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Abstract

This paper studies the causal relations between real stock returns and industrial production in a panel of emerging and advanced economies. It's worth saying that Indonesia, Korea, Malaysia, Philippines, Thailand, Taiwan are classified as emerging markets through the listing adopted by the International Finance Corporation (in Emerging Markets Factbook, 1997). On the contrary, Australia, Hong Kong, Japan, Singapore are regarded as advanced markets, according to the International Finance Corporation. Using a multivariate vector auto-regression (VAR) approach, we find that industrial production granger cause real stock returns in Korea and Philippines. Moreover, the paper finds that real stock returns granger cause industrial production in China, Korea, Malaysia, Thailand, Indonesia and Hong Kong. Last but not least, we find that there is no causality between real stock returns and real activity in Australia, Japan, Singapore and Taiwan at all. In general, our findings indicate that stock markets are efficient in some of these markets while in other they are not.

Keywords: stock returns, industrial production, VAR methodology, Granger causality

2) Introduction - Purpose of the study

Nowadays, stock markets returns play a major role in the modern economic environment. First of all, stock markets returns are important for portfolio managers and economic policy makers. Fluctuations of the stock markets influence investor's decisions and their company's decisions. The study of the relationship between the stock markets returns and real economic activity is important for governments, central banks and companies. The conclusions that can be derived from such analysis can help the central banks and the minister of economy to organize a better economic program for enterprises.

The purpose of the study is to examine the correlation of the following variables: real stock returns and real economic activity in both emerging and advanced economies and to explain the empirical results. In other words, we will analyze the role of the stock market in the evolution of economic activity in different markets. Then, we will compare and explain our empirical results between emerging markets and advanced markets.

The emerging countries that have been chosen are: Indonesia, Korea, Malaysia, Philippines, Thailand and Taiwan. The advanced countries are Australia, Hong Kong Japan and Singapore.

3) Reasons for the analysis in the emerging markets

Analyzing the link between the above variables is especially interesting for emerging markets due to the following reasons:

First of all, in emerging markets, leading indicators are relatively scarce. These countries have relatively low financial market liquidity and frequent changes in financial structure. Stock returns are one of the available financial variables, which can successfully forecast economic growth.

Second, these countries are characterized by high volatility, which make the investigation more attractive, although data are shorter in emerging markets than data in mature markets. Returns and risks have been found to be higher relative to developed markets. (Errunza 1983, Chaessens 1993, Harvey 1995).

Third, we investigate in which countries there is correlation between the two examined variables, according to their level of economic development, their size, their liquidity and legislation, which governs their stock markets and their capitalization.

It's worth saying that Mundell predicts that in the future, these countries will form a third area of currency such as countries of United States and European Monetary Union. Therefore, it's significant to find common characteristics and elements among these countries in this paper. This will enable their central banks and governments to build a common economic, fiscal and monetary policy.

Furthermore, returns achievable from emerging stock markets appear more predictable than developed markets and exhibit strong mean reversion properties. (Bekaert 1995, Bekaert and Harvey 1995) with a high degree of correlation. Moreover, they appear to be more integrated than expected based on prior knowledge of investment restrictions.

Recent evidence by Goetzman and Jorion (1999) shows that emerging markets may go through several phases of emergence and should not be viewed as static. While emerging markets are segmented to a degree, there is significant commonality in return variation across markets.

It's worth saying that after the economic crisis of Asian countries, investors focused on China because GDP growth rate surpassed 8 and 5%. In addition, during the 90s, stock markets of these countries experienced a tremendous growth in the market capitalization along with a high and steady growth rate of GDP in the last decade. But, Asian markets remained much smaller in trading activities and market capitalization from developed stock markets.

This paper presents two findings: First, the empirical association between industrial production and real stock returns is significant in emerging countries. Second, the correlation is not necessarily stronger in countries that have high market capitalization.

The remainder of this paper is organized as follows. Section 1 reviews theoretical links between industrial production and real stock returns. Section 2 reviews the bibliography and the empirical studies. Section 3 describes the methodology. Section 4 describes the statistical data and reports the estimation results. Section 5 concludes.

Section 1

1) Theoretical relationships between real stock returns and real economic activity

There are several theoretical channels that explain the relationship between stock returns and real activity.

For example, optimistic expectations of future profits may increase stock prices. This causes an increase in wealth, which leads to an increase in demand for consumption and investment goods. In addition, when there is an expansionary policy shock, asset prices change because real interest rates and profitability change. This has an effect on wealth and spending. There is a rise in supply and equilibrium output, which justifies the original rise in stock prices. As a result, asset prices will tend to predict future output.

Moreover, stock market valuation plays a significant role in models, which determine investment. When the market value of an additional unit of capital is higher than its replacement cost, then a firm can raise its profit by investing. Another possible link between investment and share prices is information asymmetry in financial markets. For instance, share prices improve the balance sheet position of a firm, because it increases its ability to fund projects or provide collateral for external finance. Similarly, stock prices tend to reflect future corporate earnings, which in turn reflect future economic conditions. If profits are highly pro-cyclical, useful information can be extracted from stock price changes.

In 1990 Morck reviewed the five existing theories on the link between stock returns and output growth. These theories can be put in two different groups. The first group contains theories according to which, stock price movements can predict changes in output and those that cannot.

According to the passive informant hypothesis, there is only one mechanism that can underlie the correlation between stock returns and output growth. Under the assumption that stock prices reflect the present discounted value of all future dividends and that dividend growth is related to GDP growth, there is a correlation between this year's stock returns and next year's economic growth. If next year's economic growth is buoyant, news revealed this year will be positive and will cause large stock price increases this year.

According to the accurate active informant hypothesis, stock price changes provide managers with information about market's expectations of future economic developments. Managers base their investment decisions upon that information, thereby justifying the market's expectations. In this case, stock price changes turn to be perfectly correlated with fundamentals.

According to the active informant hypothesis, stock price movements influence decisions about investment, but managers cannot distinguish between movements reflecting fundamental and movements reflecting market sentiment. Stock market movements that are not motivated by fundamentals can, therefore, mislead managers into over-investing or under-investing compared with what later turns out to be warranted b fundamentals.

According to financing hypothesis, based upon Tobin's q theory, when stock prices are high compared to the replacement cost of capital, entrepreneurs will be more likely to expand their activities by investing in new physical capital rather than purchasing existing firms on the stock market.

According to the stock market pressure on manager's hypothesis, stock price changes can affect investment even if managers neither convey information nor convey financing costs. If investors have negative views on a firm's prospects and drive down its stock price, managers may have to cut their investment projects to protect themselves from the possibility of being fired or taken over.

Section 2

1) Review of the bibliography- Empirical studies

There have been many attempts to explain the relationship between stock returns and real activity.

In 2003, Paolo Mauro shows that there is a positive and significant correlation between output growth and lagged stock returns in both advanced and developing countries. He comes to the conclusion that countries with a high market capitalization to GDP ratio, a large number of domestic companies and initial public offerings tend to display a stronger correlation.

He uses data on real stock returns and real GDP growth at an annual frequency from 1971-1998, for 8 emerging countries (Argentina, Chile, Greece, India, Korea, Mexico, Thailand, Zimbabwe) and 17 advanced countries (Australia, Austria, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Norway, Singapore, Spain). At a quarterly frequency, he uses data on the same variables for 6 emerging countries and 18 advanced countries. He follows two different strategies to estimate the model. The first is regression computing the average slope co-efficient on lagged stock returns for each country. The second is panel regressions, which allow the individual country to fix effects but restrict the slope co-efficients to be the same, for all the countries.

The results indicate that real economic growth and real stock returns lagged by 1 year are positively and significantly associated in 4 emerging countries (Korea, Mexico, Thailand, Zimbabwe) and 10 advanced countries (Australia, Canada, Denmark, Japan, Netherlands, Singapore, Spain, Sweden, United Kingdom, United States). On the whole, stock returns can predict output growth in both advanced and emerging countries and the conclusion of this estimation is common in both types of countries. Moreover, the empirical relationship between stock returns and output growth is as important in emerging economies as in mature ones. Of course, the longer the forecast horizon, the stronger the correlation between the two examined variables.

In 1981, Eugene Fama investigates the relationship between real common stock returns and economic activity in monthly, quarterly and annual data from 1953 to 1977. He comes to the conclusion that real common stock returns are positively related to real variables like capital expenditures, the real rate of return on capital and output. Stock returns influence all real variables, which suggest that the market can make rational forecasts of the real sector. In many respects, the empirical tests of this model are successful. There is evidence that real stock returns are positively related to measures of real activity such as capital expenditures, the average real rate of return on capital and output, which Fama hypothesizes that reflects variation in the quantity of capital investment with expected rates of return in excess of capital. The growth rate of industrial production is the only real variable that shows a strong contemporaneous relation with the stock return. In particular, the next year's rate of change in real GNP explains slightly more of the variation of the current stock return than the future change in the capital expenditures ratio. It's worth saying that the real variables used, are current and future rates of change of output (industrial production and real GNP) because of the data availability for the monthly and quarterly tests. A wider range of real variables are tried in preliminary annual tests with results similar to those shown below, in which rates of change of real GNP are used to summarize annual real activity. In this point, we have to note that real activity is exogenous with respect to the stock return.

In 1984 Roger D. Huang and William A. Kracaw investigate how the variability of stock market returns affect fluctuations in real economic activity. They use quarterly data spanning the period 1962 to 1978. Quarterly changes in the log of real GNP are used to measure changes in aggregate output. The variance of stock market returns is calculated for each quarterly interval from daily observations of the value-weighted index of Standard and Poors 500. Changes in commodities prices are proxy by changes in the log of the GNP price deflator. The results indicate that changes in the log of real GNP are granger caused by the variation of stock market returns. This result may incur due to the fact that the arrival of information, relevant to production decisions, impacts real output, slowly, through time.

In 1985 Gershon Mandelker and Kishore Tandon investigate if the stock market makes rational forecasts of the real sector in six major industrial countries (United States, United Kingdom, France, Canada, Japan and Belgium) over the period 1966-1979. They find a positive relationship between stock returns and real activity. The real sector explains real stock returns as a function of real activity growth rates. The real activity variable considered in this study is real GNP and industrial production. They use quarterly data by the OECD National Accounts and the International Financial Statistics (IFS) data tape of the International Monetary Fund.

In 1990 Eugene Fama examines the relation between stock returns and future real activity. He uses a simple equation method to find a strong positive correlation between the above variables. Actually, he shows (1990) that monthly, quarterly, and annual stock returns are highly correlated with future production growth rates from 1953 to 1987. As the length of period increases, the degree of the correlation decreases. Stock returns are significant in explaining future real activity, for the same period. Quarterly and annual stock returns are highly correlated with future production growth rates. Past stock returns are significant in explaining current production growth rates and conversely future production growth rates are significant in explaining current stock returns. The degree of correlation between stock returns and future production growth rates increases with the length of the time period, for which returns are calculated. The tests suggest that large fractions of annual stock return variances are traced to forecasts of variables such as real GNP, industrial production that are important determinants of the cash flows to firms. In particular, the results indicate that variables, which measure time-varying expected returns and shocks to expected returns, capture about 30% of the variance of annual real returns on the value-weighted portfolio of New York Stock Exchange stocks (NYSE). Future growth rates of industrial production used, explain 43% of the variance of annual returns. The tests attempt to explain real returns on the value-weighted portfolio of NYSE stocks. Real returns are nominal returns adjusted for the inflation rate of the U.S Consumer Price Index (CPI). In addition, the tests use continuously compounded real returns of one month, one quarter and one year. In general, the results indicate that real activity plays a central role in the variation of returns. Of course, real activity explains larger fractions of return variation for longer return horizons. Some of the production growth of future periods is unpredictable and so irrelevant for current terms. The results imply that irrelevant production variation acts like measurement error to smear the relevant information in production about returns. Last but not least, Fama notes that information about future real activity is reflected in stock prices well before it occurs.

In 1990, William Schwert investigates the stability of the relations estimated by Fama using different data from 1889 to 1988. In addition, he compares the new Miron-Romer (1989) index of industrial production for 1884-1940 with the Babson index of the physical volume of business activity from Moore (1961) for 1889-1918. The tests use continuously compounded real returns for horizons T of 1 month, one quarter, and 1 year. Schwert focus on the extent to which Fama's results hold up, in different sample periods, with different data, although the differences are small. The results for 1889-1925 show that Babson-Fed production growth rates are more highly correlated with the past real stock returns than Miron-Romer data. In other words, there is extra short-term variation in the Miron-Romer production series that is unrelated to stock returns. Thus, the positive relation between production growth rates and past real stock returns documented by Fama is not quite as strong for 1889-1952. The new Miron-Romer production growth rates are less related to stock returns than the Babson-Fed series for monthly and quarterly horizons. Therefore, the strength of the relation is larger for longer horizons. Moreover, he argues that the relation between current stock returns and future production growth reflects information about future cash flows that is impounded in stock prices. The purpose of his paper is to investigate the stability of the relations estimated by Fama using different data. Schwert uses capital gain returns from the end-of-month values of the Dow Jones composite portfolio and adds dividend yields from the Cowles (1939) portfolio to measure total stock returns. Real returns are nominal returns adjusted for the inflation rate of the Bureau of Labor Statistics' Producer Price Index (PPI). The tests are continuously compounded real returns for horizons T of 1 month, one quarter and one year. The new Miron-Romer production index of industrial production is a value-weighted average of indexes for 13 industrial products (iron, coal, petroleum, sugar, cattle, hogs, coke, flour, wool, coffee, tin, rubber and silk). The index is not seasonally adjusted. Not only are the Miron-Romer production growth rates more variable but also have smaller autocorrelations than the Babson data. At monthly and quarterly horizons, they are less related to real stock returns. On the contrary, Babson index of industrial production is seasonally adjusted and is influenced by the value of imports and exports in addition to physical production. Last but not least, the fact that the relations between stock returns and economic activity show up in 100 years of data strengthens Fama's conclusions. This is surprising because the pre-1953 data undoubtedly contain more measurement error than the data used by Fama.

In 2003, Christis Hassapis investigates the relationship between stock prices (Canadian and US) and Canadian output growth from January 1966 to September 2000. He uses a non-parametric technique utilizing Canadian and U.S monthly data because US economy influences the Canadian economy. A possible explanation for this is the fact that much of the Canadian domestic investment is carried out by US firms, the shares of which are usually traded in the American stock market, rather than the Canadian market. He finds that stock prices as well as yield spreads are useful predictors of output growth. Adapting the methodology proposed by Andrews (1991), he estimates the long-run covariance matrix between stock prices and output growth, as a representation of the second-order moments or auto covariance structure of the process. It's worth saying that Andrew's methodology accounts for non-linear relationships among the variables involved. That's why this method is more general and robust than the Granger causality concept. More specifically, the results show a strong positive relationship between current Canadian and U.S stock prices and future Canadian output growth. The major effect on future Canadian output growth is within the first nine and sixteen months, although weaker effects may last for up to 26 and 36 months. This can be used as a useful predictor of a Canadian output growth for a horizon of up to 26 months. He uses as index, the industrial production index seasonally adjusted from IMF. His findings for Canada are consistent with all the theoretical explanations that show a strong positive link between stock prices and future real activity. In addition, his findings are consistent with earlier findings by Fama (1990). Similarly, his results reinforce the results by Estrella and Mishkin (1998), who find that the stock market is a useful predictor of the output, at a horizon of one to three quarters.

In 2004 Mathias Binswanger investigates whether the breakdown in the relation between real stock returns and growth rates of real economic activity in U.S, which occurred in the early 1980s, can also occur to the European G-7 countries (Canada, France, Germany, Italy Japan, U.K). He uses OLS regressions to estimate the correlation between quarterly growth rates of industrial production and quarterly growth rates of real GDP, on quarterly real stock returns. Moreover, he uses a vector error correction model, which includes quarterly growth rates of industrial production, quarterly real stock returns and an error correction term. The nominal stock indices and GDP are converted into real data, by dividing the consumer price index for each country. All of the tests use log levels of stock prices, industrial production and GDP. Growth rates are the log differences of quarterly observations and real stock returns are continuously compounded quarterly real returns. The results suggest that a breakdown occurred in Japan and in the aggregate economy, no matter whether industrial production is used as the variable, which represents real activity. The results presented in Binswanger indicate that the strong relationship between real activity and stock returns has disappeared in the US, in the early 1980s. He finds that the relationship between stock markets and real activity is stronger on an aggregate level (G-7 Europe) than on national levels (like Germany), for the 1960-1982 periods. In other words, there is a closer association between stock returns and real activity, on an aggregate level than for any of the individual's countries. Evidence for a breakdown in the relation between stock returns and real activity cannot be found, in the data for France, Italy and the U.K. The weak relation between domestic real activity and national stock returns in France and Italy can be explained by the fact that the value of national stock markets is only partially linked to domestic real activity. In addition, many stocks included in the national stock price indices are closely linked to foreign real activity in the other major European countries because of the strong trading patterns among these countries. The results for Japan and G-7 European aggregate economy are in accordance with the results for the US. The correlation between past stock returns and current growth rates of real activity is visible in the 1960-1982 subsample but absent in the 1983-1999, as well as in the 1989-1999 subsample. There, also, appears to be significant relation in Canada, Germany and the UK from 1960 to 1982. Generally, his paper suggests that speculative bubbles during the 1980s and 1990s are an international phenomenon that affects all of the major economic areas (U.S, Japan, Europe).

In 1999 Jongmoo Jay Choi, Shmuel Hauser and Kenneth J.Kopecky examine the relationship between industrial production growth rates and lagged real stock returns for the G-7 countries using several different time series methodologies. Actually, they use in-sample time series techniques to document the industrial production-stock return relation for both the US and the G-7 countries. Second, they use an out-of sample time series procedure developed by Ashley (1980). The co integration tests show a long-run equilibrium relationship between log levels of industrial production and real stock prices, whereas the error-correction models indicate a correlation between industrial production growth and lagged real stock returns, for all countries, except Italy. Real stock returns show significant evidence of short-run causality for the growth rate of industrial production in the U.S, U.K, Japan, Canada and Germany. In France, significant evidence of causality is found only at the quarterly frequency, while Italy fails to show causality at any data frequency. Irrespective of whether, monthly, quarterly or annual data are used, the in-sample co-integration analysis shows that the log levels of industrial production and real stock prices are characterized by a stationary linear relation in all G-7 countries. The out-of-sample tests reveal that the value of stock market information depends importantly on both the periodicity of the data and the length of the in-sample estimation period relative to the length of the out-of-sample period. At a monthly frequency, they find evidence of an enhanced predictability of IP growth in Japan and the UK and perhaps the US. The data consists of monthly observations of the aggregate stock price index, industrial production index of the G-7 countries- Canada, France, Germany, Italy, Japan, UK, and the US. The data are from the International Financial Statistics of the International Monetary Fund from January 1957 to March 1996. In general, they find that the stock market is not prescient in every G-7 country because industrial production is sometimes so predictable that the stock market can make only a relatively minor contribution to understanding its future evolution. Last but not least, in US, Canada, Japan and the UK, the domestic stock markets incorporate information about future industrial production. In that sense, the G-7 stock markets are prescient for the real sector.

Christis Hassapis and Kyprianos Prodromidis examine, empirically, the response of output growth to unanticipated changes in stock market prices in seven Latin American countries, namely Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. These countries have close cultural and economic ties and more or less comparable economic, social, political and geographical characteristics. Using Vector Auto-regressions, impulse response and variance decomposition analysis from estimated VARs, they find that output growth does not respond significantly to unanticipated shocks in domestic stock market. Thus, domestic stock market fluctuations do not appear to have been a prominent source of volatility, in the seven countries under consideration. They also test whether a shock in United States real stock returns can trigger an excess variability of output in the countries of the sample. The empirical results show that output volatility in these countries appears to respond to foreign financial developments. However, the picture changes when a shock in foreign real stock returns is considered. In particular, domestic output appears to respond to a foreign shock coming from the United States. Empirical results suggest that part of the excess variability in the output growth of the countries can be attributed in foreign real returns. On the contrary, domestic stock markets do not appear to have been a prominent factor of output fluctuations in the Latin America countries. In particular, output growth has not responded significantly to unexpected shifts in domestic real stock returns and excess volatility of output growth cannot be attributed to sudden movements in real stock returns.

In 1995 Fabio Canova and Gianni De Nicolo analyze the relationship between stock returns and real activity from the point of view of an international general equilibrium model where agents and markets are complete. Their data suggest that the association between stock returns and growth rates of production is as strong in some European countries as it was in the US. More specifically, lagged European stock returns explain both US and European GNP growth, whereas US stock returns are significant only in explaining European GNP growth. The strength of the association between stock returns and real activity increases when international influences are allowed. The empirical evidence suggests that there is a relationship between domestic output growth and domestic stock returns, which becomes stronger when foreign influences are considered. Moreover, future European GNP growth explains European stock returns, but the explanatory power of future US GNP for stock returns is weak. Real stock returns for Europe are computed as an average of the four component countries' stock market returns weighted by the market capitalization in 1993 US$. Stock returns have predictive power for GNP growth and future GNP affects current stock returns. The data consists of quarterly data on real stock returns and real GNP for the US, UK, France, Germany and Italy for the period 1970-1991. Stock returns and GNP data were obtained from OECD economic outlook

In 1997 Dale L. Domian and David A. Louton find evidence of a pronounced threshold-type asymmetry in the relation between stock returns and real economic activity. Negative stock returns are followed by sharp decreases in industrial production growth rates, while only slight increases in real activity follow positive stock returns. This implies that symmetric models omit information, which may be useful in describing the relationship between stock returns and real activity. It's worth saying that they use monthly time series over the period January 1947 to December 1992. Real stock returns are obtained by adjusting nominal returns from the Center for Research in Security Prices (CRSP) for the inflation rate of the US Consumer Price Index. Both value weighted and equally weighted CRSP indices are used. Seasonally adjusted industrial production data are obtained from Citibase. They use production growth rates computed as percentage changes in industrial production. They find evidence for asymmetry in the predictability of industrial production growth rates by stock returns. They come to the conclusion that stock markets do not portend strong and rapid economic expansions. But, stock market declines are significant and useful for predicting future economic activity.

