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The Impact of Oil Prices on East and Southeast Asian Economies: Evidence from financial markets*

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Abstract

Oil prices have been volatile. To investigate how oil price swings affect Asian economies, this paper examines how they affect industry and aggregate stock returns. Economic theory implies that there is a strong link between a sector's stock return and its economic activity. Evidence presented here indicates that sectors such as electricity, airlines, and industrial transportation are helped by oil price falls, and that sectors such as oil and gas production and exploration are harmed. The findings also reveal that many industries within each country are impacted by oil prices. The paper concludes by offering several suggestions to help Asian economies weather the effects of oil price changes.

Keywords: Crude oil prices, East Asia, Stock returns

JEL classification: Q43, G14

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1. Introduction

The spot price for a barrel of West Texas Intermediate (WTI) crude oil rose from $11 at the end of 1998 to $140 in June 2008. It then fell to $42 in January 2009 as the Global Financial Crisis intensified. It recovered to $113 by April 2011, fell again to $33 in February 2016, and rose over $80 in May 2018. How do oil price swings affect East and Southeast Asian economies?

A fall in oil prices reduces firms' costs. This increases aggregate supply, lowering the price level and raising output. The IMF (2014), using its G20 macroeconomic model, reported that the macroeconomic effects could be large. Among advanced economies, it predicted that a 20 percent increase in oil prices would decrease aggregate equity prices in advanced countries by between 3 and 8 percent. It argued that the response would be largest for the largest oil importer, Japan. It forecasted that Japanese GDP would fall by between 0.7 and 1.9 percent. It also posited large effects on equity prices and output for emerging market oil-importing countries.

Oil price changes do not only affect aggregate variables but also impact various sectors differently. Electricity is produced using oil, and reductions in oil prices reduce electricity costs. This increases the profitability of electricity and utility companies and of companies relying on electricity to produce. After the 2011 Fukushima accident sidelined nuclear reactors, oil and other fossil fuels became crucial for producing electricity in Japan. This increases the impact of oil price changes on the Japanese electricity sector.

Many manufacturing industries in Japan and the rest of Asia depend on electricity. These include the construction industry, the information technology and semiconductor industries, the steel industry, the telecommunications industry, and the tire industry. Reductions in electricity costs allow these industries to lower prices and raise output.

Gasoline distributors pass through oil price increases into gasoline prices. An increase in gasoline prices in turn decreases sales and profits.

As Rodrigue (2017) documented, fuel costs are airlines' largest expense. Lower oil prices lead to lower ticket prices and higher profit margins.[1] Lower prices for flying and other forms of transportation in turn stimulate tourism. Lower oil prices also increase tourism by reducing prices for hotels, recreation, and hospitality (Becken, 2011).

The trucking, transport, and logistics sectors gain from lower fuel prices. These benefits then spill over to industries such as food, beverage, clothing and electronics whose goods are shipped. In addition, food, beverages, tobacco, and other agricultural goods become cheaper to produce because the cost of fuel for tractors and farm machinery decreases.

Crude oil is a key input for making plastic and other petrochemical and commodity chemical products. Lower oil prices may thus increase supply in these sectors.

Other sectors are harmed by lower oil prices. The incentive for firms to engage in oil production and oil exploration decreases as oil prices fall. Firms in the oil value chain, such as those providing oil rigs and industrial supplies, also lose when crude prices fall.

In addition, oil price changes have indirect impacts. For instance, they affect shipping rates and the volume of shipping and thus maritime insurance premiums.

The effects discussed above work through the supply side of the economy. Drops in energy prices also impact the demand side. As less is spend on gasoline and electricity, consumers and businesses will have more to spend on other goods and services.

The discussion above has considered in general how industries are affected by oil prices. How specifically are sectors in Asia affected? This paper addresses this question by examining

[1] This magnitude of this effect depends on their fuel hedging strategies.

how oil prices affect stock prices throughout the region. Economic theory implies that there is a strong link between economic activity and stock prices. Stock prices equal the expected present value of future net cash flows. Since these cash flows depend on real activity, there is a link between economic activity and stock prices (Shapiro 1988). Industries that benefit from a fall in oil prices should see their stock prices rise and industries that are harmed should see their prices fall.

The evidence presented here indicates that in many Asian countries the electricity sector, the airline sector, and the industrial transportation sector are helped by oil price falls and the oil and gas production and exploration industries are harmed. The results also reveal that many other industries within each East Asian country are impacted by oil prices.

In previous work Taghizadeh-Hesary, Rasoulinezhad, and Yoshino (2017) employed a simultaneous equation model with weighted two-stage least squares estimation techniques and quarterly data over the 1990-2015 period to investigate how oil price shocks affect growth in 21 countries. For Iran, the Russian Federation, Kazakhstan, Indonesia, and the United Arab Emirates, they found that positive oil price shocks increase economic growth. For Japan, the PRC, the Republic of Korea, Singapore, Vietnam, and Hong Kong, China, they reported that positive oil price shocks decrease growth.

Ready (2017), using monthly regressions over the 1986 to 2011 period, found that oil supply shocks significantly affect consumer durable stocks, consumer non-durable stocks, and retail stocks in the U.S. He also reported that consumer stocks in Indonesia, Malaysia, Korea, the Philippines, Singapore, Taipei,China, and Thailand are negatively impacted by oil supply shocks. He interpreted these results as implying that oil supply shocks work primarily by influencing consumer spending.

While Ready (2017) reported results for consumer stocks in Asia, he did not report results for any other category. This paper investigates the effect of oil price shocks on a wide variety of industry stock returns across eight East Asian countries. This provides detailed evidence on the impact of oil shocks on economies throughout the region.

The next section presents the data and methodology. Section 3 contains the results. Section 4 draws policy implications and concludes.

2. Data and Methodology

One can investigate the effect of oil prices across industries in Asia by estimating oil price exposures. This involves regressing industry stock returns on oil price changes and other variables.

Monthly stock returns for industries in Japan, the Republic of Korea (henceforth Korea), Taipei,China, the People's Republic of China (henceforth PRC), Thailand, Malaysia, Indonesia, and the Philippines are obtained from the Datastream database. Returns on all of the Datastream sectoral stock indices for each economy are employed.

The U.S. dollar price of WTI crude oil is used to measure oil prices. The WTI is a benchmark for oil prices. These data are obtained from the Datastream database.

To control for other factors, each economy's real effective exchange rate, the return on each economy's aggregate stock market index, and the return on the U.S. aggregate stock market index are included in the regression. Including the exchange rate follows the long literature on estimating industry exchange rate exposure (see, e.g., Bodnar, Dumas, and Marston, 2002, or Dominguez and Tesar, 2006). Including the return on the economy's aggregate stock market follows a long literature employing the market portfolio to control for economy-wide factors that influence industry stock returns (see, e.g., Sharpe, 1964 and Lintner, 1965). Including the return

on the U.S. aggregate stock market controls for the fact that oil prices may be related to economic conditions in the U.S. and the rest of the world, rising when demand is strong and falling when demand is weak. Data on real effective exchange rates are either taken from the International Monetary Fund's International Financial Statistics database via the CEIC database or, where these data are unavailable, from the Bank for International Settlements website. Data on aggregate stock market indices comes from the Datastream database.

