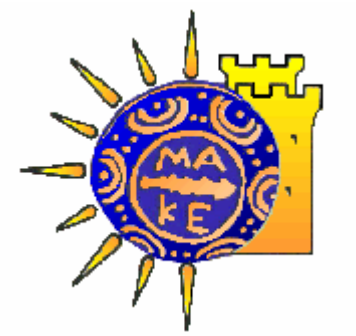

INTERDEPARTMENTAL PROGRAMME OF POSTGRADUATE STUDIES (I.P.P.S.) IN ECONOMICS (MASTER IN ECONOMICS)

Thesis Title: The relationship between oil prices, gold prices and US stock market; a time varying investigation

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Abstract

The purpose of this research is to investigate the long-run and short-run relationship between oil prices and stock prices in the US economy over the period 01/01/1992 to 07/05/2010. For this purpose four aggregate and twelve sector indices has been examined. The Johansen cointegration method is employed and the cointegrating vectors are estimated using two different estimation techniques: Maximum Likelihood Estimation (MLE) and Dynamic Ordinary Least Squares (DOLS). Moreover, as this investigation focuses on the possible time variation, estimations are conducted using both full sample and rolling sample. The results of the cointegration analysis and the impulse responses imply the existence of a positive relation between oil prices and companies engaged in the oil related sectors. The econometric approach used suggests that gold prices should be taken into consideration and also there are findings that a negative relationship between gold prices and stock prices exists.

I. Introduction

In recent years there has been a growing body of research on the relationship between oil prices and stock market. Since asset prices are valuating using the present discounted value of future dividends/earnings the links between stock prices and oil prices can be attributed to changes in expected cash flows and discount rates. Expected cash flows can be affected by rising (decreasing) oil prices, as oil is a crucial input for the production process of the most companies and leads to higher (lower) business costs that dampen expected cash flows and consequently reduce (increase) stock prices. Discount rates that are strongly related with expected inflation and real interest rates can also be affected by rising (decreasing) oil prices which are often indicative of inflationary pressures causing central banks to rise (decrease) interest rates leading to a reduce (increase) in stock prices.

Initial research has focused on the long-run relationship between national stock markets or stock market indices of different economic sectors, that are more sensitive to oil prices, such as oil related industries (oil exploration, production etc), transportation industries (airlines, trucking etc) and manufacturing industries (aluminum, steel) and oil price movements. While initial scholars has emphasized on the major oil-consuming countries a few others are oriented to oil-based (oil exporting) countries.

The methodology used to investigate the long-run relationship between oil price changes and stock returns is mostly based on a vector autoregressive (VAR) framework. An exception is the study by Jones and Kaul (1996) that uses a cash-flow dividend valuation model. The majority of these early studies examine a vector autoregressive (VAR) model or a vector error correction model (VECM) while few more recently developed studies are using variance decomposition analysis and impulse responses to investigate the dynamic effects of oil price changes to the other explanatory, endogenous variables that are used in the vector autoregressive (VAR) model specification. Common variables that are used in the vector autoregressive (VAR) models, except of oil price changes and stock returns, are industrial production, interest rates and inflation. Moreover, except of oil prices, oil volatility is another important factor that is also examined in many researches in order to investigate the existence of links between oil volatility and stock price changes, using the same methods. Some notable scholars of those that focused on the described approach and followed the above methodology are Jones and Kaul (1996), Hung, Masulis and Stoll (1996), Sadorsky (1999) Hammoudeh, Dibooglu and Aleisa (2004), Park and Ratti (2008), Cong, Wei, Jiao and Fan (2008). The results of these studies are represented in section II.

In the former studies that investigate the relationship between oil price changes and stock returns the analysis is mostly based on a vector autoregressive (VAR) framework or on a vector error correction model (VECM), depending on the existence of cointegration relationship. In contrast, in the latter studies the analysis has been focused on the relationship between oil price risk and stock returns using multi-factor arbitrage pricing theory (APT) models. The majority of the studies that follow a multi-factor arbitrage pricing theory (APT) approach focus on the following major sources of risk:

- Market risk results from unexpected movements of general market prices. Most researches have deduced that the price of all securities in a particular market tend to move together as a result of their exposure to the same set of general risk factors.
- Interest rate risk is the exposure to adverse changes in interest rates. This type of market risk is especially important for bonds and interest rate derivatives. Such

changes generally affect securities inversely and the reason of this movement is tied up with the valuation of securities.

- Exchange rate risk is the exposure to adverse changes in exchange rates. All investors who invest internationally face the prospect of uncertainty in the returns after they convert the foreign rates back to their own currency.
- Commodity risk is the risk that is related with stocks that are highly sensitive to commodities such as oil and precious metals.
- Inflation risk is also a common factor affecting all securities. With uncertain inflation the real (inflation-adjusted) returns involve risk even if the nominal return is riskless (a treasury bond).

Some interesting researches that investigate the relations between stock returns and oil price risk that also concern about the risk factors discussed above are represented in section II. Although many efforts have been done and a variety of theoretical and empirical works has been developed in order to improve the understanding of asset pricings, there is no consensus in identifying the number and the nature of the factors that influence stock prices. The prepuce of this research is to investigate the dynamics of the stock returns and particularly the relationship between stock market and oil price changes. This investigation extends the modelling framework by adding in the modelling specification two more explanatory factors: exchange rates and gold prices. In the following two paragraphs the reasons why these variables are taken into consideration and how they are related with stock market are described.

Stock Market and exchange rates

The relationship between stock market and exchange rates is a controversial issue that has focused a lot of attention among the economists and has several important implications. The relationship between the two markets is often used to predict future trends in each other by investors. Theoretically in all the macroeconomically models stock prices might influence or be influenced by exchange rates. Blanchard (1981) using a model based on the IS-LM model, had shown how stock prices could be linked to output in a dynamic, closed economy macroeconomic model making the assumption of rational expectations, and Gavin (1989) extended the

model to the open economy and showed the existence of a complex dynamic relationship between the exchange rate and the stock market index, as both markets are influenced by common factors. In all the monetary models (Classical, Keynesian) that attempt to determine the exchange rates, the links between the two markets are provided from the macroeconomic fundamentals. The monetary approach is based on the interest parity condition. Money supply, interest rate, inflation and price level are the main variables in those models that also impact assets' price valuation. According to the 'flow-oriented' macroeconomic models of exchange rate determination (Dornbush and Fisher, 1980) that focus on the country's current account and trade balance performance, the relationship between exchange rates and stock prices is positive. A decrease in the exchange value of nation's currency increases exports, decreases the demand of imported goods and stimulates national competitiveness and thus affects current and future cash flows and thus companies' assets valuation. The results may vary depending on the characteristics of the country, whether the country is an export or an import dominant country. This approach is also followed by some investigations that focus on the industry characteristics and their different exposure on exchange rate fluctuations. On the other hand 'stock-oriented' portfolio balance models (Branson, et al, 1977, Frankel, 1983) that focuses on the theory of arbitrage, suggest that a higher real interest rate reduces the present value of firms' future cash flows and thus the relationship between stock prices and exchange rates in negative. The main idea behind all portfolio balance models is that individuals allocate their wealth among alternative assets that mostly include foreign and domestic money and securities.

Stock market and gold prices

Gold is the world's oldest international currency and has played a significant role in most countries' currency systems in 1970-1800 for instance, most major countries, switch to the gold standard, a monetary standard under which the basic unit of currency is defined by a stated quantity of gold, linking their currencies to gold. Since the adoption of the gold standard the primarily role of gold in the monetary system has changed and a global market of gold as an asset has developed. The process of rebalancing reserve portfolios has led Central banks to be major holders of gold for more than 100 years. Although the adoption of gold standard followed by a

reduction in the amount of gold held by some central banks in the past few gears, they currently account for about 20% of above-ground stocks. As investment gold has been viewed as a hedge against inflation see for example J. Chua and R.S.Woodward (1982) and exchange rate devaluation see F. Capie et al (2005) and an extended literature has developed concerning these relationships. Also there is evidence that during time of political and economical crises and during market crashes as equity prices fall the price of gold rises. According to Smith, in times of economic uncertainty attention turns to investing in gold as a safe haven (2002, p.1). There are evidences that gold tends to move in the opposites direction than shares and bonds and thus the importance of gold has increased due the globalization and the increasing correlations among different assets prices. Finally the links among macroeconomic fundamentals such as GDP, CPI, PPI, unemployment and gold have also identified in many investigations (R. Christie-David et. al (2000)). Moreover as gold has numerous applications in industry (health, chemical and technology) the links between gold market and stock market indices have also investigated indicating that changes in gold prices have greater impact in the resource and mining sector industries (H. Chan, R. Faff (1998)). The links between the stock market and the gold market are described above as there are evidences that the two markets are either related directly in periods of economic instability or not, either indirectly as it seems that common macroeconomic fundamentals are related with the two markets.

II. Literature review

Jones and Kaul (1996) investigate the impact of oil price shocks to four countries' stock markets (United States, Canada, Japan and United Kingdom) using a cash-flow dividend valuation model. The evidence for United States and Canada suggests that the stock price movements caused by oil price shocks can be explained by cash flows (industrial production), thus oil prices seem to not affect stock returns. In contrast the evidence of Japan and United Kingdom suggests that oil price shocks are related with stock returns even when expected return variables (dividend yield, corporate bond yield, government bond yields, short-term treasury yields, default spread, term spread, shocks to default spreads and shocks to term spreads) are included in the model.

Hung, Masulis and Stoll (1996) is one of the primary scholars that investigates the relationship between oil prices and stock prices focusing on different sectors of US economy as they use a vary of indices and oil based companies' stocks, searching for the existence of lead-lag relations and feedback effects across oil market and stock market within a multivariable vector autoregressive (VAR) approach. In their (VAR) model they have included, except of oil future prices and stock prices both in log differences, t-bill returns. The results of their analysis of oil industry indices and individual oil companies indicate that oil futures lead / Granger cause Treasury bill rates and stock returns while there is no feedback from stocks to oil futures. Using the same approach they found that oil futures volatility lead the petroleum stock index volatility. On the basis of Ross (1989) volatility is a measure of information flow. As measure of the volatility is used the square of the residuals of a regression of returns on its own lagged values.

Sadorsky (1999) in order to investigate the interaction between oil prices and stock returns (S&P 500) an unrestricted vector autoregressive (VAR) model was estimated to capture the evolution and interdependencies between industrial production, interest rates, real oil prices and real stock returns. The dynamic effects of the shocks to the endogenous variables are investigating with the use of variance decomposition and impulse response functions. The results suggest that oil price movements can affect the economic variables but this relationship is not bidirectional. As measure of volatility, Sadorsky (1999) uses the standardized residuals of a GARCH (1,1) model of oil prices to their own lagged value but he includes only oil price changes in the vector autoregressive (VAR) framework as there is strong correlation between these two variables and the results remain unchanged from the variable selection. Some interesting results are deduced by the decomposition of the sample at 1986 the dynamics of the oil price shocks or the structure of the economy has changed seem to have changed after 1986 as oil price movements explain a larger fraction of the forecast error variance in real stock returns that do interest rates. Moreover the evidence suggest that oil price shocks and oil volatility shocks have a larger impact on the US economy than negative shocks and consequently oil price shocks appear to have asymmetric effects. Oil volatility is measured as the standardized residuals of a GARCH model of oil prices to their own lagged values.

Hammoudeh, Dibooglu and Aleisa (2004) in their analysis they use a vector error correction model (VECM) which is comprised of the 3 month futures and five

S&P oil sector stock indices the evidence indicate the existence of a unidirectional relationship running from oil prices to the oil sensitive stocks.

A quite different approach is also used to investigate the short-run relationship between oil price changes and stock market returns. They investigate the spillover effect between the two markets. Analytically they use an ARCH model in order to estimate the mean and variance of the oil futures and in addition they apply a GARCH model in the oil sensitive stocks, including the mean and variance they obtained from the oil futures. They deduce that mean and variance spillovers are statistically significant. Moreover they extent their analysis to a multivariate GARCH-M model that included the spot, future oil price changes and the oil-based stock prices and indicate the existence of cross-market effects.

Another research that uses a vector autoregressive (VAR) approach is that of Park and Ratti (2008) that focuses on the impact of an oil price shock on the real stock returns in US and 13 European countries. In their vector autoregressive (VAR) model short-term interest rates, industrial production, real stock returns and real oil prices were included. The results of orthogonalized impulse responses indicate that oil price shocks in most countries (US and ten of the thirteen countries) have a negative impact. Exceptions to these results are the findings about Norway, an oil exporting country, where oil price shocks have a positive impact on real stock returns. There are also evidences of many countries but not of US that an increase in volatility of oil prices significantly depresses real stock returns.

Measurement of monthly oil price volatility was given by the sum of squared first log differences in daily spot crude oil price (following Merton (1980) and Andersen et al. (2003)). Moreover the evidence suggests that the contribution of oil price shocks to variability in real stock returns is greater than that of interest rate. Finally there is some evidence of asymmetric effects on real stock returns of positive and negative oil price shocks for the US and Norway.

Cong, Wei, Jiao and Fan (2008) are also using an orthogonal impulse response analysis but their study focuses on the relationship between oil price shocks and China stock market. The evidence suggests that the impact of world oil price shocks to manufacturing index and oil-based companies is statistically significant. The results change when exchange rate movements are considered indicating more cases of statistically important impacts. As far as oil price volatility is concerned, the results are similar suggesting that oil price volatility does not affect the most variables except

of those that are oil sensitive such as mining index, petrochemicals and manufacturing indices. Oil price volatility was given by the sum of squared first log differences in daily spot crude oil price (following Merton (1980) and Andersen et al. (2003)).

Sadorsky (2001) uses a multifactor arbitrage pricing theory (APT) approach to investigate the relationship between Canadian oil and gas industry stock excess returns and future oil price changes. The multifactor model that is used to investigate the links between oil risk and oil and gas industry returns also includes market risk, interest rate risk and exchange rate risk. Interest rate risk factor is calculated as the premium between annual yield on the 90-day Canadian Treasury bill and the yield on the 30-day Canadian Treasury bill. As exchange rate risk factor is determined the growth rate of Canada-US exchange rate ($C/$US) that is most relevant to Canadian companies. Results indicate that there is a positive relationship between future oil price changes and Canadian oil and gas industry stock returns and negative between Canadian oil and gas industry stock returns, interest rates and exchange rates. The results of the estimated coefficient of interest rates (term premium) suggest that higher term premium increases borrowing costs and thereby lowering oil and gas industry stock returns. Moreover exchange rate estimated coefficient indicates that although a depreciation of Canadian currency improves the terms of trade in this case a depreciation of Canadian dollar increases firm costs.