In 1994 Yin-Wong Cheung, Jia He and Lilian K. Ng investigate the relationship between the Pacific-Basin country stock returns and real economic activity. Pacific-Basin countries are Australia, Malaysia, Singapore, Japan, Hong Kong. They find empirical evidence of long run co-movements between five stock market indexes and measures of aggregate real activity, using the Johansen co-integration technique and quarterly data. Real returns on these indexes are typically related to transitory deviations from the long run relationship and to changes in the macroeconomic variables. They use monthly and quarterly data on the national stock indexes of Australia, Hong Kong, Japan and Singapore, Malaysia provided by Morgan Stanley Capital International (MSCI). The sample is from January 1970 to December 1991. The indexes are value-weighted, calculated with dividend reinvestment and in US dollar-denominated currency. The stock returns are converted to real returns using inflation rates computed from the US consumer price. Their results show that the US and Japanese IP growth rates were significantly related to the Pacific-Basin stock market real returns.

In 2001 David E. Rapach examines the effects of money supply, aggregate supply shocks on real US stock prices, in a structural vector auto-regression framework. The quarterly data for this study span 1959:3-1999:1. The S&P 500 index deflated by the implicit GDP deflator serves as the real stock price measure. Real output is GDP in constant 1992 dollars. As for the method, he applies a VAR model, including in his analysis impulse responses forecast error covariance decompositions. The data are from the Federal Reserve Economic Database and Global Financial Data. GDP is in billions of fixed 1992 dollars at an annual rate. The series is quarterly and seasonally adjusted. The series are seasonally adjusted and quarterly. S&P 500 nominal stock price index is deflated by the GDP implicit price deflator. The original S&P 500 nominal stock price index series is monthly. Quarterly observations are obtained by averaging over the three months comprising each quarter. The results indicate that each macro shock has important effects on real stock prices. The estimation results show that portfolio shocks play an important role in determining real stock prices at shorter and longer horizons.

In 2000 Mathias Binswanger finds that stock returns do not seem to lead to real activity. It is evident that there is a breakdown in the relation between stock returns and future real activity in the U.S economy since the early 1980s. This result exists no matter whether one uses monthly, quarterly or annual real stock returns, whether real activity is represented by production growth rates or real GDP growth rates. His tests use continuously compounded value weighted real returns from the Center for Research in Security Prices (CRSP). Monthly real returns are continuously compounded nominal returns adjusted by the monthly inflation rate of the US Consumer Price Index. Quarterly and annual real returns are calculated from the continuously compounded monthly real returns. Production growth rates are measured as the growth rate of the seasonally adjusted total industrial production index from the Federal Reserve Board. Future production growth rates forecast stock returns over several quarters as is most evident from the regression using annual returns. Current stock returns do not seem to contain significant information about future real activity from 1984 to 1997. However, because the 1984-1997 period and 1989-1998 period are rather short, they cannot be sure whether the result has a permanent or temporary nature. In 1953-1965 period, correlations between stock returns and subsequent real activity are significant, while the present high growth period is characterized by an absence of these correlations. This is due to the emergence of persistent speculative bubbles, since the early 1980s. Further evidence for deviations from the fundamental value comes from regressions of stock returns on the dividend yield and the term spread. Both of these variables are supposed to track expected returns due to their correlation with past and present or future growth rates of real activities. According to his evidence, these variables still correlate with business conditions after 1984, although the dividend yield seems to correlate more with future real activity and less with past real activity since 1984. Consequently, because the relation between stock returns and future real activity broke down, the dividend yield and the term spread cannot track stock returns in the 1984-1997 subsample any longer. Forecastable variation in future returns on the stock market in response to changing business conditions also seem to be absent in the current stock market boom. Their results suggest that the second high stock growth period, which started in the early 1980s, is fundamentally different from the first high stock growth period from the late 1940s to the mid 1960s, although measures of stock market valuations such as the ratio of market value of shares to GDP show a similar pattern over the two high growth episodes.

In 1999 Oystein Gjerde and Frode Saettem investigate to what extent important results on relations among stock returns and macroeconomic factors from major markets are valid in a small, open economy using the multivariate vector auto-regressive approach on Norwegian data. The Norwegian industrial production is significantly influenced by international real activity, while the opposite causality does not occur. Norwegian industrial production responds spontaneously positively to changes in international real activity. Stock market shows a delayed response to changes in domestic real activity. They use a VAR model to establish the dynamic interactions among their variables. Norway's economy is very sensitive to world market prices of its natural resources. The industry structure is characterized by limited processing of raw materials into end products. The volatility of Norwegian stock prices is high. Based on market value weighted indices, the standard deviation of annual stock returns for the period from 1983 to 1996 is 24% in Norway. They take monthly observations over 20 years from 1974 to 1994. Nominal stock returns are collected from the Stock Data Base at the Norwegian School of Economics and Business Administration. They use the Oslo Stock Exchange market value weighted index and they calculate log returns. The Norwegian industrial production is represented by the index of industrial production for oil extraction, mining, quarrying, manufacturing, electricity supply of the Norwegian statistics. The relationship between stock returns and domestic real activity is unclear with no indication that the stock market rationally signals changes in real activity. Domestic real activity has a substantial influence on real stock returns, while the opposite causality does not occur. This finding indicates that the Norwegian stock market responds inaccurately to economic news from the real sector. Changes in domestic industrial production explain a significant proportion (about 8%) of the variance of real stock returns. Stock returns respond positively and delayed to changes in industrial production.

In 1998 Yin-Wong Cheung and Lilian K. Ng examine international evidence on the stock market and aggregate economic activity. Using the

Johansen co-integration technique, they find empirical evidence of long run co-movements between five national stock market indexes and measures of aggregate real activity including real output. Real returns on these indexes are related to transitory deviations from the long run relationship and to changes in the macroeconomic variables. They use quarterly data of Canada, Germany, Italy, Japan and US from International Financial Statistics ND Citibase. All data series are in natural logarithms. They use the countries' respective consumer price indexes to convert their nominal variables to real terms. The GNP measures the economy's overall economic activity that affects stock prices through its influence on future cash flows. For Canada, Japan and the US exists a single co-integration relationship between the country's stock index and aggregate economic activity, whereas for Germany and Italy, exist two co-integration relationships.

In 2001 Evangelia Papapetrou sheds light into the dynamic relationship among real stock prices and real economic activity in Greece using a multivariate vector auto-regression approach. The empirical analysis carries out using monthly data for the period 1989:1 to 1999:6 for Greece. She finds that stock returns do not lead to changes in real activity in Greece. Growth in industrial production responds negatively to a real stock return shock implying that an increase in real stock returns does not necessarily lead to higher level of industrial production. Greece serves as an example and the conclusions drawn on the dynamic interrelations among these variables can be indicative of conditions in other medium-sized economies. She performs a VAR analysis, Johansen-Juselious estimation method, based on the error-correction representation of the VAR model with Gaussian errors, variance decomposition analysis and impulse response functions. The output variable is the industrial production and real stock. Real stock is the difference between the continuously compounded return on the general stock market index and the inflation rate, which is calculated using the consumer price index. All variables are seasonally adjusted and expressed in logarithms. All data are taken from the Bulletin of Conjectural Indicators of the Bank of Greece.

In 1996 Arjun Chatrath, Sanjay Ramchander and Frank Song examined the relationship among stock returns and real activity in India. By using an auto-regressive moving average model (ARMA) they conclude that there is a positive relationship between stock returns and real activity in India. More specifically, real activity impacts the real return with a lag of about six months. It's worth saying that the study finds little evidence to indicate that the Indian stock market accurately reflects future real activity. The unique channels of influence among the stock market and real activity may be explained by the possibility that the Indian stock market is largely linked to unexpected changes in the country's economic structure. The study employs monthly values of indices representing the stock prices and industrial production in India for the period April 1984 through December 1992. The data are taken from the monthly issues of the International Financial Statistics.

In 1985 Christopher James, Sergio Koreisha, Megan Partch investigate the relationship between the lagged change in US industrial production and the return on the S&P 500 index using monthly data from 1962 to 1981. They use a vector auto-regressive moving average model (VARMA), which can be viewed as a set of reduced-form equations associated simultaneous system of linear structural equations. They report that current stock returns are related to industrial production lagged by 2 months. They find a strong link between stock returns and expected real activity. Therefore, a priori, real activity is expected to be positively related to equity returns. As a measure of common stock returns, they compound continuously the nominal return on the Standard and Poor's 500 stock index. They measure anticipated real activity by the annual growth rate of industrial production, constructed by calculating the change in industrial production. The index of industrial production is compiled by the Federal Reserve Board and was obtained from Data Resources Incorporated. All series are obtained for period 1962 through 1981.

In 2001 C.M.Bilson, Timothy J. Brailsford, Vincent J. Hooper examine whether real activity explains the variation in returns in six Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico and Venezuela), eight Asian countries (India, Indonesia, Malaysia, Pakistan, Philippines, South Korea, Taiwan and Thailand), three European countries (Greece, Portugal, Turkey), one middle Eastern country (Jordan) and two African countries (Nigeria and Zimbabwe). Return data are obtained from the International

Finance Corporation from January 1985 to December 1997. All return data are calculated on a monthly interval, include both dividend and capitalization adjustments and are expressed in continuously compounded form. They use the MSCI World Index and industrial production as real activity. The real activity series is measured as the industrial production index, which covers mining, quarrying, manufacturing, electricity, gas and water compiled using Laspeyres formula. The emerging market-return data are obtained from the IFC. Both the return data and the percentage change in real industrial production are stationary for all countries according to both Dickey-Fuller and Phillips-Perron unit root tests.

In 2003 Jeong-Ryeol Kim investigate the causal relation between stock returns and the growth rate of gross domestic production in Germany. The econometric method that it is used for analyzing causalities is the asymmetric Granger causality. She uses quarterly data from the database of the Deutsche Bundesbank, from 1970 to 1999. The empirical results of tests for Granger-causality show that the null hypothesis of Granger non-causality from stock returns to real activity can be rejected at 99% significance level. This means that the expectation of the future real activity in the stock market may be regarded as highly rational as long as the expectations are not beyond three quarters. Therefore, it is evident the indicative role of stock returns on the real activity in an asymmetric manner of causality.

In 2004 Michael D. Bradley and Dennis W. Jansen try to see if unusual changes in stock returns hold information for the dynamics of real sector growth from 1934 to 2002. They investigate if a steep and large decline in stock returns foretell a period of slower real output growth. They use monthly data on the percentage change in seasonally adjusted industrial production and monthly data on the excess returns on the Standard & Poor 500 stock index, defined as the percentage change in the S&P 500 index minus the monthly yield on 3-month Treasury Bills. The S&P 500 index is an index of the 500 largest publicly traded firms on US stock markets. In addition, they use the rate of return on this index to measure stock returns. Industrial production is measured by the Board of Governors of the US Federal Reserve System and is used as a measure of aggregate output in the economy. Their empirical results show that there is granger causality from stock returns to the growth rate of industrial production. In particular, lags of the growth rate of industrial production do not help explain stock returns. On the contrary, lags of stock returns do help explain the growth of industrial production. They conclude that it is likely that stock returns react more quickly than industrial production to shocks or other information useful to infer future movements of industrial production.

Results indicate that real activity have only limited ability to explain the variation in returns. The results show that there is significant commonality in return variation across markets, while emerging markets are segmented to a degree. Furthermore, little evidence of common sensitivities to the extracted factors is found when the markets are considered in aggregate, but common sensitivity is found at the regional level. In particular, emerging markets show little sensitivity to the return on the world market index, consistent with previous findings. Only 10 markets display significant coefficient on the world market. These coefficients are positive, indicating that increases in emerging market returns are associated with increases in returns on the world market index.

In 1983 Rati Ram and David E. Spencer investigate the relation between stock returns and real activity. They use quarterly data over two sample periods, 1953:1-1973:4 and 1953:1-1978:4. Data are from US Department of Commerce, Business Statistics, 1979. Real stock returns are nominal stock returns –rate of inflation. The nominal stock return data are from the Center for Research in Security Prices of the University of Chicago. Their empirical results show that the positive association between stock returns and real activity occurs when the growth rate of real GNP is the real activity variable. Otherwise, the association between real stock returns and economic activity is strongly negative. This finding is true for both time periods, although the results are especially strong for the shorter period.

In 1999 Bahram Adrangi, Arjun Chatrath and Todd M. Shank test for the long-run equilibrium relationship among industrial production and stock prices in Chile and Peru employing Johansen and Juselious (1990) co-integration tests. Co-integration refers to the possibility that non-stationary variables may have a linear combination that is stationary. Such a linear combination, the co-integrating vector, implies that there is a long-run equilibrium relationship among real stock returns and real activity. They show that stock prices have a strong long-run equilibrium with the real economic activity in developing Latin American countries, Peru and Chile. Evidence suggests that real returns are positively related to the real economic activity for Chile, but not for Peru. In particular, the findings for Chile suggest that real returns lead the real economic activity. Real economic activity and real returns show a bilateral causality, at least for Chile, suggesting that the Chilean stock market directly influences real economic activity, which in turn appears to stimulate the stock market. Most Latin American economies are characterized by high and volatile inflation during the 1980s. They are selected because they are at different stages of implementing market economic systems. While Chile is the one of the first Latin American economies to introduce economic reforms in the mid-1980s, Peru has only recently adopted free market measures since the election of its new president in 1990. Therefore, they assume that these economies represent two Latin American emerging economies at different stages of development. The period of this study covers from January 1985 through to December 1995 for Chile and January 1990 through to March 1996 for Peru. The data are from the International Financial Statistics of the IMF. In addition, they selected these markets because of the availability of the monthly observations for all the variables in the study. In the case of Peru, the IFS database only provides monthly manufacturing activity index, while a more comprehensive index of industrial production is provided for Chile.

From the above, we come to the conclusion that the opinions concerning the causal relations among stock returns and real economic activity are diverse. Not only do they vary from country to country (i.e developed economies, emerging economies) but even in the same country (i.e U.S.A). This is due to the fact that economists use different models and theorems in their studies.

Section 3

1) Methodology

First of all, we examine whether the above variables are stationeries or not using the Augmented Dickey –Fuller test (ADF) and the Phillips Perron (PP) test of E views program. More specifically, we examine if the series of the first differences (the growth rates) of the variables are stationeries or not. It's worth saying that variables are stationeries, when the mean and variance of the series during time are stable. We create graphs of all the series in order to see whether they seem to contain a trend or not, whether they fluctuate around a zero mean. We do that in order to decide whether we will include a constant, a linear trend and a constant or neither in the test regression. One approach would be to run the test with both a constant and a linear trend since the other two cases are just special cases of this more general specification. However, including irrelevant regressors in the regression reduces the power of the test, possibly concluding that there is a unit root when in fact, there is none. We have to choose a specification that is plausible description of the data under both the null and alternative hypothesis. If the series seems to contain a trend we include both a constant and trend in the test regression. If the series does not exhibit any trend and has a non zero mean, we include a constant in the regression, while if the series seems to be fluctuating around a zero mean, we include neither a constant nor a trend in the test regression. If we include a constant in the test regression, the t-statistic has a non standard distribution if the underlying process contains a unit root with a zero constant. If we include a constant and linear trend in the test regression, the t-statistic has a non standard distribution if the underlying process contains a unit root with a zero linear trend. The asymptotic distribution changes when these assumptions are not satisfied. For instance, if we include a constant in the test regression and if the underlying process contains a unit root with a non zero constant, then the t-statistic has an asymptotic standard normal distribution under the null hypothesis of a unit root. If the variables are stationeries, we use a VAR method in order to estimate our model.

After that we choose the number of lags that we will add to the test regression. We choose lags sufficient to remove any serial correlation in the residuals according to the Akaike criterion. In the end, we test for granger causality. The examination of this causality relationship among real activity and real stock returns is going to take place with the help of Granger Causality in a VAR model, if the series of the two examined variables are stationeries.

Unit root tests

1.1) The Augmented Dickey Fuller unit root test

The simple unit root test described above is valid only if the series is an AR (p) process. If the series is correlated at higher order lags, the assumption of white noise disturbances is violated. The ADF and PP tests use different methods for high – order serial correlation in the series. The ADF tests make a parametric correction for higher – order correlation by assuming that the y series follows an AR(ρ) process and adjusting the test methodology.

The ADF approach controls for higher order correlation by adding lagged difference terms on the dependent variable y to the right hand side of the regression:

$$\Delta y_t = \mu + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \delta_2 \Delta y_{t-2} + \ldots + \delta_\rho \Delta y_{t-\rho} + \varepsilon t$$

This augmented specification is then used to test

$$H_0 : \gamma = 0$$
$$H_1 : \gamma < 0$$

in this regression. An important result obtained by Fuller is that the asymptotic distribution of the t-statistic on γ is independent of the number of lagged first differences included in the ADF regression. Moreover, while the parametric assumption that y follows and autoregressive (AR) process may seem restrictive, Said and Dickey (1984) demonstrate that the ADF test remains valid even when the series has a moving average (MA) component, provided that enough lagged difference terms are augmented to the regression.

Finally except for determining the number of different lagged difference terms we must also decide whether to include a constant, a constant and a linear trend or neither in the test regression. One approach would be to run the test with both a constant and a linear trend since the other two cases are just special cases of this more general specification. However, including irrelevant regressors in the regression reduces the power of the test, possibly concluding that there is a unit root when in fact there is none.

The general principle is to choose a specification that is a plausible description of the data under both the null and alternative hypothesis. If the series seems to contain a trend (whether deterministic or stochastic), we should include both a constant and trend in the test regression. If the series does not exhibit any trend and has a non zero mean, we should only include a constant in the regression, while if the series seems to be fluctuating around a zero mean, we should include neither a constant nor a trend in the test regression.

1.2) The Phillips-Perron unit root test

Phillips and Perron (1988) propose a non-parametric method of controlling for higher – order serial correlation in a series. The test regression for the Phillips – Perron (PP) test is the AR (1) process:

$$\Delta y_t = \alpha + \beta y_{t-1} + \varepsilon_t$$

While the ADF test corrects for higher order serial correlation by adding lagged differenced terms on the right hand side, the PP test makes a correction to the t-statistic of the γ coefficient from the AR(1) regression to account for the serial correlation in ε. The correction is non-parametric since we use an estimate of the spectrum of ε at frequency zero that is robust to heteroskedasticity and autocorrelation of unknown form. Finally we must underline that the asymptotic distribution of the PP t – statistic is the same as the ADF t – statistic.

2) The determination of number of lags

After we apply the above unit root tests, we have to determine the number of lags. Akaike Information Criterion help us to choose the best model among others with different number of factors but with the same number of observations. We use the Akaike criterion in order to determine the exact number of lags in the equation of the ADF regression. We choose the model, which has the smallest Akaike value. The model, which minimizes AIC is the following:

$$AIC = N \ln(\sigma_\varepsilon^*) + 2\kappa$$

where N=the number of observations
k= number of factors
σ_ε^*=variance estimator of the disturbing term

3) Vector Autoregressive Model(VAR)

The vector auto-regression (VAR) is commonly used for forecasting systems of interrelated time series and for analyzing the dynamic impact of random disturbances on the system of variables. The VAR approach sidesteps the need for structural modeling by treating every endogenous variable in the system as a function of the lagged values of all of the endogenous variables in the system.

The mathematical representation of a VAR is

$$y_t = A_1 y_{t-1} + \ldots + A_p y_{t-p} + B x_t + \varepsilon_t$$

Where yt is a k vector of endogenous variables, xt is a d vector of exogenous variables, A1, Ap, and B are matrices of coefficients to be estimated, and ε_t is a vector of innovations that may be contemporaneously correlated but are uncorrelated with their own lagged values and with of the right hand side variables.

Since only lagged values of the endogenous variables appear on the right hand side of the equations, simultaneity is not an issue and OLS yields consistent estimates. Moreover, even though the innovations εt may be contemporaneously correlated, OLS is efficient and equivalent to GLS since all equations have identical regressors.

Furthermore, the multivariate vector auto-regression modeling technique is a useful alternative to the conventional structural modeling procedure. VAR analysis works with unrestricted reduced forms, treating all variables as potentially endogenous. The results of causality tests within a multivariate VAR system are considerably more general and reliable as compared to bivariate test results. The VAR technique provides an unbiased test for Granger causality and can detect feedback relations among the series.

4) Pairwise Granger Causality Tests

Granger was the one who linked the meaning of "causality" with the probability of estimating. According to Granger, if we have a specific total of variables, which includes variables X and Y, then variable X "causes" variable Y, if the present value of variable Y can be well predicted by past values of variable X. This relationship can be of course vice versa. Granger causality has more to do with the usefulness of a variable in the prediction of another one rather than creation.

More specifically variable A may "granger cause" variable B, although in reality its variable B that "granger causes" variable a. For example, according to historic data, increases of wages proceed inflation which they granger cause. Although, in reality, increases in wages are depended from the predictions of inflation so that the real relationship is that an increase in future inflation (if it is correctly predicted) cause an increase at current wages.

The causality relationship is estimated by applying double regression:

$$Y_t = a + \sum_{i=1}^{n} b_I Y_{t-I} + \sum_{i=1}^{n} c_I X_{t-I} + \varepsilon_t$$

$$X_t = a + \sum_{i=1}^{n} \beta_I Y_{t-I} + \sum_{i=1}^{n} \gamma_I X_{t-I} + u_t$$

If in the first equation $c_i = 0$ for $I = 1,2,\ldots n$ then we come to the conclusion that variable X fails according to Granger to cause variable Y. also, if the second equation $\gamma_i = 0$ for $I = 1,2,\ldots n$ then variable Y fails to cause variable X. The final conclusion is that the two variables do not correlate.