A four-factor model is thus estimated using monthly data, with the change in the log of industry stock prices depending on the change in the log of crude oil prices, the change in the log of the real effective exchange rate, the change in the log of the economy's aggregate stock market index, and the change in the log of the U.S. aggregate stock market index. The estimated equation takes the form:

$$\Delta R_{i,j,t} = \alpha_0 + \alpha_1 \Delta WTI_t + \alpha_2 \Delta REER_{j,t} + \alpha_3 \Delta R_{m,j,t} + \alpha_4 \Delta R_{m,US,t} \quad , \quad (1)$$

where $\Delta R_{i,j,t}$ is the change in the log of the price index for industry i in country j, ΔWTI_t is the change in the log of the spot price for WTI crude oil, $\Delta REER_{j,t}$ is the change in the log of the real effective exchange rate for country j, $\Delta R_{m,j,t}$ is the change in the log of the price index for country j's aggregate stock market, and $\Delta R_{m,US,t}$ is the change in the log of the price index for the aggregate U.S. stock market. For each industry the focus is on α_1, the effect of oil price changes on returns for industry i. A positive coefficient on α_1 implies that an increase in oil prices raises returns on industry i and a negative coefficient implies the opposite.

The price of oil is ultimately an endogenous variable that depends on oil supply and oil demand. Price rises due to supply factors may have different effects than price rises due to

demand factors. For instance, a price decrease due to an increase in U.S. shale oil production may affect foreign companies differently from a price decrease due to a drop in worldwide demand for commodities. An increase in U.S. shale production may harm oil producers in the rest of the world, whereas a drop in demand for commodities may affect steel producers, aluminum producers, and others who benefit from a commodity boom.

One way to disentangle these effects is to use the approach of Kilian (2009). He constructed a three-variable structural vector autoregression (VAR) including global crude oil production, an index of real economic activity to capture global commodity demand, and crude oil prices. Data on global crude oil production are available from the U.S. Energy Information Agency.[2] To construct an index of global real economic activity in industrial commodity markets, he employed data on dry cargo bulk freight rates. He noted that freight rates provide a good indicator of global demand for commodities.[3]

Killian (2009) argued that crude oil supply shocks will not respond within the same month to a shock to demand. He also posited that shocks to the real price of oil will not affect global commodity demand within the same month. This implies that the VAR has a recursive structure, with oil supply ordered first, followed by commodity demand and then crude oil prices. It is thus possible to use the Cholesky decomposition the find structural shocks to oil supply, global real economic activity, and crude oil prices from the reduced form errors. For those cases where the coefficient on crude oil in equation (1) is statistically significant, a second regression is performed with the price of crude oil replaced by structural shocks to oil supply,

[2] The website is https://www.eia.gov/ .
[3] Details on the construction of the series are available in Kilian (2009). The data are available at: http://www-personal.umich.edu/~lkilian/paperlinks.html .

global commodity demand, and crude oil prices obtained from the structural VAR. This second equation takes the form:

$$\Delta R_{i,j,t} = \alpha_0 + \alpha_1 \Delta OilSS_t + \alpha_2 \Delta CommDD_t + \alpha_3 \Delta ExogWTI_t + \alpha_4 \Delta REER_{j,t} + \alpha_5 \Delta R_{m,j,t} + \alpha_6 \Delta R_{m,US,t} , \quad (2)$$

where $\Delta OilSS_{,t}$ is the innovation in the world supply of oil, $\Delta CommDD_t$ is the innovation in global demand for commodities, $\Delta ExogWTI_{,t}$ is the exogenous change in oil prices, and the other variables are defined after equation (1).

Where possible, equations (1) and (2) are estimated over the 1990M01-2017M11 period. For the ASEAN-4 countries, the exchange rate data are only available beginning in 1994M01. For these countries, the model is estimated over the 1994M02-2017M11 period. For some of the individual industries, stock return data are only available after 1990M01. In these cases the model is estimated beginning in the first month when data are available and extending to 2017M11. The VAR that is used to obtain structural shocks to oil supply, global commodity demand, and crude oil prices is estimated over the 1990M01 -2017M12 period with 6 lags of the endogenous variables included.

3. Results

Panel A of Table 1 presents the results for Japan, Panel B for Korea, Panel C for Taipei,China, Panel D for the PRC, Panel E for Thailand, Panel F for Malaysia, Panel G for Indonesia, and Panel H for the Philippines. Column (1) of the tables reports the coefficients on the change in the log of WTI Crude from equation (1) that are statistically significant at at least

the 10 percent level. Columns (2) through (4) report results from estimating equation (2). Column (2) reports the coefficients on the innovation in the world supply of oil, column (3) reports the coefficients on unexpected changes in global commodity demand, and column (4) reports the coefficients on exogenous changes in oil prices. The other results are available on request.

Across several countries the airline and electricity industries are harmed by higher oil prices. The oil production and exploration sectors in several countries benefit from oil price increases.

In Japan the industries most exposed to oil price increases are electricity and other utilities. A one standard deviation increase in the first difference of the log spot price of oil, equal to 0.0965, lowers the return on electricity stocks by 1.4 percent (equal to 0.0965 times 0.145) and on construction electricity stocks by 1.38 percent. A one standard deviation increase would also reduce airlines stocks by 1.1 percent and trucking stocks by 0.8 percent.

Heavy construction and home construction are exposed to oil price increases, reflecting the effect of oil prices on construction electricity and on the cost of using construction machinery. Many other individual sectors such as food, beverage, and retail are also exposed to oil price increases. This could reflect the effect of higher oil prices on producing and transporting these goods and on the ability of consumers to spend on other items. In addition, property and casualty insurance is also harmed by an increase in oil prices, perhaps reflecting the impact of oil prices on maritime shipping rates and the volume of shipping.

The oil and gas production and exploration sectors benefit the most from higher oil prices. A one standard deviation increase in oil prices would increase returns on oil and gas exploration and production stocks by 1.5 percent. The commercial vehicle sector benefits also,

reflecting the increased demand for buses and public transportation when oil prices increase. In addition the auto parts sector benefits, reflecting the increased demand for auto parts that aid in fuel efficiency when oil prices increase. A one standard deviation increase in oil prices would raise returns on nonferrous metal stocks by 1.1 percent. Nonferrous metal stocks include gold and silver mining companies. This large effect reflects the fact that an increase in oil prices increase inflation, and gold and silver mining stocks are a hedge against inflation.[4] Industrial suppliers including petrochemical companies benefit as do a whole range of Japanese industrial groups that provide goods for sectors that benefit from oil price increases.

Decomposing oil price changes into changes due to supply, changes due to global commodity demand, and changes due to exogenous price changes, only three of the 96 coefficients on world oil supply and world commodity demand residuals are significant. In contrast, two-thirds of the coefficients on exogenous oil price changes are significant. For the Japanese economy, this suggests that oil prices themselves are a key variable and that world demand for commodities has no effect. This makes sense because Japan is much more a maker of things (*monozukuri*) than a commodity producer. In addition, as Abhyankar, Xu, and Wang (2013) discussed, Japan has public and private strategic oil reserves that reduces concern about global oil supply.

Panel B presents results for Korea. Again, the airline sector is highly exposed to oil price increases. A one standard deviation increase in oil prices would reduce returns on Korean airline stocks by 1.3 percent. The industrial transportation sector, including both land and marine transportation, and the electricity sector are also highly exposed to oil price increases. Oil and

[4] Obstfeld, Milesi-Ferretti, and Arezki (2016) documented a close relationship between oil prices and 5-year inflation expectations. Frankel (2008) and others demonstrated that if monetary policy actions raise anticipated inflation they will increase prices of metals such as gold and silver.

gas producers benefit from oil price increases, with a one standard deviation increase causing returns on oil and gas stocks to fall by 0.9 percent. Industrial suppliers benefit even more. Industrial suppliers include petrochemical makers. When oil prices rise, their profits increase.

