Can Cheap Oil Hurt Net Importers? Evidence from the Philippine Economy

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Motivation:
Recent Oil Price Drops

Brent Crude Oil, 1970-2016 (USD/BBL)
Motivation: Conventional Wisdom

CHANGE IN GDP GROWTH

SOURCE: OXFORD ECONOMICS
Motivation: Focus on US

Fig. 1.—Changes in crude oil prices (solid lines) and U.S. recessions (shaded areas), 1947–75.

Source: Hamilton, 1983

Source: EIA, NBER
Motivation: US States’ Experience

1980 Oil Price Surge

1986 Oil Price Drop
Motivation: Little Attention to Developing Countries

Many studies on oil price-macroeconomy relationships focusing on:

- Advanced economies
  - Jimenez-Rodriguez and Sanchez (2004) for G-7 countries
  - Jimenez-Rodriguez (2008) on 6 OECD countries
Motivation: Little Attention to Developing Countries

Very few on non-OECD countries (Brown and Yucel, 2000; Rasmussen, 2011)

- Within the few non-OECD, very little on oil-importing countries.
  - Berument, et al., (2010) on MENA countries
  - Jumah and Pastuszyn (2007) on Ghana
  - Wakeford (2006) and Bouzid (2012) on South Africa and Tunisia

Assumed oil price change is exogenous

Analysis assumed no indirect effect through trade
Motivation: Oil-Price Macro is Complicated!

Kilian, et al. (2007)
Rasmussen (2011)
Brucal and Roberts (2016)

\[ GSP_{it} = \alpha + \beta P_t + \varepsilon_{it} \]

"Reverse Causality"
This Study

Assesses the dynamic relationship between oil prices and output in the Philippines

- Apply Kilian’s (2008) structural decomposition of oil price shocks
- Analyze subcomponents of output to explore other potential mechanisms
Philippine Crude Oil Production and Consumption

Source: U.S. Energy Information Administration
Personal Remittance Received, 1977-2016

Source: WDI
Top OFW Destinations, 2014

- Canada: 18,107
- Saudi Arabia: 402,837
- Kuwait: 70,098
- Singapore: 140,205
- Taiwan: 58,681
- UAE: 246,231
- Qatar: 114,511
- Bahrain: 18,958
- Malaysia: 31,451
- Hong Kong: 140,205

Source: POEA (Rappler.com)
Empirical Strategy

Near-VAR Estimation Strategy (Kilian, 2009)

VAR model based on monthly data: \[ z_t = (\Delta prod_t, rea_t, rpo_t)' \]


Structural (Recursively Identified) VAR:

\[ A_0 z_t = \alpha + \sum_{i=1}^{24} A_i z_{t-i} + \varepsilon_t \]

Identification (Recursive Structure):

\[ e_t = \begin{pmatrix} e_t^{\Delta prod} \\ e_t^{rea} \\ e_t^{rpo} \end{pmatrix} = \begin{bmatrix} \alpha_{11} & 0 & 0 \\ \alpha_{21} & \alpha_{22} & 0 \\ \alpha_{31} & \alpha_{32} & \alpha_{33} \end{bmatrix} \begin{pmatrix} \varepsilon_{t-oil supply shock} \\ \varepsilon_{t-commodities demand shock} \\ \varepsilon_{t-oil-specific demand shock} \end{pmatrix} \]
Estimation of Shocks to Philippine Macroeconomic Aggregates:

$$\Delta y_t = \alpha_j + \sum_{i=0}^{12} \phi_j i \hat{\xi}_{jt-i} + Qtr_k + \varepsilon_t, \quad j = 1, 2, 3$$

Where:

$$\hat{\xi}_{jt} = \frac{1}{3} \sum_{m=1}^{3} \hat{\xi}_{jtm}, \quad j = 1, 2, 3$$
Historical Decomposition of Oil Price Changes

Oil price inflation rate

- Oil supply shock
- Aggregate demand shock
- Oil-specific demand shock
Historical Decomposition of Oil Price Changes

Oil price inflation rate (Quarter average)

- Oil supply shock
- Aggregate demand shock
- Oil-specific demand shock
Effect of Oil Price Shocks on the Philippine’s GDP Growth

- Oil supply shock
- Aggregate demand shock
- Oil-specific demand shock

Cumulative Impulse Response Function (IRF)
Effect of Oil Price Shocks on the Philippine’s Consumption Growth

- Oil supply shock
- Aggregate demand shock
- Oil-specific demand shock

Cumulative Impulse Response Function (IRF)
Effect of Oil Price Shocks on the Philippine’s Export Growth

Cumulative Impulse Response Function (IRF)
Effect of oil price shocks on net importers may be different, depending on what causes the shock.

There may be offsetting effects that help mitigate the direct impact of oil price shocks to domestic economy.

Net effect may be ambiguous.

Given empirical results, the Philippine economy may have been hurt by the recent oil price decline.
Mahalo!
Appendices
Historical Decomposition of Oil Price Changes

- Oil price inflation rate
- Oil supply shock
- Aggregate demand shock
- Oil-specific demand shock
Correlation between Crude Oil Futures and S&P500

Source: Brucal and Roberts, 2016
Effect of Oil Price Shocks on the Philippine’s Investment Growth

- Cumulative Impulse Response Function (IRF)

- Oil supply shock
- Aggregate demand shock
- Oil-specific demand shock