If $c_i \neq 0$ for $I = 1,2,\ldots n$ in the first equation and $\gamma_i = 0$ for $I = 1,2,\ldots n$ in the second equation then variable X causes variable Y. If $c_i = 0$ for $I = 1,2,\ldots n$ in the first equation and $\gamma i \neq 0$ for $I = 1, 2, \ldots n$ in the second equation then variable Y causes variable X. Finally, if c_i and γ_i are different that zero then we conclude that variables X and Y granger cause each other.

The Pair wise Granger Causality Test examines whether the endogenous variable can be turned into exogenous. We examine a VAR(2) model. In particular, we examine if there is a correlation between the industrial production IP and the real stock returns in every country. The equations that relate the 2 variables are:

$$IP_t = a_{11} IP_{t-1} + a_{12} R_{t-1} + b_{11} IP_{t-2} + b_{12} R_{t-2} + e_{1t}$$
$$Rt = a_{21} IP_{T-1} + a_{22} R_{t-1} + b_{21} IP_{t-2} + b_{22} R_{t-2} + e_{2t}$$

We examine whether the hypothesis Ho: $a_{12}=b_{12}=0$ exists. If the hypothesis exists then R_t is not correlated with $IP_{t..}$ Furthermore, we examine whether the hypothesis Ho: $a_{21}=b_{21}=0$. If the hypothesis exists, then IP_t does not correlate with R_t.

Section 4

1) Review of statistical data

The data that we are going to use for our study in order to prove the relationship between real stock returns and industrial production are derived from Datastream. We will use monthly data of the stock price index FTSE and industrial production index. We turn the nominal stock prices in real terms. Real returns are nominal returns adjusted for the inflation rate of the Consumer Price Index (CPI) for each country. According to Datastream, industrial production is a measure of the rate of change in the production of industrial commodities in real terms over time. The Index of Industrial Production covers the Mining, Manufacturing and Electricity sectors. The chosen countries for which we have monthly data are Indonesia, China, Korea, Malaysia, Singapore, Philippines, Taiwan, Thailand and Japan. Similarly, the countries for which we have quarterly data of stock price index FTSE and industrial production are Hong-Kong and Australia.

It's worth saying that we turn the nominal stock returns into real, taking as based date: Q4 1989 in Australia. The sample for Australia is from Q4 1989 to Q1 2006. In China, the examined sample is from 15/9/1994 to 15/5/2006. Furthermore, the nominal real stock returns are turned into real according to 15/9/1994 (based date). In Hong Kong the period of the sample is from Q4 1989 to Q1 2006. We take as based date in order to change the variable (stock return) into real, the quarter Q4 1989. In Indonesia, the period of the sample is from 15/7/1996 to 15/4/2006 with based date 15/7/1996 for the change of nominal returns into real. In Japan, the period of the sample is from 15/12/1989 to 15/02/2006 with based date 15/12/1989 for the change of nominal returns into real. In Korea, the period of sample is from 15/12/1993 to 15/05/2006 with based date 15/12/1993 for the change of nominal returns into real. In Malaysia, the period of the sample is from 15/12/1993 to 15/05/2006 with based date 15/12/1993 for the change of nominal returns into real. In Philippines, the period of the sample is from 15/07/1996 to 15/04/2006 with based date 15/07/1996 for the change of the nominal returns into real. In Singapore, the period of the sample is from 15/12/1989 to 15/05/2006 with based date 15/12/1989 for the change of the nominal returns into real. In Thailand, the period of the sample is from 15/11/1994 to 15/05/2006 with based date 15/11/1994 for the change of the nominal returns into real. In Taiwan, the period of the sample is from 15/12/1993 to 15/05/2006 with based date 15/12/1993 for the change of the nominal returns into real.

1.1) Unit root testing of the variables of the system

We examine the stationarity of our series by using the Augmented Dickey Fuller unit roots test of E Views program. More specifically, we first create graphs of all the series in order to see whether they seem to contain a trend or not or if they fluctuate around a zero mean. We do that in order to decide whether to include a constant, a linear trend and a constant or neither in the test regression. One approach would be to run the test with both a constant and a linear trend since the other two cases are just special cases of this more general specification. However, including irrelevant regressors in the regression reduces the power of the test, possibly concluding that there is a unit a unit root when in fact, there is none. The general principle is to choose a specification that is plausible description of the data under both the null and alternative hypotheses. If the series seems to contain a trend (whether deterministic or stochastic) we should include both a constant and trend in the test regression. If the series does not exhibit any trend and has a non zero mean, we should only include a constant in the regression, while if the series seems to be fluctuating around a zero mean, we should include neither a constant nor a trend in the test regression.

This choice, of including other exogenous variables in the test regression is very important since the asymptotic distribution of the t-statistic under the null hypothesis depends on our assumptions regarding these deterministic terms. If we include a constant in the test regression, the t – statistic has a non standard distribution if the underlying process contains a unit root with a zero constant. On the other hand if we include a constant and linear trend in the test regression, the t-statistic has a non standard distribution if the underlying process contains a unit root with a zero linear trend. The asymptotic distribution changes when these assumptions are not satisfied. For example if we include a constant in the test regression and if the underlying process contains a unit root with a nonzero constant, then the t-statistic, has an asymptotic standard normal distribution under the null hypothesis of a unit root.

Last but not least, we have to specify the number of lags to add to the test regression. The usual technique is to include lags sufficient to remove any serial correlation in the residuals.

All the series of the system (real stock returns and industrial production) are stationary. The following tables show how many lags we conclude for each series and if we included a constant (intercept), a linear trend and a constant or neither in each test regression

2) Number of lags in each VAR model

By using the E Views program we specify the VAR models for each of the twelve countries we examine. The endogenous variables for each model are stock returns, industrial production growth. The series of the endogenous variables is kept the same for each model. The exogenous variable for all the VAR models of our study has chosen to be a simple constant.

By using the lag length criteria option from the VAR we estimated the lag order for each model. According to theory and past studies Akaike information criterion best indicate the best lag order for each VAR model. We use 12 lags in China, Malaysia, Singapore, Taiwan and Thailand. For Indonesia, we use 11 lags and for Hong Kong we use 4 lags. Similarly, for Korea and Philippines we use 2 lags. Last but not least we use 1 lag for Australia and Japan. According to Akaike criterion, the lag order selected for the VAR models of the countries under examination are shown at the following table.

Country	Lag order chosen by Akaike criterion
Australia	1
China	12
Honk Kong	4
Indonesia	11
Japan	1
Korea	2
Malaysia	12
Philippines	2
Singapore	12
Taiwan	12
Thailand	12

3) Empirical results of the unit root tests of the variables of the system

Country	ADF test		PP test	
Variable	R_t	IP	R_t	IP
Australia	{-7,170881} 0	(-1,142773) 0,2276	{-7,185357}	{-6,868897} 0
China	{-9,760236} 0	{-0,638886} 0,4387	{-9,798004} 0	{-14,54983} 0
Indonesia	{-2,670446} 0,0079	{-2,546802} 0,011	{-4,243242} 0	{-24,34513} 0
Japan	{-13,24538} 0	{-6,507414} 0	{-13,24482} 0	{-24,28571} 0
Korea	{-11,06559} 0	{3,781667} 0,0002	{-11,04373} 0	{-19,99165} 0
Malaysia	{-3,924797} 0,0001	{-10,46628} 0	{-1,895562} 0,0556	{-25,26562} 0
Philippines	{-8,636318} 0	{-3,080825} 0,0022	{-8,478232} 0	{-21,57435} 0
Singapore	{-12,18748} 0	{-3,368284} 0,0008	{-12,11221} 0	{-35,54018} 0
Thailand	{-6,803271} 0	{-1,993866} 0,0444	{-11,4669} 0	{-22,75755} 0
Hong-Kong	{-9,314505} 0	{-2,602557} 0,0097	{-9,270346} 0	{-15,2123} 0
Taiwan	{-4,268672} 0	{-3,313076} 0,001	{-12,06655} 0	{-43,67519} 0,0001

In the above table, we can see the results of unit root tests of first difference of each variable for each country. R_t= 1st difference of real stock index FTSE, IP= 1st difference of industrial production}. In the parenthesis, we can see the t-statistics and below the probability.

According to Dickey Fuller unit root test, the series of the real stock returns are stationeries in all the examined countries. As for the series of the industrial production we can see that they are stationeries in Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Thailand, Hong-Kong, Taiwan with the exception for Australia (prob.>0,2276>0,05) and China (prob.0,4387>0,05).

According to the Phillips-Perron unit root test, the series of real activity and real stock returns are stationeries in all countries, except for Malaysia (prob.0,0556>0,05). As for the series of the industrial production, they are stationeries in all countries.

As a result, all series of the real stock returns are stationeries according to Augmented Dickey Fuller unit root test and all series of industrial production are stationeries according to Phillips Perron unit root test. Since all series of the variables are stationeries, we can apply the Auto-regressive model in our analysis in order to forecast the interrelated time series and analyze the correlation between real stock returns and real activity.

3.1) Variable R_t

Country	Augmented Dickey Fuller	Phillips-Perron	Number of lags	Include in test equation
Australia	Stationary	Stationary	1	None
China	Stationary	Stationary	12	None
Indonesia	Stationary	Stationary	11	None
Japan	Stationary	Stationary	1	Trend+Intercept
Korea	Stationary	Stationary	2	None
Malaysia	Stationary	Non-Stationary	12	None
Philippines	Stationary	Stationary	2	None
Singapore	Stationary	Stationary	12	None
Thailand	Stationary	Stationary	12	None
Hong-Kong	Stationary	Stationary	4	None
Taiwan	Stationary	Stationary	12	None

3.2) Variable IP

Country	Augmented Dickey Fuller	Phillips-Perron	Number of lags	Include in test equation
Australia	Non-stationary	Stationary	1	None
China	Non-stationary	Stationary	12	None
Indonesia	Stationary	Stationary	11	None
Japan	Stationary	Stationary	1	Trend+Intercept
Korea	Stationary	Stationary	2	None
Malaysia	Stationary	Stationary	12	None
Philippines	Stationary	Stationary	2	None
Singapore	Stationary	Stationary	12	None
Thailand	Stationary	Stationary	12	None
Hong-Kong	Stationary	Stationary	4	None
Taiwan	Stationary	Stationary	12	None

The above tables show if our series are stationeries or not, according to Augmented Dickey Fuller and Phillips-Perron unit root tests, how many lags we concluded for each series and if we included a constant (intercept), a linear trend and a constant or neither in each test equation.

In particular, all series of real stock returns are stationeries in all examined countries, according to Augmented Dickey Fuller unit root test. Similarly, the series of the industrial production are stationeries in all countries. According to Augmented Dickey Fuller unit root test, the series of Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Thailand, Hong-Kong, Taiwan are stationeries, except for Australia (prob.0,2276>0,05} and China (prob.0,4387>0,05). According to Phillips-Perron unit root test, the series of real stock returns are stationeries in all countries with the exception for Malaysia (prob. 0,0556>0,05).

As for the test regression of the real stock returns and industrial production, we include a linear trend and intercept in the test equation in Japan. On the contrary, we include neither a linear trend and intercept nor an intercept in the test equation in all other examined countries. (Australia, China, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand and Hong-Kong.)

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4) Granger causality results

Country	Chi-sq	IP->R_t	CAUSALITY
Australia	0,246621	0,6195	No
China	15,74336	0,2033	No
Indonesia	10,33526	0,5005	No
Japan	0,007926	0,9291	No
Korea	7,843646	0,0198	Yes
Malaysia	7,929115	0,7906	No
Philippines	7,60874	0,0223	Yes
Singapore	12,96063	0,3719	No
Thailand	11,12097	0,5186	No
Hong Kong	1,832153	0,7666	No
Taiwan	13,52493	0,3321	No

Country	Chi-sq	R_t->IP	CAUSALITY
Australia	0,509511	0,4754	No
China	24,06243	0,0199	Yes
Indonesia	78,1764	0	Yes
Japan	2,167571	0,1409	No
Korea	8,706511	0,0129	Yes
Malaysia	37,36193	0,0002	Yes
Philippines	2,848512	0,2407	No
Singapore	9,157216	0,6894	No
Thailand	32,7532	0,001	Yes
Hong Kong	16,19185	0,0028	Yes
Taiwan	20,51454	0,058	No

Section 5

1) Conclusions for the granger causality analysis

The granger causality analysis among real stock returns and real activity for Australia, China, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Thailand, Hong Kong and Taiwan we examine has led us to the following conclusions:

On the one hand, industrial production seems to granger cause real stock returns in Korea and Philippines. On the other hand, real stock returns seem to granger cause industrial production in China, Korea, Malaysia, Thailand, Indonesia and Hong-Kong. As for Australia, Japan, Singapore and Taiwan we find that there is no correlation between real stock returns and real activity at all. It's worth saying that China, Indonesia, Korea, Malaysia, Philippines, Thailand, Taiwan are regarded as emerging markets. On the contrary, Australia, Japan, Singapore and Hong Kong are regarded as developed markets. Real stock returns affect industrial production in most of the emerging countries (China, Indonesia, Korea, Malaysia, Thailand). On the contrary, industrial production affect real stock returns only in two of the examined emerging countries (Korea and Philippines).

Advanced markets have higher ratio of market capitalization to GDP, on average, a large number of listed domestic companies, initial public offering and English origin of the regulations governing the stock market tend to display a significantly stronger correlation than emerging markets.

This paper has shown that there is a significant causality between real stock returns and real activity in several countries, including both advanced countries with highly developed stock markets and developing countries with emerging stock markets. There is more causality between the two examined variables in emerging countries than in advanced countries.

2) Conclusions and Concluding remarks

The analysis of the granger causality tests of the variables of the Vector Auto-regressive model of the eleven countries has led us to the following conclusions.

First of all, our findings reinforce the theorems that the relationship between real stock returns and real industrial production is positive in some of the examined countries. A sensible explanation of this finding stems from the fact that stock market developments affect consumption and investment behavior of economic agents, which in turn affect economic activity. Additionally, stock markets can be considered as efficient in terms of information as they reflect society's expectations for the evolution of economic activity in a very efficient way.

Secondly, according to the granger causality tests, industrial production granger causes real stock returns in emerging countries such as Korea and Philippines. In addition, real stock returns granger cause industrial production in emerging markets such as China, Korea, Malaysia, Korea and Thailand. Therefore, in these countries, stock market is regarded as an important leading factor among leading economic indicator whose changes can be predicted by values of industrial production.

It's worth saying that there is no causality between real stock returns and real industrial production in most of the advanced markets. For example, we find that there is no granger causality between the two examined variables in Australia, Japan and Singapore, which are considered to be advanced countries. In addition, Taiwan, which is regarded as emerging market fails to be efficient as we would expect to be, although Taiwan's stock market capitalization is quite big in relation to other emerging countries.

Our empirical conclusion comes opposite with Paulo Mauro's empirical analysis. Paolo Mauro shows in his article in 2003 that advanced countries with a high market capitalization to GDP ratio, a large number of listed domestic companies and initial public offerings and English origin of the regulations governing the stock market tend to display a significantly stronger correlation than emerging countries. According to Paolo Mauro, this is due to the fact that stock market puts pressure on managers and their behavior in consumption and investment, which has an impact on real economic activity.

As for the market capitalization of the countries, our empirical results show that in countries with high capitalization such as Australia (874,283 US $ millions) and Japan (2.495,757 US $ millions) there is no correlation between real stock returns and real activity. On the contrary, in countries such as Indonesia (22,104 US $ millions) and Thailand (34,903 US $ millions) which have low market capitalization, real stock returns granger cause industrial production.

As for the market capitalization of GDP of the examined countries, our empirical results indicate that in countries such as Australia (240) and Singapore (112), which have high market capitalization of GDP, there is no correlation at all.

According to the nominal GDP per capita US $ of the examined countries, our empirical results show that real stock returns have an influence in industrial production in China (772 US $) and Indonesia (435 US $) which have high nominal GDP per capita US $. On the contrary, there is no correlation between the two examined variables in Australia (19,249 US $), Taiwan (11,702 US $) and Singapore (26,423 US $), which have low nominal GDP per capita US $.

According to the turnover ratio of the examined countries, our empirical results show that industrial production affect real stock returns in Korea (176,2), which has high turnover ratio. Moreover, real stock returns have an influence on real activity in China (130,1) and Taiwan (323), which have high turnover ratio.

According to the listed of domestic companies, our empirical results show that there is no causality at all in countries that have a large number of domestic companies listed. For example, there is no causality between real stock returns and real activity in Australia, which has 1.162 domestic companies. Similarly, there is no causality between real stock returns and real activity in Japan too, which has 2.416 domestic companies. On the contrary, real stock returns have an effect on industrial production in Indonesia, which has only listed 287 domestic companies. Moreover, industrial production affects real stock returns in Philippines, which has a small number of domestic companies (221).

As far as the ratio of initial public offerings to population is concerned, there is no causality between real stock returns and industrial production in Singapore, which has a large ratio of initial public offerings to population (5,67 millions). In contrast, real stock returns granger cause industrial production in Korea which has a low ratio of initial public offerings to population (0,02 millions). In addition, real stock returns have an effect on industrial production in Korea, which has a low ratio of initial public offerings to population (0,02 millions). In conclusion, there is causality between the two examined variables in Korea, which has a low ratio of initial public offerings to population (0,02 millions).

According to legal origin, real stock returns granger cause industrial production in Indonesia and Philippines, which have French legal origin in stock market regulations. On the contrary, there is no causality between real stock returns and real activity in Japan and Taiwan at all, which have German legal origin in stock market regulations. As for Australia and Singapore, which have English legal origin in stock market regulations, there is no causality between the two examined variables. It’s worth saying that real stock returns affect real activity in Malaysia and Thailand and Hong Kong, which have English legal origin in stock market regulations.

As for the index of anti-director right from LLSV (1997), it takes a value between 0 and 5. It is used as an alternative to the English origin dummy and is more precisely measured, although it has the disadvantage that it is not clear whether an increase from 0 to 1 has the same meaning as an increase from 4 to 5. Our empirical results show that industrial production affect real stock returns in Philippines, which have high index of anti-director rights. Additionally, real stock returns affect real activity in Hong Kong, which has low index of anti-director rights.

Under the perspective of increasing capitalization, the main policy objectives in these countries of macroeconomic stability and economic development will be pursued in the light of new developments, as increasing capitalization will play a major role for development prospects by promoting allocative efficiency, creating new financial instrument and improving the quality if services provided by financial intermediaries. The Asian crisis of 1997 has shown that asset markets and particularly stock markets are becoming more and more important in determining the behavior of industrial production and its effect on the economies, especially of countries in transition or developing where policymakers and domestic corporations tend to rely more on foreign savings, through capital inflows from abroad are becoming stronger. These measures will help the economies of these countries, their stock markets to be more precise, to become more efficient and mature by absorbing more external capital inflows which help the development of their economies and industries/firms in order to increase the level of domestic processing of raw materials (natural resources) which are quite plenty, into end products. This will finally push, in the long run, the economic and monetary convergence among these countries of the Asian Pacific basin, in order to start organizing in the future a common monetary area after the application of proper economic and monetary policies.

