Chapter 1

Introduction

Rationales

At present, the world energy needs come from exhaustible resource about 85 percent, uranium and mainly fossil fuels. The oil supply covers about 34 %, by far the largest share followed by coal (24%), natural gas (21.5%), nuclear (5.5%) and renewables (15%), including traditional biomass. One third of these sources is used for electricity production of about 16,000 Terawatt hours. Electricity is produced from coal (39%), gas (~18%), renewables (18%), and nuclear energy (17%), followed by a small amount from oil (7.5%). Within the renewables about 90% of the electricity come from hydropower, 5% from biomass and a small amount (<1%) from wind and other sources (China and India Insight, 2007). Industrialized countries consume about 5-6 kW on average. This includes countries like USA or Canada with more than 10 kW. Most important will be the development of China (at present 1.3 kW) and India (0.5 kW) with 2.3 billion people (Zitel).

Asia with the strongest rise in demand over the last year has come to the top of its production capacities. The oil depletion certainly will influence the economic development of the emerging Asian countries China and India. The Asian oil balance is highly negative since Asia is a huge net importer of oil. China became the world's second largest oil consumer with close to 6 Mb/day behind the USA (20 Mb/day) and in front of Japan with 5.4 Mb/day. While Japan has to import all of its oil, China produced about 55% from domestic sources. However, while the demand strongly increases, domestic production is flat and within this decade will presumably start to decline. India's production covers only about 30 percent of consumption with a declining share. At present, it consumes the same amount of oil as South Korea needs. The latter, however, has to import all of its demand from international oil markets. Malaysia is Asia's only remaining oil exporting country, since Indonesia's production decline over the last years forced the country to switch to a net importer in March 2004. Given the fact, that the emerging markets in China and India show strong growth rates, Asia as a region shows

by far the strongest growth in energy (and especially oil) demand for the last decade. Therefore Asia will be strong hit by the beginning supply scarcity of oil.

‘‘Oil is so significant in the international economy that forecasts of economic growth are routinely qualified with the caveat: provided there is no oil shock.’’ (Robert W. Faff, 1999) Sadorsky confirms that oil prices and oil price volatility both play important roles in affecting economic activity (Sadorsky, 1999). His results suggest that changes in oil prices affect economic activity but changes in economic activity have little impact on oil prices. There is also evidence that oil price volatility shocks have asymmetric effects on the economy. There are the dynamic interactions among interest rates, real oil prices, real stock returns, industrial production, and the employment. The oil prices are also important in explaining stock price movements. For both specifications, the results suggest that a positive oil price shock depresses real stock returns. Stock returns do not rationally signal (or lead) changes in real activity and employment (Papapetrou, 2001). China and India became the world’s largest oil consumer. Oil price movement is often indicative of inflationary pressure in the economy and depresses real stock returns. The impact of oil price changes may have on Asia stock index. Particularly, the Chinese markets have jumped overnight, with the Shanghai Composite Index down 6.5% and the smaller Shenzhen Composite Index down 7.2%. Five million new Chinese brokerage accounts were opened in April, two-thirds more than during last year 2006 in total. There is a lot of money flowing into international funds and especially in Asia during 2007. Volumes in Asian stock markets are increasing at an unprecedented rate, with trading volume on the Chinese markets at $16.4 billion a day in March of this year, while six months prior it was only $5 billion a day. The total number of shares traded on China's stock market was greater than the combined volume of all other Asia exchanges. This includes Japan, Hong Kong, Thailand, and Singapore. In April 2003 to April 2007, the MSCI Asia Pacific Price Index is up a whopping 148.15%, annualizing 24.93%. The Hang Seng Index in Hong Kong is up 135.33% over the same time period, annualizing 23.32%. The Shanghai Stock Exchange is up 154.18%, annualizing at 25.67%. India is even more impressive, up 317.91% in the Nifty 50, which comes to a 41.94% annualized return (Sundt, 2007). The last year 2008, financial crisis in Asia suffers further stock market slide. The Tokyo's Nikkei 225 average drowns continuing. It is the lowest level since May 2003. It has lost half its value this year. The

carry trades that have depressed the currency for years are unwinding, with the yen rising to a 13-year high against the dollar. The Korea Exchange temporarily halted trading for the 11th time this year to break a run on index futures. The falls followed third quarter growth figures showing the economy expanded 3.9 percent, the slowest since 2005 (Spencer, 2008). There are evidences to support the existence of such relationship between the stock markets of Thailand and Indonesia, and between Thailand and the Philippines, over both the pre- and post-1997 crisis periods (Daly, 2003). Singapore and Taiwan are cointegrating with Japan while Hong Kong is cointegrating with the United States and the United Kingdom. The relationship between the developed and emerging markets also change over time (Wong, Penm ,Terrell, Lim, 2004).

The study investigates the nature of co-movements between oil prices on the Thai and Asia stock index movements using time-varying conditional correlations. Compared with a bivariate model without any explanatory variables, the inclusion of oil price changes increases the persistence of time-varying correlations in a dynamic conditional correlation multivariate model. The regime-switching smooth transition conditional correlation model investigates the nature of potential time variation in the correlations of shocks to these two variables; oil prices and Asia stock index.

