1. Introduction

1.1 Motivations of the study

The impact on oil was affected by many incidences. One such incidence is the hurricane in the Gulf of Mexico in the United States. A record price of the commonly quoted West Texas Intermediate (WTI) crude oil of $70.85 per barrel was reached on August 29, 2005 because hurricane Katrina struck the Gulf coast of the United States and caused significant damage to a number of US oil refineries. In fact, since the 1970s, crude oil prices in the world market have experienced fluctuations, including sharp rises during the first and second oil crises, a plunge in 1986, a steep rise on the Persian Gulf crisis, a decline on the Asian economic crisis and an uptrend since 1999. Since 2000, crude prices have continued an upward trend while repeating fluctuations. In particular, crude oil prices have risen further since 2004. In 2005, the WTI price hit its record high at the average of 53.6. Figure 1-1 shows the annual average crude oil price of WTI from 1976 to 2006.

**Figure 1-1 Annual Average Crude Oil Price of WTI for the 1976-2006 Period**
Geopolitical factors regarding the destabilization of the Middle East situation (e.g. Gulf War in 1990 and Iraq War in 2003), the state of turmoil (e.g. Venezuela’s political instability, potential bankruptcy in Yukos and Nigeria’s strikes in 2004), and changes in oil supply and demand fundamentals are also important factors in determining the price of crude oil.

Figure 1-2 shows the annual growth of world oil demand from 1990 to 2005. World demand for oil has consistently increased since the 1990s as the world economy has expanded smoothly. However, oil demand growth varies among regions. Outside North America, oil consumption in the mature markets grows much more slowly, reflecting slow growth or declines in population and economic growth in these regions, and successful policies for promoting alternative energy for oil over this period. Conversely, demand growth for developing markets is strong in Asia, particularly for China. China shifted to a net oil importer in 1993 and in 2003 replaced Japan as the world’s
second-largest oil importer (after the United States). Almost a half of the increase is seen in North America and China. Fast growth in North America and China has apparently worked to tighten the demand-supply balance in the oil market.

Over the past ten years, a significant proportion of the increase in world oil production has come from non-OPEC producers as shown in Figure 1-3. A key factor behind the sharp increase in non-OPEC oil production is the promotion of investment in the development of the upstream oil sector in the North Sea, Alaska and other parts of the world in response to crude oil price hikes during the oil crises in the 1970s. However, production trends differ sharply from regions. Production in non-OPEC oil-producing countries, excluding United States and former Soviet Republics, has basically continued to expand. In recent years, however, North Sea oil production, which had dominated non-OPEC production growth in the past, has been declining. Overall, non-OPEC oil production growth has slowed down in recent years. Since 2003, the expansion in production by non-OPEC countries alone has failed to cover world demand growth. As a result, OPEC has been required to expand production substantially by using their surplus
capacity.

The stabilization of the supply-demand balances is very important to prices in the world oil market. Jimenez-Rodriguez and Sanchez (2004) report that oil price increases have a direct impact on economic activity for both oil-importing and oil-exporting countries. Furthermore, oil price increases are found to have an impact on some countries’ GDP growth of a larger magnitude than that of oil price declines. Recent crude price hikes which was caused by declining supply capacity of the world oil markets and substantial oil demand growth in North America, China and other developing countries in Asia may cause serious problems for the world economy. Therefore, if accurate and timely analysis of oil prices changes can be obtained, we can take properly measures and changes in advance to avoid the unforeseeable change in oil price.

Most of the OECD countries published their projections or forecasts of future energy consumption periodically since 1970. Much effort have been devoted to the task of forecasting oil prices and oil consumption in industrialized countries, in order to manage the use of this important resource. The institutions of scheduled reports about the oil industry primarily include large institutions such as American Petroleum Institute (API), Energy Information Administration (EIA), International Energy Agency (IEA), and Organization of the Petroleum Exporting Countries (OPEC). The contents of weekly reports in API and EIA mainly focus on the change of oil stocks, especially for the United States. The reports in OPEC provide a vast amount of oil-related data, but are with less detail than IEA monthly oil survey. IEA, among other sources, provides such a wealth of information to participants in the world oil market. IEA based in Paris, is an autonomous organization within the framework of the Organization for Economic Cooperation and Development (OECD). In addition to other functions, IEA develops detailed statistics on world oil supply, demand, and crude stocks that it publishes in its monthly Oil Market Report (OMR).

Despite the impact of many unexpected incidences in the oil markets, much of the increase of oil prices in recent years are appeared to be related to the oil supply and demand forecast which are included in monthly announcement in IEA’s Oil Market Report. To explore whether this is indeed the case, Appendix A and Appendix B display the 50 largest positive and negative returns over the sample period from 1993 to 2005.
These news reports are gathered from Bloomberg News and may account for the striking price change of the oil markets. The evidence shows that 11 of the 50 positive returns and 7 of 50 negative returns are associated with the announcements in IEA’s reports. Notably, the largest positive return of 7.96% driven by IEA occurred on October 12, 2000 after the IEA announced that spare capacity are limited in the Middle East to produce, refine and transport. The WTI price rose from US$33.21 to US$35.96, or by US$2.75. On November 15, 2001 after IEA released a report saying that demand for oil for this year will rise by 100,000 barrels a day, the smallest increase since 1984. This resulted in the largest negative price changes affected by IEA. Though there were other large price changes caused by other factors such as actual output changes in OPEC and non-OPEC, consumer demand for oil, political tension in the Middle East, labor strikes, the hurricane effect in the Gulf of Mexico, the change in weather, and oil inventories in the United States. It seems that an anticipated factor which could result in increased oil price volatility for market participants would be the release of IEA’s reports. Consequently, we are interested to examine whether monthly IEA’s Oil Market Report contribute to the significant price changes in the oil-related markets.

1.2 Objectives of the study

In this article, we offer a comprehensive study on whether IEA reports on the forecasts of world oil supply and demand have any information content on oil-related markets. To address this issue, we use event study methodology to examine how oil-related prices react to IEA’s forecasts over a 16-year period. The oil-related markets that we study include the Brent Crude oil price, oil industry indices and individual stock prices of six countries - the Japan, Canada, France, the United States, the United Kingdom and Norway. One important feature of this research is that we also conduct separate analysis for monthly forecast changes of increased versus decreased supply in non-OPEC countries and demand in North America and China of IEA’s reports.

The results of this study should be useful to participants including oil companies, investment firms, governments, and other participants in the world oil market. Knowing the change in supply and demand helps oil companies make decisions about storing or selling stocks in oil and they can also hedge appropriate quantities for their stock prices.
If governments know the foreseeable change of oil price, some measures could be taken to protect economy from damage. Individual investors can also base on the supply and demand forecasts generated by the IEA to understand why oil prices changed and design a more successful investment strategy.

1.3 Chapter outline

The remainder of this paper is organized as follows: Chapter 2 reviews relevant literature on announcement effects in the financial market and the accuracy of IEA’s reports. Chapter 3 provides summary statistics of IEA’s reports and oil-related price data. Chapter 4 discusses the event study methodology and cross-sectional regression analysis used in this paper. Chapter 5 presents the estimated empirical results and Chapter 6 concludes the paper and offers suggestions for future research.