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# A comparative analysis of the dynamic relationship between oil prices and exchange rates<sup>☆,☆☆</sup>



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### ABSTRACT

This paper applies cDCC model to compare the dynamic correlations between oil prices and exchange rates of G20 members. The significant shifts in the correlations are then endogenously detected. For each pair of oil price-exchange rate, empirical evidence confirms of a strengthening negative correlation in the last decade. Methodology suggests only two events; US' invasion of Iraq in 2003 and the 2008 global financial crisis, associating shifts of correlations to stronger negative level. While the first event has a shifting effect on mainly developed members, the latter affects them all. The new relationship provides benefits in risk diversification and inflation targeting.

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## 1. Introduction

Oil is one of the most important forms of energy. It is a natural and non-renewable resource that goes into making virtually everything including steel, aluminum, plastics, rubber, fabrics and fertilizers. Moreover, it is commonly regarded as a comparative advantage and a key strategic resource.

As widely accepted, oil is a significant determinant of global economic performance and its price dynamics can affect the world economy in many different ways: An increase in the oil price will raise the cost of production and services, so will lead to an increase in price levels. Concerns about likely increases in price levels in the near future will produce uncertainty and negative sentiment in the financial markets, and the expected inflation will lower the equity values. In addition, the price of oil can set economic trends by dominating growth in the gross domestic product (GDP). An oil price increase will also have an effect on a country's wealth by a transfer of income from oil importing to oil exporting countries through a shift in the terms of trade thus, inevitably, exchange rates are also expected to change (Turhan et al., 2013).

These facts make it essential to understand the crude oil price dynamics and its impacts on the world economy, however it is a challenging question as the crude oil prices experienced very large fluctuations over the last three decades and recently became more volatile than ever. Fig. 1 shows the history of the oil price from Jan 2000 to April 2013. Oil prices have increased very sharply after the US' invasion of Iraq, rising from about \$30 per barrel at the beginning of 2003 to their highest level of \$147 in July 2008 but by the end of December 2008, had fallen to \$40 due to the global financial crisis. However, the prices again reached above \$110 in 2012.

The recently observed frequent and uncertain changes in oil prices are transmitted to the real economy and financial markets primarily through exchange rates vis-à-vis United States (US) dollar. In case of a strong US dollar, the major invoicing and settlement currency in international oil markets, it is probable that crude oil importing countries (except US) will be adversely affected (and vice versa), or an increase in the volatility of the US dollar exchange rate will create an environment of uncertainty for the crude oil exporting countries in terms of international purchasing power (Zhang et al., 2008).

Financial globalization presents new challenges in understanding the effects of the oil prices to local economies and financial markets: Prior to financial globalization (*first episode*), oil price was affecting the economies mainly through the mechanisms related to fundamental or “more tangible” real factors such as the standard supply side effect and the current account balances. Even when the financial sector was concerned, the impact was limited to inflationary consequences. However since the late 1990s (*second episode*) with financial markets started to function in an integrated pattern at global scale, that is cross-border capital flows liberalized and became a major determinant on local economies, the relationship between the oil prices and the macroeconomic performance has changed in several ways.

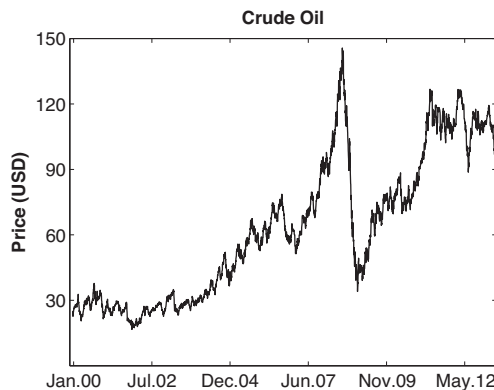


Fig. 1. Crude oil price per barrel between Jan 2000 and April 2013.

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