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Understanding crude oil import demand behaviour in Africa: Evidence from Ghana

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Abstract

As in many African countries, crude oil importation is a major drain on the economy of Ghana. We estimate short-run and long-run import demand models for crude oil using data over the period 1980–2012. Results show that demand for crude oil is price inelastic in the short-run but elastic in the long-run. Other important drivers of crude oil import are the real effective exchange rate, domestic oil production and population growth. Income is found to be the strongest driver of crude oil demand. Policy implications of our results are presented.

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JEL classification: F10; Q11; Q31; Q41; Q48

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1. Introduction

Crude oil is a major driver of businesses, manufacturing, transportation, as well as maritime trade at the national, regional and global levels. The pursuit of higher economic growth implies the need for adequate supply of crude oil and its constituent products such as gasoline, liquefied petroleum gas (LPG), and kerosene for the domestic, industrial, and agricultural and transport sectors of any economy. Since the episodes of the global oil price hikes in the 1970s and during the 2007–2008 crisis period where (light blend Brent) crude oil price shot up from US\$25 per barrel in January 2000 to US\$134 in July 2008 (International Monetary Fund, 2017), interest in the analysis of price and demand dynamics of crude oil has increased. Although crude prices have fallen substantially recently, they still represent large portions of African countries' budgets (see International Monetary Fund, 2015; Essandoh-Yeddu and

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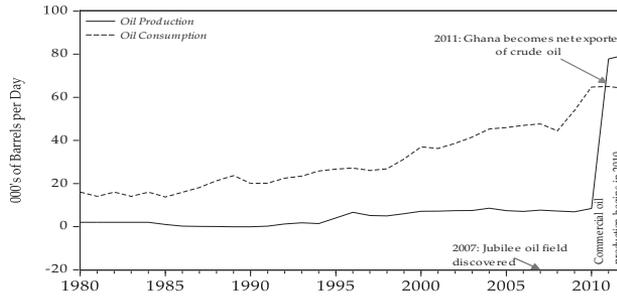
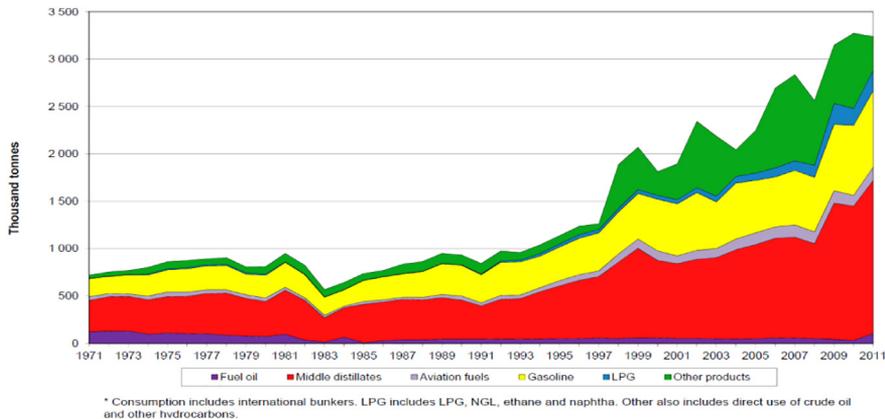


Fig. 1. Ghana’s crude oil production and consumption (1980–2012).
Data source: International Energy Statistics, U.S. EIA database.

Yalamova, 2015; The Economist, 2016). Understanding the dynamics of the petroleum subsector and demand for petroleum and related products is therefore crucial for policy purposes.

Ghana achieved lower middle income status in 2006 after a rebasing of the national accounts. With a chequered economic history characterized by a series of fluctuating revenue inflows and losses from commodity exports (mainly gold, cocoa and timber), Ghana has since the last two decades posted considerable growth rates. Real gross domestic product (GDP) growth has hovered around 5% since 2003, hitting an all-time high of 15% in 2011. The rapid growth of the economy might imply increase demand for energy, especially crude oil. Ghana has traditionally been a net importer of crude oil, the price of which is determined on the international market. As a small and open economy, Ghana is often vulnerable to oil price shocks in the event of any significant price fluctuations. Total domestic oil consumption continues to rise while production has remained largely constant from 1980 until 2010 when commercial production came on-stream. Consequently, domestic production surged significantly from almost 9000 barrels a day in 2010 to about 80,000 barrels by 2012. From 16,000 barrels per day in 1980, crude oil consumption stood at 64,000 barrels per day in 2012 (see Figs. 1 and 2). In 2009 and 2010 alone, crude oil consumption grew by about 21.4% and 20.2%, respectively.

Crude oil constitutes a significant share of total imports and a major contributor to the worsening trade balance and overall balance of payment (BOP) position in Ghana (Table 1 and Fig. 3). Crude oil imports have increased from US\$307 million in 1980 to US\$3.2 billion in 2011 (about 11% annual



* Consumption includes international bunkers. LPG includes LPG, NGL, ethane and naphtha. Other also includes direct use of crude oil and other hydrocarbons.

Fig. 2. Consumption of oil products.
Source: IEA, 2013.

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