Decomposing oil price changes into the three subcategories indicates that a positive shock to oil supply would raise industrial transportation stocks and lower oil production stocks. These findings make sense since industrial transportation includes oil transport ships that are used more as oil supply increases and since oil production stocks are harmed by supply increases due to factors such as U.S. shale oil exports. For Korea, exogenous oil price changes only affect stock returns in one-third of the cases in Panel B.

Panel C presents results for Taipei,China. Several individual sectors such as footwear, clothing, and food are exposed to oil price increases. This may reflect the costs of transporting goods to and from Taipei,China and the fact that higher oil prices reduce consumers' purchasing power. A one standard deviation increase in oil prices would reduce returns on footwear stocks by 3 percent. In addition, the semiconductor, electronic equipment, and technology hardware sectors are harmed by oil price increases. These sectors require a lot of electricity to produce, and higher oil prices that raise electricity costs harm these industries. Oil and gas production and exploration again gains from higher oil prices. A one standard deviation increase in oil prices would raise returns on oil and gas stocks by 1.1 percent. The chemical sector also benefits. As oil prices rise, firms are able to raise prices for petrochemicals.

Decomposing oil price changes into constituent parts, shocks to global commodity demand do not affect returns for any of the sectors. This may reflect the fact that Taipei,China, like Japan, does not specialize in producing commodities. For the chemical industry, an increase

in oil supply increases returns. An increase in oil supply will provide more inputs into the petrochemical and related industries.

Panel D presents results for the PRC. Airlines again are harmed by higher oil prices while oil and gas production and the sectors providing equipment and services to oil and gas production gain. A one standard deviation increase would reduce returns on airlines stocks by 0.8 percent and increase oil equipment and services stocks by 0.8 percent. In addition, automobiles are harmed and railroads gain. This effect occurs because an increase in oil prices causes individuals to shift from cars to public transportation. A positive shock to oil supply also reduces the price of railroad stocks. This follows because increases in world supply would reduce the need to use railroads to economize on oil. Finally, a one standard deviation increase in oil prices would increase the return on gold mining stocks by 1.8 percent. This large effect reflects the fact that an increase in oil prices increase inflation, and gold mining stocks are a hedge against inflation.

Panel E through H present the results for the ASEAN-4 countries. Utilities and electricity in Thailand, Malaysia, and Indonesia, industrial transportation in Malaysia and Indonesia, and airlines in Malaysia are harmed by oil price rises and oil and gas producers in Thailand and mining in Indonesia are helped. The alternative electricity industry in the Philippines benefits from higher oil prices. The metals and mining sector in Indonesia gains. As in the case of gold mining stocks from the PRC, an increase in oil prices produces a large increase in metal and mining stock prices. This again reflects the ability of these stocks to hedge against an increase in inflation that accompanies oil price increases.

Panel G and H show that the real estate sectors in Indonesia and the Philippines are exposed to rising oil prices. In Panel G, the construction industry in Indonesia is negatively

affected by oil price increases. Higher oil prices can harm construction and thus the real estate industry both by increasing the cost of fuel for construction equipment and the cost of electricity for building houses and buildings.

Decomposing the results for ASEAN into the component shocks, exogenous changes in oil prices are important for many Thai stocks. Shocks to commodity demand are also important in several cases, reflecting Thailand's role as a commodity exporter. For mining stocks in Indonesia, an increase in world oil supply, global commodity demand, and exogenous oil prices all increase returns. World oil supply may matter because oil is an input into mining, and an increase in supply should benefit the industry. An increase in commodity demand would also clearly benefit the mining sector. Finally, an increase in oil prices could contribute to inflation and benefit mining stocks because these act as a hedge against inflation.

Panel A through H examined individual sectors. Oil price increases benefited some sectors and harmed others. One can also investigate how oil prices affect the aggregate stock market.[5] These results are presented in Table 2. For every economy except Taipei,China the coefficients are greater than zero, implying that an increase in oil prices is associated with an increase in aggregate returns. The coefficient is only significant, however, for Korea. The beneficial effect of oil prices on the oil supply chain including industries such as petrochemicals outweighs the negative effect on industries such as airlines and electricity. Table 2 also indicates that Asian stock markets are very exposed to the U.S. stock market and in several cases to exchange rate changes.

Table 2 focuses on the impact of oil price changes across industries in a single country. Table 3 investigates how oil prices affect individual industries across Asian countries. The

[5] The oil and gas industries are capital-intensive and firms in this industry rely on equity financing. This gives these industries a larger weight in aggregate stock market indexes than they have in the economy.

results in column (1) come from estimating a panel regression including the variables in equation (1) and country fixed effects. The results in columns (3) through (5) come from estimating a panel regression including the variables in equation (2) and country fixed effects. Column (5) lists the number of countries that contain indexes for each of the specified industries.[6] The coefficients in column (1) are ordered from the industry most exposed to oil price increases (airlines) to the industry that benefits the most (oil and gas exploration and production).

The negative effects of oil prices on airlines, utilities, construction electricity, and real estate reflect the findings that these industries in several countries are exposed to oil prices. The positive effects on the mining, metals, and oil and gas industries also reflect results across several countries.

Figures 1a through 1c investigate whether industries' exposures to oil prices in Table 3 are driven by their exposure to oil supply shocks, commodity demand shocks, or exogenous changes in oil prices. In the figures the coefficients on oil prices in column (1) are plotted against the corresponding coefficients on the three shocks in columns (2) through (4). The results indicate that there is a close relationship between industries' exposure to oil price changes and their exposure to exogenous changes in oil prices. Thus oil prices themselves, rather than world oil supply or the state of global commodity demand, are especially important for Asian economies.

The important implication of the results presented here is that some sectors in Asian countries are harmed by oil price increase and some benefit. For most countries these effects offset each other and for the Korean stock market the overall effect of oil price changes is positive. In addition, exogenous changes in oil prices are very important for Asian economies.

[6] Only indexes that were available for more than three of the countries are employed.

Most often stock returns not responding to the signal in oil prices about oil supply and oil demand but rather to price changes themselves.

4. Policy Implications and Conclusion

Oil prices have fluctuated wildly, impacting profits for industries that produce and use oil and consumers' ability to purchase goods and services. To gauge these effects, this paper investigates how oil prices affect stock returns. Economic theory implies that there is a strong link between a sector's stock return and its economic activity.

The results indicate that industries such as electricity, airlines, and trucking are harmed by higher oil prices. On the other hand, the oil and gas production sector, the petrochemical sector, and the precious metals sector benefit from oil price increases. Within individual Asian countries, a wide cross section of industries is affected by oil prices.

The finding that oil prices affect so many industries indicates that oil price swings matter for firms' cash flow. Adopting energy-saving technologies would reduce companies' exposure to oil price changes. For Taipei,China, 38 percent of the industries investigated are affected by oil prices; for Japan; 33 percent are; and for Indonesia 32 percent are.[7] The exposure of so many sectors to oil prices indicates that reducing industries' reliance on fossil fuels would reduce volatility in these economies.