Basher and Sadorsky (2006) investigate the relationship between oil price risk and 21 emerging stock markets using an international multi-factor model that allows for both unconditional and conditional risk factors. As factors they indicate in the model world market excess returns, oil price returns and exchange rate returns. Exchange rate risk is measured by a single variable following Ferson and Harvey (1994). In addition they investigate the existence of risk premium that is the payment of the risk determined by the sensitivity of the factors included in the model. In their approach they follow the methodology of Pettengill, Sundaram and Mathur (1995) who focus on the difference between expected returns and real returns. Consequently the relationship between beta and returns is investigating using an unconditional approach based on Fama and Macbeth (1973) and a conditional approach that separates positive market returns from negative market returns. The importance of additional risk factors (squared beta, total risk, skewness and kurtosis) is also investigating. Total risk is an appropriate risk measure for emerging markets because emerging markets are not fully integrated with the world stock market (Bekaert and Harvey (1995)).

Alternatively, total risk is an appropriate measure of risk when investors do not hold well diversified portfolios and is measured using the variance of market returns. The main results of their investigation of the unconditional models imply that the estimated coefficient on the market risk variable is negative, that is inconsistent with the expectation of a positive relation between risk and returns, while the results of the conditional models suggest that there is a positive trade off between market risk and stock returns. Moreover most conditional models suggest that there is a positive risk premium on the oil price risk of the emerging stock market returns but only when the oil price is up. The conditional models show that the regression coefficients of the total risk are positive (negative) in up (down) markets and statistically significant. The exchange rate risk factor is statistically insignificant indicating that exchange rate risk is not an important factor of excess stock returns in emerging stock markets. Also there is evidence that a significant asymmetric relationship exists between market betas and oil betas and returns in up and down markets.

Hammoudeh and Li (2005) investigate both short-run and long-run relationship between oil price growth and oil based countries (Mexico and Norway) and US oil and transportation industries stock returns. The cointegration test they apply following the autoregressive representation discussed in Johansen (1998) and Johansen and Juselius (1990) shows that there are cointegration vectors (long-run relationship) or equivalently common stochastic trends among the six endogenous variables in the system. (World capital market index (MSCI), the NYMEX 3-month futures price, the US Amex oil index, the US NYSE Transportation Index, Mexico's PLC Index and Norway's Oslo All Shares Index). In their system they also include four trading dummies (for Monday to Thursday) and three dummies, one for the 1987 stock market crash, one for the 1990 Gulf war and one for the 1997 Asian crisis. In order to observe the dynamic evolution of the cointegration tests and determine the robustness of the cointegration results they use the iterated Johansen test. Following Sephton and Larsen (1991) examine the results sensitivity to model specification and sample period selection. Sephton and Larsen (1991) use the first 80 observations to form the first test and subsequent test values are then obtained by adding 75 observations each time iteratively. Similarly Hammoudeh and Li (2005) use 80 observations in the first step and they add 20 observations each time iteratively in order to observe the test statistics evolution over time. Consequently they study a vector error correction model (VECM) to investigate the existence of causality relations running from oil prices to

oil sensitive stock returns. The evidence the vector error correction model (VECM) suggests that oil prices lead stock returns and oil price impact is positive on all the oil-sensitive returns but is negative on the world capital market' returns. Moreover they investigate the impact of the world capital market' returns and oil price changes to oil sensitive stocks through an arbitrage pricing theory (APT) framework. They investigate the links between these two risk factors and stock returns employing the methodology of Pettengill, Sundaram and Mathur (1995). Results of the arbitrage pricing theory APT approach imply that oil sensitivity is positive for all the indices and negative for US Transportation Index and not statistically significant for Mexico's PLC Index.

Nandha and Hammoudeh (2007) examine the relationship between beta risks and realized stock index returns in presence of oil and exchange rate sensitivities for 15 countries in the Asia-Pacific region using the international arbitrage pricing theory (APT) model. They focus on the short-run relationship between realized stock index returns, oil price changes measured in domestic currency and US dollars and exchange rates following the methodology proposed by Pettengill, Sundaram and Mathur (1995). In the first step they estimate the stock index returns to the World Market Index and oil price growth measured in domestic currency using rolling estimation. In the second step they determine as risk factor the market risk (beta) for each country and they investigate if there is any different investment behavior between the up (down) world market and up (down) oil prices. The results suggest that when oil prices are measured in US dollars none of the countries seem to be oil sensitive while when oil prices are expressed in local currency the results differ and some countries (Philippines and South Korea) estimated coefficients of oil price risk variable become statistically significant. However in addition to these countries most countries (India, Indonesia, Malaysia, Singapore, Taiwan and New Zealand) show a significant relationship between the domestic stock index returns and changes in the exchange rate, while when exchange rate is striped off the oil price in local currency and is included as an independed variable and the oil prices is expressed in US dollar, the oil sensitivity looses its power. A summary of the literature is provided in Table 1 where the methodology used and the main results are presented.

Table 1. Summary of the literature review

Methodology	Data, Sample period	Empirical Results	Paper
Cash-flow dividend valuation model	Quarterly data 1947-1991. United States, Canada, Japan, United Kingdom.	Oil price shock has not a significant impact for United States and Canada. In contrast evidence of Japan and United Kingdom imply that oil price shocks are related with stock returns.	Jones and Kaul (1996)
VAR-VECM Models	Daily data 09/10/1979 -16/03/1990. Indices of different economic sectors and oil based companies' stocks of US stock market.	Oil futures lead Treasury bill rates and stock returns of oil sensitive indices and companies. Oil futures volatility also leads the petroleum stock index volatility.	Hung et. Al (1996)
	Monthly data 01/1947-04/1996. US stock market (S&P 500 index)	Oil price movements can affect the economic variables.	Sadorsky (1999)
1)VAR-VECM Models 2)GARCH-MGARCH models	Daily data 7/17/1995-10/10/2001. US stock market S&P oil sector stock indices.	1) VECM. Oil prices impact oil sensitive stocks. 2) GARCH. Mean and variance spillovers are statistically significant. MGARCH-M indicates the existence of cross market effects.	Hammoudeh et. al (2004)
VAR-VECM Models	Monthly data 01/1986-12/2005. US and 13 European countries.	Oil price shocks have a negative impact in most countries (US and ten of thirteen countries) while in oil exporting countries (Norway) oil price shocks have a positive impact on stock returns. Oil price volatility in many countries significantly depresses stock returns.	Park and Ratti (2008)
	Monthly data 01/1996-12/2007. China stock market indices and individual oil company stock prices.	World oil price shocks impact manufacturing index and oil-based companies. The results of oil price volatility are similar.	Cong et. Al (2008)
APT Models	Monthly data 04/1983-04/1999. Canadian oil and gas industry stocks.	There is a positive relationship between future oil price changes and Canadian oil and gas industry stock returns.	Sadorsky (2001)
	Daily data 31/12/1992-31/10/2005 21 emerging stock markets.	Most conditional models suggest that there is a positive risk premium on the oil price risk when the market is up.	Basher and Sadorsky (2006)
1)VAR-VECM Models 2) APT models	Daily data 02/01/1986-30/09/2003. US oil and Transportation indices, Mexico's and Norway's stock market indices.	1) VECM. Oil price lead stock returns and has a positive impact on all indices except of that on the World index. 2) APT. Oil sensitivity is positive for all the indices and negative for US transportation index.	Hammoudeh and Li (2005)
APT Models	Weekly data 04/05/1994-30/06/2004. 15 countries' stock markets in the Asia-Pacific region.	Oil price risk is statistically significant for Philippines and South Korea.	Nandha and Hammoudeh (2006)

III. Data description

The purpose of this research is to investigate the links between US stock market and oil prices while two other markets are considered, foreign exchange and gold market. The sample data of the US stock market include four aggregate (S&P 500, S&P MidCap 400, S&P SmallCap 600, Amex oil index) and twelve sector indices (Automobile and Parts, Basic Materials, Financials, Food and Beverage, Health Care, Industrials, Oil and Gas, Personal & Household Goods, Real Estate, Technology, Telecommunications and Utilities), the exchange range data include four different currencies (Euro, Japanese Yean, Canadian Dollar and Australian Dollar) and one constructed index (NEER), spot oil prices (WTI), gold fixed prices and one index (MSCI World) for the world stock market performance. Data sample at higher frequencies are considered to contain more information than lower data and also as it is known economic forces acting to eliminate arbitrage opportunities work very quickly and thus daily data are selected for the analysis of this investigation. The data are over the period from 01/01/1992 to 07/05/2010 for all variables except of those of S&P smallcap 600 which are from 17/08/1996 to 07/05/2010.

The current research's analysis focuses on both aggregate and sector indices of US economy. The sample data include the following aggregate size-segment indexes categorized stocks based on market capitalization: The S&P 500, the S&P MidCap 400 and the S&P SmallCap 600. These indices are designed to reflect all sectors of the U.S. equity markets. The S&P 500 focuses on the large-cap sector of the market companies, considering leading companies in leading industries, it represents about 75% of the total U.S. equities market and is the most widely accepted barometer of the US market. The S&P MidCap 400 represents the mid-cap companies, 400 companies are included, and represents about 7% of the U.S. markets. The S&P SmallCap 600 represents small-cap companies with 600 companies included, and represents about 3% of the U.S. equities markets. Companies eligible for addition to the S&P 500, S&P MidCap 400, S&P SmallCap 600 have market capitalization of at least US$3.5 billion, between US$850 million and US$3.8 billion and between US$250 million and $US1.2 billion respectively. Another aggregate index included in the sample data is the Amex oil index which is a price-weighted index of the leading companies involved in the exploration, production, and development of petroleum. It

measures the performance of the oil industry through changes in the sum of the prices of component stocks.

The sector indexes which are subsets of the Dow Jones U.S. Index included in the data more analytically are Automobile and Parts (automobiles, auto parts and tires), Basic Materials (chemicals, forestry, paper, industrial metals and mining), Financials (banks, insurance, real estate, and financial services), Food and Beverage (beverages and food producers), Health Care (health care equipment and services and pharmaceuticals and biotechnology), Industrials (construction and materials, aerospace and defence, general industrials, electronic and electrical equipment, industrial transportation, support services), Oil and Gas (oil and gas producers, oil equipment and services, distribution and alternative fuels), Personal & Household Goods (household goods, home construction, leisure goods and personal goods and tobacco), Real Estate, Technology (software and computer service and technology hardware and equipment), Telecommunications (fixed line and mobile telecommunications), Utilities (electricity, gas, water and multi-utilities). The industry and sector classification ties are designed to reflect the performance of the most important industry sectors including the largest companies that engaged in each sector.

As a measure of equity market performance of developed countries I use the Morgan Stanley Capital International (MSCI) world index. MSCI world index is an index of 1,500 stocks from 24 different countries and is used as a common benchmark for ‘world’ or ‘global’ stock funds.

As for oil prices, the West Texas intermediate (WTI) also known as Texas light sweet prices are used. WTI is a type of crude oil produced in Texas and southern Oklahoma which is traded in the domestic spot market at Cushing, Oklahoma. It is used as a benchmark in oil pricing which serves as a reference for pricing a number of other crude streams and is also the underlying commodity of New York Mercantile Exchange’s oil future contracts.

The investigation also takes into consideration five different foreign exchange rates expressed as units of foreign currency per unit of the US Dollar. The exchange rates used are the Euro, the Japanese Yean, the Canadian Dollar and the Australian Dollar considered as currencies that are traded widely in currency markets outside their respective home areas and also that consist some of the most important trade partners’ currencies of US. These exchange rates along with British Pound, Swiss

Franc and Swedish Krona, which are not taken into consideration in this research, are referred as major currencies. The unadjusted weighted average value of a country's currency relative to all major currencies being traded within an index is called Nominal Effective Exchange rate (NEER) and is also included in the investigation. Because the major currencies generally trade in liquid financial markets, the NEER can be used to gauge financial market pressures on the dollar and also can be viewed as an indicator of the evolution of the competitiveness of US products against those made in the other major currency economies.

Finally gold fixed prices are taken from the London Bullion Market, which is the biggest (over-the-counter) OTC market for the trading of gold; other important markets are those of New York Mercantile Exchange (NYMEX) and Tokyo Commodity Exchange (TOCOM). The gold prices are measured in US Dollars per troy ounce.

IV Econometric Approach

1. Integration

First I investigate the properties of the times series of the stock market indices, the exchange rates, the oil and gold prices in order to determine if these individual series are stationary or not. A series is said to be weakly or covariance stationary if the mean and autocovariances of the series do not depend on time. If a series of a structural variable has a unit root, then a shock that hits it will have permanent effects. The unit root tests that are performed are the augmented Dickey-Fuller (ADF) test, the Phillips and Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test. All tests are conducted considering three cases: the absence of constant and deterministic trend, the existence of constant without any deterministic trend and the existence of both constant and deterministic trend.

The Dickey-Fuller (DF) test is based on a simple AR (1) process:

$$y_t = \rho y_{t-1} + x_t'\delta + e_t \qquad \text{eq.1}$$

Where x_t are the exogenous regressors that described above and ρ, δ are parameters to be estimated. Subtracting y_{t-1} from both sides of equation 1 becomes:

$\Delta y_t = \alpha y_{t-1} + x_t'\delta + e_t$, where $\alpha = \rho - 1$. The null and alternative hypothesis may be written as:

$H_0 : \alpha = 0$, $H_1 : \alpha < 0$

The Augmented Dickey-Fuller (ADF) test that is performed in this investigation contracts a parametric correction for higher order correlation by assuming that y_t series follows an AR (P) process and adding p lagged differenced terms of the dependent variable to the right side of the regression:

$$\Delta y_t = a y_{t-1} + x_t'\delta + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + ... + \beta_p \Delta y_{t-p} + u_t$$

To illustrate how the Dickey-Fuller (DF) test can be extended to autoregressive process of order greater than one, consider the simple AR (2) process below.

$y_t = \rho_1 y_{t-1} + \rho_2 y_{t-2} + x_t'\delta + e_t$.

Then notice that this is the same as:

$y_t = (\rho_1 + \rho_2) y_{t-1} + \rho_2 (y_{t-2} - y_{t-1}) + x_t'\delta + e_t$. And subtracting y_{t-1} from both sides gives:

$\Delta y_t = a y_{t-1} + x_t'\delta + \beta_1 \Delta y_{t-1} + x_t'\delta + e_t$.

Where the following have been defined:

$\alpha = \rho_1 + \rho_2 - 1$ and $\beta_1 = \rho_2$.

The test statistics for the original DF and ADF test are defined as:

$$\text{Test statistic} = \frac{\hat{a}}{\hat{se}(\hat{a})}$$

The test statistics do not follow the usual t-distribution under the null hypothesis, but rather they follow a non-standard distribution. Critical values are derived from simulation experiments Fuller (1979) and more recently MacKinnon (1991, 1996) who implements a much larger set of simulations than those tabulated by Dickey and Fuller, and these calculations are used in this study.

