The Effect of Crude Oil Price on Merchandise Trade: Evidence from East Asia and Pacific

Bhenu Artha^{1*}
Bahri²
Cahya Purnama Asri³
Ardhi Khairi⁴
Fikri Alamsyah⁵

^{1,2,3,4,5} Entrepreneurship Study Program, Faculty of Economics, Widya Mataram University,
Yogyakarta, Indonesia

ARTICLE INFO	ABSTRACT
ISSN: 2723-1097	<i>One of the most important production inputs is energy, particularly crude oil. The impacts of oil price fluctuations on global trade flows can be understood by the uncertainty channel. Fluctuations in oil prices may create uncertainty about the future path of the oil price, causing consumers to postpone irreversible purchases of consumer durable goods, and also causing firms to postpone irreversible investments. Recent hikes and fluctuations in oil prices since 1999 have attracted attention and invoked concerns about their devastating effects on a variety of economic activities. The objective of this research is to determine the influence of crude oil price to merchandise trade in East Asia and Pacific. This research uses quantitative methods and linear regression analysis. The results of the analysis show that there is negative and significance effect of crude oil price on merchandise trade in East Asia and Pacific for the period 1987 – 2019.</i>
Keywords: <i>Crude oil price; merchandise trade; East Asia and Pacific</i>	

Introduction

One of the most important production inputs is energy, particularly crude oil ([Taghizadeh-Hesary et al., 2019](#)). Crude oil is amongst the most important resources in today's world, it is the chief fuel and its cost has a direct effect on the global habitat, our economy and oil exploration ([Gupta & Nigam, 2020](#)). Since globalization, the world's engines had been running smoothly and had never been halted, even in times of turmoil in some parts of the globe ([Allam, 2020](#)). According to the International Energy Agency (IEA), in the month of April alone, the demand for oil across the globe fell by an average of 29 million barrels per down, compared with demand for the same last year ([Agency, 2020](#)).

The impacts of oil price fluctuations on global trade flows can be understood by the uncertainty channel, fluctuations in oil prices may create uncertainty about the future path of the oil price, causing consumers to postpone irreversible purchases of consumer durable goods, and also causing firms to postpone irreversible investments, and recent hikes and fluctuations in oil prices since 1999 have attracted attention and

invoked concerns about their devastating effects on a variety of economic activities ([Chen & Hsu, 2012](#)). More recently, the sharp decrease in oil prices that started in mid-2014 and which decreased global crude oil prices to less than half drew attention to the role of oil prices on the macroeconomy and the causes of oil price fluctuation ([Taghizadeh-Hesary et al., 2019](#)). Nevertheless, as a tradable commodity, most consider oil as a primary impetus for international trade, with oil price volatility accounting for major uncertainty in the future prices of nearly all goods and services, in turn, this encourages consumers to postpone their purchases of durable commodities and for firms to delay investment, assume international trade to be a function of aggregate expenditure, the resultant weakening of current aggregate demand given the decline in domestic consumption and investment may reduce the volume of international trade ([Sotoudeh & Worthington, 2016](#)).

Crude oil price and merchandise trade have been the main topic for the past few years. The objective of this research is to determine the influence of crude oil price to merchandise trade in East Asia and Pacific. The managerial implications of the results of this research will also be discussed here.

Literature Review

In many economies, including China, the United States, and a large number of European economies, the demand for energy plummeted rapidly, causing a subsequent crash in the oil markets as introduced earlier and with this, for the first time in history, the pressure in the oil market demanded a reduction in production to check on the losses prompted by the reduced oil prices and also by the reduced demand ([Allam, 2020](#)).

There is strong evidence that oil price volatility does decrease global trade flows and the increase in oil prices due to oil supply shocks has a significantly negative effect on international trade, on the other hand, positive oil-specific demand shocks cause higher trade flows ([Chen & Hsu, 2012](#)). The increase in the oil price driven by shocks in global economic activity exerts a significant influence on merchandise exports, and thereby merchandise trade as a whole, for periods of more than one year, however, the responses of merchandise imports to oil price shocks are more modest and persist for only a few months ([Sotoudeh & Worthington, 2016](#)). In China, oil aggregate demand and oil specific demand shocks can significantly decrease trade terms ([Wei, 2019](#)).

[Abdelhedi & Boujelbène-Abbes \(2020\)](#) support the behavioral theory of contagion and highlight that the Chinese investor's sentiment is a channel through which shocks are transmitted between the oil and Chinese equity markets, thus, these results are important for Chinese authorities that should monitor the investor's sentiment to better control the interaction between financial and real markets. [Abid & Alotaibi \(2020\)](#) quantify a positive and significant impact of crude oil price on the Saudi Arabian private investment. [Adekunle et al. \(2020\)](#) show significant in-sample predictability of stock returns using crude oil prices, thereby affirming our argument

that oil price matters in the predictability of stock returns for some listed oil and gas firms in Nigeria. [Bernal et al. \(2019\)](#) found that crude oil, natural gas and coal prices have a significant positive impact on electricity prices-domestic electricity rates in Mexico in the short-run. [Brigida \(2018\)](#) found that crude oil is able to predict stock market returns after mid-2008, the predictive relationship switched signs, and exhibited characteristics which make it much more likely that the predictive relationship is due to time-varying risk premia rather than a market inefficiency.

