysis of petroleum price data was conducted using Bai-Perron procedure and successfully identified three breakpoints that divided the range of data into four different "regimes". Regime 1 in the range January 1996 to October 2003 had characteristics of lower and relatively more stable petroleum prices, Regime 2 from November 2003 to July 2008 was a transition from low to high prices marked by a large price increase, Regime 3 in August 2008 - November 2012 has the characteristic of high and fluctuating petroleum prices, and Regime 4 in December 2012 to December 2016 is a transition from high price to low price characterized by a negative slope.

The impact of oil price shocks and sectoral returns is analyzed using the vector autoregression (VAR) model. The oil price data is transformed into the rate of change and sectors' indices data are transformed into sectors' returns. VAR analysis at the level is performed after unit-root test confirmed the time series data are stationary. A VAR model is built for each pairs of variable rates of changes in oil prices and returns of a sector. Lag length of the VAR model for each sector is selected based on the Akaike Information Criterion (AIC) criteria. Based on the VAR model, the effect of oil price shock on sectoral return is analyzed by using impulse response function, variance decomposition, and granger causality.

The analysis results show that the impact of oil price shocks on the return of each sector varies, depending on which regime the shocks occur. In general, in regimes where oil prices are low and stable, the impact of oil price shocks on sector

returns is insignificant, while for those regimes where oil prices and volatility are high, oil price shocks affect several sectors in the Indonesian Stock Market significantly. In line with Sadorsky's (1999) study which states that the increase and decrease in oil prices have different effects. Oil price shock in the form of price appreciation has a greater effect than the depreciation of oil prices.

In the low oil price regime, Regime 1, causality is not significant for all sectors. Whereas in the high oil price regime, Regime 3, the causality relationship is significant for all sectors, except for Miscellaneous Industry Sector. During the transition from low to high oil prices, Regime 2, the contribution of oil price levels to changes in the sector's rate of return increased for all sectors. While during the transition from high to low price, Regime 4, the contribution of the rate of oil price changes to the return of each sector decreased. Oil price shock can be a signal of return of a sector depending on which regime oil price shocks occur.

The results of this research can be utilized in investment portfolio optimization through sector rotation, an investment strategy by reallocating investments from one sector to another. The effect of petroleum prices on a sector differs depending on which petroleum price regime is in effect.

**Keywords:** oil price shock, stock return, vector autoregression, structural break