Phillips and Perron (1988) have developed a more comprehensive theory of unit root non-stationarity; they proposed an alternative (non-parametric) method of controlling for serial correlation when testing for a unit root. The Phillips Perron (PP) test deals with potential serial correlation in the errors by employing a correction

factor that estimates the long-run variance of the error process with a variant of the Newey-West formula. The Phillips Perron (PP) method estimates the non-augmented DF test equation as described above and is based on the statistic:

$$\text{Test statistic} = t_\alpha \left(\frac{\gamma_0}{f_0}\right)^{1/2} - \frac{T(f_0 - \gamma_0)(se(\hat{\alpha}))}{2 f_0^{1/2} s},$$

Where $\hat{a}$ is the estimate, t_α the t-ratio of α, $se(\hat{\alpha})$ is coefficient standard error, s is the standard error of the test regression, γ_0 is an estimate of the error variance, and f_0 is an estimate of the residual spectrum at frequency zero. As the power of the tests is low if the process is stationary but with a root close to the non-stationary boundary, it has been argued that the tests are poor at deciding if α=1 or α=0.95, especially with small sample sizes, for example if the true data generating process is $y_t = 0.95 y_{t-1} + e_t$ then the null hypothesis of a unit root should be rejected. This means that a failure to reject the null hypothesis may occur because either the null hypothesis was correct, or because there isn't sufficient information to reject the null hypothesis.

In order to handle this problem and to have robust results, I employed the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) test (1992), a stationarity test that reverses the null hypothesis of the unit root test. Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) tests have as null hypothesis: $H_0 : y_t \sim I(1)$ and their alternative is: $H_1 : y_t \sim I(0)$, while under Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) testing approach the null and alternative hypothesis are $H_0 : y_t \sim I(0)$ and $H_1 : y_t \sim I(1)$ respectively. For the conclusions to be robust both stationarity and unit root test should imply the same results. This method is known as confirmatory data analysis.

2. Cointegration

A system of two or more series, which are nonstationary in levels and contains a single unit root, and thus are integrated of the same order, can share common stochastic trends; in this case those series are said to be cointegrated. This means that

a linear combination of them is stationary, suggesting the presence of a long-run relationship among these variables. Thus the existence of cointegration is tested using the method of Johansen (1991, 1995) which involves investigation of the p-dimensional vector autoregressive process of kth order:

Consider a VAR of order k:

$$y_t = A_1 y_{t-1} + ... + A_k y_{t-k} + B x_t + e_t$$

Where y_t is a p-vector of non-stationary I(1) variables, x_t is a d-vector of deterministic variables, and e_t is a vector of innovations. We may rewrite this VAR as,

$$\Delta y_t = \sum_{i=1}^{k-1} \Gamma_i \Delta y_{t-i} + \Pi y_{t-1} + \mu + e_t, t = 1, ..., T$$

Where

$$\Pi = \sum_{i=1}^{k} A_i - I, \quad \Gamma_i = -\sum_{j=i+1}^{k} A_j$$

Where Δ is the first-difference lag operator, y_t is the set of I (1) variables discussed above, $e_t \sim n.i.i.d.(0, \Sigma)$, μ is a drift parameter, Γ_i are (p x p) matrices of parameters, Π is a (p x p) matrix of the form $\Pi = \alpha \beta'$, where α and β are (p x r) matrices of full rank, with β containing the r cointegrating vectors and α the corresponding loadings in each of the r vectors. The Π matrix can be interpreted as a long-run coefficient matrix since in equilibrium, setting all $\Delta y_t = 0$ and the error terms to their expected value of zero $\Pi y_{t-1} = 0$. The Johansen test centers around an examination of matrix Π and thus is affected by the lag length employed in the VECM. In this study the lag length was determined by employing several lag length in the VAR model and the selection was made according to Schwarz Bayesia Information Criterion (SBIC).

There are two test statistics for cointegration under the Johansen approach, which are formulated as:

$$LR_{trace}(r_0) = -T \sum_{i=r_0+1}^{p} \ln(1 - \hat{\lambda}_i)$$

LR_{trace} Is a joint test where the null hypothesis is that the number of cointegrating vectors is less than or equal to r_0 against an unrestricted or general alternative that there are more than r_0.

$$LR_{max}(r_0) = -T \ln(1 - \hat{\lambda}_{r_{0+1}})$$

LR_{max} Conducts separate tests on each eigenvalue and has as its null hypothesis that the number of cointegration vectors is r_0 against the alternative r_{0+1}.

In this investigation, the cointegration analysis is based on the trace statistics that are used allowing for a linear deterministic trend in the data and an intercept in the cointegrating equations. Thus in order to investigate the existence of long-run relationships between the stock prices and the oil prices, the Johansen cointegration method is employed in two different VAR models. The first VAR model, VAR model A, includes 4 variables which are the stock prices, the MSCI index, the exchange rates and the oil prices while the second VAR model, VAR model B, is extended as gold prices are adding in the model. The reason of the two different VAR systems use is to investigate how the cointegrating relationships vary depending on the existence of gold prices or not in the system and to determine if gold prices should be considered in this approach. Both models are employed considering all the exchange rates described above. The VAR models employed are described in table 2.

3. Dynamics of the cointegrating relationship

In order to examine the dynamics of the cointegrating relationship, whether the long-run relationships are time varying and giving the possible sensitivity of the results to sample selection a five year rolling window is employed in the two different VAR models. At each stage at the rolling technique the Johansen (1991, 1995) cointegration test is conducted as described above; the lag length employed in the VECM model is determined by the use of Schwarz Bayesia Information Criterion (SBIC) in every step of the rolling technique and the cointegration analysis is based on the trace statistics that are used allowing for a linear deterministic trend in the data and an intercept in the cointegrating equations. The analysis following is based only in the model which is considered to be the most appropriate. Moreover in order to further investigate the possible time variation in the cointegrating relationships among the investigated variables and to identify these relationships, an estimation of the cointegrating vectors β is conducted over a five year rolling window. As is well

known, the cointegrating vector is not identified unless we impose some arbitrary normalization, the normalization commonly used is defined in Johansen (1995) and is based on $\hat{\beta}' S_{11} \hat{\beta} = I$ where S_{11} is defined as:

Let $Z_{0t} = \Delta y_t$, $Z_{1t} = (\Delta y'_{t-1,\ldots,} \Delta y'_{t-k+1})'$ and $Z_{kt} = y_{t-k}$, then we first regress $Z_{it}, i = 0, k$ on Z_{1t} and get the residuals $R_{it,} i = 0, k$ and secondly we regress Z_0 and Z_k on Z_1. The residual sum of squares of the second regression is defined as:

$$S_{ij} = \frac{1}{T} \sum_{t=1}^{T} R_{it} R'_{jt} .$$

The maximum likelihood estimation of α and β is a function of these residuals. Johansen (1991) shows that $\hat{\beta}$ can be found from choosing the eigenvectors $\hat{v}_1 \ldots \hat{v}_r$ where $\hat{\beta}_{mle} = (\hat{v}_1 \ldots \hat{v}_r)$, of the equation:

$\left| \lambda S_{kk} - S_{k0} S_{00}^{-1} S_{0k} \right| = 0$. It is also common to normalize on a particular variable, so that the coefficient value of this variable to be unity. Instead of Johansen normalization in this research, the normalization used is following the second approach as it improves the interpretation of the results of the cointegration analysis and also makes the comparison among different cointegrating vectors of the same or different VAR models easier. For more details about the maximum likelihood estimation you can see Hamilton (1994). A second approach which is due to Saikkonen (1992), and Stock and Watson (1993) in estimating the cointegrating relationships is also employed. Although the simplest way to estimate a cointegrating vector is just to regress one variable on the others, after confirming that the all variables are integrating of order one, by OLS the asymptotic behavior of the estimated cointerating vector is non-standard and in general is asymptotic biased and non-normal. The OLS regression can be described as:

$y_t = x_t' \beta + D_{1t}' \gamma_1 + u_{1t}$, where the y_t is the variable that has been selected as regressand, the Dynamic OLS (DOLS) methodology introduced by Saikkonen (1992) and Stock and Watson (1993) involves augmenting the cointegration regression with q lags and r leads of $\Delta \chi_t$, the idea is to add enough leads and lags so that the error terms appear to be serially independent:

$$y_t = x_t^{'}\beta + D_{1t}^{'}\gamma_1 + \sum_{j=-q}^{r} \Delta x_{t+j}^{'}\delta + u_{1t}$$

In order to investigate the dynamics of the cointegrating vectors a five years rolling window is employed. Another contribution of this investigation is that the methodology used and described above more specifically the use of a fixed rolling window in the investigation of the cointegration analysis have never be used in order to investigate the links between oil prices and stock prices.

4. Generalized impulse responses

One of the main disadvantages of the VAR modelling is the large number of the parameters involved making the estimated models difficult to interbred. As the lagged variables may have coefficients that change sign across the lags it becomes difficult to understand what effect a given change to a variable would have on the future values of each of the others variables included in the VAR system. In order to handle this problem and to investigate whether the change of a variable has a negative or positive impact on the other variables of the VAR model and also to examine how this effect would last VAR's impulse responses are used. An impulse response function traces the effect of a shock to the i-th variable that affects directly the i-th variable and is also transmitted to all of the other endogenous variable through the dynamic structure of the VAR system. The following example explains how impulse responses operate:

Consider an r-dimensional VAR (p) model,

$y_t = A_1 y_{t-1} + A_2 y_{t-2} + ... + A_p y_{t-p} + u_t$ where $t = 1, 2..., T$ the VAR model can be written in vector MA(∞) form.

$y_t = (I_k + C_1 L + C_2 L^2 + ...)u_t$ where L is the lag operator, $Ly_t = y_{t-1}$. So every variable of the y_t can be written as:

$y_{it} = \sum_{j=1}^{r} (C_{ij}^{(0)} u_{jt} + C_{ij}^{(1)} u_{jt-1} + ...), t = 1, 2, ..., T$ where $C_{rj}^{(q)}$ is the r row and jth line element of the matrix C_q that can be interpreted as:

$C_{ij}^{(q)} = \partial y_{t+q} / \partial u_{jt}$. Although impulse response functions show the response of a variable to a shock under the assumption that the other variables of the VAR model are constant, this assumption is violated as the innovations are usually correlated as

may a common component which cannot be associated with a specific variable exist. Thus in order to interpret the impulses, a transformation to the innovations so that they become uncorrelated should be applied. The transformation used in this investigation is based on the methodology used by Pesaran and Shin (1998) known as general impulse method. The generalized impulse response functions are employed in all the sample data but only in the VAR models that at least one cointegrating relationship exists at the end of the investigated period.

Table 2. Var Model Specification

	VAR MODEL A	VAR MODEL B
VAR MODEL 1	Stock Prices, MSCI, EUR/USD, WTI	Stock Prices, MSCI, EUR/USD, WTI, Gold Prices
VAR MODEL 2	Stock Prices, MSCI, JYD/USD, WTI	Stock Prices, MSCI, JYD/USD, WTI, Gold Prices
VAR MODEL 3	Stock Prices, MSCI, CAD/USD, WTI	Stock Prices, MSCI, CAD/USD, WTI, Gold Prices
VAR MODEL 4	Stock Prices, MSCI, AUD/USD, WTI	Stock Prices, MSCI, AUD/USD, WTI, Gold Prices
VAR MODEL 5	Stock Prices, MSCI, NEER, WTI	Stock Prices, MSCI, NEER, WTI, Gold Prices

Notes: All the variables including in the VAR models are in logarithmic form. EUR, JYD, CAD, AUD, NEER denotes Euro, Japanese Yean, Canadian Dollar, Australian Dollar and Nominal Effective Exchange Rates respectively. The exchange rates are expressed as units of foreign currency per one unit of dollar.

V. Empirical results

1. Integration

The results of ADF and PP test indicate that for all variables we can not reject the null hypothesis, that the log level of each variable has a unit root at 5-percent significance level. Also the results of the KPSS are consistent with those of ADF and PP, suggesting that the null hypotheses that the log level of the variables are level or trend stationary is rejected at 5-percent significance level. When the unit root tests are employed in first log differences of each variable series the results indicate that all the variables are stationary I (0) processes, that is in log levels contain a single root and thus are integrated of degree one I (1). The results of the unit root tests are presented in table 3 and table 4.

2. Cointegration

The results of the cointegration analysis of the VAR model A are reported in Table 5. The results indicate the existence of one cointegrating relationship in 15

Table 3. Unit root and stationarity tests.

