IMPULSE RESPONSE ON THE RELATIONSHIP BETWEEN STOCK PRICE, OIL PRICE AND FUTURES: REGIONAL RESPONSE AMONG ASIAN EQUITIES

by

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REAKSI IMPULS TERHADAP HUBUNGAN ANTARA HARGA SAHAM, HARGA MINYAK DAN KONTRAK HADAPAN: REAKSI SERANTAU DI KALANGAN PASARAN EKUITI NEGARA-NEGARA ASIA

ABSTRAK

Adalah diketahui bahawa prestasi sesuatu pasaran saham adalah dipengaruhi oleh pelbagai faktor, terutamanya pembolehubah-pembolehubah makroekonomi. Desertasi ini mengkaji hubungan jangka panjang dan hubungan jangka pendek antara pasaran saham Malaysia yang diwakili oleh Indeks Komposit Kuala Lumpur (KLCI) dan enam pembolehubah makroekonomik tempatan, iaitu Indeks Harga Pengguna (CPI), Kontrak hadapan KLCI (FUT), Penawaran wang (M1), Harga Minyak Mentah Tapis (OIL), Kadar tukaran wang Pound Sterling (STG) dan Kadar Bil Perbendaharaan (TBR). Selain itu, pertalian dinamik antara harga saham negara-negara Asia terpilih juga dikaji. Indeks yang terpilih ialah KLCI (Malaysia), Indeks Pertukaran Pasaran Bombay (BSE - India), Indeks Hang Seng (HSI - Hong Kong), Indeks Nikkei 225 (NIK - Japan), Indeks Komposit Shanghai (SSE - China) dan Indeks Straits Times (STI - Singapore). Tambahan lagi, ketegapan pertalian dinamik di antara harga saham dan pembolehubah makroekonomi juga dikaji.

Analisis dijalankan dengan menggunakan teknik-teknik yang standad dan diterima ramai, iaitu ujian punca unit, ujian kointegrasi dan analisis model VAR. Reaksi impuls dan dikomposisi varians diperoleh berdasarkan model VAR. Data bulanan dari Januari 1996 sehingga September 2006 digunakan. Bagi objektif pertama, data

dibahagikan kepada dua subsampel: Tempoh Krisis Kewangan Asia dan Tempoh Pemulihan. Ujian punca unit mencadangkan bahawa semua pembolehubah adalah pegun pada pembezaan peringkat pertama. Analisis kointegrasi menunjukkan bahawa wujud hubungan jangka panjang antara KLCI dan pembolehubah makroekonomi bagi setiap subsampel. Persamaan kointegrasi mencadangkan bahawa dalam jangka masa panjang, KLCI sentiasa mempunyai hubungan positif dengan FUT dan M1 sementara berhubung negative dengan CPI.

Secara umumnya, KLCI bertindakbalas positif and signifikan terhadap kejutan dalam FUT, M1, dan CPI. sementara STG dan TBR menunjukkan tindakbalas negatif yang serta merta terhadap kejutan dalam KLCI. Seperti yang dijangkakan, tindakbalas antara pembolehubah pada tempoh Krisis Kewangan Asia adalah amat berbeza dengan tindakbalas bagi sampel keseluruhan dan Tempoh Pemulihan. Keputusan dari analisis-analisis dikomposisi varians mencadangkan peranan utama harga minyak semasa kedua-dua subsampel.

Berdasarkan keputusan empirikal analisis kointegrasi, KLCI mempunyai hubungan positif dengan BSE, NIK dan HSI dalam jangka masa panjang. Keputusan model VAR mencadangkan bahawa STI dan HSI adalah lebih berpengaruh berbanding dengan KLCI. Keputusan dikomposisi varians menunjukkan bahawa STI, HSI, dan SSE menyumbang kepada kebanyakan variasi dalam KLCI. Tambahan lagi, dalam jangka masa panjang, perubahan pasaran di India menyumbang secara signikan terhadap variasi di pasaran saham Asia yang lain. Analisis kepekaan menunjukkan interaksi di antara KLCI dan setiap pembolehubah makroeconomi adalah tidak tegap terhadap model yang berbeza dengan pembolehubah yang berbeza. Secara umumnya, kecekapan

pasaran tidak wujud dalam KLCI dalam KLCI kerana harga pada masa akan datang boleh diramalkan dengan menggunakan perubahan pada indeks-indeks lain dan juga perubahan pada pembolehubah makroekonomi.

