



# Does the China factor matter: What drives the surge of world crude oil prices?



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## ABSTRACT

This paper employs a structural VAR model using five endogenous variables, including world crude oil prices, China's oil imports and share of world consumption, speculation, and OPEC supply. Monthly data from January 1997 to January 2012 is used to investigate the impacts of different factors on world crude oil prices. The empirical results suggest that OPEC supply is the main factor and China's oil consumption share is the second most important factor with an immediate effect on world oil prices between 1997 and 2012. During the third oil crisis from 2003 to 2008, speculation became the most important factor, and OPEC supply had a secondary short run and long run influence on oil prices. However, since 2009, OPEC supply has become the key factor, with China's oil consumption share the second most important factor determining oil prices. The China factor appears to be secondary to other factors in all three time frames and to act via the share of world consumption rather than via import volumes.

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## 1. Introduction

With rapid economic growth since 1978, China's oil demand has increased sharply while domestic production has been relatively stable. China's dependence on foreign oil has increased to 55%, which exceeds the international warning level of 50% (Chen & Yu, 2011). China became a net crude oil importer and a net refined oil importer in 1993 and 1996, respectively. In 2003, China's oil consumption surpassed that of Japan to become second to the United States (Zhang & Choi, 2013). According to the

International Energy Statistics published by United States Energy Information Administration (EIA), China's oil consumption increased from 3.916 million barrels per day in 1997 to 9.392 million barrels per day in 2010. Moreover, net oil imports rose from 0.632 million barrels per day in 1997 to 5.086 million barrels per day in 2010. China's oil consumption and net oil imports have increased by 140% and 700% respectively between 1997 and 2010 (Fig. 1).

Since 1997, world oil prices have fluctuated widely with an overall upward trend (Fig. 2). There are three significant price decline periods<sup>3</sup> in the price graph: the 24-month period from January 1997 to December 1998 in which

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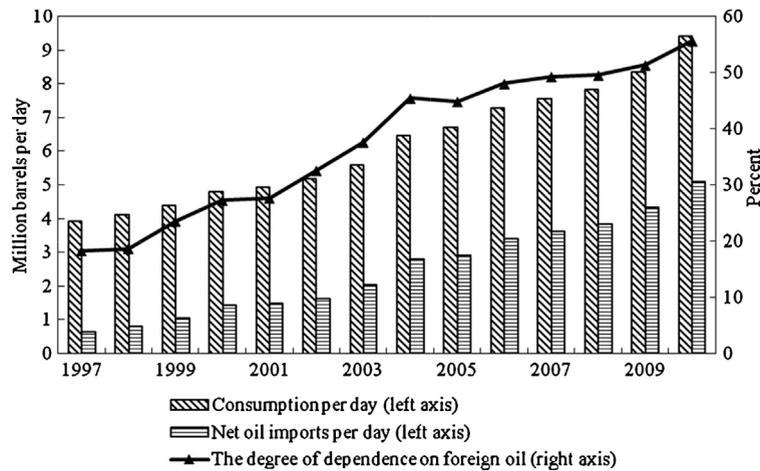
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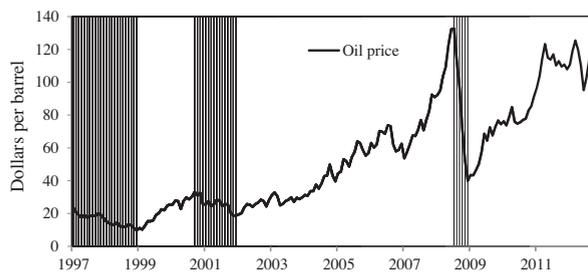
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<sup>3</sup> This paper defines oil price decreases of at least 40% from peak to trough as significant. The first significant decline during 1997–1998 was triggered by the Asian financial crisis. The bursting of the Internet bubble and a terrorist attack caused the second decline in 2001. The third oil price decline in 2008 was triggered by the 2008 financial crisis.



**Fig. 1.** China's oil consumption per day, net oil imports per day, and degree of dependence on foreign oil.

Sources: EIA (2011), BP Statistical Review of World Energy (2011).



**Fig. 2.** The world crude oil prices fluctuation. *Notes:* We consider Europe Brent crude spot price as a proxy variable for world crude oil prices. The shaded areas denote the duration times in the different price declines. *Source:* EIA (2013).

prices bottom out at \$9.82/bbl; the 16-month period from September 2000 to December 2001 when prices bottom out at \$18.71/bbl; and the 6-month period from July to December 2008 when prices fell from an intra-month high of \$132.72 to an intra-month low of \$39.95. It is obvious that the third price decline was larger in both absolute and percentage terms, but bottomed out at a much higher level than the first and second decline and quickly reversed itself. The overall trend is toward rising prices. Between 2003 and mid-2008, the Brent spot price increased 300%, and China's oil consumption increased from 5.578 to 7.817 million barrels per day. The 40% increase represents 1/3 of the global increase in oil consumption over the period, and the recent surge in world oil prices triggered a heated debate on the relationship between world oil prices and China's strong oil demand. The goal of this paper is to identify the key factor driving the surge of world oil prices with consideration of three different factors including speculation, supply, and demand, particularly in China.

The paper is organized as follows. Section 2 presents literature review. Section 3 employs a SVAR model with the five endogenous variables of world oil prices, China's crude oil imports and consumption share, speculation, and OPEC supply. Empirical results are discussed in Section 4, and the two different robustness checks are presented in

Section 5. In Section 6, contains the main conclusions and implications.

## 2. Literature review

Many factors may influence the dynamics of world oil prices such as rigid oil supply, strong oil demand, speculation in international oil markets, a weak U.S. dollar, political turmoil and wars (Askari & Krichene, 2008; Hannesson, 2012; Möbert, 2007; Mu & Ye, 2011). Crude oil is a nonrenewable resource and its price has been mainly determined by fundamentals of supply and demand over the past century. But speculation also plays an important role. Rising futures prices could move spot oil prices upwards via arbitrage between physical and futures markets (Hannesson, 2012). A recent paper by Kaufmann and Ullman (2009) indicates that speculation will influence world oil prices via inventories in the physical oil market. Most oil trade is conducted in U.S. dollars, and a weak U.S. dollar will drag oil prices upwards. In the short term, political turmoil and wars interrupt production and cause higher prices.

Many economists and market analysts believe that the chief culprit for the surge in world oil prices under weak demand in developed countries since 2003 is strong oil demand from China. The International Energy Agency argues that rapid development and industrialization in Asia is the most important factor driving the surge of world oil prices. Oil demand from China and India is projected to almost quadruple by 2030, which could create a supply crunch as soon as 2015 unless oil producers step up production, energy efficiency improves, and demand from the two countries dampens (Jad & Julia, 2007; Wei, Ni, & Sheng, 2011).

Askari and Krichene (2008) demonstrate that oil price dynamics during 2002–2006 is caused by the pressure resulting from rigid crude oil supply and expanding world crude oil demand. Hamilton (2009a) argues that strong demand from China as well as insufficient world supply accounts for the world oil price surge in 2007–2008. And China's annualized oil consumption growth rate of

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