	Levels								First difference							
US Sectoral Indices	ADF			PP			KPSS		ADF			PP			KPSS	
Automobile and Parts	0.27$^{\alpha}$	-2.36$^{\beta}$	-2.48$^{\gamma}$	0.26$^{\alpha}$	-2.4$^{\beta}$	-2.53$^{\gamma}$	1.54*$^{\beta}$	1.47*$^{\gamma}$	-68.41*$^{\alpha}$	-68.4*$^{\beta}$	-68.42*$^{\gamma}$	-68.42*$^{\alpha}$	-68.41*$^{\beta}$	-68.42*$^{\gamma}$	0.24$^{\beta}$	0.05$^{\gamma}$
Basic Materials	0.67$^{\alpha}$	-2.12$^{\beta}$	-3.12***$^{\gamma}$	0.7$^{\alpha}$	-2.07$^{\beta}$	-3.05$^{\gamma}$	5.5*$^{\beta}$	0.33*$^{\gamma}$	-69.52*$^{\alpha}$	-69.52*$^{\beta}$	-69.51*$^{\gamma}$	-6956*$^{\alpha}$	-69.56*$^{\beta}$	-69.56*$^{\gamma}$	0.03$^{\beta}$	0.02$^{\gamma}$
Financials	0.71$^{\alpha}$	-2.05$^{\beta}$	-1.11$^{\gamma}$	0.8$^{\alpha}$	-2.04$^{\beta}$	-0.93$^{\gamma}$	5.47*$^{\beta}$	1.51*$^{\gamma}$	-73.54*$^{\alpha}$	-73.54*$^{\beta}$	-73.58*$^{\gamma}$	-74.3*$^{\alpha}$	-74.35*$^{\beta}$	-74.49*$^{\gamma}$	0.45***$^{\beta}$	0.05$^{\gamma}$
Food and Beverage	1.31$^{\alpha}$	-1.43$^{\beta}$	-1.88$^{\gamma}$	1.44$^{\alpha}$	-1.39$^{\beta}$	-1.72$^{\gamma}$	7.02*$^{\beta}$	1.32*$^{\gamma}$	-52.04*$^{\alpha}$	-52.07*$^{\beta}$	-52.07*$^{\gamma}$	-71.47*$^{\alpha}$	-71.53*$^{\beta}$	-71.53*$^{\gamma}$	0.11$^{\beta}$	0.05$^{\gamma}$
Healhtcare	1.32$^{\alpha}$	-1.19$^{\beta}$	-1.06$^{\gamma}$	1.44$^{\alpha}$	-1.17$^{\beta}$	-0.92$^{\gamma}$	6.82*$^{\beta}$	1.76*$^{\gamma}$	-51.98*$^{\alpha}$	-52.01*$^{\beta}$	-52.01*$^{\gamma}$	-67.91*$^{\alpha}$	-67.99*$^{\beta}$	-68*$^{\gamma}$	0.23$^{\beta}$	0.12***$^{\gamma}$
Industrials	0.98$^{\alpha}$	-1.96$^{\beta}$	-1.95$^{\gamma}$	1.04$^{\alpha}$	-1.94$^{\beta}$	-1.87$^{\gamma}$	5.56*$^{\beta}$	1.11*$^{\gamma}$	-70.39*$^{\alpha}$	-70.4*$^{\beta}$	-70.41*$^{\gamma}$	-70.47*$^{\alpha}$	-70.48*$^{\beta}$	-70.5*$^{\gamma}$	0.15$^{\beta}$	0.04$^{\gamma}$
Oil and Gas	1.54$^{\alpha}$	-1.05$^{\beta}$	-2.54$^{\gamma}$	1.7$^{\alpha}$	-1$^{\beta}$	-2.4$^{\gamma}$	7.98*$^{\beta}$	0.34*$^{\gamma}$	-55.04*$^{\alpha}$	-55.07*$^{\beta}$	-55.07*$^{\gamma}$	-75.55*$^{\alpha}$	-75.8*$^{\beta}$	-75.8*$^{\gamma}$	0.06$^{\beta}$	0.05$^{\gamma}$
Personal & Household Goods	1.55$^{\alpha}$	-1.4$^{\beta}$	-1.95$^{\gamma}$	1.5$^{\alpha}$	-1.39$^{\beta}$	-2.01$^{\gamma}$	7.4*$^{\beta}$	0.75*$^{\gamma}$	-52.81*$^{\alpha}$	-52.85*$^{\beta}$	-52.85*$^{\gamma}$	-72.45*$^{\alpha}$	-72.49*$^{\beta}$	-72.49*$^{\gamma}$	0.08$^{\beta}$	0.04$^{\gamma}$
Real estate	0.59$^{\alpha}$	-1.78$^{\beta}$	-1.9$^{\gamma}$	0.57$^{\alpha}$	-1.87$^{\beta}$	-2.01$^{\gamma}$	4.84*$^{\beta}$	0.39*$^{\gamma}$	-23.7*$^{\alpha}$	-23.71*$^{\beta}$	-23.72*$^{\gamma}$	-80.68*$^{\alpha}$	-80.69*$^{\beta}$	-80.69*$^{\gamma}$	0.09$^{\beta}$	0.05$^{\gamma}$
Technology	1.09$^{\alpha}$	-2$^{\beta}$	-1.59$^{\gamma}$	1.19$^{\alpha}$	-2$^{\beta}$	-1.51$^{\gamma}$	4.5*$^{\beta}$	1.52*$^{\gamma}$	-69.58*$^{\alpha}$	-69.6*$^{\beta}$	-69.61*$^{\gamma}$	-69.74*$^{\alpha}$	-69.77*$^{\beta}$	-69.8*$^{\gamma}$	0.29$^{\beta}$	0.08$^{\gamma}$
Telecommunications	-0.03$^{\alpha}$	-1.52$^{\beta}$	-1.58$^{\gamma}$	-0.01$^{\alpha}$	-1.37$^{\beta}$	-1.43$^{\gamma}$	1.16*$^{\beta}$	1.12*$^{\gamma}$	-71.75*$^{\alpha}$	-71.74*$^{\beta}$	-71.76*$^{\gamma}$	-72.26*$^{\alpha}$	-72.25*$^{\beta}$	-72.31*$^{\gamma}$	0.33$^{\beta}$	0.1$^{\gamma}$
Utilities	0.4$^{\alpha}$	-1.7$^{\beta}$	-2.11$^{\gamma}$	0.37$^{\alpha}$	-1.73$^{\beta}$	-2.2$^{\gamma}$	4.56*$^{\beta}$	0.27*$^{\gamma}$	-52.89*$^{\alpha}$	-52.89*$^{\beta}$	-52.88*$^{\gamma}$	-73.21*$^{\alpha}$	-73.21*$^{\beta}$	-73.2*$^{\gamma}$	0.06$^{\beta}$	0.05$^{\gamma}$
Aggregate Indices																
S&P 500	1.25$^{\alpha}$	-1.84$^{\beta}$	-1.18$^{\gamma}$	1.29$^{\alpha}$	-1.86$^{\beta}$	-1.14$^{\gamma}$	5.65*$^{\beta}$	1.5*$^{\gamma}$	-53.46*$^{\alpha}$	-53.48*$^{\beta}$	-53.51*$^{\gamma}$	-74.52*$^{\alpha}$	-74.59*$^{\beta}$	-74.67*$^{\gamma}$	0.32$^{\beta}$	0.07$^{\gamma}$
S&P Midcap 400	1.75$^{\alpha}$	-1.37$^{\beta}$	-2.11$^{\gamma}$	1.89$^{\alpha}$	-1.36$^{\beta}$	-1.95$^{\gamma}$	8.11*$^{\beta}$	1.13*$^{\gamma}$	-51.33*$^{\alpha}$	-51.38*$^{\beta}$	-51.38*$^{\gamma}$	-70.05*$^{\alpha}$	-70.12*$^{\beta}$	-70.12*$^{\gamma}$	0.1$^{\beta}$	0.03$^{\gamma}$
S&p Smallcap 600	1.12$^{\alpha}$	-1.76$^{\beta}$	-2.62$^{\gamma}$	1.2$^{\alpha}$	-1.72$^{\beta}$	-2.51$^{\gamma}$	6.92*$^{\beta}$	0.54*$^{\gamma}$	-63.94*$^{\alpha}$	-63.96*$^{\beta}$	-63.96*$^{\gamma}$	-64.01*$^{\alpha}$	-64.04*$^{\beta}$	-64.04*$^{\gamma}$	0.07$^{\beta}$	0.03$^{\gamma}$
Amex oil index	1.5$^{\alpha}$	-1.06$^{\beta}$	-2.34$^{\gamma}$	1.53$^{\alpha}$	-1.06$^{\beta}$	-2.35$^{\gamma}$	7.93*$^{\beta}$	0.39*$^{\gamma}$	-55.04*$^{\alpha}$	-55.07*$^{\beta}$	-55.07*$^{\gamma}$	-73.29*$^{\alpha}$	-73.39*$^{\beta}$	-73.38*$^{\gamma}$	0.06$^{\beta}$	0.05$^{\gamma}$

Notes: All variables are in natural logs. ADF is the Augmented Dickey-Fuller test, PP the Phillips-Perron test, and KPSS the Kwiatkowski-Phillips-Schmidt-Shin test. ($^{\alpha}$) indicates a model without constant or deterministic trend, ($^{\beta}$) a model with constant and without deterministic trend, ($^{\gamma}$) a model with constant and deterministic trend. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Table 4. Unit root and stationarity tests

	levels							First difference						
Exchange rates against US Dollars	ADF			PP			KPSS	ADF			PP			KPSS
Australian Dollar	-0.86 $^{\alpha}$	-1.41 $^{\beta}$	-1.72 $^{\gamma}$	-0.82 $^{\alpha}$	-1.27 $^{\beta}$	-1.6 $^{\gamma}$	1.78* $^{\beta}$	1.38* $^{\gamma}$	-71.81* $^{\alpha}$	-71.8* $^{\beta}$	-71.81* $^{\gamma}$	-71.94* $^{\alpha}$	-71.94* $^{\beta}$	-71.96* $^{\gamma}$	0.19 $^{\beta}$	0.05 $^{\gamma}$
Canadian Dollar	-0.68 $^{\alpha}$	-0.87 $^{\beta}$	-2.04 $^{\gamma}$	-0.64 $^{\alpha}$	-0.76 $^{\beta}$	-1.96 $^{\gamma}$	3.63* $^{\beta}$	1.8* $^{\gamma}$	-68.28* $^{\alpha}$	-68.28* $^{\beta}$	-68.32* $^{\gamma}$	-68.45* $^{\alpha}$	-68.44* $^{\beta}$	-68.56* $^{\gamma}$	0.44*** $^{\beta}$	0.04 $^{\gamma}$
Europian Euro	-1.13 $^{\alpha}$	-1.59 $^{\beta}$	-1.82 $^{\gamma}$	-1.13 $^{\alpha}$	-1.59 $^{\beta}$	-1.82 $^{\gamma}$	1.94* $^{\beta}$	1.62* $^{\gamma}$	-68.58* $^{\alpha}$	-68.57* $^{\beta}$	-68.58* $^{\gamma}$	-68.58* $^{\alpha}$	-68.57* $^{\beta}$	-68.58* $^{\gamma}$	0.18 $^{\beta}$	0.07 $^{\gamma}$
Great British Pound	-0.93 $^{\alpha}$	-2.3 $^{\beta}$	-2.58 $^{\gamma}$	-0.92 $^{\alpha}$	-2.24 $^{\beta}$	-2.52 $^{\gamma}$	2.18* $^{\beta}$	0.51* $^{\gamma}$	-65.04* $^{\alpha}$	-65.03* $^{\beta}$	-65.03* $^{\gamma}$	-64.97* $^{\alpha}$	-64.97* $^{\beta}$	-64.96* $^{\gamma}$	0.1 $^{\beta}$	0.1 $^{\gamma}$
Japanish Yen	-0.62 $^{\alpha}$	-2.15 $^{\beta}$	-2.24 $^{\gamma}$	-0.63 $^{\alpha}$	-2.17 $^{\beta}$	-2.26 $^{\gamma}$	0.82* $^{\beta}$	0.62* $^{\gamma}$	-68.24* $^{\alpha}$	-68.24* $^{\beta}$	-68.23* $^{\gamma}$	-68.25* $^{\alpha}$	-68.24* $^{\beta}$	-68.24* $^{\gamma}$	0.06 $^{\beta}$	0.05 $^{\gamma}$
WTI Spot Prices	0.69 $^{\alpha}$	-1.04 $^{\beta}$	-3 $^{\gamma}$	0.81 $^{\alpha}$	-0.87 $^{\beta}$	-2.79 $^{\gamma}$	7.19* $^{\beta}$	0.99* $^{\gamma}$	-70.12* $^{\alpha}$	-70.12* $^{\beta}$	-70.12* $^{\gamma}$	-70.47* $^{\alpha}$	-70.5* $^{\beta}$	-70.5* $^{\gamma}$	0.06 $^{\beta}$	0.03 $^{\gamma}$

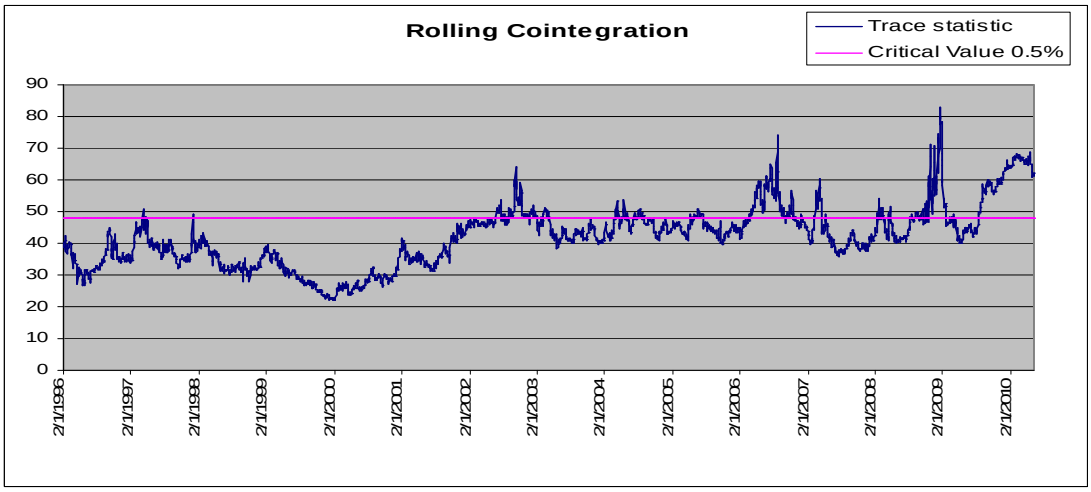
Notes: All variables are in natural logs. ADF is the Augmented Dickey-Fuller test, PP the Phillips-Perron test, and KPSS the Kwiatkowski-Phillips-Schmidt-Shin test. ($^{\alpha}$) indicates a model without constant or deterministic trend, ($^{\beta}$) a model with constant and without deterministic trend, ($^{\gamma}$) a model with constant and deterministic trend. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

VAR models at 5-persent significance level concerning 8 stock market indices (S&P madcap 400, S&P smallcap 600, Automobile & Parts, Basic Materials, Health Care, Industrials, Telecommunications and Utilities). The cointegrating relationships are changing when different exchange rates are including in the VAR model. The results of the cointegration test of the VAR model B are presented in Table 6 and indicate that when gold prices are included in the model the results are changing, which means that the Johansen cointegration test is sensitive to the variables that are concerned in the VAR model. The results of the Table 6 suggest that there is no cointegrating relationship among those variables at 5-persent significance in any of the VAR models. In order to examine how stable these long-run relationships are and if they exist in all the investigated period, further analysis must be employed. Tables 5 and 6 are presented in Appendix A.

3. Dynamics of the cointegrating relationships

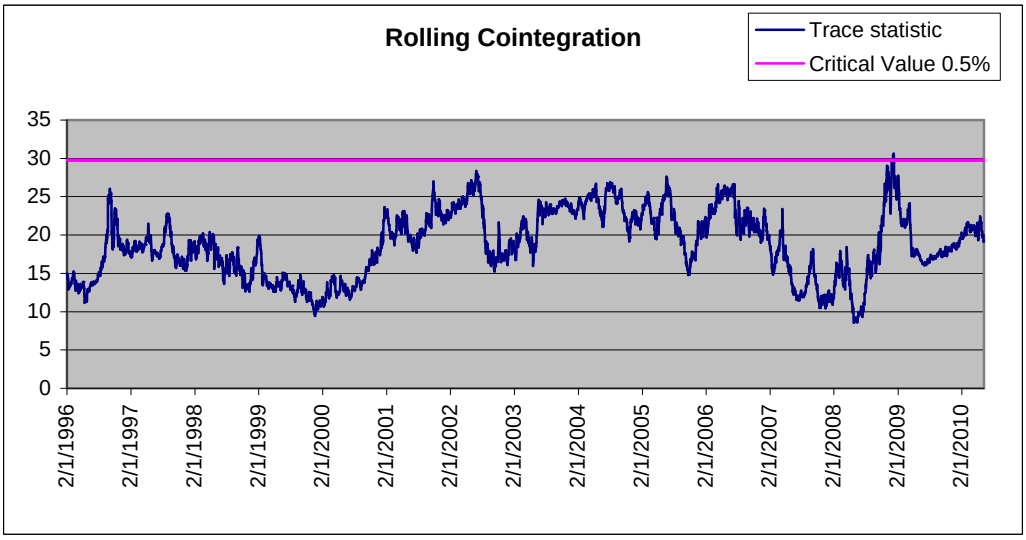
3.1 Rolling Johansen Cointegration Test

In order to examine the dynamics of the cointegrating relationships or in other worlds to see if these relations are time varying, a five years rolling window cointegration tests is employed as it has been described above, in both VAR models A and B. The results show that the cointegrating relationships vary through time and do not exist in the hall period, in all the investigated VAR models. In figure 1 for example we see the cointegration test of the VAR model A (S&P 500, MSCI, EUR/USD, WTI). In this figure we can see how the cointegrating relationship varies over time based on trace test and as it can be seen in some periods a long-run relation exist while in other periods there is no cointegrating relationship. When the trace statistic is over its critical value then at least one cointegrating relationship exists. The same test is also employed to investigate the existence of two cointegrating relationships. The results of the rolling trace tests for the existence of two cointegrating relationships show that, in almost all the investigated period, two long-run relationships do not exist for all the VAR models examined. In figure 2 for example we can see that two cointegrating relationships exist but only during a very short period.