ABSTRACT

It is widely known that the performance of a particular stock market is affected by various factors, particularly macroeconomic variables. This dissertation investigates long run and short run relationship between Malaysia stock market, represented by Kuala Lumpur Composite Index (KLCI) and six macroeconomic variables such as Consumer Price Index (CPI), KLCI Futures (FUT), Money Supply (M1), Tapis Crude Oil Price (OIL), Pound Sterling Exchange Rate (STG) and Treasury Bills Rate (TBR). In addition, dynamic linkages among selected Asian Stock Indices are also investigated. The selected indices are KLCI (Malaysia), Bombay Stock Exchange (BSE - India), Hang Seng Index (HSI - Hong Kong), Nikkei 225 Stock Average (NIK - Japan), Shanghai Composite Index (SSE - China) and Straits Times Index (STI - Singapore). Furthermore, the robustness of dynamic linkages between stock price and macroeconomic variables is also investigated.

The analyses applied standard and well accepted techniques of unit root test, cointegration test and analysis on VAR model. Impulse response and variance decomposition are obtained based on the VAR model. Monthly data from January 1996 to September 2006 are used. For the first objective, the data is further divided into two sub-samples: Asian Financial Crisis Period and Recovery Period. Unit root test suggests that all the variables are stationary at the first difference. Cointegration analysis shows that there exists a long run relationship between KLCI and macroeconomic variables for each of the sub-sample. Cointegration equations suggest that KLCI, in the long-run,

consistently has a positive relationship with FUT and M1 while the price is negatively related to CPI.

Generally, KLCI responds positively and significantly to shocks in FUT, M1 and CPI whereas STG and TBR show immediate and negative responses to shocks in KLCI. As expected, the responses among the variables during the Asian Financial Crisis period are very much different to those for the whole sample and Recovery Period. The result from variance decomposition analyses suggests the relative leading role of the oil price during the two sub-sample periods.

According to the empirical result of cointegration analysis, KLCI is positively related to BSE, NIK and HSI in the long run. The VAR result suggests that STI and HSI are more influential than KLCI. The results of variance decomposition show that STI, HSI and SSE contribute a relatively large proportion of variations in KLCI. In addition, in the long run, market changes in India contribute significantly on variations in the rest Asian stock markets. Sensitivity analysis shows the interaction between KLCI and each macroeconomic variable are not robust to different model with different set of variables. In general, KLCI is not informationally efficient as future price can be predicted using changes in other indices as well as changes in macroeconomic variables.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

According to Stock Market (2006), a stock market is a market for the trading of company stock, and derivatives of same both of these are securities listed on a stock exchange as well as those only traded privately. In addition, the stock market is a concept for the mechanism that enables the trading of company stocks, other securities, and derivatives.

The stock market is one of the most important sources for companies to raise capital. This allows businesses to go public, or raise more capital for expansion. This provides affords investors the place to quickly and easily sell securities. This is an attractive feature of investing in stocks, compared to other less liquid investments such as real estate.

According to the efficient market hypothesis (EMH), only changes in fundamental factors, such as profits or dividends, ought to affect share prices. Moreover, while the EMH predicts that all price movement (in the absence of change in fundamental information) is random. Many studies have shown a marked tendency for the stock market to trend over time periods of weeks or longer.

In addition, economic theory suggests that stock prices should reflect

expectations about future corporate performance. Meanwhile, corporate profits generally may reflect the level of economic activities. If stock prices accurately reflect the underlying fundamentals, then the stock price should be employed as leading indicators of future economic activity.

History has shown that the price of shares and other assets is an important part of the dynamics of economic activity and can influence or be an indicator of social mood. For instance, rising share prices tend to be associated with increased business investment and vice versa. Share prices also affect the wealth of households and their consumption. Therefore, central banks tend to keep an eye on the control and behavior of the stock market and, in general, on the smooth operation of financial system functions. Thus, causal relations and dynamic interactions among macroeconomic variables and stock prices are important in the formulation of the nation's macroeconomic policy.

Based on the brief discussion above, it is important to study, investigate and forecast character of the stock market. In addition to that, is it important to identify factors affecting the stock price and also the dynamic between stock price and various macroeconomic variables.

1.1.1 Kuala Lumpur Composite Index

According to Stock Market Indices (2007), the Kuala Lumpur Composite Index (KLCI) is the benchmark of Malaysia stock Market. The KLCI is introduced in 1986 to answer the need for a stock market index which would serve as an accurate performance

indicator of the Malaysian stock market as well as the economy. The KLCI is also one of the best known indices in region and is widely used by local and foreign fund managers and investors as a performance benchmark to measure their portfolios held in Malaysia.

The KLCI is a market capitalization-weighted index (shares outstanding multiplied by stock price) of 100 blue chip stock on the index's performance and is directly proportional to its relative market value. The 100 component stock chosen from different sectors including Consumer Products, Industrial Products, Industrial Products, Constructions, Trading, Finance, Properties, Plantation, Mining, Infrastructure Projects, Hotels and Technologies.