[Hau et al. \(2020\)](#) presented that extremely high or low quantiles of oil volatility exert a considerable influence, while crude oil volatility does not influence the agricultural volatility in the normal mode of the crude oil market, furthermore, a high persistence is noted in the volatility dynamics, and the impacts of volatility on the returns exhibit substantial time variation. [He \(2020\)](#) finds a significant non-linear Granger causality relationship run from oil price to Chinese investor sentiment. [Hui et al. \(2020\)](#) show that the oil price dynamics can be calibrated according to the model, where the mean reversion of the price dynamics is positively co-integrated with the oil production reaction to negative demand shocks, and with the risk reversals of the commodity currencies, the Canadian dollar and the Australian dollar in currency option markets, and finally the results are consistent with an increased price crash risk with negative demand shocks and negative risk reversals. [Lin et al. \(2020\)](#) show that the proposed hybrid forecasting model achieves significant effect during periods of extreme incidents. [Lu et al. \(2020\)](#) present that Google trend can reflect the changes in the crude oil price to a certain extent, moreover, the impact of shale oil production on the oil price is gradually increasing, yet remains relatively small.

[Mongi \(2019\)](#) presents that short-run causality is bi-directional but long-run Granger causality does not run from refined oil to the Dow Jones Islamic equity indices and crude oil. [Naeem et al. \(2020\)](#) found strong enough positive correlations of energy and commodity exchange traded funds with oil prices to suggest that they could be used as a tool for managing oil price risk. [Nonejad \(2020\)](#) found that gains in utility for an investor that uses predictions produced under the model employing crude oil price log-realized semi volatilities are statistically significant higher than an investor relying on predictions produced under the competitors as well as the historical average benchmark. [Nonejad \(2020b\)](#) shows that crude oil price volatility tend to afford statistically significant improvements in terms of population level-predictability and finite-sample forecast accuracy relative to the benchmark at the one-quarter ahead horizon. [\(Nonejad, 2020a\)](#) presents that it is very difficult to find evidence that point forecasts exploiting crude oil price variables are statistically significant more accurate than point forecasts produced under the benchmark, on the other hand, the null hypothesis of no population-level predictability is borderline rejected for certain nonlinear crude oil price variables.

[Okorie & Lin \(2020\)](#) found evidence of bidirectional volatility spillover between the crude oil market and Bit Capital Vendor as well as a unidirectional volatility spillover effect from crude oil market to Bitcoin Cash market and finally, Ethereum, XRP, and

Redd Coin cryptocurrency markets have a significant unidirectional volatility spillover to the crude oil markets. [Olayeni et al. \(2020\)](#) found a role for asymmetry in the long run, confirming the presence of equilibrium-path adjustment asymmetry and suggesting that the positive and negative variations must be accounted for in designing the policymaking process to enforce stable exchange rate movement. [Olofin et al. \(2020\)](#) show that only a unidirectional causal relationship from crude oil price to shale oil production exists, and this happens as crude oil price appears to be a good predictor of shale oil production; however, shale oil production does not serve as a good predictor for crude oil price. [Pandey & Vipul \(2018\)](#) found that there is evidence of volatility spillover from both the crude oil and gold to the BRICS stock markets. [Phan et al. \(2020\)](#) found strong evidence for a negative effect of crude oil price uncertainty on firm performance at both aggregate market and sectoral levels.

[Raji et al. \(2018\)](#) research's results indicate unidirectional cross-market mean spillovers from oil market (OILM) to foreign exchange market (FXM), and found that the effects of cross-volatility spillovers between the OILM and FXM are bidirectional. [Singh & Sharma \(2018\)](#) present that during the crisis period, both crude oil and Sensex models show long-run causality, however, in some cases, results indicate short-run causality and there is one-way causality from USD and Sensex to crude oil, and from gold and Sensex to USD. [Urom et al. \(2020\)](#) show a substantial level of business cycle spillover among the markets with crude oil. [Wang et al. \(2020\)](#) show that the real financial risk is much higher than the importer might believe if physical risks are not considered, unless the importer is risk neutral, more forward crude oil will be imported when physical risks are considered, and the distribution of forward crude oil will depend strongly on correlations among risks. [Wang et al. \(2020\)](#) show that the ensemble probabilistic prediction approach (EPPA) could generate high-quality prediction intervals of crude oil price.

[Wang et al. \(2020\)](#) demonstrate that the proposed multi-granularity heterogeneous combination approach based on artificial bee colony (ABC) can outperform not only individual competitive benchmarks but also single-granularity heterogeneous and multi-granularity homogenous approaches. [Wen et al. \(2020\)](#) found that there exists upside and downside risk spillover effects that are stronger from exchange rates to crude oil than those from oil to exchange rate markets. [Yao et al. \(2018\)](#) show that the stock markets significantly led international crude oil prices, revealing varying lead-lag orders among stock markets. [Zhang & Wu \(2018\)](#) found significant bidirectional linear causality between WTI crude oil returns and China's traditional energy sectoral stock returns, but the nonlinear causality appears weaker, and the influence of WTI crude oil returns on traditional energy sectoral stock returns has time-varying characteristics and industry heterogeneity both in the linear and nonlinear cases, and finally, the decline of WTI crude oil prices may strengthen its linear influence on the stock returns of traditional energy sectors, while the excessive rise of market values in traditional energy sectors may weaken the linear and nonlinear influence of WTI on them.