VAR model A1: S&P 500, MSCI, EUR/USD, WTI

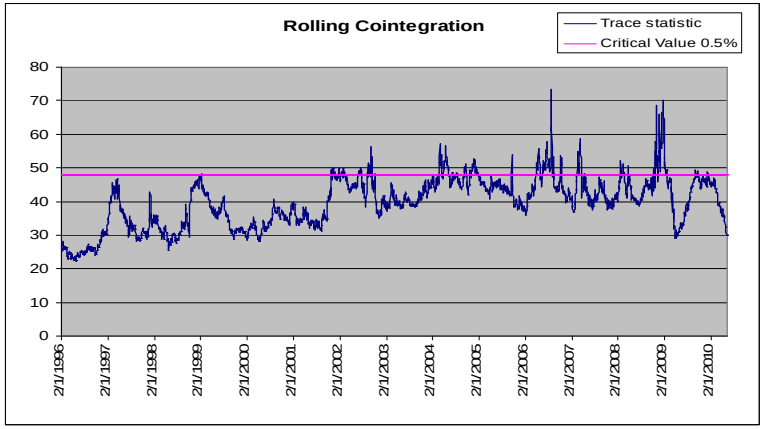
Figure 1



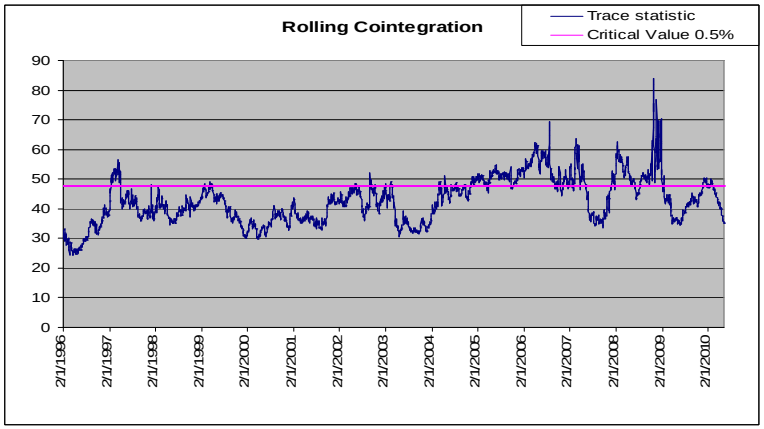
VAR model A1: S&P 500, MSCI, EUR/USD, WTI

Figure 2

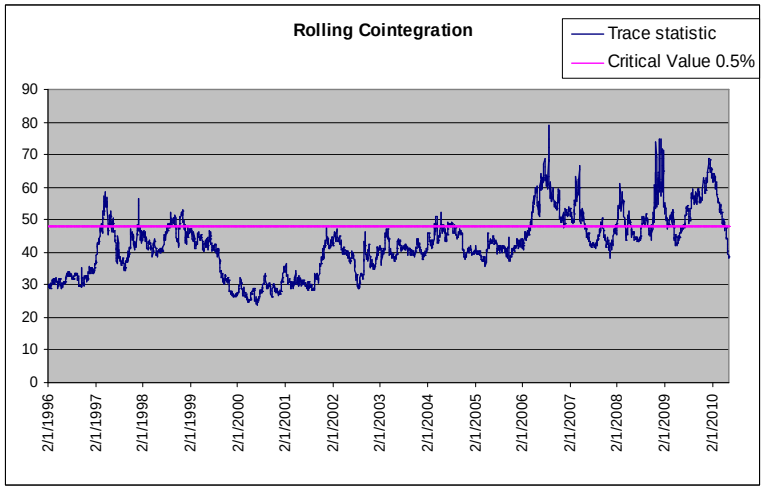
The results of all the models are similar to the results presented in figure 2 and for this reason the figures for the other models are not presented. In figure 3 we see how these relationships vary between the same models depending on the foreign exchange rate which is included in the model. In this figure the results of the same VAR model A of that of figure 1 concerning the presence of at least one cointegrating relationship are presented. The results of figure 3 reveal that the existence of cointegration vary when different exchange rate is including in the model and as we can see in the VAR model A2 (S&P 500, MSCI, JYD/USD, WTI) where Japanese Yean is included the cointegrating relationships exist less frequently than exist in the other VAR models.



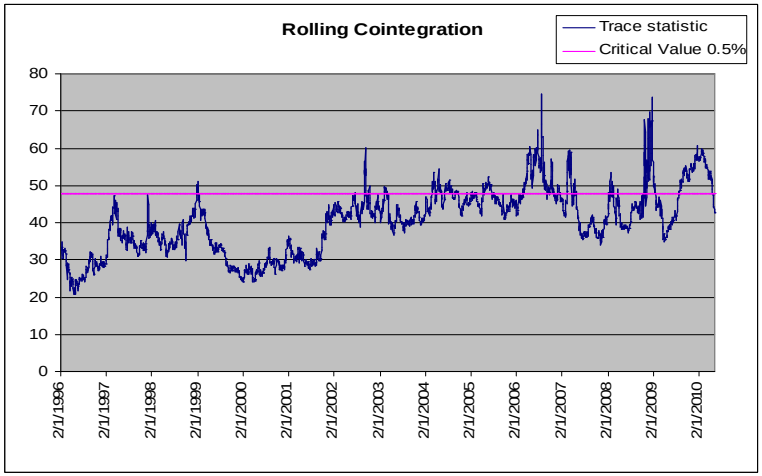
VAR model A2: S&P 500, MSCI, JYD/USD, WTI



VAR model A3: S&P 500, MSCI, CAD/USD, WTI



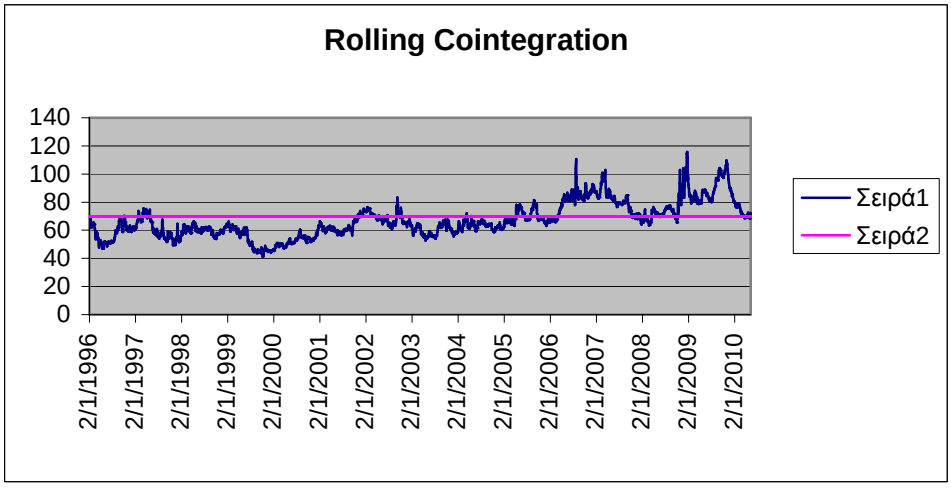
VAR model A4: S&P 500, MSCI, AUD/USD, WTI



VAR model A5: S&P 500, MSCI, NEER, WTI

Figure 3

In figure 4 the extended VAR model B (S&P 500, MSCI, EUR/USD, WTI, GOLD) is presented. The results of the dynamic cointegration test indicate that in contrary to the results of the cointegration test that was employed in the full sample, there are cointegrating relationships; and moreover comparing the two models, the model that gold prices are concerned and the one that are not, presented in figure 1, we can see that in the extended VAR model of the figure 4 there are more cointegrating relationships which means that a cointegrating relation exists more frequently during the investigated period. Because of lack of space I do not present any other figures for the extended VAR models.



VAR model B1: S&P 500, MSCI, EUR/USD, WTI, GOLD

Figure 4

In order to investigate the dynamics of the long-run relationships in all the examined VAR models I represent the percentage of cointegrating relationships based on the rolling procedure as discussed above, so that we can compare the existence of cointegration among the different stock market indices and VAR models. These results are represented in Table 7, where we can see how much the percentage of cointegration vary between different VAR models of the same stock indices, for example, in the Automobile and Parts VAR models the percentage of cointegration vary from 3.04% to 24.60%. Also we can see how the percentage vary among the different stock market indices; Technology, Telecommunications and Utilities are the indices where the smallest percentages of cointegrating relationships are observed while on the other hand S&P smallcap 600, Amex Oil and Oil and Gas are the indices

Table 7. Cointegrating relationships

Stock Market Indices	Model A1	Model A2	Model A3	Model A4	Model A5	Model B1	Model B2	Model B3	Model B4	Model B5
Sectoral Indices										
Automobile and Parts	10.50	17.84	13.65	16.85	11.49	18.75	14.42	3.04	24.60	17.15
Basic Materials	22.76	21.34	20.01	25.48	27.88	23.53	12.39	11.11	28.90	19.18
Financials	19.26	13.30	20.41	21.31	15.12	25.75	20.35	11.65	29.70	18.72
Food and Beverage	10.98	8.04	10.44	11.00	16.16	13.43	9.08	6.76	17.33	17.04
Healhtcare	14.56	16.48	18.51	23.50	8.12	21.50	15.87	6.46	21.23	15.25
Industrials	26.47	29.14	22.70	28.26	23.61	18.96	13.30	15.79	25.53	16.13
Oil and Gas	15.28	12.74	25.88	35.42	13.81	28.50	18.75	26.18	37.98	19.20
Personal & Household Goods	14.82	8.79	21.02	23.88	16.13	21.39	12.77	15.89	30.13	20.83
Real estate	15.38	24.44	31.89	19.82	23.24	20.67	13.60	18.67	22.86	16.61
Technology	7.69	10.12	13.54	9.64	4.35	6.89	5.45	4.49	13.43	4.38
Telecommunications	5.40	13.01	8.12	7.43	6.70	4.65	6.44	3.95	10.79	5.15
Utilities	1.42	8.81	2.11	12.39	2.08	10.31	6.78	1.71	10.76	4.91
Aggregate Indices										
S&P 500	22.60	11.43	25.99	25.00	18.72	33.44	24.23	23.24	35.92	25.40
S&P Midcap 400	15.79	16.27	19.39	13.17	14.26	19.18	14.50	6.25	23.85	14.69
S&p Smallcap 600	21.19	30.81	29.49	21.98	21.44	27.53	28.64	12.58	43.58	22.99
Amex oil index	21.74	18.99	28.18	39.32	24.41	36.46	28.93	25.56	46.21	30.50

Notes: Var model1a: Stock Market Index, MSCI, EUR/USD,WTI,Var model1b: Stock Market Index, MSCI, EUR/USD,WTI,GOLD
Var model2a: Stock Market Index, MSCI, JYD/USD,WTI, Var model2b: Stock Market Index, MSCI, JYD/USD,WTI, GOLD
Var model3a: Stock Market Index, MSCI, CAD/USD,WTI, Var model3b: Stock Market Index, MSCI, CAD/USD,WTI,GOLD
Var model4a: Stock Market Index, MSCI, AUD/USD,WTI, Var model4b: Stock Market Index, MSCI, AUD/USD,WTI, GOLD
Var model5a: Stock Market Index, MSCI, NEER,WTI, Var model5b: Stock Market Index, MSCI, NEER,WTI, GOLD

where the cointegrating percentages take the highest value. In contrast with the results of the cointegration test in the full sample that suggest that there are no long-run relationships in the VAR models that includes gold prices, the rolling procedure indicates that long run relationships exist and in some cases the percentage is over 40%. Another interesting issue is the differences in the cointegrating percentages between the models depending on the existence of gold prices or not in the VAR models. The results of the VAR models B, for example in the extended VAR models which contain Euro, the cointegrating relationships in most models are increasing comparing with the VAR models where gold prices are not including, while in the extended VAR models which contain Canadian Dollar the existence of cointegration is reduced or in other words appears less frequently. Although the results are puzzling, in the models in which gold prices are contained we can say that the percentages of cointegration generally are increasing; this result is indicated from the models where the nominal effected exchange rates are included. The nominal effected exchange rate, as it is known is a weighted average of a basket of foreign currencies in which the currencies that are concerned in this investigation are contained, thus we can say that the results of these models take into account all the currency movements. The results of the rolling cointegration test in most indices employed 12 of 16 indicate that the VAR models B in which gold prices and NEER are taken into consideration have higher percentages of cointegrating relationships that the corresponding VAR model A.