Governments can facilitate this process. For countries such as Japan and Korea that are close to the technology frontier, providing funding for research and development on decarbonization is helpful. For emerging economies such as Indonesia and the Philippines, governments can publicize how industries in more advanced countries have developed energy-

[7] These percentages are calculated as the sectors reported in Table 1 that have statistically significant exposures to oil prices divided by all of the sectors investigated for each economy.

efficient production techniques and how these techniques have yielded competitive advantages. Governments in advanced Asia, as part of their foreign assistance budgets, could send engineers to interact with engineers in the same industries in emerging Asia and help them to develop actionable plans to adopt energy-efficient production methods. They could also sponsor students from emerging Asia to receive training in carbon-saving technologies (e.g., nuclear power). Asian governments could help small and medium-sized enterprises to handle the cash flow volatility that accompanies oil price swings by providing technical training in hedging, cash management, and risk management strategies.

Some of the steps to saving energy are common across industries (e.g., making buildings more energy-efficient). Others are industry-specific (e.g., using electric processes rather than blast furnaces in the steel industry). Government campaigns and tax policy could be employed at both levels to improve energy efficiency.

Indonesia, Thailand, Malaysia, and other countries have frequently employed subsidies to reduce fuel and electricity prices. These policies have increased fossil fuel consumption and carbon dioxide emissions, congested roads, reduced the cost advantages for investing in renewable energy and energy efficient technologies, burdened the state, and increased fuel imports and thus energy insecurity (see, e.g., Burke, Batsuuri, and Yudhistira, 2017). General price support programs should be replaced by subsidies that target the poor and near poor.

Because some sectors gain and some lose from higher oil prices, promoting a more diversified industrial structure will also help the aggregate economy to weather oil price changes. Hidalgo, Klinger, Barabási, and Hausmann (2007) have elucidated how economies can diversify and advance by initially producing goods similar to what they already make and by progressing step-by-step towards more advanced products. For instance, Indonesia could export more labor-

intensive manufactures to complement its exports of metals and other commodities that are sensitive to oil prices.

For many countries, volatile oil prices have large impacts on the electricity and utility industries.[8] ASEAN countries could reduce their exposure by increasing energy connectivity. Some countries (e.g., Myanmar and Cambodia) have the potential to export hydropower. Others (e.g., Indonesia and Thailand) use expensive gas, oil, and diesel to generate electricity. Trading across countries could reduce costs and promote decarbonization. Achieving energy integration though will require resolving issues of regulatory and price harmonization and countries' desire for energy self-sufficiency.

Integration will also require massive infrastructure investment. Public-private partnerships could be used to attract private funds into infrastructure investment. ASEAN policymakers at both the national and regional levels can help by affirming their commitment to reducing carbon emissions and maintaining stable policies. Many difficult issues remain concerning how to design appropriate incentives and attract sufficient capital to fund energy integration. Researchers and policymakers in ASEAN are focusing on resolving these issues (see, e.g., Anbumozhi, 2018).

For the PRC, the automobile industry is exposed to oil price increases. Producing more energy efficient cars in China would reduce this exposure. China has promoted electric vehicles (EVs) by requiring residents who want gasoline cars to participate in a lottery or pay up to 100,000 renminbi in an auction. Residents purchasing EVs face no such obstacles. Other Asian countries could learn from initiatives such as these.

[8] I am indebted to Dr. Venkatachalam Anbumozhi for ideas in this and the next paragraph. However, he is not responsible for any errors.

The IMF (2014) posited that higher oil prices would roil equity markets and cause large drops in GDP in oil-importing countries. The results here do not support this conclusion. Higher oil prices cause equity values to rise for some industries and fall for others. There is no evidence that they cause aggregate equity values to fall, and higher oil prices even cause aggregate equity prices to rise in Korea. Assuming that low oil prices will be a boon and high oil prices a bane for oil-importing countries is too simplistic. Policymakers should thus adopt a nuanced and evidence-based perspective when considering how oil prices affect their economies and how they should respond.

Table 1. The Exposure of Industry Stock Returns to Oil Prices

	(1)	(2)	(3)	(4)
Asset	Beta to WTI Crude Oil Price	Beta to Residual World Oil Supply	Beta to Residual World Commodity Demand	Beta to Residual WTI Crude Oil Price
Panel A. The Exposure of Japanese Industry Stock Returns to Oil Prices				
Electricity	-0.145*** (0.032)	0.276 (0.426)	-0.000 (0.001)	-0.112*** (0.030)
Construction Electricity	-0.143*** (0.031)	0.276 (0.426)	-0.000 (0.001)	-0.112*** (0.030)
Utilities	-0.141*** (0.030)	0.131 (0.355)	-0.000 (0.000)	-0.107*** (0.026)
Gas Distributors	-0.132*** (0.034)	-0.271 (0.254)	-0.000 (0.000)	-0.099*** (0.031)
Gas, Water, and Multi-Utilities	-0.132*** (0.034)	0.271 (0.253)	-0.000 (0.000)	-0.099*** (0.030)
Airlines	-0.112*** (0.041)	0.317 (0.312)	-0.000 (0.000)	-0.088** (0.036)
Apparel Retail	-0.108** (0.044)	0.230 (0.356)	0.000 (0.000)	-0.078*** (0.034)
Broadcast and Entertainment	-0.105** (0.045)	0.548 (0.373)	0.000 (0.000)	-0.047 (0.033)
Travel and Tourism	-0.087*** (0.020)	0.241 (0.226)	-0.000 (0.000)	-0.044*** (0.020)
Trucking	-0.081*** (0.024)	0.152 (0.237)	0.000 (0.000)	-0.049** (0.020)
Retail	-0.069** (0.021)	-0.024 (0.181)	0.000 (0.000)	-0.054*** (0.018)
General Retailers	-0.069*** (0.020)	-0.098 (0.191)	0.000 (0.000)	-0.053*** (0.017)
Broadline Retail	-0.066*** (0.023)	0.360 (0.245)	0.000 (0.000)	-0.051** (0.020)
Heavy Construction	-0.066*** (0.027)	0.589 (0.379)	-0.000 (0.000)	-0.064** (0.025)
Transport Services	-0.059** (0.030)	0.539 (0.330)	0.000 (0.000)	-0.051* (0.026)
Restaurants and Bars	-0.057* (0.031)	-0.167 (0.351)	-0.000 (0.000)	-0.048* (0.025)
Food Producers	-0.057** (0.026)	0.359 (0.234)	-0.000 (0.000)	-0.039* (0.023)
Food Products	-0.057** (0.026)	0.370 (0.240)	-0.000 (0.000)	-0.038* (0.023)
Soft Drinks	-0.057* (0.031)	0.044 (0.329)	-0.000 (0.000)	-0.049* (0.026)
Home Construction	-0.055** (0.025)	0.446 (0.331)	-0.000 (0.000)	-0.055** (0.025)
Property/Casualty Insurance	-0.054* (0.030)	0.275 (0.316)	0.000 (0.000)	0.038 (0.028)
Nonlife Insurance	-0.053* (0.030)	0.275 (0.316)	-0.000 (0.000)	-0.038 (0.028)
Consumer Services	-0.052*** (0.011)	0.113 (0.115)	-0.000 (0.000)	-0.027** (0.012)
Delivery Services	-0.052* (0.032)	0.180 (0.478)	-0.000 (0.000)	-0.029 (0.027)