References

1. Arjun Chatrath, Sanjay Ramchander and Frank Song Stock prices, Inflation and output : Evidence from India Journal of Asian Economics 2 1996 237-245

2. Bahram Adrangi, Arjun Chatrath, Todd M. Shank Inflation, Output and Stock Prices: Evidence from Latin America, Managerial and Decision Economics 2 (Mar, 1999) 63-74

3. Christis Hassapis Financial variables and real activity in Canada, Canadian Journal of Economics 2 (2003)

4.Christis Hassapis & Prodromidis Kyprianos Stock Market Returns and Real Economic Activity: Evidence from Latin America Working Paper

5.Christopher James, Sergio Koreisha & Megan Partch A VARMA analysis of the causal relations among stock returns, real output and nominal interest rates The Journal of Finance Volume XL No.5 December 1985 1375 – 1384

6.Christopher M. Bilson, Timothy J. Brailsford, Vincent J. Hooper Selecting macroeconomic variables as explanatory factors of emerging stock market returns, Pacific-Basin Finance Journal 9 (2001) 401-426

7. Dale L. Domian and David A. Louton A Threshold auto regressive analysis of stock returns and real economic activity International Review of Economics and Finance 6(1997) 167-179

8.David E. Rapach Macro shocks and real stock prices, Journal of Economics and Business 53 (2001) 5-26

9. Eugene F. Fama (1981) Stock returns, real activity, inflation and money. American Economic Review, 71, 541 – 565

10. Eugene F. Fama (1990) Stock returns, real returns and real activity. Journal of Finance, 45 1089 – 1108

11. Evangelia Papapetrou, Oil price shocks, stock market, economic activity and employment in Greece, Energy Economics 23 (2001) 511-532

12. E-views 4.0 User's Guide

13. Fabio Canova, Gianni De Nicolo, Stock returns and real activity : Structural approach, European Economic Review 39 (1995) 981-1015

14. Gershon Mandelker and Kishone Tandon, Common stock returns, real activity, money, and inflation: Some international evidence

15. William G. Schwert, Stock returns and Real activity : A century of Evidence, The Journal of Finance, 45 (4) September 1990

16.Jeong-Ryeol Kim The stock return-inflation puzzle and the asymmetric causality in stocks, inflation and real activity, Economic Letters 80(2003) 155-160

17. Jongmoo Jay Choi, Shmuel Hauser, Kenneth J.Kopecky Does the stock market predict real activity? Time series evidence from the G-7 countries, Journal of Banking and Finance 23 (1999) 1771-1792

18. Mathias Binswanger, Stock market booms and real economic activity: Is this time different? International Review of Economics and Finance 9 (2000) 387-415

19. Mathias Binswanger, Srock returns and real activity in the G-7 countries: did the relationship change during the 1980s? The Quarterly Review of Economics and Finance 44 (2004) 237-252

20. Michael D. Bradley, Dennis W. Jansen Forecasting with a nonlinear dynamic model of stock returns and industrial production International Journal of Forecasting 20 (2004) 321-342

21. Paolo Mauro Stock returns and output growth in emerging and advanced economies Journal of Development Economics 71 (2003) 129 - 153

22. Qystein Gjerde, Frode Saettem, Causal relations among stock returns and macroeconomic variables in a small, open economy, The Journal of International Financial Markets, Institutions and Money 9 (1999) 61-74

23. Rati Ram, David E. Spencer Stock returns, real activity, inflation and money: Comment The American Economic Review 3 (1983) 463-470

24. Robert Mundell Prospects for an Asian currency area Journal of Asian Economics 14 (2003) 1-10

25. Roger D.Huang and William A.Kracaw Stock market returns and real activity: A note The Journal of Finance 1 (1984) 267-273

26. Yin Wong Cheung, Lilian K. Ng, International evidence on the stock market and aggregate economic activity, Journal of Empirical Finance 5 (1998) 281-296

27.Yin-Wong Cheung, Jia He and Lilian Ng, Pasific-Basin stock markets and real activity, The Finance Journal 2 (1994) 349-373

APPENDIX

1) TABLES OF

SOME BASIC INDICATORS

AND CHARACTERISTICS OF

THE EXAMINED COUNTRIES

AUSTRALIA	
Form of government	Republic, Federal System
Capital	Camberra
Area	7.686.849 km^2
Official Language	English
Currency	Australian Dollar
Religion	Christian
Nominal GDP per capita (US$)	19,249
Market capitalization (US $ million)	874,283
Market capitalization of GDP	240
Turnover ratio	51,9
Listed of domestic companies	1,162
IPO's population	n.a
Legal origin	GBR
Anti-dir. Rights	4

CHINA	
Form of government	Republic Democracy
Capital	Benjing
Area	9.596.961 km^2
Official Language	Chinese
Currency	Renminbi
Religion	Buddhism
Nominal GDP per capita (US$)	772
Market capitalization (US $ million)	231,322
Market capitalization of GDP	24
Turnover ratio	130,1
Listed of domestic companies	853
IPO's population	n.a
Legal origin	n.a
Anti-dir. Rights	n.a

INDONESIA	
Form of government	Independent Republic
Capital	Jakarta
Area	2.027087 km^2
Official Language	Bahaza
Currency	Rupiah
Religion	Muslim, Christian, Buddhism
Nominal GDP per capita (US$)	435
Market capitalization (US $ million)	22,104
Market capitalization of GDP	25
Turnover ratio	37,9
Listed of domestic companies	287
IPO's population	0,1
Legal origin	FRA
Anti-dir. Rights	2

JAPAN	
Form of government	Constitutional Monarchy
Capital	Tokyo
Area	372.313 km^2
Official Language	Japanese
Currency	Yen
Religion	Buddhism, Sintoism
Nominal GDP per capita (US$)	29,957
Market capitalization (US $ million)	2.495.757
Market capitalization of GDP	66
Turnover ratio	40,3
Listed of domestic companies	2,416
IPO's population	0,26
Legal origin	DEU
Anti-dir. Rights	3

KOREA	
Form of government	Republic
Capital	Seoul
Area	98.484 km^2
Official Language	Korean
Currency	Won
Religion	Buddhism, Sintoism
Nominal GDP per capita (US$)	6,694
Market capitalization (US $ million)	114,593
Market capitalization of GDP	37
Turnover ratio	176,2
Listed of domestic companies	748
IPO's population	0,02
Legal origin	DEU
Anti-dir. Rights	2

MALAYSIA	
Form of government	Constitutional Monarchy
Capital	Kuala Lumpur
Area	329,749 km^2
Official Language	Malaysian, English, Chinese
Currency	Malaysia Ringgit
Religion	Muslim
Nominal GDP per capita (US$)	3,072
Market capitalization (US $ million)	98,557
Market capitalization of GDP	146
Turnover ratio	30,0
Listed of domestic companies	736
IPO's population	2,89
Legal origin	GBR
Anti-dir. Rights	3

PHILIPPINES	
Form of government	Democracy
Capital	Manilla
Area	300.000 km^2
Official Language	Philippino, English
Currency	Peso
Religion	Christian
Nominal GDP per capita (US$)	875
Market capitalization (US $ million)	35,314
Market capitalization of GDP	55
Turnover ratio	30,0
Listed of domestic companies	221
IPO's population	0,27
Legal origin	FRA
Anti-dir. Rights	4

SINGAPORE	
Form of government	Parliamentary Democracy
Capital	Singapore
Area	581 km^2
Official Language	Chinese, Malaysian, Tamil, English
Currency	Singapore Dollar
Religion	Buddhism, Muslim
Nominal GDP per capita (US$)	26,423
Market capitalization (US $ million)	94,469
Market capitalization of GDP	112
Turnover ratio	50,5
Listed of domestic companies	321
IPO's population	5,67
Legal origin	GBR
Anti-dir. Rights	3

THAILAND	
Form of government	Constitutional Monarchy
Capital	Bangkok
Area	514.000 km^2
Official Language	Thai, English
Currency	Baht
Religion	Buddhism
Nominal GDP per capita (US$)	1,906
Market capitalization (US $ million)	34,903
Market capitalization of GDP	30
Turnover ratio	71,0
Listed of domestic companies	418
IPO's population	0,56
Legal origin	GBR
Anti-dir. Rights	3

HONG KONG	
Form of government	Democracy (Chinese government)
Capital	Victoria
Area	1.046km^2
Official Language	Chinese
Currency	Honk Kong Dollar
Religion	Buddhism
Nominal GDP per capita (US$)	26,51
Market capitalization (US $ million)	343,394
Market capitalization of GDP	206
Turnover ratio	54,4
Listed of domestic companies	658
IPO's population	5,16
Legal origin	GBR
Anti-dir. Rights	0

TAIWAN	
Form of government	One Party Democracy
Capital	Taipei
Area	35.961 km^2
Official Language	Chinese, Taiwan, Haka
Currency	Taiwan Dollar
Religion	Buddhism
Nominal GDP per capita (US$)	11,702
Market capitalization (US $ million)	260,015
Market capitalization of GDP	100
Turnover ratio	323,0
Listed of domestic companies	437
IPO's population	0,00
Legal origin	DEU
Anti-dir. rights	3

Note: Turnover ratio is total value traded during the year divided by average market capitalization. IPOs is the ratio of initial public offerings to population (in millions) GBR is English, FRA is French, DEU is German, SCA is Scandinavian, Anti-dir. rights is the index of anti-director rights from LLSV (1997).

2) AUGMENTED DICKEY FULLER UNIT ROOT TESTS

AUSTRALIA

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on AIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.170881	0.0000
Test critical values:	1% level	-2.601596	
	5% level	-1.945987	
	10% level	-1.613496	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 66 129
Included observations: 64 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.898795	0.125340	-7.170881	0.0000

R-squared	0.449404	Mean dependent var	-8.26E-05
Adjusted R-squared	0.449404	S.D. dependent var	0.572385
S.E. of regression	0.424722	Akaike info criterion	1.140737
Sum squared resid	11.36449	Schwarz criterion	1.174470
Log likelihood	-35.50360	Durbin-Watson stat	2.012724

Null Hypothesis: DIP has a unit root
Exogenous: None
Lag Length: 8 (Automatic based on AIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.142773	0.2276
Test critical values:	1% level	-2.606911	
	5% level	-1.946764	
	10% level	-1.613062	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 74 129
Included observations: 56 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-0.291049	0.254686	-1.142773	0.2589
D(DIP(-1))	-0.494875	0.258024	-1.917943	0.0612
D(DIP(-2))	-0.471139	0.260611	-1.807823	0.0770
D(DIP(-3))	-0.502680	0.255874	-1.964563	0.0554
D(DIP(-4))	-0.556481	0.247023	-2.252747	0.0290
D(DIP(-5))	-0.340734	0.227664	-1.496651	0.1412
D(DIP(-6))	-0.351768	0.204655	-1.718833	0.0922
D(DIP(-7))	-0.164135	0.177068	-0.926961	0.3587
D(DIP(-8))	-0.355856	0.132377	-2.688198	0.0099

R-squared	0.562757	Mean dependent var	-0.000191
Adjusted R-squared	0.488333	S.D. dependent var	0.014757
S.E. of regression	0.010556	Akaike info criterion	-6.117999
Sum squared resid	0.005237	Schwarz criterion	-5.792496
Log likelihood	180.3040	Durbin-Watson stat	1.952457

KINA

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on AIC, MAXLAG=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.760236	0.0000
Test critical values:	1% level	-2.581705	
	5% level	-1.943140	
	10% level	-1.615189	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 12 150
Included observations: 139 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.816165	0.083621	-9.760236	0.0000

R-squared	0.408390	Mean dependent var	0.000138
Adjusted R-squared	0.408390	S.D. dependent var	0.135334
S.E. of regression	0.104094	Akaike info criterion	-1.679877
Sum squared resid	1.495306	Schwarz criterion	-1.658766
Log likelihood	117.7515	Durbin-Watson stat	2.035755

Null Hypothesis: DIP has a unit root
Exogenous: None
Lag Length: 13 (Automatic based on AIC, MAXLAG=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.638886	0.4387
Test critical values:	1% level	-2.583444	
	5% level	-1.943385	
	10% level	-1.615037	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 25 150
Included observations: 126 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-0.192949	0.302008	-0.638886	0.5242
D(DIP(-1))	-1.329720	0.308378	-4.311979	0.0000
D(DIP(-2))	-1.578458	0.318656	-4.953478	0.0000
D(DIP(-3))	-1.562629	0.307740	-5.077754	0.0000
D(DIP(-4))	-1.563860	0.294406	-5.311913	0.0000
D(DIP(-5))	-1.568610	0.287275	-5.460312	0.0000
D(DIP(-6))	-1.498049	0.279561	-5.358571	0.0000
D(DIP(-7))	-1.483788	0.268245	-5.531460	0.0000
D(DIP(-8))	-1.476716	0.254330	-5.806298	0.0000
D(DIP(-9))	-1.439020	0.234295	-6.141909	0.0000
D(DIP(-10))	-1.532315	0.209432	-7.316518	0.0000
D(DIP(-11))	-1.461001	0.188301	-7.758847	0.0000
D(DIP(-12))	-0.680468	0.159386	-4.269300	0.0000
D(DIP(-13))	-0.135881	0.092322	-1.471819	0.1439

R-squared	0.939891	Mean dependent var	-0.000193
Adjusted R-squared	0.932914	S.D. dependent var	0.187045
S.E. of regression	0.048447	Akaike info criterion	-3.112274
Sum squared resid	0.262871	Schwarz criterion	-2.797131
Log likelihood	210.0732	Durbin-Watson stat	2.003648

ΙΝΔΟΝΗΣΙΑ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Lag Length: 7 (Automatic based on AIC, MAXLAG=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.670446	0.0079
Test critical values:	1% level	-2.585962	
	5% level	-1.943741	
	10% level	-1.614818	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 41 151
Included observations: 111 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.212831	0.079699	-2.670446	0.0088
D(DFTSE(-1))	-0.167743	0.110975	-1.511536	0.1337
D(DFTSE(-2))	-0.224999	0.112071	-2.007639	0.0473
D(DFTSE(-3))	-0.075429	0.113946	-0.661968	0.5095
D(DFTSE(-4))	-0.039403	0.111531	-0.353288	0.7246
D(DFTSE(-5))	0.140951	0.108111	1.303756	0.1952
D(DFTSE(-6))	0.184008	0.099963	1.840754	0.0685
D(DFTSE(-7))	0.277824	0.094936	2.926419	0.0042

R-squared	0.269154	Mean dependent var	3.81E-05
Adjusted R-squared	0.219484	S.D. dependent var	0.016631
S.E. of regression	0.014693	Akaike info criterion	-5.533577
Sum squared resid	0.022235	Schwarz criterion	-5.338296
Log likelihood	315.1136	Durbin-Watson stat	1.948819

Null Hypothesis: DIP has a unit root
Exogenous: None
Lag Length: 13 (Automatic based on AIC, MAXLAG=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.546802	0.0110
Test critical values:	1% level	-2.582465	
	5% level	-1.943247	
	10% level	-1.615122	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 17 149
Included observations: 133 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.986281	0.779912	-2.546802	0.0121
D(DIP(-1))	0.281790	0.761245	0.370170	0.7119
D(DIP(-2))	-0.051967	0.729630	-0.071224	0.9433
D(DIP(-3))	-0.175828	0.674551	-0.260659	0.7948
D(DIP(-4))	-0.305322	0.610689	-0.499963	0.6180
D(DIP(-5))	-0.422800	0.548937	-0.770216	0.4427
D(DIP(-6))	-0.564855	0.488473	-1.156368	0.2498
D(DIP(-7))	-0.711834	0.429833	-1.656070	0.1003
D(DIP(-8))	-0.888928	0.372852	-2.384132	0.0187
D(DIP(-9))	-1.071411	0.318512	-3.363796	0.0010
D(DIP(-10))	-1.282210	0.267675	-4.790176	0.0000
D(DIP(-11))	-1.178719	0.223759	-5.267807	0.0000
D(DIP(-12))	-0.462927	0.172042	-2.690776	0.0082
D(DIP(-13))	-0.124010	0.090045	-1.377203	0.1710

R-squared	0.872463	Mean dependent var	-0.000126
Adjusted R-squared	0.858531	S.D. dependent var	0.163754
S.E. of regression	0.061592	Akaike info criterion	-2.637272
Sum squared resid	0.451434	Schwarz criterion	-2.333025
Log likelihood	189.3786	Durbin-Watson stat	1.998467

ΙΑΠΩΝΙΑ

Null Hypothesis: DFTSE has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on AIC, MAXLAG=14)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-13.24538	0.0000
Test critical values:	1% level	-4.006311	
	5% level	-3.433278	
	10% level	-3.140478	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Included observations: 193 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.959036	0.072405	-13.24538	0.0000
C	-0.041829	0.032337	-1.293517	0.1974
@TREND(1)	0.000174	0.000130	1.335934	0.1832

R-squared	0.480091	Mean dependent var	0.000491
Adjusted R-squared	0.474618	S.D. dependent var	0.138275
S.E. of regression	0.100226	Akaike info criterion	-1.747356
Sum squared resid	1.908598	Schwarz criterion	-1.696641
Log likelihood	171.6199	F-statistic	87.72428
Durbin-Watson stat	1.997882	Prob(F-statistic)	0.000000

Null Hypothesis: DIP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic based on AIC, MAXLAG=16)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.507414	0.0000
Test critical values:	1% level	-3.985773	
	5% level	-3.423336	
	10% level	-3.134615	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 7 340
Included observations: 334 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-0.794237	0.122051	-6.507414	0.0000
D(DIP(-1))	-0.577486	0.109583	-5.269844	0.0000
D(DIP(-2))	-0.503247	0.088875	-5.662402	0.0000
D(DIP(-3))	-0.200227	0.054107	-3.700590	0.0003
C	0.002845	0.001476	1.927527	0.0548
@TREND(1)	-9.02E-06	7.25E-06	-1.244748	0.2141

R-squared	0.694727	Mean dependent var	7.18E-07
Adjusted R-squared	0.690073	S.D. dependent var	0.022518
S.E. of regression	0.012536	Akaike info criterion	-5.902607
Sum squared resid	0.051546	Schwarz criterion	-5.834144
Log likelihood	991.7354	F-statistic	149.2896
Durbin-Watson stat	2.016635	Prob(F-statistic)	0.000000

KOPEA

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on AIC, MAXLAG=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.06559	0.0000
Test critical values:	1% level	-2.580681	
	5% level	-1.942996	
	10% level	-1.615279	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 171 318
Included observations: 148 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.906168	0.081891	-11.06559	0.0000

R-squared	0.454387	Mean dependent var	-0.001644
Adjusted R-squared	0.454387	S.D. dependent var	0.168907
S.E. of regression	0.124764	Akaike info criterion	-1.318053
Sum squared resid	2.288208	Schwarz criterion	-1.297801
Log likelihood	98.53591	Durbin-Watson stat	1.991066

Null Hypothesis: DIP has a unit root
Exogenous: None
Lag Length: 7 (Automatic based on AIC, MAXLAG=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.781667	0.0002
Test critical values:	1% level	-2.572492	
	5% level	-1.941857	
	10% level	-1.616011	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 11 318
Included observations: 308 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-0.478614	0.126562	-3.781667	0.0002
D(DIP(-1))	-0.642074	0.125321	-5.123419	0.0000
D(DIP(-2))	-0.532127	0.124591	-4.270975	0.0000
D(DIP(-3))	-0.458874	0.120958	-3.793649	0.0002
D(DIP(-4))	-0.336584	0.115093	-2.924451	0.0037
D(DIP(-5))	-0.271996	0.103256	-2.634200	0.0089
D(DIP(-6))	-0.208849	0.086282	-2.420544	0.0161
D(DIP(-7))	-0.124938	0.058426	-2.138379	0.0333

R-squared	0.575451	Mean dependent var	0.000101
Adjusted R-squared	0.565545	S.D. dependent var	0.034710
S.E. of regression	0.022878	Akaike info criterion	-4.691631
Sum squared resid	0.157024	Schwarz criterion	-4.594745
Log likelihood	730.5112	Durbin-Watson stat	1.985464

ΜΑΛΑΙΣΙΑ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Lag Length: 6 (Automatic based on AIC, MAXLAG=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.924797	0.0001
Test critical values:	1% level	-2.581349	
	5% level	-1.943090	
	10% level	-1.615220	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 57 198
Included observations: 142 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.737180	0.187826	-3.924797	0.0001
D(DFTSE(-1))	-0.063556	0.170190	-0.373443	0.7094
D(DFTSE(-2))	0.081205	0.154750	0.524747	0.6006
D(DFTSE(-3))	-0.015364	0.137074	-0.112085	0.9109
D(DFTSE(-4))	-0.101230	0.120492	-0.840139	0.4023
D(DFTSE(-5))	-0.101820	0.107640	-0.945934	0.3459
D(DFTSE(-6))	-0.215289	0.081430	-2.643840	0.0092

R-squared	0.463313	Mean dependent var	-0.000677
Adjusted R-squared	0.439460	S.D. dependent var	0.134061
S.E. of regression	0.100370	Akaike info criterion	-1.711863
Sum squared resid	1.360014	Schwarz criterion	-1.566154
Log likelihood	128.5423	Durbin-Watson stat	1.999331

Null Hypothesis: DIP has a unit root
Exogenous: None
Lag Length: 12 (Automatic based on AIC, MAXLAG=14)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.895562	0.0556
Test critical values:	1% level	-2.577660	
	5% level	-1.942574	
	10% level	-1.615547	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Date: 09/16/06 Time: 09:31
Sample(adjusted): 16 198
Included observations: 183 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-0.581039	0.306526	-1.895562	0.0597
D(DIP(-1))	-0.938219	0.301358	-3.113310	0.0022
D(DIP(-2))	-1.073726	0.290605	-3.694795	0.0003
D(DIP(-3))	-0.973914	0.280714	-3.469413	0.0007
D(DIP(-4))	-0.928818	0.266633	-3.483506	0.0006
D(DIP(-5))	-0.838701	0.250675	-3.345765	0.0010
D(DIP(-6))	-0.838828	0.233585	-3.591107	0.0004
D(DIP(-7))	-0.844320	0.217603	-3.880088	0.0001
D(DIP(-8))	-0.851958	0.202398	-4.209318	0.0000
D(DIP(-9))	-0.855738	0.183242	-4.669995	0.0000
D(DIP(-10))	-0.826815	0.158740	-5.208619	0.0000
D(DIP(-11))	-0.791583	0.119521	-6.622983	0.0000
D(DIP(-12))	-0.229102	0.072690	-3.151778	0.0019

R-squared	0.848849	Mean dependent var	0.000652
Adjusted R-squared	0.838179	S.D. dependent var	0.089184
S.E. of regression	0.035876	Akaike info criterion	-3.749107
Sum squared resid	0.218805	Schwarz criterion	-3.521110
Log likelihood	356.0432	Durbin-Watson stat	1.999923

ΦΙΛΙΠΠΙΝΕΣ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on AIC, MAXLAG=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.636318	0.0000
Test critical values:	1% level	-2.585050	
	5% level	-1.943612	
	10% level	-1.614897	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 142 257
Included observations: 116 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.785363	0.090937	-8.636318	0.0000

R-squared	0.393385	Mean dependent var	-0.000934
Adjusted R-squared	0.393385	S.D. dependent var	0.132939
S.E. of regression	0.103540	Akaike info criterion	-1.689126
Sum squared resid	1.232872	Schwarz criterion	-1.665388
Log likelihood	98.96929	Durbin-Watson stat	1.975731

Null Hypothesis: DIP has a unit root
Exogenous: None
Lag Length: 12 (Automatic based on AIC, MAXLAG=15)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.080825	0.0022
Test critical values:	1% level	-2.574553	
	5% level	-1.942142	
	10% level	-1.615825	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 16 257
Included observations: 242 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-0.876329	0.284446	-3.080825	0.0023
D(DIP(-1))	-0.418359	0.276185	-1.514780	0.1312
D(DIP(-2))	-0.496294	0.262533	-1.890402	0.0600
D(DIP(-3))	-0.432438	0.250562	-1.725867	0.0857
D(DIP(-4))	-0.415657	0.240432	-1.728793	0.0852
D(DIP(-5))	-0.407104	0.228215	-1.783861	0.0758
D(DIP(-6))	-0.416751	0.215032	-1.938092	0.0538
D(DIP(-7))	-0.409855	0.198982	-2.059761	0.0406
D(DIP(-8))	-0.395571	0.181711	-2.176928	0.0305
D(DIP(-9))	-0.350775	0.161404	-2.173274	0.0308
D(DIP(-10))	-0.441942	0.136339	-3.241497	0.0014
D(DIP(-11))	-0.494636	0.104031	-4.754717	0.0000
D(DIP(-12))	-0.157280	0.064350	-2.444125	0.0153