3.2. Rolling Cointegrating Vectors

3.2.1 Maximum Likelihood Estimation (MLE)

The cointegrating Vectors β are estimated in order to investigate the implied long-run effects imposed by the variables including in the model. Taking into account the possible time variation and the possible sensitivity of the results to sample selection a five years rolling window is employed and the mean and the standard deviation of the estimated long-run relations are calculated. The results are presented in table 8. The normalization used is made so that the stock market indices take the value of unity. A positive relationship exists between MSCI and the majority of the

Table 8. Normalized Cointegrating Coefficients MLE estimation

	S&P 500	S&P midcap	S&P smallcap	Amex Oil	Automobile & Parts	Basic Materials	Financials	Food & Beverage	Health Care	Industrials	Oil & Gas	Personal & Household Goods	Real Estate	Technology	Telecommunications	Utilities
Var Model 1																
MSCI	1.12323	1.03154	-0.642425	0.75871	14.8657	-0.195767	0.64062	0.23768	0.21648	0.92523	0.77402	1.00161	2.19568	2.06133	-1.1501	0.46477
	0.697482	3.79185	53.084792	2.358244	822.4928	11.70926	3.237855	43.25471	45.098985	2.5614246	1.5306162	10.513358	72.327172	14.995431	110.62184	25.620547
EUR/USD	-0.092095	0.10744	-4.785955	-0.293746	76.556	-1.420727	0.27997	-0.771185	0.7582	-0.106364	0.14863	0.10463	0.7419	0.46864	-8.834962	-2.588799
	1.674676	13.55726	271.71401	10.14231	4686.191	8.477204	14.10749	61.6061	43.443094	7.6603305	2.3285586	7.9350428	79.265836	29.054222	214.48457	56.352971
WTI	-0.074941	0.05969	-0.312127	0.2904	3.89974	0.42678	0.05171	-0.384747	0.94589	-0.005907	0.26978	-0.321553	-0.229762	0.1735	2.3888	-0.012219
	0.451188	4.36309	14.007123	1.453229	273.3313	8.564416	3.320972	7.369031	61.903105	4.2358187	0.6996591	10.052784	12.526295	9.4573928	97.173408	20.76113
GOLD	-0.399757	-0.469232	-2.072735	-0.896067	29.1935	-0.038373	-0.621268	-0.697487	-1.174745	-0.196951	-0.622397	-0.155404	-1.88549	-0.022475	-5.962167	-2.020393
	2.64615	10.17593	107.03883	11.30986	1786.966	23.96885	9.925483	45.76195	58.080133	5.4273457	1.8989747	13.071573	42.471673	15.455368	163.05029	25.509297
Var Model 2																
MSCI	1.18536	0.9247	0.52879	2.08092	2.71006	-0.514115	2.02322	0.7733	0.07791	0.97659	0.72579	0.58833	0.00435	1.79453	1.11138	-2.85826
	2.286868	4.174994	4.681696	82.71032	125.8418	42.33884	72.20849	26.93714	48.731764	1.2999505	6.9208381	11.165771	13.425435	16.087808	23.235925	671.48554
JYD/USD	-0.043045	0.70716	0.24382	-0.002668	-8.93329	-0.076072	8.17058	0.87025	0.77631	-0.159764	0.9015	-0.212834	0.98114	-0.199295	-1.105501	17.1539
	2.95642	13.07104	15.656198	81.36487	376.6817	54.64335	460.536	125.5891	16.740566	2.1614887	8.8874601	9.3857245	29.842332	30.545375	70.048313	684.21529
WTI	-0.13585	0.22037	0.06469	0.61275	-0.508037	-0.717677	3.68059	0.38531	0.70934	0.02993	0.39877	-0.010263	-0.165715	-0.165405	-0.218687	-0.42993
	3.409066	4.126644	3.7696621	14.52662	17.67321	26.32478	218.3031	42.0182	29.490112	0.5662659	0.6746044	9.6094739	12.4096	4.0160648	17.519348	22.461628
GOLD	-0.37602	-0.208024	-0.120065	-0.877391	-0.831305	-1.129207	-1.641426	-1.737096	2.13859	-0.317942	-0.436734	-0.97426	-0.39747	-0.24475	-0.624931	-0.636524
	5.817657	5.597962	4.8197042	42.45573	81.50527	7.844553	62.69746	25.73004	119.4495	1.0439508	2.9383711	16.439184	10.912753	10.493692	36.003606	299.14216
Var Model 3																
MSCI	1.16235	1.07646	0.76572	0.72238	1.3459	0.68401	0.55204	7.09902	-0.261964	2.1224	0.57144	0.51965	0.66788	2.77293	-6.911049	1.57295
	3.262371	6.579224	3.619259	4.25827	9.240035	6.19207	9.276096	358.1074	83.945158	67.142157	6.5738519	19.625917	8.8134813	18.64642	816.66119	11.359488
CAD/USD	0.48882	0.55956	-0.776525	0.43795	-1.799047	-1.031322	-0.80857	32.1883	2.78469	1.33664	0.16301	-1.127153	-1.170416	4.0638	132.665	2.45019
	14.8299	39.76975	11.467979	12.87463	43.25927	53.52611	38.84887	1755.197	18.564568	113.21058	27.545902	53.105212	21.151555	169.44221	6300.8485	27.694057
WTI	-0.061931	-0.085222	-0.07671	0.53636	-0.873385	-0.248388	-0.032267	3.26703	1.2184	0.03136	0.43229	-0.29285	0.09802	-0.759068	17.134	-0.147479
	2.216744	6.675399	1.8894113	10.28952	3.417995	1.5196	3.852096	217.3987	61.322871	3.0459741	5.8768528	12.407703	3.6286082	12.810262	880.33273	4.0749695
GOLD	-0.203641	-0.176808	0.03623	-0.656906	-0.352879	-0.059924	-0.75901	2.18011	3.4347	-0.407452	-0.542725	-0.4441	-0.692589	1.23785	3.72184	-0.35958
	6.553382	11.06183	3.4061466	10.47554	13.46606	16.71722	10.69724	121.6216	225.24769	8.4609614	6.5416447	13.398044	8.461935	50.937869	889.6024	11.822913
Var Model 4																
MSCI	2.09782	-4.50639	-6.830954	1.61362	-2.091261	0.54294	0.60951	0.58871	-8.177115	1.45958	1.48065	1.91023	0.14106	19.3264	0.63347	2.18825
	45.44605	290.2231	381.38133	31.66835	281.098	5.889695	29.74926	25.255574	709.4049	18.461138	5.4143158	40.571808	17.349699	1012.7545	84.397363	49.022826

AUD/USD	3.95147	-24.17019	17.4604	3.06215	-4.661216	0.79359	0.37306	-0.588006	-52.60637	1.17213	1.83288	1.85621	0.30746	82.6791	-4.573828	0.04554
	252.2025	1111.426	1072.5386	118.1419	289.5082	27.43825	65.08181	54.590007	4535.9724	52.766343	14.496018	227.79662	54.988748	3074.592	190.87969	104.59284
WTI	1.00889	-8.70805	2.78853	0.66849	-1.27764	0.41243	0.17421	-0.226953	-18.54658	0.10034	0.58253	-0.059897	0.24991	3.79242	-0.430836	-1.200249
	76.1452	383.6203	192.05204	20.74299	34.71952	13.03262	4.49828	13.02594	1475.8454	7.8736639	2.4254469	82.070512	8.3382541	605.45414	39.051707	85.925166
GOLD	2.11392	-12.79043	-0.160255	0.52106	0.8637	0.09276	-0.693559	-0.627804	-29.77251	0.55584	-0.023084	1.8664	-1.203167	72.5527	-4.716785	0.6589
	146.1808	638.1523	22.561103	25.33775	180.333	5.741609	77.64813	44.384413	2323.0091	26.991366	9.0024788	126.29388	33.148439	3339.4493	236.01877	71.832944
Var Model 5																
MSCI	1.16074	0.88135	0.49723	0.60268	3.33077	-0.068798	1.66148	-0.796096	1.60836	0.86017	0.77393	0.53963	2.22978	3.05292	1.67071	-120.1548
	8.009673	18.91261	4.697848	3.787927	128.7741	5.325558	43.77065	50.143508	18.654037	1.5782309	1.8770996	4.0129626	83.399751	36.713619	32.014038	7424.7583
NEER	0.381978	-1.26591	-0.66821	0.308627	-4.29505	0.933667	-3.78843	2.599039	3.791375	0.262526	0.084345	0.132913	0.805558	-5.67752	2.203917	253.2358
	9.066514	104.015	30.254446	7.338977	266.9473	23.55803	230.9814	86.672995	68.801937	2.7924652	5.4170843	2.8162621	269.34002	276.06134	87.675606	15680.118
WTI	-0.255954	0.10437	0.03857	0.28041	-1.259751	0.01765	0.71432	0.58324	0.2581	0.0277	0.28327	0.05447	0.63991	0.92212	-0.281588	39.5473
	11.39295	12.16581	2.395779	0.531341	42.07869	3.82861	43.56529	49.153143	15.192404	0.3412905	0.735686	3.3378841	46.782655	44.371596	10.586237	2454.7643
GOLD	-0.257669	0.25219	0.10916	-0.706745	0.72364	-0.460691	0.7679	-3.754747	-3.343102	-0.237428	-0.797908	-0.767931	-1.129478	0.26395	-1.546594	-32.59793
	20.02799	71.23157	8.7696382	4.125703	43.80812	10.36662	126.3145	92.391742	57.978637	1.5255652	2.7134127	6.2404824	72.768493	76.743292	59.084957	1951.3423

Table 9. Normalized Cointegrating Coefficients significance MLE estimation

	S&P 500	S&P midcap	S&P smallcap	Amex Oil	Automobile & Parts	Basic Materials	Financials	Food & Beverage	Health Care	Industrials	Oil & Gas	Personal & Household Goods	Real Estate	Technology	Telecommunications	Utilities
Var Model 1																
MSCI	99.52	85.12	72.65	73.42	92.17	78.18	65.01	73.32	81.76	91.32	74.65	72.97	83.76	93.27	89.61	77.80
EUR/USD	52.72	67.33	64.28	49.63	57.08	66.05	68.08	72.06	68.43	68.99	57.08	53.04	68.72	78.07	71.34	63.43
WTI	66.61	60.84	58.56	82.67	67.39	71.42	66.64	71.90	68.62	45.49	81.14	82.99	60.76	86.73	61.24	73.13
GOLD	76.31	71.15	68.22	78.26	48.69	56.62	72.01	57.37	61.70	52.46	75.91	64.88	58.04	67.47	72.36	83.97
Var Model 2																
MSCI	98.08	84.13	77.05	77.56	88.60	83.55	67.68	81.36	88.11	96.77	74.95	83.17	76.82	84.11	82.85	91.53
JYD/USD	46.37	56.54	64.21	52.67	56.46	56.65	51.28	60.15	62.18	48.90	48.40	49.20	58.89	75.19	69.02	63.51
WTI	64.64	73.16	63.64	75.61	65.71	52.80	50.83	47.68	53.74	64.16	87.42	70.97	50.45	50.77	72.54	76.07
GOLD	80.29	65.54	63.28	85.39	65.06	61.49	84.35	72.68	62.74	59.54	89.66	75.77	69.71	67.20	72.65	77.94
Var Model 3																
MSCI	99.52	80.98	81.12	73.21	86.03	77.62	75.03	71.53	87.85	96.07	78.71	79.70	82.53	83.33	76.71	80.45
CAD/USD	54.51	64.00	53.09	52.72	50.88	64.85	53.10	73.66	66.32	69.66	52.35	56.94	64.56	64.80	65.79	67.82
WTI	57.24	81.62	68.64	81.22	83.76	68.99	69.42	61.75	69.34	61.89	81.52	77.80	71.42	73.40	87.93	68.91
GOLD	76.95	54.51	51.05	73.08	43.59	65.84	80.48	61.81	39.93	15.22	77.72	66.48	67.84	56.46	50.29	73.72
Var Model 4																
MSCI	94.31	81.46	78.33	79.57	81.57	82.32	73.13	83.33	84.03	92.52	81.20	76.68	88.22	83.41	77.91	75.88
AUD/USD	61.19	80.98	80.09	76.50	75.00	77.27	70.33	68.99	76.18	66.99	68.19	75.64	62.85	74.25	79.46	74.36
WTI	67.25	70.91	70.33	88.09	84.13	68.24	55.13	65.20	59.00	63.81	86.14	89.98	59.78	62.77	76.55	69.79
GOLD	77.32	70.38	64.53	88.06	58.09	78.66	76.79	74.28	58.68	66.29	87.53	68.56	75.93	62.85	59.05	71.21
Var Model 5																
MSCI	96.77	93.03	74.22	73.72	92.23	80.45	63.09	77.56	85.95	93.00	75.05	80.82	90.12	92.33	85.58	75.19
NEER	44.34	65.92	70.11	51.50	51.12	59.83	52.94	64.61	59.75	54.94	48.56	46.42	65.28	78.26	72.09	54.86
WTI	64.96	72.68	58.31	85.39	82.80	60.55	49.33	59.08	52.80	47.17	85.87	66.43	54.91	71.31	72.57	73.24
GOLD	75.08	72.81	60.92	83.79	50.37	61.24	72.78	56.76	60.10	52.72	80.42	69.82	60.84	68.88	76.12	83.47

indices indicating that most sectors of US economy are strongly influenced by the world economy and as MSCI is an index representing the global market performance it seems that there are common factors that influence the stock markets internationally. The results of the estimated normalized cointegrating vectors of the exchange rates are puzzling. The signs of the estimated long-run relations between the stock market indices and the exchange rate vary across the currencies and the indices. The relationship for example between the S&P 500, the Amex Oil, the Industrials and the exchange rate is negative when Euro or Japanese Yean is contained in the model and positive when Canadian Dollar, Australian Dollar or Neer is considered. Another example in which the results of the estimated vectors of the currencies vary across the indices is that of the models in which Euro or Japanese Yean is included in the VAR system, as we can see the results are controversial implying the existence of a positive or negative relationship at the same percentage. The results of the normalized cointegrating vectors of oil prices are also mixing as US sector sensitivities to oil prices can be asymmetric to the extent that some sectors may be more affected than others. The relationship between oil prices and stock prices can be either positive or negative. Higher oil prices imply lower stock prices due to higher production and transaction costs resulting in a reduce in companies earnings and thus a negative relationship, while on the other hand periods of high economic growth increase oil demand and thus oil prices leading to a positive relationship between stock and oil prices. The results imply the existence of a positive relation between oil prices and oil related sectors (Amex oil and Oil and Gas) as oil can be considered as an output for these companies. These results are consistent with the finding of the most investigations focus on the oil sensitive companies. Moreover the evidences imply the existence of a negative relationship between gold prices and stock prices in the most models examined. These results are important indicating that gold can be used by investors in order to diversify their portfolios and also confirms the theoretical relationship between gold investments and stock prices in periods of economic crises. The statistical significance of the estimated cointegrating vectors is also investigated. The results are presented in table 9 as percentages of the statistical significant vectors at 5-percent significance level. The estimated cointegrating vector of MSCI are statistical significant in almost all the investigated period regardless the model specification. The statistical significance of the other variables vary, for example the estimated cointegrating vectors of the Euro are statistical significant at 49.63 to 78.07

percentage of the investigated period, while the cointegrating vectors of gold vary between 15.22 and 80.48.