Business Supplies and Services	-0.050* (0.029)	-0.091 (0.336)	-0.001* (0.000)	-0.046* (0.026)
Food and Beverages	-0.048** (0.023)	0.326 (0.224)	-0.000 (0.000)	-0.035* (0.019)
Consumer Staples	-0.042** (0.020)	0.033 (0.132)	0.000 (0.000)	-0.004 (0.010)
Personal Products	-0.042* (0.022)	-0.086 (0.263)	-0.000 (0.000)	-0.025 (0.019)
Travel and Leisure	-0.041* (0.025)	-0.224 (0.319)	-0.000 (0.000)	-0.017 (0.024)
Pharmaceuticals and Biotechnology	-0.039** (0.020)	0.398 (0.265)	0.000 (0.000)	-0.022 (0.018)
Health Care	-0.039** (0.019)	0.223 (0.247)	0.000 (0.000)	-0.023 (0.017)
Pharmaceuticals	-0.039** (0.020)	0.399 (0.265)	0.000 (0.000)	-0.022 (0.018)
Electronic and Electrical Equipment	0.023* (0.013)	-0.014 (0.157)	0.000 (0.000)	0.006 (0.011)
Industrials	0.032*** (0.012)	0.023 (0.112)	0.000 (0.000)	0.015*** (0.010)
Industrial Goods and Services	0.034** (0.014)	0.061 (0.110)	0.000 (0.000)	0.019* (0.011)
Leisure Goods	0.041* (0.022)	0.043 (0.072)	0.000 (0.000)	0.025 (0.019)
Electrical Components and Equipment	0.044*** (0.015)	0.038 (0.16)	0.000 (0.000)	0.019 (0.016)
Auto Parts	0.048** (0.024)	0.532*** (0.184)	0.000 (0.000)	0.027 (0.022)
Industrial Engineering	0.052** (0.021)	0.016 (0.150)	-0.000 (0.000)	0.026 (0.016)
Computer Services	0.066* (0.037)	-0.912*** (0.342)	-0.000 (0.000)	0.062* (0.037)
Diversified Industrials	0.066* (0.037)	0.501 (0.441)	-0.000 (0.000)	0.040 (0.033)
Computer Hardware	0.068** (0.031)	-0.123 (0.365)	-0.000 (0.000)	0.054* (0.028)
Commercial Vehicles and Trucks	0.101*** (0.027)	0.256 (0.290)	0.000 (0.000)	0.059** (0.027)
Integrated Oil and Gas	0.110*** (0.037)	0.495 (0.407)	-0.000 (0.000)	0.081*** (0.031)
Nonferrous Metals	0.114*** (0.031)	-0.002 (0.334)	0.001 (0.000)	0.074*** (0.028)
Industrial Suppliers	0.142*** (0.035)	0.349 (0.322)	0.000 (0.000)	0.097*** (0.034)
Oil and Gas Production	0.145*** (0.044)	0.327 (0.333)	0.000 (0.000)	0.109*** (0.032)
Oil and Gas	0.148*** (0.043)	0.302 (0.380)	0.000 (0.000)	0.112*** (0.032)
Oil and Gas Exploration and Production	0.156*** (0.043)	0.241 (0.413)	0.001 (0.000)	0.113*** (0.033)
Panel B. The Exposure of Korean Industry Stock Returns to Oil Prices				
Airlines	-0.136** (0.068)	0.614 (0.629)	0.000 (0.000)	-0.147** (0.054)
Mobile Telecommunications	-0.097* (0.055)	-0.858 (0.677)	-0.001 (0.001)	-0.058 (0.052)
Telecommunications	-0.091** (0.041)	-1.111 (0.702)	-0.000 (0.000)	-0.055 (0.035)
Industrial Transportation	-0.075* (0.038)	0.854** (0.421)	0.000 (0.000)	-0.062* (0.036)

Electronic and Electrical Equipment	-0.072** (0.038)	0.538 (0.068)	0.000 (0.000)	-0.063** (0.031)
Construction Electricity	-0.068* (0.041)	-0.572 (0.442)	-0.001** (0.000)	-0.033 (0.034)
Electricity	-0.068* (0.041)	-0.572 (0.442)	-0.001** (0.000)	-0.033 (0.034)
Oil and Gas	0.086** (0.043)	-0.800** (0.373)	0.000 (0.000)	0.042 (0.039)
Oil and Gas Production	0.090** (0.045)	-0.812** (0.319)	0.000 (0.001)	0.040 (0.041)
Industrial Suppliers	0.110** (0.056)	-0.779 (0.771)	0.000 (0.001)	0.035 (0.053)
Support Services	0.168** (0.078)	0.638 (0.810)	0.001 (0.001)	0.145** (0.072)
Panel C. The Exposure of Taipei,China Industry Stock Returns to Oil Prices				
Footwear	-0.308** (0.0135)	0.123 (0.657)	0.000 (0.000)	-0.215** (0.101)
Personal Goods	-0.286** (0.134)	0.390 (0.640)	-0.000 (0.000)	-0.198** (0.098)
Clothing and Accessories	-0.277** (0.135)	0.521 (0.650)	-0.000 (0.000)	-0.192** (0.097)
Telecommunications, Media, Information Technology	-0.105** (0.044)	0.365 (0.640)	0.000 (0.000)	-0.053 (0.034)
Technology	-0.103** (0.042)	0.308 (0.620)	0.000 (0.000)	-0.054 (0.032)
Technology Hardware and Equipment	-0.102** (0.041)	0.320 (0.621)	0.000 (0.000)	-0.053 (0.033)
Semiconductors	-0.082** (0.037)	0.039 (0.476)	0.000 (0.000)	-0.040 (0.033)
Electronic Equipment	-0.080** (0.031)	-0.384 (0.377)	0.000 (0.000)	-0.092 (0.028)
Food Products	-0.070* (0.041)	1.336*** (0.424)	-0.000 (0.000)	-0.030 (0.042)
Food and Beverages	-0.070* (0.041)	1.129 (0.423)	-0.000 (0.000)	-0.039 (0.042)
Basic Materials	-0.069** (0.027)	0.408 (0.329)	0.000 (0.000)	0.041 (0.030)
Consumer Staples	-0.062* (0.037)	1.141 (0.402)	0.000 (0.000)	-0.029 (0.041)
Industrials	-0.057** (0.026)	-0.025 (0.327)	0.000 (0.000)	-0.073*** (0.022)
Chemicals	0.083** (0.035)	0.613* (0.324)	0.000 (0.000)	0.057 (0.038)
Commodity Chemicals	0.084** (0.038)	0.443 (0.323)	0.000 (0.000)	0.055 (0.039)
Oil and Gas Exploration and Production	0.104** (0.047)	0.954 (0.654)	0.000 (0.000)	0.018 (0.041)
Oil and Gas Production	0.104** (0.047)	0.954 (0.654)	0.000 (0.000)	0.018 (0.041)
Oil and Gas	0.109** (0.045)	0.933 (0.601)	0.000 (0.000)	0.022 (0.040)
Electrical Components and Equipment	0.118** (0.050)	1.334* (0.746)	0.001 (0.000)	0.079* (0.040)
General Retailers	0.124*** (0.054)	0.835* (0.457)	0.000 (0.001)	0.092** (0.042)
Investment Services	0.127** (0.051)	0.048 (0.581)	0.000 (0.001)	0.086* (0.044)
Panel D. The Exposure of Chinese Industry Stock Returns to Oil Prices				