R-squared	0.696871	Mean dependent var	-6.83E-05
Adjusted R-squared	0.680987	S.D. dependent var	0.093530
S.E. of regression	0.052827	Akaike info criterion	-2.991361
Sum squared resid	0.639072	Schwarz criterion	-2.803938
Log likelihood	374.9546	Durbin-Watson stat	1.978621

ΣΙΓΚΑΠΟΥΡΗ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on AIC, MAXLAG=14)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-12.18748	0.0000
Test critical values:	1% level	-2.576814	
	5% level	-1.942456	
	10% level	-1.615622	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 15 210
Included observations: 196 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.866099	0.071065	-12.18748	0.0000

R-squared	0.432351	Mean dependent var	-0.000911
Adjusted R-squared	0.432351	S.D. dependent var	0.152375
S.E. of regression	0.114803	Akaike info criterion	-1.486110
Sum squared resid	2.570045	Schwarz criterion	-1.469385
Log likelihood	146.6388	Durbin-Watson stat	1.993676

Null Hypothesis: DIP has a unit root
Exogenous: None
Lag Length: 13 (Automatic based on AIC, MAXLAG=14)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.368284	0.0008
Test critical values:	1% level	-2.576936	
	5% level	-1.942473	
	10% level	-1.615611	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 17 210
Included observations: 194 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-2.030154	0.602727	-3.368284	0.0009
D(DIP(-1))	0.310595	0.586684	0.529407	0.5972
D(DIP(-2))	-0.101264	0.561661	-0.180294	0.8571
D(DIP(-3))	-0.122914	0.522782	-0.235115	0.8144
D(DIP(-4))	-0.081719	0.484980	-0.168499	0.8664
D(DIP(-5))	-0.067956	0.448292	-0.151588	0.8797
D(DIP(-6))	-0.125819	0.410870	-0.306226	0.7598
D(DIP(-7))	-0.253899	0.375897	-0.675448	0.5003
D(DIP(-8))	-0.424236	0.341586	-1.241959	0.2159
D(DIP(-9))	-0.498774	0.305736	-1.631389	0.1046
D(DIP(-10))	-0.620137	0.263341	-2.354878	0.0196
D(DIP(-11))	-0.762087	0.211252	-3.607483	0.0004
D(DIP(-12))	-0.335184	0.147338	-2.274933	0.0241
D(DIP(-13))	-0.109618	0.074408	-1.473207	0.1424

R-squared	0.893912	Mean dependent var	-0.000859
Adjusted R-squared	0.886250	S.D. dependent var	0.209656
S.E. of regression	0.070710	Akaike info criterion	-2.391025
Sum squared resid	0.899988	Schwarz criterion	-2.155200
Log likelihood	245.9294	Durbin-Watson stat	2.001720

TAIBAN

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Lag Length: 6 (Automatic based on AIC, MAXLAG=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.268672	0.0000
Test critical values:	1% level	-2.581349	
	5% level	-1.943090	
	10% level	-1.615220	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 285 426
Included observations: 142 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.876019	0.205220	-4.268672	0.0000
D(DFTSE(-1))	-0.064807	0.185515	-0.349333	0.7274
D(DFTSE(-2))	0.115700	0.170086	0.680241	0.4975
D(DFTSE(-3))	0.021198	0.151542	0.139880	0.8890
D(DFTSE(-4))	-0.045058	0.132892	-0.339058	0.7351
D(DFTSE(-5))	0.020542	0.115537	0.177798	0.8591
D(DFTSE(-6))	-0.153647	0.083470	-1.840740	0.0679

R-squared	0.556343	Mean dependent var	-0.001570
Adjusted R-squared	0.536625	S.D. dependent var	0.137273
S.E. of regression	0.093444	Akaike info criterion	-1.854868
Sum squared resid	1.178792	Schwarz criterion	-1.709158
Log likelihood	138.6956	Durbin-Watson stat	2.001919

Null Hypothesis: DIP has a unit root
Exogenous: None
Lag Length: 13 (Automatic based on AIC, MAXLAG=17)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.313076	0.0010
Test critical values:	1% level	-2.570614	
	5% level	-1.941598	
	10% level	-1.616181	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 17 426
Included observations: 410 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.024810	0.309323	-3.313076	0.0010
D(DIP(-1))	-0.726594	0.303675	-2.392668	0.0172
D(DIP(-2))	-1.065517	0.294353	-3.619868	0.0003
D(DIP(-3))	-1.140292	0.277226	-4.113216	0.0000
D(DIP(-4))	-1.147089	0.261718	-4.382922	0.0000
D(DIP(-5))	-1.071937	0.248562	-4.312550	0.0000
D(DIP(-6))	-1.036958	0.234767	-4.416966	0.0000
D(DIP(-7))	-0.998673	0.219560	-4.548513	0.0000
D(DIP(-8))	-1.012670	0.201429	-5.027435	0.0000
D(DIP(-9))	-1.064363	0.180302	-5.903215	0.0000
D(DIP(-10))	-1.214527	0.153990	-7.887031	0.0000
D(DIP(-11))	-1.286795	0.125454	-10.25708	0.0000
D(DIP(-12))	-0.657706	0.094751	-6.941427	0.0000
D(DIP(-13))	-0.161222	0.049234	-3.274583	0.0012

R-squared	0.886649	Mean dependent var	-0.000355
Adjusted R-squared	0.882928	S.D. dependent var	0.154595
S.E. of regression	0.052896	Akaike info criterion	-3.007428
Sum squared resid	1.108004	Schwarz criterion	-2.870290
Log likelihood	630.5226	Durbin-Watson stat	2.000606

ΤΑΥΛΑΝΔΗ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Lag Length: 3 (Automatic based on AIC, MAXLAG=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.803271	0.0000
Test critical values:	1% level	-2.582334	
	5% level	-1.943229	
	10% level	-1.615134	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 101 234
Included observations: 134 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-1.067851	0.156961	-6.803271	0.0000
D(DFTSE(-1))	0.081737	0.136897	0.597072	0.5515
D(DFTSE(-2))	0.294091	0.119018	2.470989	0.0148
D(DFTSE(-3))	0.188260	0.085915	2.191224	0.0302

R-squared	0.529909	Mean dependent var	-0.000182
Adjusted R-squared	0.519061	S.D. dependent var	0.204382
S.E. of regression	0.141739	Akaike info criterion	-1.040267
Sum squared resid	2.611681	Schwarz criterion	-0.953764
Log likelihood	73.69789	Durbin-Watson stat	2.009489

Null Hypothesis: DIP has a unit root
Exogenous: None
Lag Length: 13 (Automatic based on AIC, MAXLAG=14)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.993866	0.0444
Test critical values:	1% level	-2.575613	
	5% level	-1.942289	
	10% level	-1.615730	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 17 234
Included observations: 218 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-0.531827	0.266731	-1.993866	0.0475
D(DIP(-1))	-1.044419	0.265609	-3.932167	0.0001
D(DIP(-2))	-1.201389	0.268433	-4.475557	0.0000
D(DIP(-3))	-1.178229	0.255876	-4.604683	0.0000
D(DIP(-4))	-1.233010	0.239399	-5.150437	0.0000
D(DIP(-5))	-1.278929	0.224414	-5.698965	0.0000
D(DIP(-6))	-1.275567	0.210468	-6.060624	0.0000
D(DIP(-7))	-1.282378	0.194320	-6.599298	0.0000
D(DIP(-8))	-1.239349	0.178795	-6.931683	0.0000
D(DIP(-9))	-1.212833	0.161988	-7.487191	0.0000
D(DIP(-10))	-1.237554	0.145195	-8.523392	0.0000
D(DIP(-11))	-1.225947	0.131602	-9.315547	0.0000
D(DIP(-12))	-0.497603	0.115921	-4.292617	0.0000
D(DIP(-13))	-0.106388	0.067180	-1.583640	0.1148

R-squared	0.875553	Mean dependent var	0.000471
Adjusted R-squared	0.867622	S.D. dependent var	0.098935
S.E. of regression	0.035996	Akaike info criterion	-3.748731
Sum squared resid	0.264331	Schwarz criterion	-3.531378
Log likelihood	422.6117	Durbin-Watson stat	1.979335

ΧΟΝΓΚ-ΚΟΝΓΚ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on AIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.314505	0.0000
Test critical values:	1% level	-2.601596	
	5% level	-1.945987	
	10% level	-1.613496	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 35 98
Included observations: 64 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-1.157964	0.124318	-9.314505	0.0000
R-squared	0.579327	Mean dependent var	-0.000228	
Adjusted R-squared	0.579327	S.D. dependent var	0.324558	
S.E. of regression	0.210506	Akaike info criterion	-0.263099	
Sum squared resid	2.791717	Schwarz criterion	-0.229367	
Log likelihood	9.419173	Durbin-Watson stat	2.004292	

Null Hypothesis: DIP has a unit root
Exogenous: None
Lag Length: 7 (Automatic based on AIC, MAXLAG=11)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.602557	0.0097
Test critical values:	1% level	-2.591505	
	5% level	-1.944530	
	10% level	-1.614341	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 11 98
Included observations: 88 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-0.578067	0.222115	-2.602557	0.0110
D(DIP(-1))	-0.332433	0.210386	-1.580113	0.1180
D(DIP(-2))	-0.306835	0.196926	-1.558117	0.1232
D(DIP(-3))	-0.471241	0.188580	-2.498888	0.0145
D(DIP(-4))	0.142381	0.190094	0.749002	0.4561
D(DIP(-5))	-0.067600	0.163745	-0.412837	0.6808
D(DIP(-6))	-0.250727	0.136496	-1.836887	0.0699
D(DIP(-7))	-0.225754	0.096962	-2.328282	0.0224
R-squared	0.975094	Mean dependent var	-0.000284	
Adjusted R-squared	0.972914	S.D. dependent var	0.202070	
S.E. of regression	0.033256	Akaike info criterion	-3.882650	
Sum squared resid	0.088477	Schwarz criterion	-3.657437	
Log likelihood	178.8366	Durbin-Watson stat	1.962565	

3) PHILLIPS PERRON UNIT ROOT TEST

ΑΥΣΤΡΑΛΙΑ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Bandwidth: 2 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.185357	0.0000
Test critical values:	1% level	-2.601596	
	5% level	-1.945987	
	10% level	-1.613496	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.177570
HAC corrected variance (Bartlett kernel)	0.183729

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 66 129
Included observations: 64 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.898795	0.125340	-7.170881	0.0000

R-squared	0.449404	Mean dependent var	-8.26E-05
Adjusted R-squared	0.449404	S.D. dependent var	0.572385
S.E. of regression	0.424722	Akaike info criterion	1.140737
Sum squared resid	11.36449	Schwarz criterion	1.174470
Log likelihood	-35.50360	Durbin-Watson stat	2.012724

Null Hypothesis: DIP has a unit root
Exogenous: None
Bandwidth: 2 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.868897	0.0000
Test critical values:	1% level	-2.601596	
	5% level	-1.945987	
	10% level	-1.613496	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000116
HAC corrected variance (Bartlett kernel)	0.000124

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 66 129
Included observations: 64 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-0.836706	0.122417	-6.834867	0.0000

R-squared	0.425104	Mean dependent var	-0.000490
Adjusted R-squared	0.425104	S.D. dependent var	0.014321
S.E. of regression	0.010858	Akaike info criterion	-6.192294
Sum squared resid	0.007428	Schwarz criterion	-6.158561
Log likelihood	199.1534	Durbin-Watson stat	2.047088

KINA

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Bandwidth: 2 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-9.798004	0.0000
Test critical values:	1% level	-2.581705	
	5% level	-1.943140	
	10% level	-1.615189	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.010758
HAC corrected variance (Bartlett kernel)	0.011190

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 12 150
Included observations: 139 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.816165	0.083621	-9.760236	0.0000

R-squared	0.408390	Mean dependent var	0.000138
Adjusted R-squared	0.408390	S.D. dependent var	0.135334
S.E. of regression	0.104094	Akaike info criterion	-1.679877
Sum squared resid	1.495306	Schwarz criterion	-1.658766
Log likelihood	117.7515	Durbin-Watson stat	2.035755

Null Hypothesis: DIP has a unit root
Exogenous: None
Bandwidth: 31 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-14.54983	0.0000
Test critical values:	1% level	-2.581705	
	5% level	-1.943140	
	10% level	-1.615189	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.015162
HAC corrected variance (Bartlett kernel)	0.008141

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 12 150
Included observations: 139 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.128590	0.084421	-13.36866	0.0000

R-squared	0.564285	Mean dependent var	9.36E-06
Adjusted R-squared	0.564285	S.D. dependent var	0.187216
S.E. of regression	0.123579	Akaike info criterion	-1.336704
Sum squared resid	2.107504	Schwarz criterion	-1.315593
Log likelihood	93.90094	Durbin-Watson stat	2.120608

ΙΝΔΟΝΗΣΙΑ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Bandwidth: 1 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.243242	0.0000
Test critical values:	1% level	-2.584707	
	5% level	-1.943563	
	10% level	-1.614927	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000225
HAC corrected variance (Bartlett kernel)	0.000218

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 34 151
Included observations: 118 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.272448	0.063450	-4.293937	0.0000

R-squared	0.136130	Mean dependent var	4.02E-05
Adjusted R-squared	0.136130	S.D. dependent var	0.016211
S.E. of regression	0.015067	Akaike info criterion	-5.544156
Sum squared resid	0.026561	Schwarz criterion	-5.520676
Log likelihood	328.1052	Durbin-Watson stat	2.063542

Null Hypothesis: DIP has a unit root
Exogenous: None
Bandwidth: 15 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-24.34513	0.0000
Test critical values:	1% level	-2.580897	
	5% level	-1.943027	
	10% level	-1.615260	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.007917
HAC corrected variance (Bartlett kernel)	0.002543

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 4 149
Included observations: 146 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.365451	0.077477	-17.62385	0.0000

R-squared	0.681735	Mean dependent var	-0.000517
Adjusted R-squared	0.681735	S.D. dependent var	0.158258
S.E. of regression	0.089281	Akaike info criterion	-1.987222
Sum squared resid	1.155819	Schwarz criterion	-1.966786
Log likelihood	146.0672	Durbin-Watson stat	2.090230

ΙΑΠΩΝΙΑ

Null Hypothesis: DFTSE has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-13.24482	0.0000
Test critical values:	1% level	-4.006311	
	5% level	-3.433278	
	10% level	-3.140478	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.009889
HAC corrected variance (Bartlett kernel)	0.009871

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 147 339
Included observations: 193 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.959036	0.072405	-13.24538	0.0000
C	-0.041829	0.032337	-1.293517	0.1974
@TREND(1)	0.000174	0.000130	1.335934	0.1832

R-squared	0.480091	Mean dependent var	0.000491
Adjusted R-squared	0.474618	S.D. dependent var	0.138275
S.E. of regression	0.100226	Akaike info criterion	-1.747356
Sum squared resid	1.908598	Schwarz criterion	-1.696641
Log likelihood	171.6199	F-statistic	87.72428
Durbin-Watson stat	1.997882	Prob(F-statistic)	0.000000

Null Hypothesis: DIP has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 11 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-24.28571	0.0000
Test critical values:	1% level	-3.985524	
	5% level	-3.423215	
	10% level	-3.134544	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000170
HAC corrected variance (Bartlett kernel)	0.000334

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 4 340
Included observations: 337 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.326758	0.051665	-25.67987	0.0000
C	0.005012	0.001454	3.448106	0.0006
@TREND(1)	-1.59E-05	7.35E-06	-2.163929	0.0312

R-squared	0.663801	Mean dependent var	2.62E-05
Adjusted R-squared	0.661788	S.D. dependent var	0.022491
S.E. of regression	0.013080	Akaike info criterion	-5.826633
Sum squared resid	0.057141	Schwarz criterion	-5.792626
Log likelihood	984.7877	F-statistic	329.7298
Durbin-Watson stat	1.982097	Prob(F-statistic)	0.000000

KOPEA

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Bandwidth: 5 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-11.04373	0.0000
Test critical values:	1% level	-2.580681	
	5% level	-1.942996	
	10% level	-1.615279	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.015461
HAC corrected variance (Bartlett kernel)	0.014707

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 171 318
Included observations: 148 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.906168	0.081891	-11.06559	0.0000

R-squared	0.454387	Mean dependent var	-0.001644
Adjusted R-squared	0.454387	S.D. dependent var	0.168907
S.E. of regression	0.124764	Akaike info criterion	-1.318053
Sum squared resid	2.288208	Schwarz criterion	-1.297801
Log likelihood	98.53591	Durbin-Watson stat	1.991066

Null Hypothesis: DIP has a unit root
Exogenous: None
Bandwidth: 11 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-19.99165	0.0000
Test critical values:	1% level	-2.572324	
	5% level	-1.941834	
	10% level	-1.616026	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.000549
HAC corrected variance (Bartlett kernel)	0.001210

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 4 318
Included observations: 315 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.071022	0.056304	-19.02204	0.0000

R-squared	0.535392	Mean dependent var	8.53E-06
Adjusted R-squared	0.535392	S.D. dependent var	0.034441
S.E. of regression	0.023475	Akaike info criterion	-4.662555
Sum squared resid	0.173044	Schwarz criterion	-4.650642
Log likelihood	735.3524	Durbin-Watson stat	1.976672

ΜΑΛΑΙΣΙΑ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Bandwidth: 6 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-10.46628	0.0000
Test critical values:	1% level	-2.580681	
	5% level	-1.942996	
	10% level	-1.615279	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.010838
HAC corrected variance (Bartlett kernel)	0.010399

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 51 198
Included observations: 148 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.847015	0.080720	-10.49325	0.0000

R-squared	0.428230	Mean dependent var	0.000946
Adjusted R-squared	0.428230	S.D. dependent var	0.138146
S.E. of regression	0.104460	Akaike info criterion	-1.673293
Sum squared resid	1.604045	Schwarz criterion	-1.653042
Log likelihood	124.8237	Durbin-Watson stat	2.018960

Null Hypothesis: DIP has a unit root
Exogenous: None
Bandwidth: 2 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-25.26562	0.0000
Test critical values:	1% level	-2.576875	
	5% level	-1.942465	
	10% level	-1.615617	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.002052
HAC corrected variance (Bartlett kernel)	0.001622

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 4 198
Included observations: 195 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.479919	0.062352	-23.73479	0.0000

R-squared	0.743832	Mean dependent var	0.000514
Adjusted R-squared	0.743832	S.D. dependent var	0.089724
S.E. of regression	0.045412	Akaike info criterion	-3.340958
Sum squared resid	0.400080	Schwarz criterion	-3.324173
Log likelihood	326.7434	Durbin-Watson stat	2.198955

ΦΙΛΙΠΠΙΝΕΣ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Bandwidth: 6 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-8.478232	0.0000
Test critical values:	1% level	-2.585050	
	5% level	-1.943612	
	10% level	-1.614897	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.010628
HAC corrected variance (Bartlett kernel)	0.008443

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Date: 09/16/06 Time: 09:37
Sample(adjusted): 142 257
Included observations: 116 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.785363	0.090937	-8.636318	0.0000

R-squared	0.393385	Mean dependent var	-0.000934
Adjusted R-squared	0.393385	S.D. dependent var	0.132939
S.E. of regression	0.103540	Akaike info criterion	-1.689126
Sum squared resid	1.232872	Schwarz criterion	-1.665388
Log likelihood	98.96929	Durbin-Watson stat	1.975731

Null Hypothesis: DIP has a unit root
Exogenous: None
Bandwidth: 0 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-21.57435	0.0000
Test critical values:	1% level	-2.574098	
	5% level	-1.942079	
	10% level	-1.615866	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.003357
HAC corrected variance (Bartlett kernel)	0.003357

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 4 257
Included observations: 254 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.295825	0.060063	-21.57435	0.0000

R-squared	0.647854	Mean dependent var	0.000132
Adjusted R-squared	0.647854	S.D. dependent var	0.097829
S.E. of regression	0.058054	Akaike info criterion	-2.850965
Sum squared resid	0.852670	Schwarz criterion	-2.837039
Log likelihood	363.0726	Durbin-Watson stat	2.080076

ΣΙΓΚΑΠΟΥΡΗ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Bandwidth: 5 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-12.11221	0.0000
Test critical values:	1% level	-2.576814	
	5% level	-1.942456	
	10% level	-1.615622	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.013112
HAC corrected variance (Bartlett kernel)	0.011750

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 15 210
Included observations: 196 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.866099	0.071065	-12.18748	0.0000

R-squared	0.432351	Mean dependent var	-0.000911
Adjusted R-squared	0.432351	S.D. dependent var	0.152375
S.E. of regression	0.114803	Akaike info criterion	-1.486110
Sum squared resid	2.570045	Schwarz criterion	-1.469385
Log likelihood	146.6388	Durbin-Watson stat	1.993676

Null Hypothesis: DIP has a unit root
Exogenous: None
Bandwidth: 6 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-35.54018	0.0000
Test critical values:	1% level	-2.576181	
	5% level	-1.942368	
	10% level	-1.615679	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.010239
HAC corrected variance (Bartlett kernel)	0.004077

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 4 210
Included observations: 207 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.527910	0.058611	-26.06851	0.0000