3.2.2. Dynamic Ordinary Least Squares (DOLS) estimation

The results of the cointegrating vectors of the Dynamic Ordinary Least Squares (DOLS) estimation are slightly different from those obtained of the Maximum Likelihood Estimation (MLS) process as far as the main conclusions are concerned. The results are presented in table 10 the methodology followed is the same, a five years rolling window is employed and the averages and the standard deviations are reported. The positive relationship between MSCI and the stock market indices is confirmed and exists in every model examined. Oil price changes have a positive impact on oil related sector indices. Gold prices' relationship with stock prices vary depending on the considered exchange rates, although the results of the DOLS estimations imply that in all investigated models in which NEER is included there is a negative relationship between these variables. Also the results of the DOLS estimation method concerning the relationship between exchange rates and stock prices are more explicit. Analytically the relationship between the investigated exchange rates and S&P 500, S&P MidCap 400, S&P SmallCap 600, Amex oil, Financials, Food and Beverage, Health Care, Oil and Gas, Real Estate and Utilities is positive except of these of the Canadian Dollar and S&P SmallCap 600, Oil and Gas and Real Estate. In addition a negative relation exists between exchange rates and Basic Materials, Industrials, Technology and Telecommunications except of the Euro and the Industrials which are positive related. The results about the relationship of Automobile and Parts and Personal & Household Goods with the investigated currencies are controversial. The percentages of the statistical significant estimated cointegrating vectors of the DOLS process are presented in table 11. As we can see the estimated cointegrating vectors of DOLS appear to be statistical significance more frequently that those obtained by the MLE technique. Another important result is the differences between the two methods used as far as the standard deviations of the estimated long-run relationships are concerned. The results of the two estimation techniques have significant differences; the cointegrating vectors estimated by MLE process have much higher standard deviations than those of DOLS in each model examined. In conclusion the results of both techniques used imply the existence of a

Table 10. Normalized Cointegrating Coefficients DOLS estimation

	S&P 500	S&P midcap	S&P smallcap	Amex Oil	Automobile & Parts	Basic Materials	Financials	Food & Beverage	Health Care	Industrials	Oil & Gas	Personal & Household Goods	Real Estate	Technology	Telecommunications	Utilities
Var Model 1																
MSCI	1.137686	0.85016	0.573416	0.649437	1.162755	0.578422	0.982914	0.677324	1.004367	0.950836	0.616744	0.723156	0.403015	1.683131	1.211299	0.627751
	0.179656	0.280211	0.29946	0.274875	0.342239	0.229314	0.448776	0.504884	0.448327	0.217143	0.277964	0.380396	0.47302	0.552103	0.421806	0.284879
EUR/USD	0.136101	0.3756	0.447287	0.297213	-0.05387	-0.20298	0.533953	0.297155	0.209766	0.013841	0.299762	0.116248	0.647023	-0.69261	-0.64215	0.204349
	0.209429	0.604446	0.739374	0.389755	0.618259	0.609048	0.582235	0.635037	0.807651	0.342971	0.572042	0.378912	0.833127	0.61485	0.74326	0.707659
WTI	-0.01805	0.020004	0.008188	0.250437	-0.23844	-0.01173	-0.07055	-0.08564	-0.05947	0.043556	0.288398	-0.04008	-0.0054	0.038222	-0.09704	0.045163
	0.088561	0.078882	0.13489	0.272124	0.184351	0.163242	0.197698	0.210852	0.130552	0.078749	0.234567	0.19497	0.202477	0.296083	0.137133	0.223536
GOLD	-0.14433	0.026287	0.254707	0.164763	-0.29325	0.192931	-0.09533	0.170829	-0.21334	-0.2171	0.039078	0.088214	0.43415	-0.97698	-0.52362	0.04814
	0.237312	0.366875	0.393104	0.397405	0.370127	0.324204	0.615471	0.679342	0.596666	0.266752	0.371681	0.530677	0.626026	0.681679	0.494005	0.36075
Var Model 2																
MSCI	1.077014	0.847891	0.607502	0.711337	1.156023	0.713575	0.930796	0.627797	0.920492	1.004203	0.717833	0.724208	0.447383	1.718538	1.236988	0.666217
	0.191912	0.317987	0.354734	0.285628	0.390959	0.325118	0.456112	0.505632	0.505646	0.208117	0.282169	0.40959	0.4997	0.582021	0.386927	0.311029
JYD/USD	0.186381	0.190793	0.183914	0.201065	0.067478	-0.08438	0.398178	0.410609	0.325809	-0.0244	0.147228	0.239846	0.335191	-0.57906	-0.23794	0.272565
	0.095585	0.340069	0.486158	0.428394	0.358103	0.420092	0.388564	0.316931	0.29092	0.181019	0.506263	0.28557	0.550244	0.460434	0.438207	0.505394
WTI	0.00679	0.094524	0.105325	0.302354	-0.26447	0.016399	0.015086	0.025215	0.058419	0.06322	0.349746	0.003731	0.063549	0.020291	-0.21243	0.082079
	0.059127	0.155138	0.158619	0.199195	0.181343	0.170482	0.140686	0.149444	0.167896	0.087309	0.161549	0.136539	0.151339	0.176691	0.171786	0.167511
GOLD	-0.23734	-0.17062	0.00497	-0.10861	-0.33235	0.087311	-0.416	-0.16724	-0.43726	-0.27033	-0.2424	-0.13253	0.051699	-0.51203	-0.28747	-0.24472
	0.215934	0.303209	0.256054	0.239448	0.270298	0.198932	0.47492	0.491227	0.512509	0.254319	0.288645	0.420698	0.326651	0.520417	0.338561	0.38977
Var Model 3																
MSCI	1.13431	0.910906	0.691347	0.767464	1.097159	0.677922	1.071075	1.071075	0.986171	1.01084	0.754423	0.79435	0.581026	1.602306	1.138313	0.67916
	0.171665	0.287864	0.321713	0.262074	0.248829	0.209105	0.477136	0.477136	0.434939	0.207447	0.274047	0.387777	0.424377	0.549495	0.350552	0.280706
CAD/USD	0.188313	0.156424	-0.06127	0.094897	-0.06244	-0.73321	0.060836	0.060836	0.801218	-0.4163	-0.09309	-0.06932	-0.35794	-0.50243	-0.34998	0.326532
	0.488162	1.183058	1.31032	0.961484	0.664982	0.917929	1.331212	1.331212	1.264081	0.496566	1.16781	0.765014	1.391803	1.278124	1.251559	1.69962
WTI	0.010242	0.056495	0.03601	0.237589	-0.24954	-0.05468	-0.04201	-0.04201	0.060012	0.029318	0.270162	-0.02807	-0.02206	0.052627	-0.17833	0.044286
	0.059008	0.138264	0.160495	0.209112	0.139563	0.167504	0.150803	0.150803	0.148488	0.06933	0.16659	0.19057	0.179794	0.237838	0.158578	0.12296
GOLD	-0.16867	-0.08212	0.0963	0.019019	-0.21236	0.145459	-0.23275	-0.23275	-0.30316	-0.25591	-0.11683	0.000481	0.236129	-0.83471	-0.36139	-0.03887
	0.206561	0.284344	0.306656	0.338264	0.307907	0.28539	0.532053	0.532053	0.528903	0.231558	0.31503	0.491038	0.494043	0.680334	0.369992	0.376237
Var Model 4																
MSCI	1.146971	0.887142	0.624801	0.710727	1.141523	0.621247	1.049175	0.727507	0.989629	0.978567	0.694082	0.775341	0.522547	1.599557	1.137908	0.654054
	0.164963	0.257	0.268573	0.264872	0.313063	0.186287	0.454891	0.4719	0.364614	0.203131	0.285415	0.37187	0.429041	0.499905	0.365039	0.252622

AUD/USD	0.16916	0.214884	0.121514	0.135866	0.061908	-0.4196	0.335237	0.148108	0.222861	-0.13808	0.117266	-0.04888	0.180609	-0.56448	-0.07014	0.548719
	0.151997	0.431468	0.482836	0.351222	0.434193	0.319846	0.454445	0.491207	0.694726	0.207237	0.504406	0.29834	0.461386	0.510575	0.618275	0.749857
WTI	-0.00047	0.053673	0.049685	0.265606	-0.26182	-0.03101	-0.03477	-0.05301	-0.01445	0.039389	0.302035	-0.03839	0.023693	0.025005	-0.12818	0.084821
	0.090296	0.08355	0.121323	0.249598	0.166044	0.157517	0.150485	0.192798	0.142084	0.049113	0.197264	0.190928	0.173843	0.243903	0.137709	0.154216
GOLD	-0.17744	-0.05582	0.155856	0.068929	-0.25831	0.184046	-0.22552	0.077101	-0.24044	-0.23898	-0.07325	0.026187	0.251584	-0.81681	-0.3987	-0.03937
	0.218887	0.307079	0.291824	0.366284	0.312314	0.263152	0.584886	0.590321	0.445416	0.235494	0.359005	0.49248	0.525965	0.608508	0.400592	0.326181
Var Model 5																
MSCI	1.073717	0.832447	0.574561	0.662733	1.106968	0.654548	0.899357	0.559942	0.913677	0.997589	0.662894	0.689382	0.362981	1.811128	1.306314	0.608142
	0.198776	0.355377	0.422288	0.356433	0.318258	0.311336	0.536861	0.589163	0.534484	0.240768	0.349238	0.456215	0.644539	0.628332	0.42325	0.356763
NEER	0.186351	0.270123	0.292833	0.327509	0.144468	-0.06789	0.503784	0.467673	0.255865	-0.02674	0.301605	0.272922	0.602541	-0.85951	-0.35827	0.475493
	0.154904	0.498682	0.609507	0.560289	0.365709	0.386761	0.61039	0.6223	0.631078	0.242605	0.616436	0.422287	0.845936	0.658508	0.564119	0.692805
WTI	0.005088	0.060878	0.053631	0.263331	-0.26519	-0.01367	-0.02524	-0.00437	0.028469	0.050491	0.308176	-0.01714	0.026238	0.039875	-0.183	0.048628
	0.070278	0.103067	0.120724	0.214688	0.163606	0.178161	0.136978	0.181486	0.165405	0.076395	0.162419	0.180975	0.162011	0.212908	0.136697	0.14379
GOLD	-0.22691	-0.19152	-0.00794	-0.12249	-0.32897	0.157762	-0.42639	-0.10404	-0.35353	-0.25485	-0.27075	-0.09801	-0.02288	-0.43744	-0.29697	-0.30634
	0.215684	0.31668	0.25337	0.259976	0.252798	0.230266	0.525124	0.445686	0.367092	0.234666	0.2951	0.429304	0.421953	0.327852	0.35074	0.339315

Table 11. Normalized Cointegrating Coefficients significance DOLS estimation

	S&P 500	S&P midcap	S&P smallcap	Amex Oil	Automobile & Parts	Basic Materials	Financials	Food & Beverage	Health Care	Industrials	Oil & Gas	Personal & Household Goods	Real Estate	Technology	Telecommunications	Utilities
Var Model 1																
MSCI	100.00	100.00	100.00	100.00	100.00	100.00	100.00	87.55	100.00	100.00	100.00	100.00	86.19	100.00	100.00	91.99
EUR/USD	80.66	84.21	95.50	72.41	68.88	76.15	89.21	90.36	90.81	86.57	83.87	74.09	90.44	83.25	90.25	86.00
WTI	86.73	67.23	72.23	71.85	77.51	76.95	86.40	75.53	74.52	64.42	78.58	76.39	80.85	87.74	62.93	79.67
GOLD	93.64	83.71	80.84	92.52	74.31	86.57	80.32	94.39	92.82	87.77	92.44	94.58	82.99	95.78	81.94	66.40
Var Model 2																
MSCI	100.00	98.26	93.25	100.00	100.00	100.00	100.00	91.88	100.00	100.00	100.00	100.00	93.14	100.00	100.00	96.05
JYD/USD	91.24	78.10	89.10	73.77	64.50	88.30	84.43	91.32	94.44	89.56	81.76	79.17	85.36	88.11	90.63	82.59
WTI	76.60	84.19	84.06	94.63	84.00	65.89	84.27	58.76	78.77	68.19	100.00	78.58	72.30	70.62	73.90	76.01
GOLD	91.32	85.52	74.45	72.46	83.79	63.94	81.94	74.04	80.53	89.37	84.99	88.73	71.13	90.73	68.24	78.98
Var Model 3																
MSCI	100.00	100.00	93.10	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	94.31	100.00	100.00	95.49
CAD/USD	92.07	87.71	89.60	68.22	51.31	78.98	85.04	85.04	88.25	96.21	86.99	81.70	73.61	70.54	83.44	84.32
WTI	78.26	74.95	79.77	86.57	88.35	60.60	70.81	70.81	78.93	56.46	90.76	87.63	62.61	76.76	70.49	73.10
GOLD	96.23	88.43	86.06	86.06	76.47	64.98	82.83	82.83	86.16	88.68	82.32	95.41	82.77	94.58	75.67	93.08
Var Model 4																
MSCI	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	93.96	100.00	100.00	99.76
AUD/USD	87.29	74.01	81.38	69.12	55.50	82.96	76.10	75.80	95.09	80.48	69.58	73.61	69.58	76.76	86.91	86.91
WTI	84.05	72.06	72.55	85.31	86.46	62.58	85.02	76.76	67.60	67.76	92.33	80.15	68.91	78.63	65.38	68.64
GOLD	93.99	88.03	79.74	89.53	64.88	73.29	82.48	93.11	89.66	78.39	87.87	94.95	80.82	94.98	84.29	80.56
Var Model 5																
MSCI	100.00	98.34	83.24	100.00	100.00	94.04	100.00	81.09	100.00	100.00	97.68	100.00	96.45	100.00	100.00	90.38
NEER	95.30	83.97	95.14	73.99	53.02	84.40	84.16	91.80	93.56	95.33	84.32	90.68	90.57	89.10	82.43	78.50
WTI	78.66	75.85	82.92	88.73	86.38	74.33	81.54	79.67	60.50	61.19	97.14	79.73	60.68	71.77	67.90	63.41
GOLD	82.48	90.57	77.91	73.82	83.84	56.28	86.32	83.97	85.87	91.37	88.68	90.87	83.12	88.68	68.83	89.85

negative relation between stock market and gold prices while a positive relationship between oil prices and the oil related stock market indices exists.

4. Generalized impulse responses

In this section the results of the generalized impulse response functions are presented. Generalized impulse response functions are used in order to investigate the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables. These simulations are employed in the VAR models B presented in table 12 in which at least one cointegrating relationship exists in the end of the investigated period, in each model a positive one standard deviation shock is employed in all the endogenous variables. The results of the impulse response functions are presented in table 13 in Appredix A. As we are interested in the relationships between MSCI, exchange rates, oil prices and gold prices with the stock market we will focus on the consequences of introducing a shock to these factors in the stock market indices. The results imply that a positive shock to MSCI has a positive impact on the stock market indices which last for two to seven periods and has the greatest magnitude on S&P 500 and Industrials sector while the lowest impact is attributed to Food and Beverage and Utilities sectors. A shock to oil prices has a positive effect in most models which dies out after 2 or even 5 periods in some cases and moreover the greatest impact is observed to oil related sectors (Amex oil and Oil and Gas) and the lowest impact appears to Food and Beverage and Personal and Household Goods sectors while is insignificant to Health Care related companies. The results of the responses of stock indices to a shock to exchange rates in most models are negative except of those derived from a shock to Japanese Yean. As we can see the responses of some stock indices such as Amex Oil, Basic Materials and Oil and Gas index to a shock to gold prices are positive while the response of Financials and S&P 500 index are negative. The responses vary among the indices and also change sign among the periods examined. The socks to gold prices have a significant impact which last from 3 to 6 periods and in most cases last longer than the corresponding socks of the other factors examined. Although the results are different of those obtained by the cointegrating analysis as far as the relationship between the exchange rates, the gold prices and the stock prices a positive relation between oil prices and oil related sector is also implied.