Airlines	-0.087* (0.046)	0.717 (0.632)	0.000 (0.000)	-0.076** (0.033)
Automobiles	-0.086* (0.049)	-0.0424 (0.526)	-0.000 (0.000)	-0.049 (0.034)
Heavy Construction	-0.082* (0.050)	0.384 (0.479)	0.001 (0.000)	-0.041 (0.034)
Basic Materials	0.038* (0.022)	-0.056 (0.281)	0.002 (0.003)	0.017 (0.019)
Oil and Gas	0.059* (0.033)	0.012 (0.439)	-0.000 (0.000)	0.044 (0.026)
Oil and Gas Production	0.063* (0.043)	-0.157 (0.452)	-0.000 (0.000)	0.060** (0.027)
Oil Equipment and Services	0.087* (0.051)	0.619 (0.555)	0.000 (0.000)	0.077** (0.039)
Railroads	0.118** (0.060)	-1.239** (0.535)	0.001 (0.000)	0.059 (0.045)
Diversified Industrials	0.173** (0.085)	-0.895 (0.643)	-0.001 (0.001)	0.079 (0.057)
Gold Mining	0.182* (0.094)	0.429 (1.199)	-0.001 (0.001)	0.071 (0.071)
Panel E. The Exposure of Thai Industry Stock Returns to Oil Prices				
Food Products	-0.188*** (0.068)	0.243 (0.743)	0.000 (0.001)	-0.129*** (0.049)
General Industrials	-0.174** (0.088)	-0.066 (0.985)	0.000 (0.001)	-0.056 (0.066)
Containers and Packaging	-0.174** (0.088)	-0.066 (0.985)	0.000 (0.001)	-0.056 (0.066)
Electricity	-0.142*** (0.048)	0.279 (0.459)	0.001* (0.000)	-0.107*** (0.038)
Utilities	-0.141*** (0.048)	0.301 (0.461	0.001* (0.000)	-0.108*** (0.038)
Construction Electricity	-0.136** (0.055)	0.170 (0.446)	0.001* (0.000)	-0.107*** (0.038)
Financials	-0.117*** (0.058)	0.179 (0.252)	0.000 (0.000)	-0.085** (0.035)
Banks	-0.117*** (0.040)	0.177 (0.300)	-0.000 (0.000)	-0.085** (0.037)
Hotels	0.099* (0.059)	-0.664 (0.805)	0.001 (0.001)	0.075* (0.045)
Health Care Providers	0.120* (0.071)	0.308 (0.807)	0.002** (0.001)	0.138** (0.058)
Health Care Equipment and Services	0.144* (0.079)	0.160 (0.741)	0.002** (0.001)	0.155** (0.072)
Oil and Gas	0.247*** (0.050)	0.779 (0.730)	0.000 (0.000)	0.176*** (0.049)
Oil and Gas Production	0.264*** (0.051)	0.704 (0.759)	0.000 (0.000)	0.184*** (0.050)
Panel F. The Exposure of Malaysian Industry Stock Returns to Oil Prices				
Airlines	-0.098* (0.053)	0.666 (0.743)	-0.000 (0.001)	-0.110** (0.046)
Mobile Telecommunications	-0.090* (0.048)	1.430 (0.963)	-0.000 (0.000)	-0.042 (0.044)
Multi-Utilities	-0.071** (0.035)	0.310 (0.424)	-0.000 (0.000)	-0.054** (0.026)
Tobacco	-0.061* (0.036)	0.404 (0.406)	-0.001*** (0.000)	-0.022 (0.026)
Personal and Household Goods	-0.058* (0.033)	0.331 (0.359)	-0.001*** (0.000)	-0.020 (0.024)

Industrial Transportation	-0.045* (0.027)	0.265 (0.263)	-0.000 (0.000)	-0.046** (0.021)
Broadcast and Entertainment	0.075* (0.038)	-0.043 (0.555)	-0.000 (0.000)	0.032 (0.091)
Panel G. The Exposure of Indonesian Industry Stock Returns to Oil Prices				
Heavy Construction	-0.271*** (0.094)	1.120 (0.948)	-0.001 (0.001)	-0.139* (0.071)
Real Estate	-0.203* (0.111)	-3.550** (1.446)	-0.000 (0.001)	-0.045 (0.101)
Real Estate Holding and Development	-0.202* (0.110)	-3.553** (1.446)	-0.000 (0.001)	-0.045 (0.101)
Real Estate Investment, Services	-0.196* (0.113)	-3.846** (1.513)	-0.000 (0.001)	-0.040 (0.101)
Gas Distributors	-0.170* (0.089)	-0.884 (1.031)	-0.000 (0.001)	-0.165** (0.074)
Gas, Water, and Multi-Utilities	-0.170* (0.089)	-0.884 (1.031)	-0.000 (0.001)	-0.165** (0.074)
Utilities	-0.168* (0.089)	-0.705 (1.043)	-0.000 (0.001)	-0.165** (0.074)
Industrial Transportation	-0.158** (0.072)	0.393 (0.704)	-0.000 (0.001)	-0.051 (0.056)
Personal Products	-0.117** (0.049)	0.070 (0.768)	-0.001 (0.000)	-0.052** (0.042)
Personal Goods	-0.115** (0.049)	0.017 (0.768)	-0.001 (0.000)	-0.051** (0.042)
Personal and Household Goods	-0.108** (0.046)	0.185 (0.426)	-0.001* (0.000)	-0.044 (0.038)
Tobacco	-0.089* (0.052)	0.131 (0.447)	-0.000 (0.000)	-0.014 (0.045)
Consumer Staples	-0.066* (0.035)	0.328 (0.386)	-0.000 (0.000)	-0.025 (0.028)
Basic Materials	0.155** (0.066)	-0.050 (0.540)	0.001 (0.001)	0.060 (0.060)
Beverages	0.161** (0.078)	-0.401 (0.862)	0.001** (0.001)	0.112* (0.059)
Brewers	0.161** (0.079)	-0.401 (0.862)	0.001** (0.001)	0.112* (0.059)
Food and Drug Retail	0.170** (0.077)	-0.197 (1.631)	0.001 (0.001)	0.153** (0.064)
Industrial Metals and Mines	0.232*** (0.076)	1.692 (1.096)	0.001 (0.001)	0.112* (0.067)
Nonferrous metals	0.232*** (0.076)	1.693 (1.096)	0.001 (0.001)	0.112* (0.067)
Mining	0.292*** (0.071)	1.572* (0.872)	0.001** (0.001)	0.160*** (0.057)
Panel H. The Exposure of Philippine Industry Stock Returns to Oil Prices				
Restaurants and Bars	-0.097** (0.048)	-0.388 (0.639)	0.000 (0.000)	-0.068* (0.041)
Real Estate Holding and Development	-0.043* (0.023)	-0.388 (0.259)	-0.000 (0.000)	-0.024 (0.020)
Real Estate Investment Services	-0.042** (0.023)	-0.412 (0.259)	-0.000 (0.000)	-0.024 (0.020)
Real Estate	-0.043** (0.023)	-0.403 (0.258)	-0.000 (0.000)	-0.024 (0.020)
Electricity	0.082* (0.040)	-0.076 (0.603)	0.000 (0.000)	0.0300 (0.0303)
Utilities	0.089** (0.038)	-0.106 (0.583)	0.000 (0.000)	0.037 (0.028)

Alternative Electricity	0.172** (0.075)	1.091* (0.581)	0.001 (0.000)	0.072 (0.065)
Distillers and Vintners	0.345*** (0.130)	-2.705 (3.294)	-0.001 (0.001)	0.276*** (0.097)

Notes: Column (1) of the table reports the coefficient on the spot price for West Texas Intermediate (WTI) crude oil in a regression of monthly industry stock returns on the spot price for WTI crude oil, the country's CPI-deflated real effective exchange rate, the return on the country's stock market, and the return on the U.S. stock market. Column (2) reports the coefficients on shocks to oil supply, column (3) on shocks to global commodity demand, and column (4) on shocks to crude oil prices in a regression of monthly industry stock returns on these three shocks, the country's CPI-deflated real effective exchange rate, the return on the country's stock market, and the return on the U.S. stock market. The shocks are obtained from a structural VAR. Data on crude oil prices and stock returns come from the Datastream database. HAC standard errors are in parentheses.
Source: Datastream database, CEIC Database, BIS Database, and calculations by the author.
*** (**) [*] denotes significance at the 1% (5%) [10%] levels.