R-squared	0.767372	Mean dependent var	0.001312
Adjusted R-squared	0.767372	S.D. dependent var	0.210309
S.E. of regression	0.101435	Akaike info criterion	-1.733973
Sum squared resid	2.119557	Schwarz criterion	-1.717873
Log likelihood	180.4662	Durbin-Watson stat	2.531587

TAIBAN

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Bandwidth: 2 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-12.06655	0.0000
Test critical values:	1% level	-2.580681	
	5% level	-1.942996	
	10% level	-1.615279	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.009324
HAC corrected variance (Bartlett kernel)	0.010379

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 279 426
Included observations: 148 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.994987	0.082630	-12.04140	0.0000

R-squared	0.496560	Mean dependent var	-0.000518
Adjusted R-squared	0.496560	S.D. dependent var	0.136554
S.E. of regression	0.096890	Akaike info criterion	-1.823754
Sum squared resid	1.379978	Schwarz criterion	-1.803503
Log likelihood	135.9578	Durbin-Watson stat	1.982571

Null Hypothesis: DIP has a unit root
Exogenous: None
Bandwidth: 4 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-43.67519	0.0001
Test critical values:	1% level	-2.570440	
	5% level	-1.941574	
	10% level	-1.616197	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.006540
HAC corrected variance (Bartlett kernel)	0.002694

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Date: 09/16/06 Time: 19:04
Included observations: 423 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.451292	0.043418	-33.42566	0.0000

R-squared	0.725844	Mean dependent var	0.000241
Adjusted R-squared	0.725844	S.D. dependent var	0.154636
S.E. of regression	0.080967	Akaike info criterion	-2.187180
Sum squared resid	2.766512	Schwarz criterion	-2.177611
Log likelihood	463.5885	Durbin-Watson stat	2.289051

ΤΑΥΛΑΝΔΗ

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Bandwidth: 7 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-11.46690	0.0000
Test critical values:	1% level	-2.581951	
	5% level	-1.943175	
	10% level	-1.615168	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.020914
HAC corrected variance (Bartlett kernel)	0.020676

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 98 234
Included observations: 137 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-0.985309	0.085917	-11.46820	0.0000

R-squared	0.491621	Mean dependent var	-0.000615
Adjusted R-squared	0.491621	S.D. dependent var	0.203569
S.E. of regression	0.145146	Akaike info criterion	-1.014877
Sum squared resid	2.865173	Schwarz criterion	-0.993563
Log likelihood	70.51906	Durbin-Watson stat	1.995906

Null Hypothesis: DIP has a unit root
Exogenous: None
Bandwidth: 5 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-22.75755	0.0000
Test critical values:	1% level	-2.575011	
	5% level	-1.942205	
	10% level	-1.615784	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.003047
HAC corrected variance (Bartlett kernel)	0.002744

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 4 234
Included observations: 231 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.371248	0.061489	-22.30057	0.0000

R-squared	0.683767	Mean dependent var	0.000228
Adjusted R-squared	0.683767	S.D. dependent var	0.098378
S.E. of regression	0.055322	Akaike info criterion	-2.946963
Sum squared resid	0.703927	Schwarz criterion	-2.932061
Log likelihood	341.3742	Durbin-Watson stat	2.035891

<u>ΧΟΝΓΚ-ΚΟΝΓΚ</u>

Null Hypothesis: DFTSE has a unit root
Exogenous: None
Bandwidth: 3 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-9.270346	0.0000
Test critical values:	1% level	-2.601596	
	5% level	-1.945987	
	10% level	-1.613496	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.043621
HAC corrected variance (Bartlett kernel)	0.046795

Phillips-Perron Test Equation
Dependent Variable: D(DFTSE)
Method: Least Squares
Sample(adjusted): 35 98
Included observations: 64 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DFTSE(-1)	-1.157964	0.124318	-9.314505	0.0000

R-squared	0.579327	Mean dependent var	-0.000228
Adjusted R-squared	0.579327	S.D. dependent var	0.324558
S.E. of regression	0.210506	Akaike info criterion	-0.263099
Sum squared resid	2.791717	Schwarz criterion	-0.229367
Log likelihood	9.419173	Durbin-Watson stat	2.004292

Null Hypothesis: DIP has a unit root
Exogenous: None
Bandwidth: 14 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-15.21230	0.0000
Test critical values:	1% level	-2.589531	
	5% level	-1.944248	
	10% level	-1.614510	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.016104
HAC corrected variance (Bartlett kernel)	0.005039

Phillips-Perron Test Equation
Dependent Variable: D(DIP)
Method: Least Squares
Sample(adjusted): 4 98
Included observations: 95 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DIP(-1)	-1.201684	0.101732	-11.81226	0.0000

R-squared	0.597418	Mean dependent var	-0.002511
Adjusted R-squared	0.597418	S.D. dependent var	0.201065
S.E. of regression	0.127575	Akaike info criterion	-1.269760
Sum squared resid	1.529876	Schwarz criterion	-1.242877
Log likelihood	61.31362	Durbin-Watson stat	2.207601

4) VAR LAG ORDER SELECTION CRITERIA

ΑΥΣΤΡΑΛΙΑ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 132
Included observations: 61

Lag	LogL	LR	FPE	AIC	SC	HQ
0	156.6804	NA*	2.15E-05*	-5.071487*	-5.002278*	-5.044364*
1	157.3312	1.237584	2.40E-05	-4.961677	-4.754051	-4.880307
2	160.4957	5.810292	2.47E-05	-4.934285	-4.588240	-4.798667
3	162.3694	3.317414	2.65E-05	-4.864571	-4.380108	-4.674706
4	164.5691	3.750331	2.82E-05	-4.805545	-4.182665	-4.561433

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

ΚΙΝΑ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 152
Included observations: 128

Lag	LogL	LR	FPE	AIC	SC	HQ
0	194.0642	NA	0.000171	-3.001004	-2.956441	-2.982898
1	197.4486	6.610131	0.000172	-2.991385	-2.857696	-2.937066
2	215.8156	35.29900	0.000138	-3.215869	-2.993054	-3.125338
3	217.0260	2.288342	0.000144	-3.172281	-2.860340	-3.045537
4	245.4078	52.77246	9.82E-05	-3.553247	-3.152180	-3.390291
5	251.3805	10.91889	9.53E-05	-3.584070	-3.093878	-3.384903
6	257.2137	10.48157	9.26E-05	-3.612715	-3.033396	-3.377334
7	259.0176	3.184998	9.59E-05	-3.578400	-2.909956	-3.306808
8	266.3138	12.65428	9.12E-05	-3.629903	-2.872332	-3.322098
9	268.8603	4.336955	9.34E-05	-3.607191	-2.760495	-3.263174
10	289.6698	34.79089	7.19E-05	-3.869840	-2.934018	-3.489611
11	301.7306	19.78732	6.36E-05	-3.995791	-2.970842	-3.579349
12	332.6381	49.74180*	4.18E-05*	-4.416221*	-3.302146*	-3.963567*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

ΙΝΔΟΝΗΣΙΑ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 152
Included observations: 105

Lag	LogL	LR	FPE	AIC	SC	HQ
0	358.8455	NA	3.83E-06	-6.797056	-6.746505	-6.776572
1	394.6863	69.63362	2.09E-06	-7.403548	-7.251894*	-7.342095
2	400.2368	10.57236	2.03E-06	-7.433082	-7.180323	-7.330659
3	401.4387	2.243607	2.14E-06	-7.379785	-7.025924	-7.236393
4	402.9689	2.798137	2.24E-06	-7.332742	-6.877777	-7.148381
5	404.3107	2.402303	2.36E-06	-7.282108	-6.726040	-7.056778
6	406.7579	4.288533	2.43E-06	-7.252532	-6.595361	-6.986233
7	410.6756	6.715996	2.44E-06	-7.250963	-6.492689	-6.943696
8	422.1993	19.31601	2.12E-06	-7.394273	-6.534895	-7.046036
9	424.2861	3.418314	2.20E-06	-7.357830	-6.397350	-6.968625
10	440.2702	25.57458	1.76E-06	-7.586099	-6.524515	-7.155924
11	472.4581	50.27439*	1.03E-06*	-8.123011*	-6.960324	-7.651867*
12	475.5895	4.771694	1.05E-06	-8.106467	-6.842676	-7.594354

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

ΙΑΠΩΝΙΑ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 340
Included observations: 182

Lag	LogL	LR	FPE	AIC	SC	HQ
0	683.4557	NA	1.92E-06	-7.488524	-7.453315	-7.474251
1	694.1521	21.04019	1.78E-06*	-7.562111*	-7.456484*	-7.519291*
2	696.6194	4.799019	1.81E-06	-7.545268	-7.369224	-7.473902
3	697.5945	1.875285	1.87E-06	-7.512028	-7.265566	-7.412116
4	703.4386	11.11024*	1.84E-06	-7.532293	-7.215413	-7.403834
5	704.4481	1.896802	1.90E-06	-7.499429	-7.112132	-7.342424
6	708.8182	8.116022	1.89E-06	-7.503497	-7.045782	-7.317946
7	710.9675	3.944232	1.93E-06	-7.483159	-6.955026	-7.269062
8	714.3872	6.200558	1.94E-06	-7.476782	-6.878231	-7.234138
9	717.6061	5.765748	1.96E-06	-7.468199	-6.799230	-7.197009
10	718.3730	1.356883	2.03E-06	-7.432671	-6.693284	-7.132934
11	722.0387	6.404785	2.04E-06	-7.428996	-6.619192	-7.100713
12	723.3582	2.276558	2.10E-06	-7.399541	-6.519319	-7.042711

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion

ΚΟΡΕΑ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 319
Included observations: 137

Lag	LogL	LR	FPE	AIC	SC	HQ
0	415.9404	NA	8.14E-06	-6.042926	-6.000299*	-6.025603
1	424.6154	16.97008	7.60E-06	-6.111174	-5.983292	-6.059206
2	432.3367	14.87886	7.20E-06*	-6.165499*	-5.952362	-6.078885*
3	433.1631	1.568318	7.54E-06	-6.119169	-5.820776	-5.997909
4	436.7864	6.770697	7.59E-06	-6.113671	-5.730023	-5.957766
5	437.0646	0.511652	8.01E-06	-6.059337	-5.590435	-5.868787
6	438.4622	2.529903	8.33E-06	-6.021345	-5.467188	-5.796150
7	442.0603	6.408373	8.38E-06	-6.015479	-5.376067	-5.755637
8	446.1606	7.182975	8.38E-06	-6.016943	-5.292276	-5.722456
9	452.0211	10.09555*	8.16E-06	-6.044104	-5.234183	-5.714972
10	452.3840	0.614477	8.62E-06	-5.991007	-5.095831	-5.627229
11	453.2440	1.431275	9.03E-06	-5.945168	-4.964737	-5.546745
12	458.2693	8.216509	8.92E-06	-5.960136	-4.894449	-5.527067

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

ΜΑΛΑΙΣΙΑ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 198
Included observations: 137

Lag	LogL	LR	FPE	AIC	SC	HQ
0	332.5561	NA	2.75E-05	-4.825637	-4.783010	-4.808314
1	357.2863	48.37719	2.03E-05	-5.128267	-5.000384*	-5.076298
2	366.1708	17.12053	1.89E-05	-5.199574	-4.986436	-5.112960
3	372.4245	11.86827	1.83E-05	-5.232474	-4.934082	-5.111214
4	374.9917	4.797266	1.87E-05	-5.211558	-4.827911	-5.055653
5	382.0771	13.03295	1.79E-05	-5.256600	-4.787698	-5.066050
6	385.6772	6.517008	1.80E-05	-5.250763	-4.696606	-5.025567
7	391.2078	9.849995	1.76E-05	-5.273106	-4.633694	-5.013265
8	392.2756	1.870685	1.84E-05	-5.230301	-4.505634	-4.935814
9	399.8458	13.04062	1.75E-05	-5.282421	-4.472499	-4.953288
10	400.5289	1.156833	1.84E-05	-5.233999	-4.338822	-4.870221
11	414.2306	22.80282	1.60E-05	-5.375630	-4.395198	-4.977206
12	430.8343	27.14769*	1.33E-05*	-5.559626*	-4.493939	-5.126556*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

ΦΙΛΙΠΠΙΝΕΣ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 258
Included observations: 105

Lag	LogL	LR	FPE	AIC	SC	HQ
0	234.4096	NA	4.10E-05	-4.426850	-4.376298	-4.406366
1	245.1978	20.95995	3.60E-05	-4.556149	-4.404495*	-4.494696
2	251.5193	12.04079	3.45E-05*	-4.600367*	-4.347609	-4.497944*
3	255.0023	6.501704	3.48E-05	-4.590520	-4.236659	-4.447129
4	257.3025	4.206004	3.60E-05	-4.558142	-4.103178	-4.373782
5	259.4930	3.922041	3.72E-05	-4.523676	-3.967608	-4.298346
6	261.0319	2.696743	3.91E-05	-4.476798	-3.819627	-4.210499
7	262.1218	1.868471	4.14E-05	-4.421368	-3.663094	-4.114100
8	265.9222	6.370211	4.16E-05	-4.417566	-3.558189	-4.069329
9	267.2509	2.176423	4.39E-05	-4.366683	-3.406202	-3.977477
10	267.8342	0.933350	4.69E-05	-4.301604	-3.240020	-3.871429
11	277.4894	15.08057*	4.23E-05	-4.409323	-3.246635	-3.938179
12	282.4235	7.518589	4.17E-05	-4.427115	-3.163324	-3.915002

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

ΣΙΓΚΑΠΟΥΡΗ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 211
Included observations: 185

Lag	LogL	LR	FPE	AIC	SC	HQ
0	265.1512	NA	0.000199	-2.844878	-2.810063	-2.830769
1	297.3000	63.25498	0.000147	-3.149190	-3.044746	-3.106861
2	333.2025	69.86417	0.000104	-3.494081	-3.320007*	-3.423533*
3	334.9424	3.348247	0.000107	-3.469648	-3.225945	-3.370881
4	335.4349	0.937056	0.000111	-3.431729	-3.118397	-3.304743
5	339.1842	7.052703	0.000111	-3.429018	-3.046057	-3.273814
6	339.7269	1.009166	0.000115	-3.391642	-2.939052	-3.208218
7	343.3807	6.715067	0.000116	-3.387899	-2.865680	-3.176257
8	356.0794	23.06362	0.000106	-3.481940	-2.890090	-3.242078
9	358.7889	4.862452	0.000107	-3.467988	-2.806510	-3.199907
10	359.5954	1.429893	0.000111	-3.433464	-2.702356	-3.137164
11	388.3324	50.32864	8.49E-05	-3.700891	-2.900154	-3.376372
12	394.0043	9.810700*	8.34E-05*	-3.718965*	-2.848599	-3.366227

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

ΤΑΙΒΑΝ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 427
Included observations: 137

Lag	LogL	LR	FPE	AIC	SC	HQ
0	260.7668	NA	7.84E-05	-3.777618	-3.734990	-3.760295
1	279.0678	35.80038	6.36E-05	-3.986391	-3.858508*	-3.934422
2	288.0887	17.38337	5.92E-05	-4.059689	-3.846551	-3.973075
3	293.8704	10.97269	5.76E-05	-4.085700	-3.787308	-3.964440
4	303.6519	18.27779	5.30E-05	-4.170101	-3.786454	-4.014196
5	307.8137	7.655290	5.29E-05	-4.172463	-3.703561	-3.981913
6	312.9618	9.319187	5.20E-05	-4.189224	-3.635067	-3.964028
7	317.8291	8.668706	5.14E-05	-4.201884	-3.562473	-3.942043
8	319.0381	2.118021	5.36E-05	-4.161140	-3.436474	-3.866653
9	321.1873	3.702205	5.51E-05	-4.134121	-3.324199	-3.804988
10	323.5912	4.070899	5.65E-05	-4.110821	-3.215644	-3.747043
11	357.8561	57.02479*	3.64E-05	-4.552644	-3.572212	-4.154220*
12	362.1589	7.035140	3.63E-05*	-4.557064*	-3.491377	-4.123994

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

ΤΑΥΛΑΝΔΗ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 235
Included observations: 126

Lag	LogL	LR	FPE	AIC	SC	HQ
0	241.7883	NA	7.62E-05	-3.806163	-3.761143	-3.787873
1	263.8586	43.08969	5.72E-05	-4.092994	-3.957933	-4.038123
2	275.2105	21.80282	5.09E-05	-4.209691	-3.984589*	-4.118239
3	277.9627	5.198535	5.19E-05	-4.189884	-3.874741	-4.061851
4	282.5422	8.504837	5.15E-05	-4.199082	-3.793899	-4.034469
5	285.5518	5.493747	5.23E-05	-4.183362	-3.688138	-3.982168
6	287.7225	3.893532	5.39E-05	-4.154326	-3.569062	-3.916551
7	290.5563	4.992812	5.49E-05	-4.135814	-3.460509	-3.861459
8	293.2492	4.659204	5.61E-05	-4.115067	-3.349721	-3.804131
9	296.5644	5.630469	5.68E-05	-4.104196	-3.248810	-3.756680
10	298.6511	3.477819	5.87E-05	-4.073826	-3.128399	-3.689729
11	325.5502	43.97794	4.09E-05	-4.437305	-3.401837	-4.016626
12	339.0052	21.57079*	3.53E-05*	-4.587385*	-3.461876	-4.130126*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

ΧΟΝΓΚ-ΚΟΝΓΚ

VAR Lag Order Selection Criteria
Endogenous variables: DFTSE DIP
Exogenous variables: C
Sample: 1 99
Included observations: 61

Lag	LogL	LR	FPE	AIC	SC	HQ
0	46.75314	NA	0.000790	-1.467316	-1.398107	-1.440192
1	48.94963	4.176931	0.000839	-1.408185	-1.200558	-1.326814
2	66.54176	32.30030	0.000537	-1.853828	-1.507783	-1.718210
3	119.9628	94.58150	0.000106	-3.474190	-2.989727	-3.284324
4	154.5824	59.02363*	3.91E-05*	-4.478112*	-3.855231*	-4.233999*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

5) VAR ESTIMATION OUTPUT

ΑΥΣΤΡΑΛΙΑ

DFTSE = 0.09250250647*DFTSE(-1) + 2.630854811*DIP(-1) - 0.01175718866

DIP = 0.002226432844*DFTSE(-1) + 0.02993442977*DIP(-1) + 0.00358819004

ΚΙΝΑ

DFTSE = 0.1341140519*DFTSE(-1) + 0.1097548673*DFTSE(-2) - 0.1334243994*DFTSE(-3) + 0.06426086536*DFTSE(-4) - 0.03800975101*DFTSE(-5) + 0.02252486146*DFTSE(-6) + 0.08035266775*DFTSE(-7) + 0.07871981419*DFTSE(-8) + 0.03371846825*DFTSE(-9) - 0.1315260277*DFTSE(-10) - 0.03299640566*DFTSE(-11) - 0.05385392643*DFTSE(-12) - 0.0005342523553*DIP(-1) - 0.2280965773*DIP(-2) - 0.1357779271*DIP(-3) - 0.2667647902*DIP(-4) - 0.09936058791*DIP(-5) + 0.2184833924*DIP(-6) + 0.07017182954*DIP(-7) + 0.3510048605*DIP(-8) + 0.2821081637*DIP(-9) + 0.2683980136*DIP(-10) + 0.2163242666*DIP(-11) + 0.01286412939*DIP(-12) - 0.0007223192105

DIP = - 0.04869910661*DFTSE(-1) + 0.1441615467*DFTSE(-2) - 0.01395225696*DFTSE(-3) + 0.08728656121*DFTSE(-4) - 0.04476069885*DFTSE(-5) - 0.004193003524*DFTSE(-6) + 0.1023569795*DFTSE(-7) - 0.03465154738*DFTSE(-8) - 0.07223998916*DFTSE(-9) + 0.05582499885*DFTSE(-10) - 0.0437185261*DFTSE(-11) - 0.04337977932*DFTSE(-12) - 0.204524649*DIP(-1) - 0.244869015*DIP(-2) - 0.1355456608*DIP(-3) - 0.09506918326*DIP(-4) - 0.05554108219*DIP(-5) + 0.07361712384*DIP(-6) + 0.03508642907*DIP(-7) - 0.03964172982*DIP(-8) - 0.0001113448967*DIP(-9) - 0.2111329255*DIP(-10) - 0.0511345593*DIP(-11) + 0.5931157012*DIP(-12) + 0.01430871825

ΙΝΔΟΝΗΣΙΑ

DFTSE = 0.6302637194*DFTSE(-1) - 0.129661424*DFTSE(-2) + 0.1713027231*DFTSE(-3) + 0.03122932553*DFTSE(-4) + 0.1443610329*DFTSE(-5) + 0.000556988242*DFTSE(-6) + 0.263838372*DFTSE(-7) - 0.5853674159*DFTSE(-8) + 0.2405441327*DFTSE(-9) - 0.08241103265*DFTSE(-10) - 0.03477781837*DFTSE(-11) - 0.01256802165*DIP(-1) - 0.004694256001*DIP(-2) - 0.008166957088*DIP(-3) + 0.008751895811*DIP(-4) + 0.0007681924496*DIP(-5) + 0.007357502347*DIP(-6) + 0.006207068715*DIP(-7) + 0.005220247748*DIP(-8) + 0.01770897189*DIP(-9) + 0.02925307193*DIP(-10) - 0.02720826985*DIP(-11) + 0.003917902922