The ARFIMA model has become a tool in the analyses of time series in different fields. It can characterize “long-range dependence or positive memory” when d lies (0.0, 0.5), and “intermediate or negative memory” when d lies (−0.5, 0.0) (Sowel, 1992) and (Beran J., 1994). This allows flexible modelling of the long-run behavior of the series, and often provides a good description for forecasting. The semiparametric estimation methods (those of Geweke and Porter-Hudak (Geweke, 1983), (Lobato, 1996) and (John G. W., 2001)) recommend that provided the correct ARFIMA model is fitted the ML procedure is probably superior to the GPH and APER procedures (Valderio A. R., 2000), (Doornik L.A., 2004) and(Zivot., 2006) .

The CAPM can be explained by a single measure of risk. The CAPM are often debatable due to many obstacles, including non-stationarity of beta coefficient and risk premium (Black and Fraser, 2000; Fraser et al., 2000; Woo, 2004). The conditional CAPM with a time-varying beta is outperforms the unconditional CAPM with a constant beta (Jagannathan and Wang; 1995; Lettau and Ludvigson, 2001). The Adaptive Least Squares with Kalman foundations proposed by McCulloch (2006), Bayesian (Quintana,

Iglesias and Galea (2005); Johnson and Sakoulis (2008); Busse and Irvine (2006); Christodoulakis (2002); Herold and Maurer (2003)), Quantile regression (Ma and Pohlman(2008)) , are used to estimate the time-varying beta model.

Objectives of the Study

To find the oil prices effect to the Asia stock indexes; especially Thai stock index and the regime-switching smooth transition conditional correlation model captures the volatility better than dynamic conditional correlation multivariate model because the correlations have increased between the oil price and the Asia stock index over time.

To provide modelling of the long-run behavior of the series, and provide a good description for the Asia stock indexes.

To examine the relationship between return and beta using time series tests in the sense of time-varying properties of beta coefficients seems more realistic than the non-stochastic beta assumption.

Research Question or Statement of Hypothesis

Oil prices and oil price volatility both play important roles in affecting economic activity. Is there also evidence that oil price volatility shocks have asymmetric effects on the economy? Are there the dynamic interactions among interest rates, real oil prices, real stock returns, industrial production, and the employment? Are the oil prices also important in explaining stock price movements?

The uncertain situation in the many economic and financial time series lie on the borderline separating stationary from non-stationary. Does the ARFIMA model become a tool in the analyses of time series? Does the flexible modeling of the long-run behavior of the series provide a good description for forecasting?

The CAPM are often debatable due to many obstacles, including non-stationary of beta coefficient and risk premium, inadequate proxy of the market portfolio, straightforward relationship between expected return on an asset and market risk premium, and joint hypothesis test problems associated with unobservable expected returns. What are the asymmetric risk-return relationships in the bull and bear markets with a time-varying beta model?

Scope of the Study

To find the oil prices effect to the Asia stock indexes, The raw weekly data, Nikkei 225 (Nikkei Stock Average 225), Tokyo Stock Exchange, ALL (ASX All Ordinaries index), Australian Securities Exchange, KLSE (KLSE Composite index), Malaysian stock market, TWSE (Taiwan's composite index), Taiwan Stock Exchange, are collected from Reuters for the period 10 January 1982 to 6 June 2008. The BSESN (Bombay SE Sensitive index) Bombay Stock Exchange is collected from Reuters for the period 7 January 1990 to 6 June 2008.

To provide modelling of the long-run behavior of the series, and provides a good description for the Asia stock indexes. The raw daily data, Thai and Asia stock index, N225 (Nikkei Stock Average 225) Tokyo Stock Exchange, KLSE (KLSE Composite Index), Malaysian stock market, TWSE (Taiwan's composite index) Taiwan Stock Exchange, SETI (SET Composite Index) the Stock Exchange of Thailand, SSEC (Shanghai Composite Index) Shanghai Stock Exchange, The BSESN (Bombay SE Sensitive Index) Bombay Stock Exchange, JKSE (Jakarta Composite) Indonesia Jakarta Composite, PSI (PSE Composite Index) Philippine Stock Exchange, KS11 (KOSPI Index) Korean Stock Exchange are collected from Reuters for the period November 10, 1998 to November 10, 2008.

To examine the relationship between return and beta using time series tests in the sense of time-varying properties of beta coefficients seems more realistic than the non-stochastic beta assumption. The Adaptive Least Squares with Kalman foundations, Bayesian, Quantile regression, are used to estimate the time-varying beta model. The raw daily sector index data, Australian Securities Exchange (ASX), Bombay Stock Exchange (BSE), Hong Kong Stock Exchange (HKEX), Indonesia Stock Exchange (IDX), Korea Exchange (KRX), Kuala Lumpur Stock Exchange (KLSE), Shanghai Stock Exchange (SSE), Singapore Exchange (SGX), Taiwan Stock Exchange Corporation (TSEC), are collected from Reuters from June 19, 2007 to July 3, 2009. The Stock Exchange of Thailand (SET) is collected from Reuters from March 1, 1993 to July 30, 2009.