Table 2. Exposure of Aggregate Stock Returns in East and Southeast Asian Economies to Oil Prices and other Variables.

	(1)	(2)	(3)	(4)	(5)
Country	Exposure to Oil Prices	Exposure to U.S. Stock Market	Exposure to Real Effective Exchange Rate	Adjusted R-squared	Sample Period
Japan	0.042	0.62***	-0.27**	0.256	1990M01-
	(0.044)	(0.06)	(0.13)		2017M11
Korea	0.082**	0.88***	-0.08	0.217	1990M01-
	(0.041)	(0.09)	(0.20)		2017M11
Taipei,China	-0.024	0.80***	0.66*	0.159	1990M01-
	(0.081)	(0.14)	(0.39)		2017M11
PRC	0.057	0.45***	0.20	0.205	1991M09-
	(0.089)	(0.16)	(0.14)		2017M11
Thailand	0.011	1.02***	0.37	0.252	1994M02-
	(0.008)	(0.13)	(0.35)		2017M11
Malaysia	0.034	0.59***	0.66***	0.217	1994M02-
	(0.032)	(0.13)	(0.21)		2017M11
Indonesia	0.003	0.94***	-0.17	0.243	1994M02-
	(0.074)	(0.14)	(0.16)		2017M11
Philippines	0.024	0.71***	0.64***	0.262	1994M02-
	(0.041)	(0.12)	(0.18)		2017M11

Note: The table reports coefficients from a monthly regression of each economy's aggregate stock returns on the change in the log of the spot price for West Texas Intermediate crude oil, the return on the U.S. aggregate stock market, and each economy's CPI-deflated real effective exchange rate. HAC standard errors are in parentheses.
Source: Datastream database, CEIC Database, BIS database, and calculations by the author.
*** (**) [*] denotes significance at the 1% (5%) [10%] level.

Table 3. The Exposure of Industries across East and Southeast Asia to Oil Prices

	(1)	(2)	(3)	(4)	(5)
Asset	Beta to WTI Crude Oil Price	Beta to Residual World Oil Supply	Beta to Residual World Commodity Demand	Beta to Residual WTI Crude Oil Price	Number of Countries
Airlines	-0.094*** (0.030)	0.104 (0.307)	-0.000 (0.000)	-0.089*** (0.025)	5
Personal Goods	-0.093*** (0.028)	0.123 (0.355)	0.000 (0.000)	-0.060** (0.023)	5
Gas Distributors	-0.069** (0.032)	-0.408 (0.311)	-0.000 (0.000)	-0.048*** (0.025)	4
Construction Electricity	-0.046** (0.023)	-0.057 (0.246)	0.000 (0.000)	-0.042** (0.019)	6
Real Estate	-0.046** (0.022)	-0.783*** (0.290)	0.000 (0.000)	-0.014 (0.018)	6
Utilities	-0.041** (0.020)	-0.046 (0.206)	-0.000 (0.000)	-0.039** (0.017)	7
Gas, Water, & Multi-Utilities	-0.038 (0.027)	-0.256 (0.260)	0.000 (0.000)	-0.034 (0.023)	6
Mobile Telecommunications	-0.034 (0.025)	-0.175 (0.378)	-0.000 (0.000)	-0.027 (0.021)	8
Industrial Transportation	-0.021 (0.027)	-0.162 (0.247)	0.000 (0.000)	-0.017 (0.023)	7
Electronic and Electrical Equipment	-0.019 (0.026)	-0.226 (0.372)	0.000 (0.000)	-0.024 (0.022)	6
Consumer Staples	-0.018 (0.019)	0.116 (0.206)	0.000 (0.000)	-0.001 (0.015)	6
Heavy Construction	-0.015 (0.027)	0.092 (0.282)	-0.000 (0.000)	-0.017 (0.022)	5
Telecommunications	-0.014 (0.022)	-0.281 (0.291)	-0.000 (0.000)	-0.001 (0.019)	8
Automobiles	-0.011 (0.024)	0.172 (0.259)	0.000 (0.000)	-0.002 (0.019)	5
Transportation Services	-0.009 (0.022)	-0.467* (0.265)	0.000 (0.000)	-0.005 (0.019)	5
Travel & Leisure	-0.009 (0.020)	0.431* (0.239)	0.000 (0.000)	-0.012 (0.016)	6
Electricity	-0.008 (0.017)	-0.019 (0.197)	0.000 (0.000)	-0.012 (0.014)	6
Pharmaceuticals	-0.002 (0.031)	0.412 (0.454)	0.000 (0.000)	0.004 (0.024)	4
Auto Parts	0.001 (0.035)	-0.116 (0.348)	0.000 (0.000)	0.004 (0.026)	4
General Industrials	0.012 (0.028)	-0.092 (0.247)	0.000 (0.000)	0.004 (0.020)	6
Farming, Fishing, & Plantations	0.014 (0.032)	-0.240 (0.363)	0.000 (0.000)	0.004 (0.026)	5
Industrials	0.014 (0.020)	0.264 (0.272)	0.000 (0.000)	0.005 (0.026)	8
Food Producers	0.015 (0.027)	-0.046 (0.229)	0.000 (0.000)	0.011 (0.024)	8
Consumer Goods	0.015 (0.015)	-0.128 (0.190)	0.000 (0.000)	0.010 (0.012)	8
Retail	0.018	-0.552*	0.000	0.002	8

	(0.023)	(0.316)	(0.000)	(0.020)	
Support Services	0.036 (0.046)	-0.850** (0.382)	0.001 (0.000)	0.024 (0.041)	5
Chemicals	0.047** (0.020)	-0.114 (0.280)	0.000 (0.000)	0.010 (0.018)	7
Iron & Steel	0.050* (0.030)	0.012 (0.250)	0.000 (0.000)	0.012 (0.025)	4
Electronic Components and Equipment	0.050 (0.021)	0.371 (0.351)	0.000 (0.000)	0.022 (0.027)	5
Diversified Industrials	0.070*** (0.027)	-0.153 (0.310)	0.000 (0.000)	0.034 (0.022)	5
Industrial Suppliers	0.074* (0.044)	-0.895** (0.444)	0.001* (0.000)	0.048 (0.037)	5
Basic Materials	0.079*** (0.023)	0.100 (0.247)	0.000 (0.000)	0.037* (0.020)	7
Basic Resources	0.081*** (0.030)	0.136 (0.312)	0.001* (0.000)	0.045* (0.025)	8
Commercial Vehicles and Trucks	0.096* (0.055)	0.165 (0.471)	0.001 (0.001)	0.064 (0.047)	4
Oil and Gas	0.099*** (0.019)	0.071 (0.291)	0.000 (0.000)	0.064*** (0.017)	7
Oil and Gas Production	0.101*** (0.019)	-0.006 (0.290)	0.000 (0.000)	0.064*** (0.017)	7
Nonferrous Metals	0.135*** (0.043)	0.421 (0.451)	0.001 (0.001)	0.063* (0.036)	4
Mining	0.141*** (0.042)	0.733 (0.487)	0.001* (0.000)	0.095*** (0.036)	5
Oil and Gas Exploration and Production	0.149*** (0.026)	0.179 (0.303)	0.000 (0.000)	0.090*** (0.022)	6

Notes: Column (1) of the table reports the coefficient on the spot price for West Texas Intermediate (WTI) crude oil in a panel regression of monthly industry stock returns for each country on the spot price for WTI crude oil, the CPI-deflated real effective exchange rate for each country, the return on the country's stock market, and the return on the U.S. stock market. Column (2) reports the coefficients on shocks to oil supply, column (3) on shocks to global commodity demand, and column (4) on shocks to crude oil prices in a panel regression of monthly industry stock returns for each country on these three shocks, the CPI-deflated real effective exchange rate for each country, the return on each country's stock market, and the return on the U.S. stock market. The shocks are obtained from a structural VAR. Data on crude oil prices and stock returns come from the Datastream database. Country fixed effects are included. HAC standard errors are in parentheses.