DIP = - 1.650151484*DFTSE(-1) - 0.2567057848*DFTSE(-2) - 1.318248044*DFTSE(-3) - 0.518573789*DFTSE(-4) - 0.5097926198*DFTSE(-5) - 0.5084426349*DFTSE(-6) + 0.02743776998*DFTSE(-7) + 0.9057810847*DFTSE(-8) - 0.4777926996*DFTSE(-9) + 0.9114788192*DFTSE(-10) - 1.437764071*DFTSE(-11) - 0.993297082*DIP(-1) - 0.9144621272*DIP(-2) - 0.8089228874*DIP(-3) - 0.8454082418*DIP(-4) - 0.8376640826*DIP(-5) - 0.9139657441*DIP(-6) - 0.8756118055*DIP(-7) - 0.8484304294*DIP(-8) - 0.7885790288*DIP(-9) - 0.8228694986*DIP(-10) - 0.5587684765*DIP(-11) + 0.06211064343

ΙΑΠΩΝΙΑ

DFTSE = 0.05178470587*DFTSE(-1) - 0.04578313087*DIP(-1) + 0.0003014509238

DIP = 0.01437443067*DFTSE(-1) - 0.2940062679*DIP(-1) + 0.0005123071072

ΚΟΡΕΑ

DFTSE = 0.06560695521*DFTSE(-1) - 0.05985070102*DFTSE(-2) + 1.225655728*DIP(-1) + 0.8382789841*DIP(-2) - 0.005635386628

DIP = 0.02489844481*DFTSE(-1) + 0.03042300493*DFTSE(-2) - 0.2051367322*DIP(-1) + 0.1753690248*DIP(-2) + 0.00625829869

ΜΑΛΑΙΣΙΑ

DFTSE = 0.2126420206*DFTSE(-1) + 0.1787518102*DFTSE(-2) - 0.08179110662*DFTSE(-3) - 0.1159101804*DFTSE(-4) + 0.006994107704*DFTSE(-5) - 0.09512412251*DFTSE(-6) + 0.1580360092*DFTSE(-7) - 0.02756696846*DFTSE(-8) + 0.1586830069*DFTSE(-9) - 0.04267742473*DFTSE(-10) - 0.2086525164*DFTSE(-11) + 0.03161037657*DFTSE(-12) + 0.0444433812*DIP(-1) + 0.4512441316*DIP(-2) + 0.01347605457*DIP(-3) - 0.0659856624*DIP(-4) - 0.2442325984*DIP(-5) + 0.3009818349*DIP(-6) + 0.09402348063*DIP(-7) + 0.09967790497*DIP(-8) - 0.08980647548*DIP(-9) + 0.1251143328*DIP(-10) - 0.332968205*DIP(-11) - 0.1589224401*DIP(-12) - 0.002698717731

DIP = 0.02744873287*DFTSE(-1) + 0.009449112329*DFTSE(-2) + 0.09240668286*DFTSE(-3) + 0.009095855357*DFTSE(-4) + 0.08887493283*DFTSE(-5) + 0.03546659021*DFTSE(-6) + 0.03755842554*DFTSE(-7) + 0.003842351687*DFTSE(-8) + 0.0853440235*DFTSE(-9) - 0.0073265319*DFTSE(-10) + 0.003859150949*DFTSE(-11) + 0.0009943869043*DFTSE(-12) - 0.5021560712*DIP(-1) - 0.3586180058*DIP(-2) - 0.06238664416*DIP(-3) - 0.2055335923*DIP(-4) - 0.01166464129*DIP(-5) - 0.1031159677*DIP(-6) - 0.05117255024*DIP(-7) - 0.07795167458*DIP(-8) - 0.05970102294*DIP(-9) - 0.0883387144*DIP(-10) - 0.09940409939*DIP(-11) + 0.4041202007*DIP(-12) + 0.01250196454

ΦΙΛΙΠΠΙΝΕΣ

DFTSE = 0.2115552925*DFTSE(-1) - 0.08476608132*DFTSE(-2) - 0.1893794162*DIP(-1) - 0.4735114308*DIP(-2) + 0.000626396145

DIP = - 0.08308927603*DFTSE(-1) + 0.003042958185*DFTSE(-2) - 0.3992371022*DIP(-1) - 0.2376671199*DIP(-2) + 0.008267922666

ΣΙΓΚΑΠΟΥΡΗ

DFTSE = 0.1205240913*DFTSE(-1) + 0.02059006371*DFTSE(-2) - 0.01928593158*DFTSE(-3) + 0.03233212249*DFTSE(-4) - 0.0696023825*DFTSE(-5) - 0.07972683223*DFTSE(-6) + 0.1787694881*DFTSE(-7) + 0.1163582123*DFTSE(-8) - 0.09844045775*DFTSE(-9) + 0.0161510788*DFTSE(-10) - 0.1696158586*DFTSE(-11) - 0.01049627694*DFTSE(-12) + 0.0342360375*DIP(-1) + 0.07383649726*DIP(-2) + 0.04523800299*DIP(-3) - 0.08247862892*DIP(-4) - 0.1583896503*DIP(-5) - 0.02124094417*DIP(-6) + 0.2281082774*DIP(-7) + 0.2722257208*DIP(-8) + 0.0733243562*DIP(-9) - 0.2179505146*DIP(-10) - 0.233293562*DIP(-11) - 0.2556070448*DIP(-12) + 0.003975237188

DIP = 0.03080542603*DFTSE(-1) + 0.02735780414*DFTSE(-2) + 0.05842775814*DFTSE(-3) + 0.0005719874338*DFTSE(-4) + 0.1047174363*DFTSE(-5) + 0.01848072252*DFTSE(-6) + 0.02557481087*DFTSE(-7) + 0.009253537298*DFTSE(-8) - 0.004687184506*DFTSE(-9) + 0.007761278809*DFTSE(-10) + 0.04562731837*DFTSE(-11) - 0.02928287791*DFTSE(-12) - 0.7737322677*DIP(-1) - 0.5681216357*DIP(-2) - 0.2299718945*DIP(-3) - 0.156893895*DIP(-4) - 0.1688060501*DIP(-5) - 0.2410702959*DIP(-6) - 0.2870911864*DIP(-7) - 0.3209412083*DIP(-8) - 0.2256438289*DIP(-9) - 0.2933551635*DIP(-10) - 0.3437550414*DIP(-11) + 0.1725827386*DIP(-12) + 0.02235034897

ΤΑΙΒΑΝ

DFTSE = 0.01189096019*DFTSE(-1) + 0.2183678332*DFTSE(-2) - 0.008556369079*DFTSE(-3) - 0.04030323394*DFTSE(-4) + 0.04276886453*DFTSE(-5) - 0.1512995124*DFTSE(-6) + 0.1800469882*DFTSE(-7) + 0.005016109775*DFTSE(-8) - 0.003527378267*DFTSE(-9) + 0.03173423873*DFTSE(-10) - 0.03743555308*DFTSE(-11) - 0.1443441033*DFTSE(-12) - 0.2111754001*DIP(-1) - 0.3177211825*DIP(-2) - 0.1745084005*DIP(-3) - 0.2647705786*DIP(-4) - 0.1899510568*DIP(-5) - 0.1087781541*DIP(-6) + 0.1862188545*DIP(-7) + 0.266148067*DIP(-8) + 0.11148173*DIP(-9) - 0.06247450809*DIP(-10) - 0.2540337525*DIP(-11) - 0.2669665188*DIP(-12) + 0.002870189402

DIP = 0.03161766831*DFTSE(-1) + 0.05103862333*DFTSE(-2) + 0.06501737246*DFTSE(-3) + 0.07091375704*DFTSE(-4) + 0.09663088743*DFTSE(-5) + 0.0388903221*DFTSE(-6) + 0.1200679626*DFTSE(-7) + 0.04757829365*DFTSE(-8) + 0.07810546586*DFTSE(-9) - 0.009720084357*DFTSE(-10) + 0.005460498911*DFTSE(-11) - 0.04303399108*DFTSE(-12) - 0.8738634303*DIP(-1) - 0.718083811*DIP(-2) - 0.6264039964*DIP(-3) - 0.5456541343*DIP(-4) - 0.3445846812*DIP(-5) - 0.3177241525*DIP(-6) - 0.2639951074*DIP(-7) - 0.2620987639*DIP(-8) - 0.3615090207*DIP(-9) - 0.5414025742*DIP(-10) - 0.4909171627*DIP(-11) + 0.09282148832*DIP(-12) + 0.02415704776

ΤΑΥΛΑΝΔΗ

DFTSE = - 0.03335631798*DFTSE(-1) + 0.1773579523*DFTSE(-2) - 0.05823914843*DFTSE(-3) - 0.1666336067*DFTSE(-4) - 0.02450904317*DFTSE(-5) + 0.07856047292*DFTSE(-6) + 0.07308690149*DFTSE(-7) + 0.05296519032*DFTSE(-8) + 0.07366495312*DFTSE(-9) + 0.02282044034*DFTSE(-10) - 0.2193028544*DFTSE(-11) + 0.08341384947*DFTSE(-12) + 0.5303649064*DIP(-1) + 0.7984375737*DIP(-2) + 0.500952911*DIP(-3) + 0.2221876513*DIP(-4) - 0.233307297*DIP(-5) - 0.2784174827*DIP(-6) - 0.5571883999*DIP(-7) - 0.1711518715*DIP(-8) - 0.1190951545*DIP(-9) + 0.2852263709*DIP(-10) + 0.216987058*DIP(-11) + 0.2044622479*DIP(-12) - 0.01371409975

DIP = 0.02315835265*DFTSE(-1) + 0.04319398074*DFTSE(-2) + 0.03727240363*DFTSE(-3) + 0.01444429049*DFTSE(-4) + 0.08966920493*DFTSE(-5) + 0.05059384871*DFTSE(-6) + 0.02830242847*DFTSE(-7) - 0.001565265388*DFTSE(-8) + 0.06403396081*DFTSE(-9) + 0.0105589604*DFTSE(-10) + 0.05062070667*DFTSE(-11) + 0.004228059981*DFTSE(-12) - 0.5646732542*DIP(-1) - 0.3529801569*DIP(-2) - 0.2026871701*DIP(-3) - 0.309915478*DIP(-4) - 0.3606365203*DIP(-5) - 0.3466239288*DIP(-6) - 0.2901419667*DIP(-7) - 0.1791240681*DIP(-8) - 0.1025614685*DIP(-9) - 0.1731375426*DIP(-10) - 0.2194509254*DIP(-11) + 0.4118187223*DIP(-12) + 0.02207379925

ΧΟΝΓΚ-ΚΟΝΓΚ

DFTSE = - 0.1460650913*DFTSE(-1) + 0.02048714413*DFTSE(-2) + 0.1117607478*DFTSE(-3) - 0.2003396944*DFTSE(-4) - 0.07066075212*DIP(-1) + 0.1547837376*DIP(-2) - 0.141490902*DIP(-3) - 0.155726366*DIP(-4) + 0.03334565871

DIP = 0.04129564802*DFTSE(-1) + 0.050451099*DFTSE(-2) + 0.03914689765*DFTSE(-3) - 0.0006258141751*DFTSE(-4) - 0.2272183438*DIP(-1) - 0.2402278128*DIP(-2) - 0.2298551613*DIP(-3) + 0.7335212279*DIP(-4) - 0.008650788246

6) GRANGER CAUSALITY TESTS IN VAR MODELS

ΑΥΣΤΡΑΛΙΑ

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 132
Included observations: 64

Dependent variable: DFTSE

Exclude	Chi-sq	df	Prob.
DIP	0.246621	1	0.6195
All	0.246621	1	0.6195

Dependent variable: DIP

Exclude	Chi-sq	df	Prob.
DFTSE	0.509511	1	0.4754
All	0.509511	1	0.4754

ΚΙΝΑ

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 152
Included observations: 128

Dependent variable: DFTSE

Exclude	Chi-sq	df	Prob.
DIP	15.74336	12	0.2033
All	15.74336	12	0.2033

Dependent variable: DIP

Exclude	Chi-sq	df	Prob.
DFTSE	24.06243	12	0.0199
All	24.06243	12	0.0199

ΙΝΔΟΝΗΣΙΑ

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 152
Included observations: 106

Dependent variable: DFTSE

Exclude	Chi-sq	df	Prob.
DIP	10.33526	11	0.5005
All	10.33526	11	0.5005

Dependent variable: DIP

Exclude	Chi-sq	df	Prob.
DFTSE	78.17640	11	0.0000
All	78.17640	11	0.0000

ΙΑΠΩΝΙΑ

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 340
Included observations: 193

Dependent variable: DFTSE

Exclude	Chi-sq	df	Prob.
DIP	0.007926	1	0.9291
All	0.007926	1	0.9291

Dependent variable: DIP

Exclude	Chi-sq	df	Prob.
DFTSE	2.167571	1	0.1409
All	2.167571	1	0.1409

ΚΟΡΕΑ

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 319
Included observations: 147

Dependent variable: DFTSE

Exclude	Chi-sq	df	Prob.
DIP	7.843646	2	0.0198
All	7.843646	2	0.0198

Dependent variable: DIP

Exclude	Chi-sq	df	Prob.
DFTSE	8.706511	2	0.0129
All	8.706511	2	0.0129

ΜΑΛΑΙΣΙΑ

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 198
Included observations: 137

Dependent variable: DFTSE

Exclude	Chi-sq	df	Prob.
DIP	7.929115	12	0.7906
All	7.929115	12	0.7906

Dependent variable: DIP

Exclude	Chi-sq	df	Prob.
DFTSE	37.36193	12	0.0002
All	37.36193	12	0.0002

ΦΙΛΙΠΠΙΝΕΣ

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 258
Included observations: 115

Dependent variable: DFTSE			
Exclude	Chi-sq	df	Prob.
DIP	7.608740	2	0.0223
All	7.608740	2	0.0223
Dependent variable: DIP			
Exclude	Chi-sq	df	Prob.
DFTSE	2.848512	2	0.2407
All	2.848512	2	0.2407

ΣΙΓΚΑΠΟΥΡΗ

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 211
Included observations: 185

Dependent variable: DFTSE			
Exclude	Chi-sq	df	Prob.
DIP	12.96063	12	0.3719
All	12.96063	12	0.3719
Dependent variable: DIP			
Exclude	Chi-sq	df	Prob.
DFTSE	9.157216	12	0.6894
All	9.157216	12	0.6894

ΤΑΙΒΑΝ

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 427
Included observations: 137

Dependent variable: DFTSE			
Exclude	Chi-sq	df	Prob.
DIP	13.52493	12	0.3321
All	13.52493	12	0.3321
Dependent variable: DIP			
Exclude	Chi-sq	df	Prob.
DFTSE	20.51454	12	0.0580
All	20.51454	12	0.0580

ΤΑΥΛΑΝΔΗ

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 235
Included observations: 126

Dependent variable: DFTSE			
Exclude	Chi-sq	df	Prob.
DIP	11.12097	12	0.5186
All	11.12097	12	0.5186
Dependent variable: DIP			
Exclude	Chi-sq	df	Prob.
DFTSE	32.75320	12	0.0011
All	32.75320	12	0.0011

ΧΟΝΓΚ ΚΟΝΓΚ

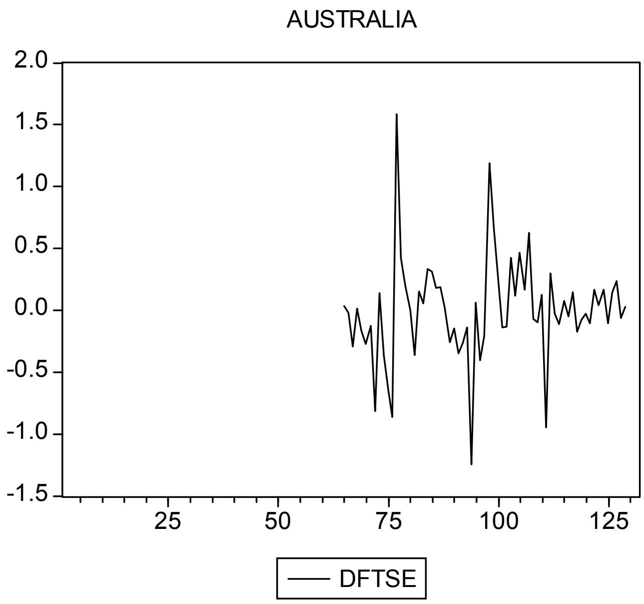
VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1 99
Included observations: 61

Dependent variable: DFTSE			
Exclude	Chi-sq	df	Prob.
DIP	1.832153	4	0.7666
All	1.832153	4	0.7666
Dependent variable: DIP			
Exclude	Chi-sq	df	Prob.
DFTSE	16.19185	4	0.0028
All	16.19185	4	0.0028

7) LINE GRAPHS OF THE

VARIABLES

OF THE VAR MODELS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0.0
-0.5
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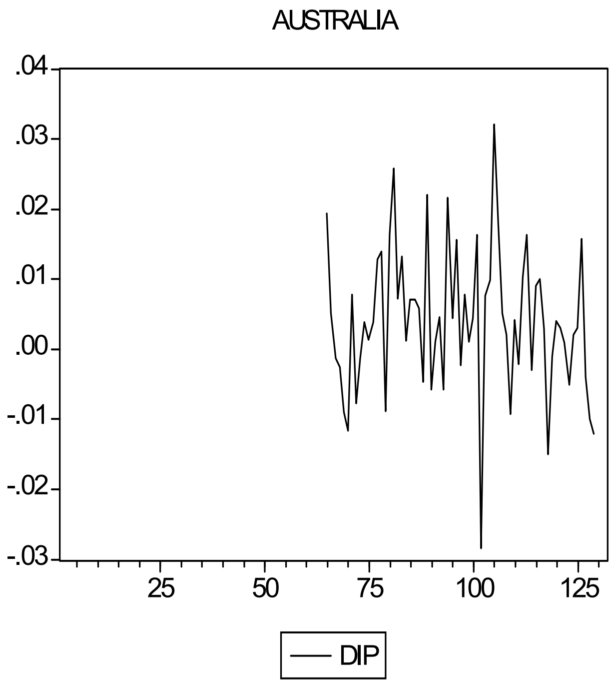
-1.5
25
50
75
100
125
DFTSE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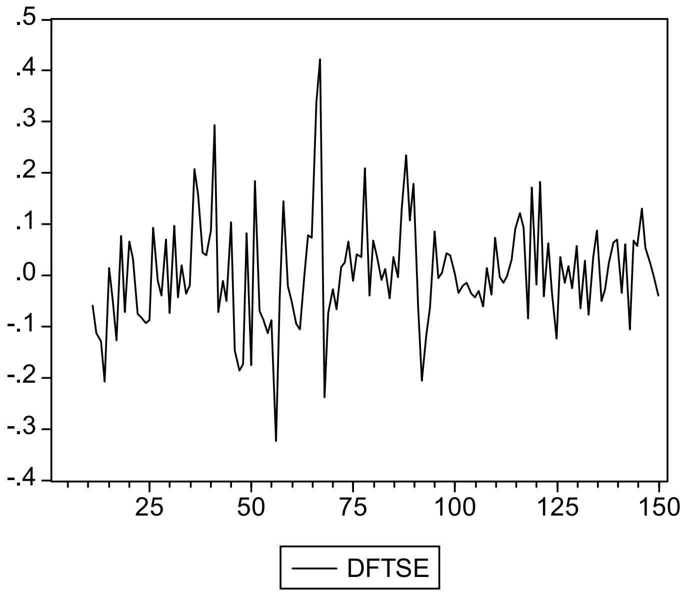
.02
.01
.00
-.01
-.02
-.03
25
50
75
100
125
DIP

KINA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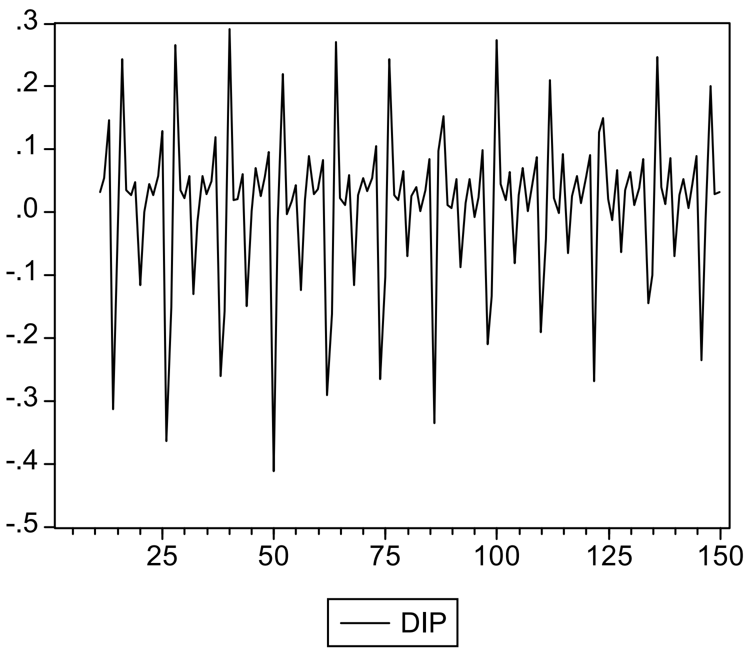
DFTSE

KINA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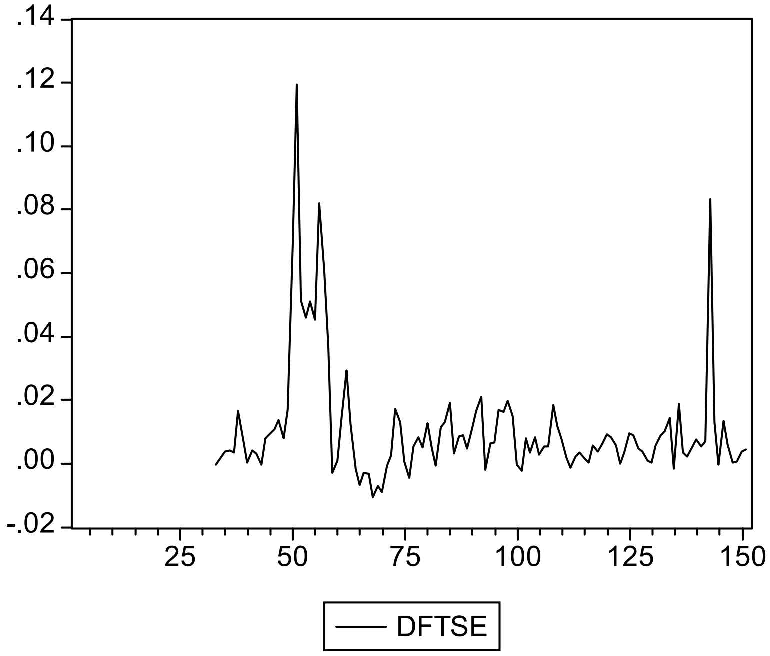
DIP