1.1.2 Market efficiency

Based on the information gathered and summarized from What Is Market Efficiency? (2002), the efficient market hypotheses (EMH) assert that financial markets are informationally efficient. In other words, the prices on traded assets such as stocks, bonds or property already reflect all known information.

The efficient market hypothesis states that it is not possible to consistently outperform the market by using any information that the market already knows, except through luck. Information in the EMH is defined as anything that may affect the stock price that is not known in the present and thus appears randomly in the future. This random information will be the cause of future stock price changes.

There are three common forms in which the efficiency market hypothesis is commonly stated. The common forms include weak form efficiency, semi-strong form efficiency and strong form efficiency where each form has different implication for how markets. Weak-form efficiency implies that technical analysis techniques will not be able to consistently produce excess returns. However, some forms of fundamental analysis may still provide excess returns. In addition, no excess returns can be earned by using investment strategies based on historical share prices or other financial data.

For semi-strong form efficient, share prices adjust within an arbitrarily small but finite amount of the time and in an unbiased fashion to publicly available new information, therefore no excess returns can be earned by trading on that information. In addition, fundamental analysis techniques will not be able to reliably produce excess returns. On the other hand, strong-form efficiency indicates that share prices reflect all information and no one can earn excess returns. However, as with insider trading laws, strong-form of efficiency is impossible if there are legal barriers to private information becoming public except in the case where the laws are universally ignored. Studies in U.S. stock market have shown that people do trade on inside information.

1.1.3 Effect of Asian Financial Crisis on Malaysia

According to Malaysia: Trade Policy Review December 2001 (2001), the East Asian Financial Crisis was a period of economic unrest that started in July 1997 in Thailand and affected currencies, stock markets, and other asset prices in several Asian countries. Indonesia, South Korea, Malaysia, Thailand and Philippines were the countries most affected by the crisis.

Before crisis, Malaysia had a large current account deficit of 5% of GDP. At the time, Malaysia was a top investment destination, and this was reflected in KLSE activity which was regularly the most active exchange in the world. In July, within days of the Thai baht depreciation, the Malaysian ringgit was "attacked" by speculators. The overnight rate jumped from under 8% to over 40%. By end 1997, the KLSE had lost more than 50% from above 1,200 to fewer than 600, and the ringgit had lost 50% of its value, falling from above 2.50 to under 3.80 to the dollar.

In 1998, the output of the real economy declined plunging the country into its first recession for many years. Overall, the country's gross domestic product plunged 6.2% in 1998. During that year, the ringgit plunged below 4.7 and the KLSE fell below 270 points. In September that year, various defensive measures were announced to overcome the crisis. In response, the Malaysian government imposed capital controls and pegged the Malaysian Ringgit at 3.80 to US dollar while refusing economic aid from International Monetary Fund (IMF) which came with austere lending conditions.

In addition, Malaysia continuously recorded budget deficits in the few years that followed. Economic recovery has been led by strong growth in exports, particularly of electronics and electrical products, to the United States, Malaysia's principal trade and investment partner. Inflationary pressures remained favorable, and, as a result, Bank Negara Malaysia, the central bank, had been able to follow a low interest rate policy. Later, the country enjoyed faster economic recovery compared to its neighbors though in many ways, the level of pre-1997 affluence has yet to be achieved.

In July 2005, the fixed exchange rate regime was abandoned in favor of

managed floating system. In the same week, Ringgit strengthened a percent against various major currencies and was expected to appreciate further. As of December 2005, there has been no further appreciation of the Ringgit. In spite of the large positive current account surplus, foreign reserves have started to fall at a rapid rate. Official statistics released in March 2006, confirmed capital flight of more than USD 10 billion.

1.2 Objective

The main goal of this study is to analyze the dynamic relationship between stock price and macroeconomic variables as well as the linkage between stock indices in selected Asian countries using Vector Autoregression (VAR) approach. Impulse Response Functions (IRFs) and Variance Decomposition (VDs) in the VAR model enable us to investigate how the variable response to shocks and contributes on the variation of other variables.

In this dissertation, three objectives will be studied. The first objective is to investigate the long run relationship between local stock price (KLCI) and fundamental macroeconomic variables such as Consumer Price Index (CPI), local stock price Futures (FUT), Money Supply (M1), local produced Tapis Crude Oil Price (OIL), Pound Sterling Exchange Rate (STG) and Treasury Bills Rate (TBR). Oil price is included in this study as the price of oil has noticeable increases in recent years and in such way, it may contributes some effects on local stock price. Analysis in this objective will be executed on the whole sample and two sub samples; the Asian Financial Crisis and the Recovery Period.