Source: Datastream database, CEIC Database, BIS Database, and calculations by the author.

*** (**) [*] denotes significance at the 1% (5%) [10%] levels.

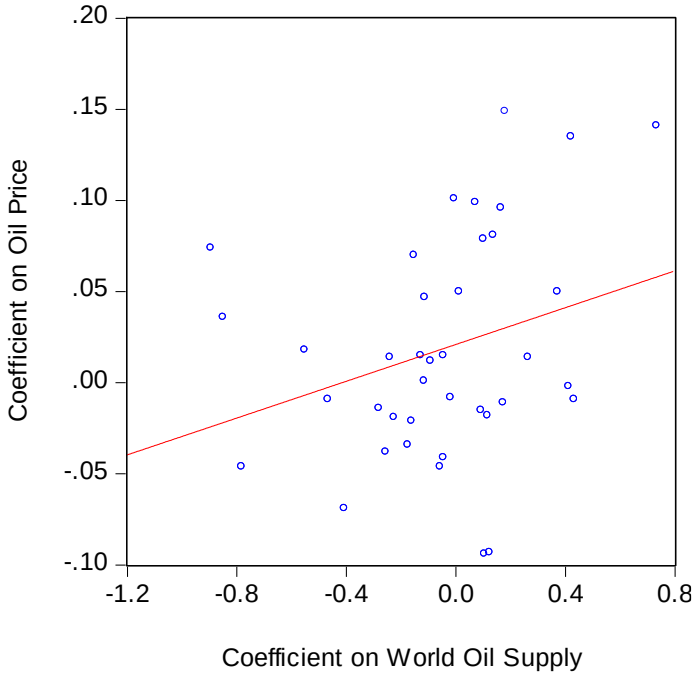

Figure 1a: The relationship between World Crude Oil Price Betas and World Oil Supply Betas in Table 3.

Note: The figure shows the relationship in Table 3 between the coefficients on crude oil prices (CoeffWTI) and the coefficients on world oil supply (CoeffOilSS). The line in the figure is from the following regression (with heteroscedasticity and autocorrelation consistent standard errors in parentheses):

CoeffWTI = -0.085 + 1.61 CoeffOilSS
(0.053) (0.96)
Adjusted R-squared = 0.0566, Standard Error of Regression = 0.336

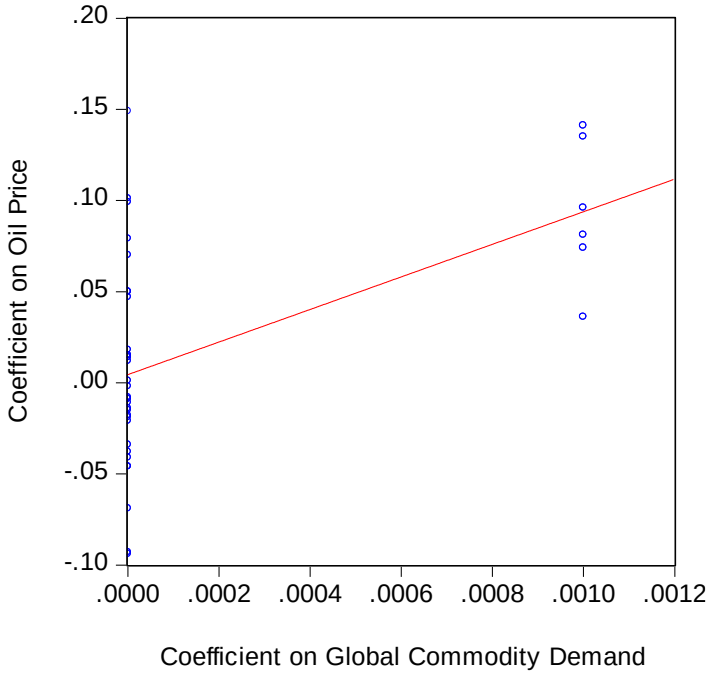

Figure 1b: The relationship between World Crude Oil Price Betas and Global Commodity Demand in Table 3.

Note: The figure shows the relationship in Table 3 between the coefficients on crude oil prices (CoeffWTI) and the coefficients on global commodity demand (CoeffCommDD). The line in the figure is from the following regression (with heteroscedasticity and autocorrelation consistent standard errors in parentheses):

CoeffWTI = 0.000 + 0.0032 CoeffCommDD
(0.000) (0.001)
Adjusted R-squared = 0.266, Standard Error of Regression = 0.0003

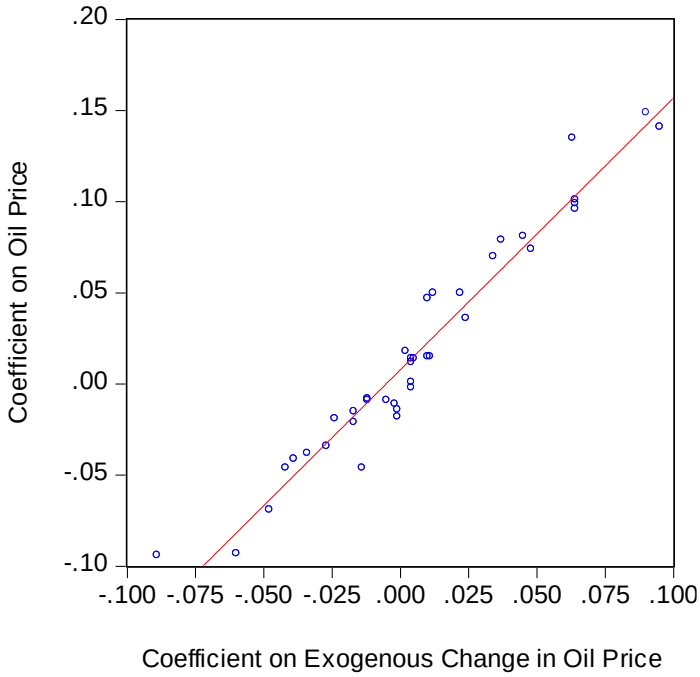

Figure 1c: The relationship between World Crude Oil Price Betas and Exogenous Changes in Crude Oil Price Betas in Table 3.

Note: The figure shows the relationship in Table 3 between the coefficients on crude oil prices (CoeffWTI) and the coefficients on exogenous changes in oil prices (ExogWTI). The line in the figure is from the following regression (with heteroscedasticity and autocorrelation consistent standard errors in parentheses):

CoeffWTI = -0.005 + 0.635 ExogWTI
(0.002) (0.024)
Adjusted R-squared = 0.946, Standard Error of Regression = 0.0093

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