ΙΝΔΟΝΗΣΙΑ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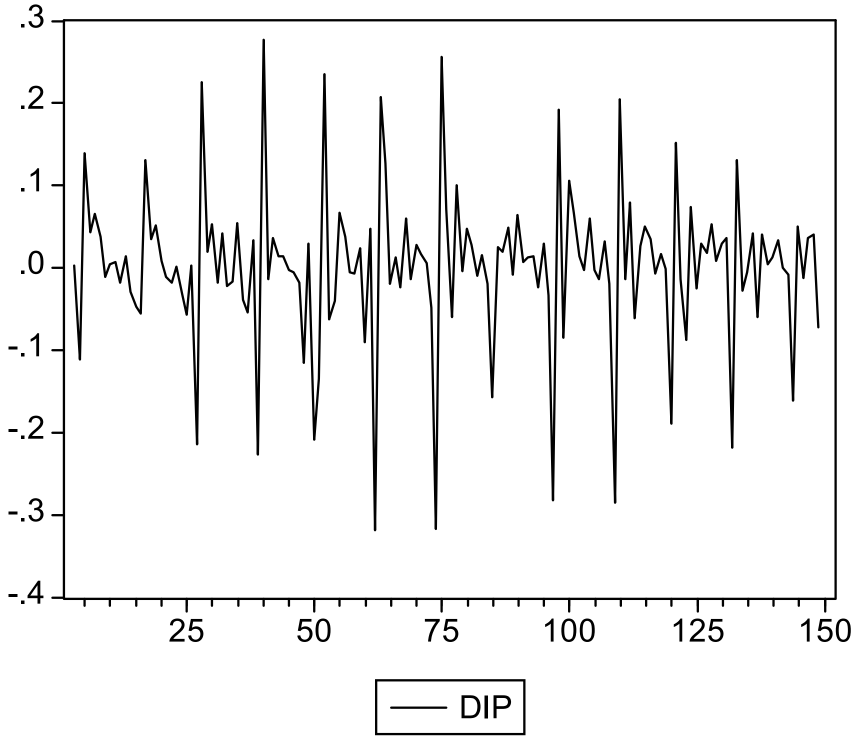
DFTSE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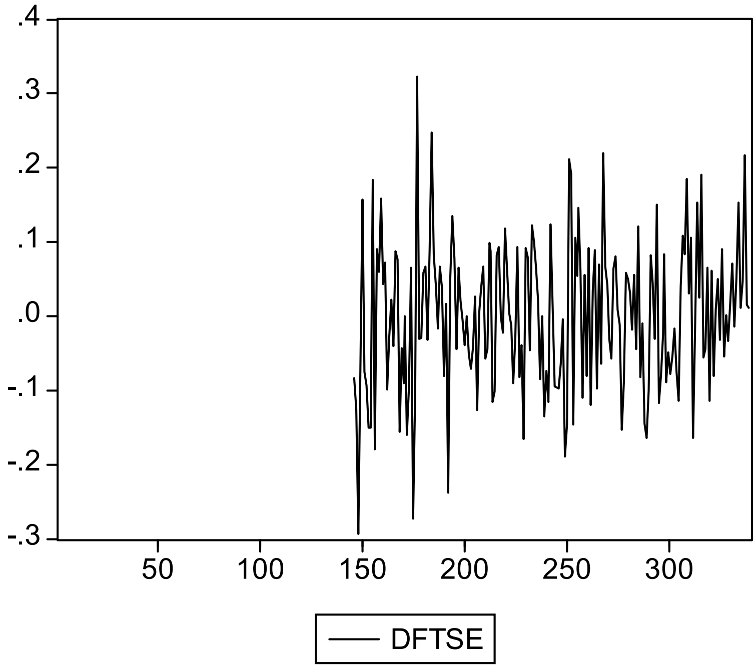
125
150
DIP

ΙΑΠΩΝΙΑ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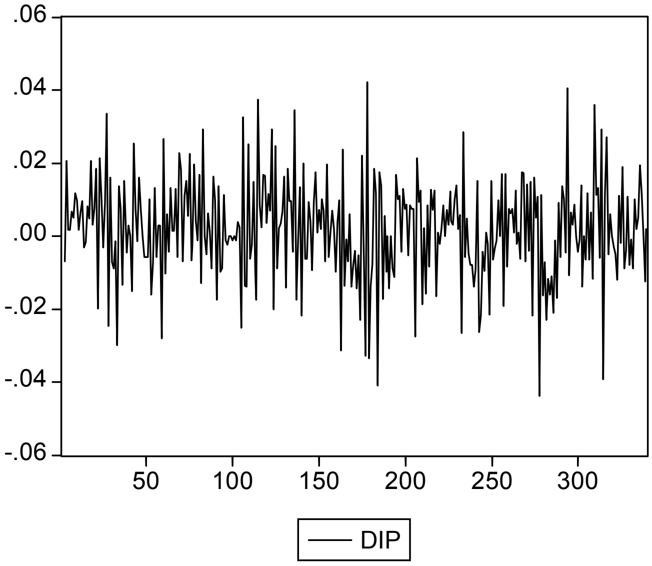
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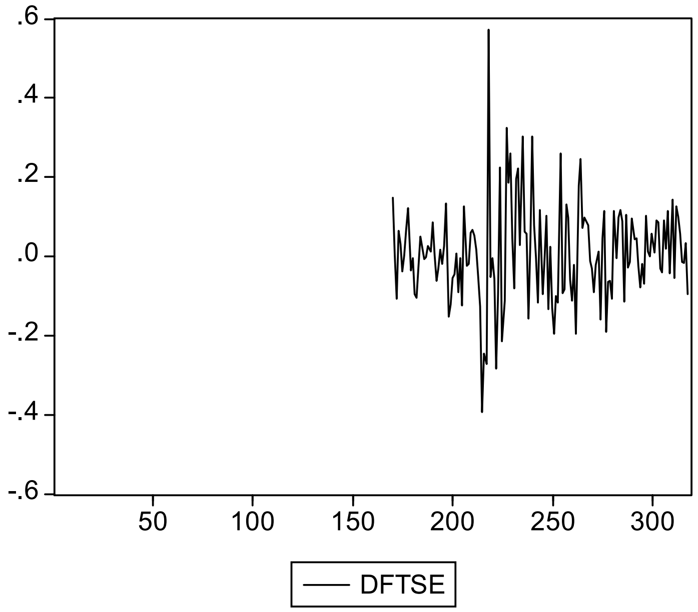
DIP

KOPEA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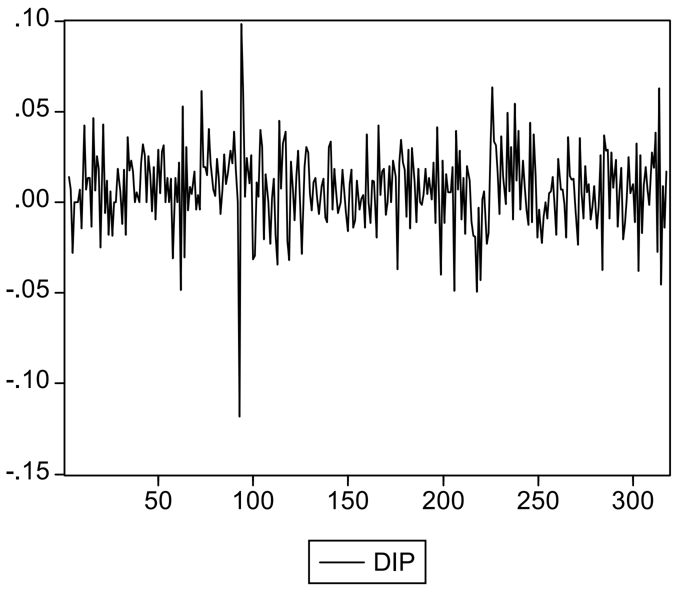
DFTSE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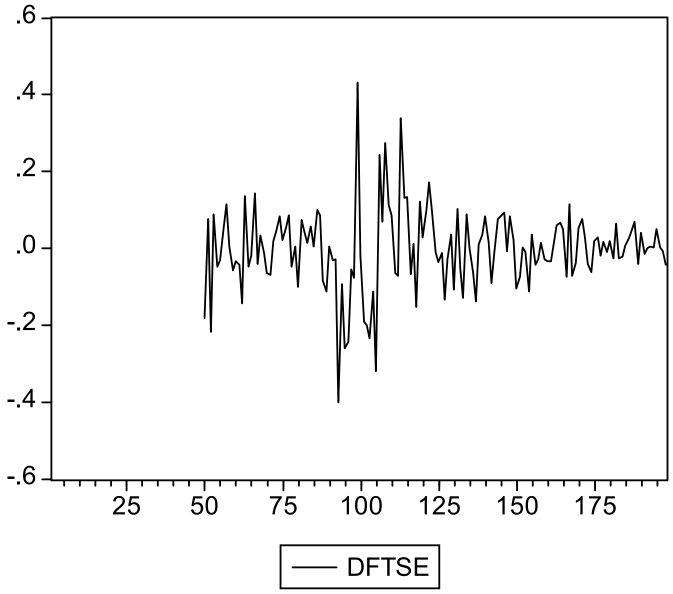
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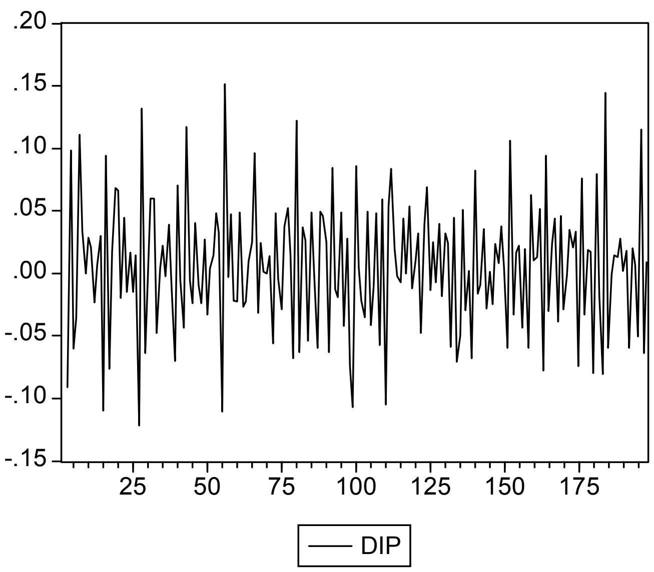
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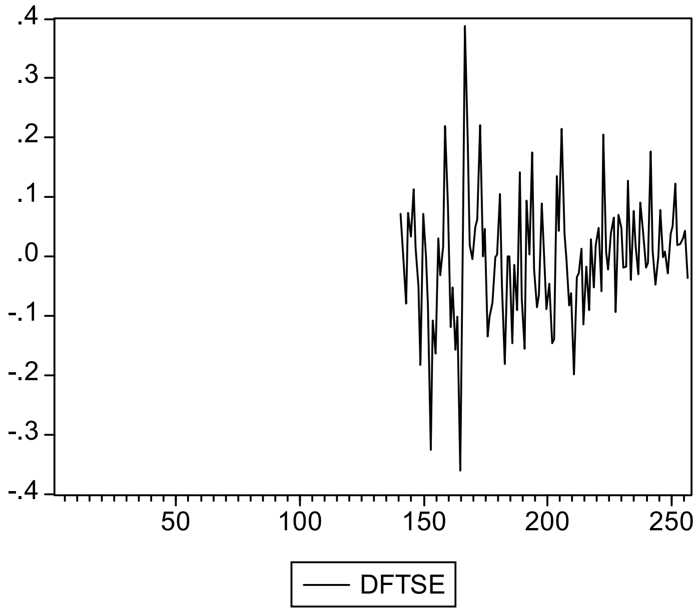
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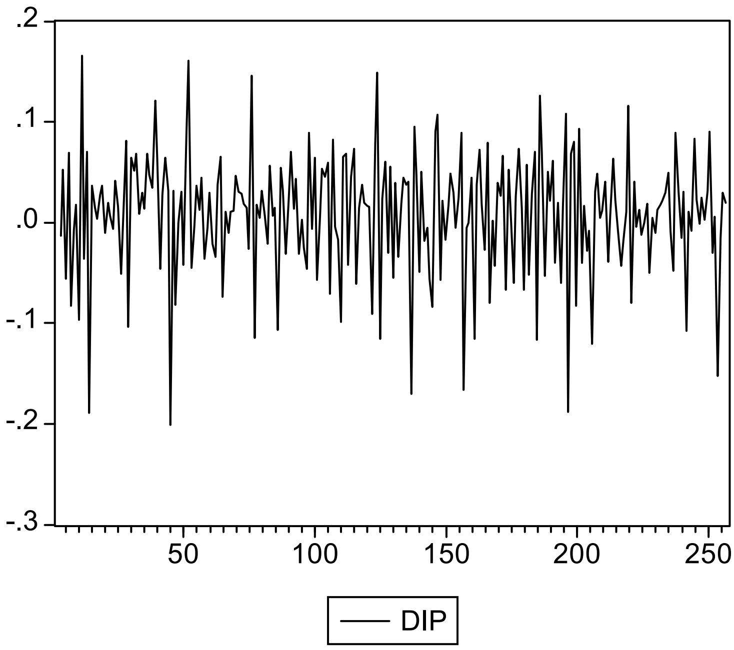
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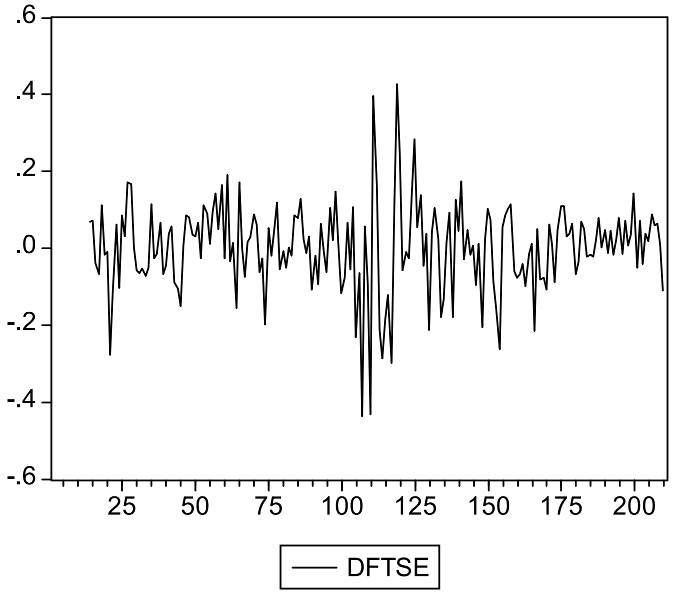
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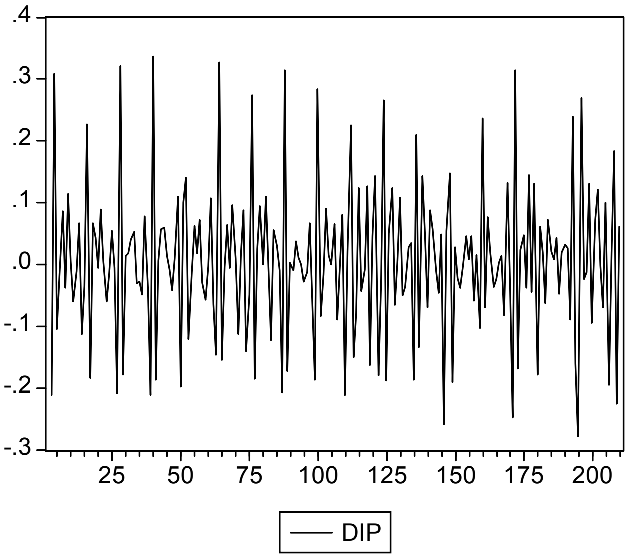
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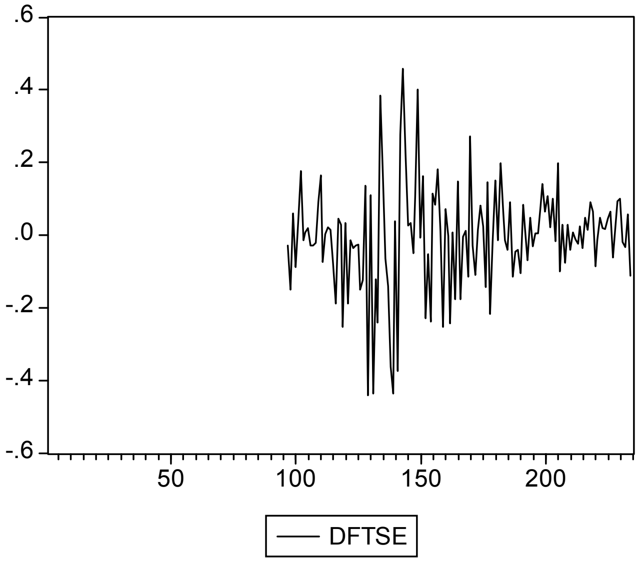
ΤΑΥΛΑΝΔΗ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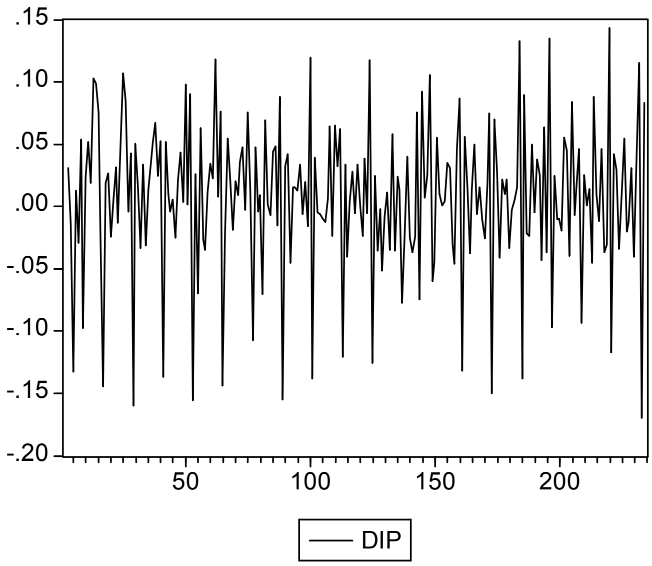
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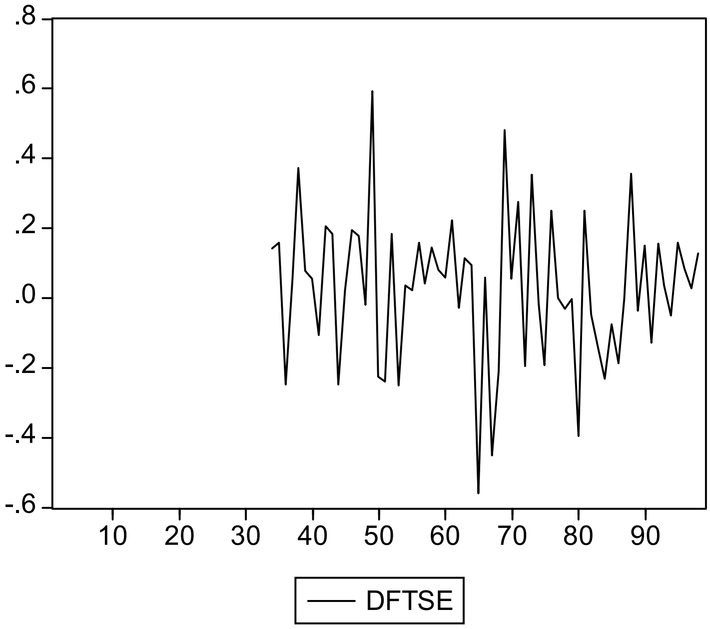
200
DIP

XONΓK KONΓK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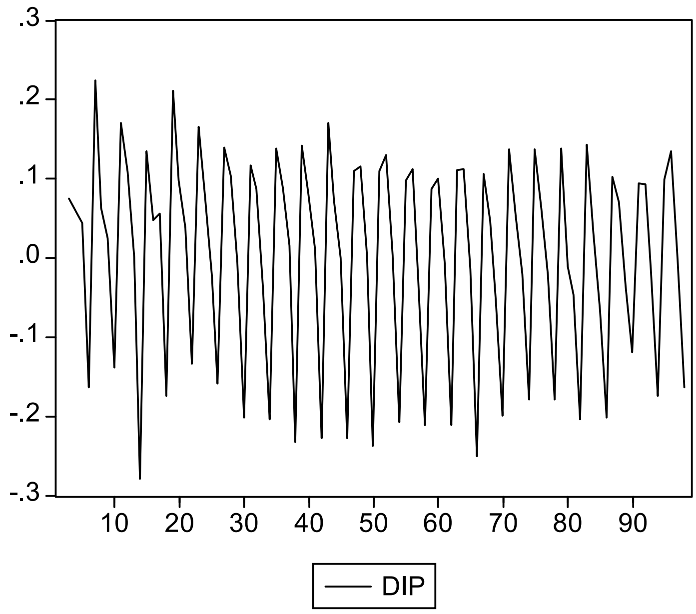
DFTSE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DIP