[Goldar et al. \(2020\)](#) present that rising foreign value added and declining domestic value added in India's total and merchandise exports across a majority of the commodities. [Goswami & Nath \(2021\)](#) show that the comparative advantage (CA) measures for India's merchandise trade with high, middle income, and least developed countries indicate that India has always had CA over all three groups in animal, food products, and textiles and clothing, and comparative disadvantage in wood. [Helmy \(2018\)](#) found cointegration exists between the budget deficit and the merchandise trade deficit. [Kupfer et al. \(2017\)](#) found that an increase of merchandise trade will lead to a higher increase of air freight in the short-run than in the long run, furthermore, the share of manufactures in merchandise trade, the price of oil and the air freight yield turned out to be variables that influence air freight development. [Lee, \(2018\)](#) propose that: (1) the outlook for maritime merchandise trade remains positive for the region despite the challenges posed by the concentration of trade among a few trading partners, (2) in trying to enhance maritime merchandise trade in Southeast Asia, the application of a one-size-fits-all approach is not considered prudent, and (3) traditional and non-traditional maritime security threats continue to threaten maritime merchandise trade in the region.

[Lin et al. \(2020\)](#) identifies and quantifies the geographical ripple of transport infrastructure on merchandise trade from a national perspective. [Liu et al. \(2019\)](#) present that merchandise trade and portfolio investment are most helpful in increasing the direct use of currency, while foreign direct investment (FDI) has a stronger effect on promoting vehicle use. Merchandise trade improves the intensity of the global use of the Chinese Renminbi, while FDI increases the number of its users. [Sokolov-Mladenović et al. \(2017\)](#) show that merchandise trade influence the economic growth forecasting accuracy. [Pan & Zhang \(2020\)](#) show the significant of merchandise trade on carbon emission. [Rakic et al. \(2019\)](#) present that merchandise trade is one of many factors that affect gross domestic product. Based on the descriptions above, it is necessary to conduct research on crude oil price and merchandise trade especially in countries that are rarely studied such as East Asia and Pacific.

Method

This research uses quantitative methods ([Bajpai, 2018](#)). The population in this study is East Asia and Pacific because this research is a case study and the choice of those because research is rarely done on it. This study uses data from the World Bank's website. This study uses the period 1987 – 2019.

This study uses linear regression analysis ([Hoffman, 2021](#)), because it uses one independent variable and dependent variable each. The independent variable in this study is the price of crude oil. The dependent variable in this study is merchandise trade.

The operational definitions of variables in this study are as follows:

The price of crude oil : Crude oil price data that shown in the World Bank's website

Merchandise trade : Merchandise trade data that shown in the World Bank's website

Result and Discussion

The result of the regression analysis on Y (merchandise trade) is as follows:

Table 1. R square

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.865 ^a	.747	.739	5.356

a. Predictors: (Constant), crude oil price

Table 1 shows that R square = 0.747 which means that crude oil price explains merchandise trade by 74,7% and the remaining 25,3% is explained by other variables which not examined in this study.

Table 2. The effect of crude oil price on merchandise trade

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	58.847	1.870		.000
	crude oil price	-.333	.035	-.865	.000

a. Dependent Variable: merchandise trade

Table 2 shows that sig = 0.000 which means that there is significance influence of crude oil price on merchandise trade in East Asia and Pacific for the period 1987 – 2019. The regression equation is $Y = -0,333 - 0,865X$

The result of the analysis shows that there is negative and significance effect of crude oil price on merchandise trade in East Asia and Pacific for the period 1987 – 2019. This research's results are in line with previous researches ([Chen & Hsu, 2012](#); [Sotoudeh & Worthington, 2016](#); [Wei, 2019](#)). There is no effect of negative and significance effect because crude oil price is an important factor that affect trade, especially in East Asia and Pacific.

Conclusion

The result of the analysis shows that there is negative and significance effect of crude oil price on merchandise trade in East Asia and Pacific for the period 1987 – 2019. It because crude oil price is an important factor that affect trade, especially in East Asia and Pacific. This research is limited to examining the effect of crude oil price on merchandise trade, does not examine other variables that influence merchandise trade. Future research should investigate about other variables that affected by merchandise trade, such as gross domestic product and the variables that associate with it like previous researches ([An et al., 2018](#); [Artha, 2020](#); [Brini et al., 2017](#)). Research on other factors related to crude oil prices can be carried out, for example firm performance ([Artha, Bahri, Sari, et al., 2021](#)) and R&D expenditure ([Artha, Bahri, Khairi, et al., 2021](#)).

Acknowledgment

Our best regard goes to Dr (cand). Imanda Firmantyas Putri Pertiwi as our advisor.

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