Table 12

Indices	VAR Model 1	VAR Model 2	VAR Model 3	VAR Model 4	VAR Model 5
Aggregate indices					
S&P 500	✓				
S&P 400					
S&P 600					
Amex Oil		✓		✓	
Sector Indices					
Automobile & Parts					
Basic Materials		✓	✓	✓	
Financials		✓		✓	
Food & Beverage	✓	✓	✓	✓	✓
Health Care				✓	
Industrials				✓	
Oil & Gas				✓	
Personal and Household Goods				✓	
Real Estate					
Technology				✓	
Telecommunications				✓	
Utilities				✓	

VI. Conclusion

In contrast with other related research that investigate the relationship between oil prices and stock market within a macroeconomic framework, in this investigation instead of macroeconomic variables such as industrial production, interest rates, and inflation one ‘world’ index and two other factors, exchange rates and gold prices are considered. The Johansen cointegration method is employed in order to investigate the long-run relationship between oil prices and stock prices both in full and rolling sample. The results imply that the cointegrating relationships vary through time and in contrast with the full sample tests the cointegrating relationship increase when gold prices are considered. The cointegrating vectors are estimated using a rolling sample and two different estimation techniques MLE and DOLS. The results of the cointegrating vectors imply the existence of a positive relation between oil prices and oil related sector indices while gold prices and stock prices are negatively related. Also the results of the impulse responses functions imply that a shock to oil prices will have a positive impact to oil related companies. This investigation improves the understanding between the stock markets, oil and gold prices relationship and also provides useful information to the investors that can be used in order to manage their investment choices and minimize their portfolio risks.

Appendix A

Table 5. US Aggregate indices cointegration test

Var model: s&p 500, MSCI, FX, WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	30.62029	25.15453	41.58216	36.51052	36.43226	47.85613
r≤1	r=2	10.08565	12.23763	12.88696	9.78236	9.851396	29.79707
r≤2	r=3	3.845395	6.013177	6.700035	3.706877	3.559303	15.49471
r≤3	r=4	0.835896	1.497823	0.8548	0.445677	0.297215	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: s&p Midcap 400, MSCI, FX,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	41.89665	27.50864	51.49328**	47.81571**	46.63714***	47.85613
r≤1	r=2	15.0665	10.70023	16.6854	17.03308	14.34411	29.79707
r≤2	r=3	6.099341	5.170268	5.311975	5.839619	5.583911	15.49471
r≤3	r=4	0.617112	0.228699	1.064732	0.400877	0.3265	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: s&p Smallcap 600, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	50.07451**	38.35083	46.61046***	45.45964***	51.68247**	47.85613
r≤1	r=2	19.80888	15.39144	14.85804	16.33761	17.36856	29.79707
r≤2	r=3	7.67197	6.597152	4.724032	7.746656	6.05939	15.49471
r≤3	r=4	0.416948	0.225867	0.223848	0.028601	0.131751	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Amex oil, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	39.29692	31.41553	44.15145***	43.41425	41.56577	47.85613
r≤1	r=2	20.08572	13.37959	18.10802	21.4343	18.43804	29.79707
r≤2	r=3	5.422359	5.511967	6.661692	4.924584	5.15834	15.49471
r≤3	r=4	0.641793	0.934064	0.701178	0.419677	0.436482	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Table 5. US Sectoral indices cointegration test

Var model: Automobile&Parts, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	44.0303***	40.43184	52.65194**	47.19741**	46.82974***	47.85613
r≤1	r=2	21.56941	18.23934	19.39521	23.0748	21.38369	29.79707
r≤2	r=3	4.555079	5.257785	5.865485	3.968498	3.947803	15.49471
r≤3	r=4	0.765743	1.174319	0.79584	0.304877	0.414973	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Basic Materials, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	47.51809**	33.82826	51.00063**	50.76173**	47.24585***	47.85613
r≤1	r=2	20.78435	14.10282	21.76352	20.79963	20.4263	29.79707

r≤2	r=3	4.367052	4.875327	5.146624	4.240817	3.878779	15.49471
r≤3	r=4	0.726665	0.940622	0.64972	0.495378	0.370765	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Financials, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	41.07697	30.56794	45.36796***	36.6386	46.80132***	47.85613
r≤1	r=2	15.48363	11.502	14.39461	10.68973	14.20507	29.79707
r≤2	r=3	7.517233	5.128335	5.411563	5.002956	6.947161	15.49471
r≤3	r=4	2.114347	1.077942	1.241226	0.791851	1.404847	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Food&Beverage, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	29.77782	26.29396	39.7091	32.67978	33.53538	47.85613
r≤1	r=2	11.29147	11.89654	12.41332	10.92148	10.42105	29.79707
r≤2	r=3	4.136661	5.393526	5.971105	3.676238	3.667866	15.49471
r≤3	r=4	0.528085	1.345542	0.629883	0.147909	0.206703	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Health Care, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	33.06443	30.24717	49.63918**	37.48128	39.40662	47.85613
r≤1	r=2	12.44168	11.65466	17.35401	12.9639	11.97597	29.79707
r≤2	r=3	3.66874	4.953216	7.486001	3.753229	3.298756	15.49471
r≤3	r=4	0.797041	1.650298	1.133675	0.389132	0.328735	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Industrials, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	44.53831***	43.58582	53.1506**	47.23169**	50.69696**	47.85613
r≤1	r=2	24.30895	19.9873	27.26813	24.76672	24.68748	29.79707
r≤2	r=3	5.692722	7.194648	7.284195	5.406676	5.260162	15.49471
r≤3	r=4	1.084994	2.491199	1.124614	0.99651	0.670424	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Oil&Gas, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	39.79887	33.4487	46.59981***	44.78641***	42.78379	47.85613
r≤1	r=2	20.62851	15.53276	20.52507	22.68676	19.36889	29.79707
r≤2	r=3	5.309423	5.861167	6.850204	4.791446	5.022428	15.49471
r≤3	r=4	0.502922	1.130121	0.597587	0.224449	0.255225	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Personal & Household Goods, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	31.1315	28.37377	40.1021	34.53012	34.82804	47.85613
r≤1	r=2	12.25428	10.78668	13.1217	12.57323	11.20128	29.79707
r≤2	r=3	4.625641	4.654375	6.252163	4.241629	4.356853	15.49471
r≤3	r=4	0.096746	0.390903	0.133394	0.000504	0.004453	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Real Estate, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	39.49318	34.51031	41.58769	35.60218	40.08564	47.85613
r≤1	r=2	13.85559	11.31815	13.66828	11.95507	11.67394	29.79707
r≤2	r=3	5.511485	6.249892	6.502226	5.034325	5.095825	15.49471
r≤3	r=4	0.831936	1.64928	0.719056	0.497784	0.431894	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Technology, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	39.60309	33.12811	41.7331	37.53762	40.29714	47.85613
r≤1	r=2	15.05351	12.65063	13.21042	12.42391	13.05534	29.79707
r≤2	r=3	6.577638	6.762117	6.470768	5.867495	5.802293	15.49471
r≤3	r=4	1.156379	1.707766	0.689993	0.636842	0.593042	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Telecommunications, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	46.98509***	36.81201	51.84718**	45.55167***	46.06804***	47.85613
r≤1	r=2	19.81684	13.29518	17.73666	19.54953	16.76568	29.79707
r≤2	r=3	6.702595	5.98354	5.132223	6.221934	6.082963	15.49471
r≤3	r=4	0.889207	0.616556	0.930101	0.45752	0.553851	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

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Var model: Utilities, MSCI, EUR/USD,WTI		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	38.84532	33.60881	51.66839**	40.55067	42.11522	47.85613
r≤1	r=2	17.65182	19.44645	21.63821	17.32465	18.37281	29.79707
r≤2	r=3	6.406154	7.188653	6.556528	5.933894	5.812603	15.49471
r≤3	r=4	1.186009	1.820808	0.923769	0.745749	0.668034	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Table 6. US Aggregate indices cointegration test

Var model: s&p 500, MSCI, FX, WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	40.39968	37.52684	50.99834	52.93422	45.16337	69.81889
r≤1	r=2	16.94061	20.39567	22.14958	23.24762	17.141	47.85613
r≤2	r=3	9.961002	11.01424	12.11894	10.07147	10.41491	29.79707
r≤3	r=4	3.532334	4.744818	5.917087	3.807661	3.894188	15.49471
r≤4	r=5	0.446017	0.642401	0.471913	0.496998	0.496497	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: s&p Midcap 400, MSCI, FX,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	50.77648	45.13621	62.4276	62.14822	55.21622	69.81889
r≤1	r=2	22.53594	26.05769	27.19952	29.09922	21.68443	47.85613
r≤2	r=3	11.09408	12.71672	14.10636	11.64263	11.17554	29.79707
r≤3	r=4	5.3672	4.089478	4.489224	4.672371	5.254373	15.49471

r≤4	r=5	0.001448	0.026806	0.001377	0.012415	0.023359	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: s&p Smallcap 600, MSCI, EUR/USD,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	58.11459	56.61425	58.11092	59.22213	58.5884	69.81889
r≤1	r=2	26.30971	31.94976	26.19332	29.11115	23.69195	47.85613
r≤2	r=3	11.70437	16.23944	12.98164	14.52896	9.771671	29.79707
r≤3	r=4	4.035574	4.740582	4.823857	3.188081	3.814398	15.49471
r≤4	r=5	0.086035	0.103607	0.012105	0.02737	0.007493	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Amex oil, MSCI, EUR/USD,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	50.53195	53.48419	59.35722	60.57336	53.55509	69.81889
r≤1	r=2	27.45598	32.18595	33.1912	35.36883	29.44207	47.85613
r≤2	r=3	11.55332	14.72797	16.24824	17.7703	12.70684	29.79707
r≤3	r=4	5.483151	5.641055	5.999717	5.37932	5.47005	15.49471
r≤4	r=5	0.157362	0.047317	0.102551	0.066173	0.154649	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Table 6. US Sectoral indices cointegration test

Var model: Automobile&Parts, MSCI, EUR/USD,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	61.66365	57.22433	68.57998***	69.29303***	66.92817***	69.81889
r≤1	r=2	38.87416	34.901	33.0479	40.68664	38.96515	47.85613
r≤2	r=3	18.50754	17.4522	15.34057	20.26672	19.23622	29.79707
r≤3	r=4	5.451202	5.356879	5.507905	4.869516	5.158992	15.49471
r≤4	r=5	0.013188	0.062209	0.003219	0.028932	0.030594	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Basic Materials, MSCI, EUR/USD,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	58.35597	50.83773	61.24068	66.34084***	57.04461	69.81889
r≤1	r=2	31.08474	28.71948	31.87668	34.44669	29.84636	47.85613
r≤2	r=3	13.08607	13.64591	14.12125	17.02839	12.44933	29.79707
r≤3	r=4	5.246895	5.100758	5.334738	4.767214	4.967942	15.49471
r≤4	r=5	0.19265	0.252747	0.183468	0.191264	0.197988	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Financials, MSCI, EUR/USD,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	59.02231	53.17895	60.93398	62.30051	60.50949	69.81889
r≤1	r=2	28.12833	23.56524	27.04004	31.5626	25.14806	47.85613
r≤2	r=3	12.46284	13.37264	13.0648	10.8717	11.97488	29.79707
r≤3	r=4	5.038009	5.496649	4.834224	3.869171	4.770333	15.49471
r≤4	r=5	0.040891	0.003706	3.42E-05	0.000105	0.006127	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Food&Beverage, MSCI, EUR/USD,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	40.07429	40.09125	50.79171	49.0383	43.3597	69.81889
r≤1	r=2	18.44269	23.18004	22.80445	23.35815	18.12519	47.85613
r≤2	r=3	10.3543	11.33668	12.12001	10.49506	10.21937	29.79707
r≤3	r=4	3.469374	4.45538	5.716437	3.402383	3.690927	15.49471
r≤4	r=5	0.383797	0.488846	0.383999	0.304058	0.378111	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Health Care, MSCI, EUR/USD,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	42.89512	43.89464	61.75021	54.56374	48.80249	69.81889
r≤1	r=2	19.47132	24.18448	28.46611	26.0809	19.55175	47.85613
r≤2	r=3	10.36269	11.48221	13.03289	12.33597	10.53777	29.79707
r≤3	r=4	3.605498	4.936897	6.217077	3.485124	3.94295	15.49471
r≤4	r=5	0.150965	0.354967	0.20105	0.175347	0.135644	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Industrials, MSCI, EUR/USD,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	54.76413	56.43308	62.76635	63.75628	59.26882	69.81889
r≤1	r=2	32.08391	32.44372	36.46235	38.17623	31.89604	47.85613
r≤2	r=3	12.25845	15.77743	16.12503	17.89118	12.25675	29.79707
r≤3	r=4	5.503258	5.813375	6.484388	5.470604	5.517277	15.49471
r≤4	r=5	0.158534	0.187657	0.163088	0.055438	0.159731	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Oil&Gas, MSCI, EUR/USD,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	51.27373	53.91627	62.02081	64.62165	57.33526	69.81889
r≤1	r=2	29.33251	32.61412	35.77573	38.37729	32.39364	47.85613
r≤2	r=3	12.08091	15.42594	16.63106	19.34103	13.32347	29.79707
r≤3	r=4	5.484272	5.735965	6.285803	5.49029	5.44849	15.49471
r≤4	r=5	0.007264	0.06837	0.023927	0.049251	0.009037	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Personal & Household Goods, MSCI, EUR/USD,WTI, GOLD		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	41.25089	43.11235	49.73926	50.39082	43.82011	69.81889
r≤1	r=2	19.09309	24.31425	22.30022	24.72315	18.59597	47.85613
r≤2	r=3	10.21814	11.40268	12.63353	10.90885	10.96513	29.79707
r≤3	r=4	4.13256	5.177604	6.394156	5.073676	4.822277	15.49471
r≤4	r=5	0.378614	0.576309	0.412517	0.575586	0.375243	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Real Estate, MSCI, EUR/USD,WTI, GOLD

		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	52.15376	50.45023	55.39143	59.48985	51.24427	69.81889
r≤1	r=2	24.01171	23.67804	26.72626	32.8312	21.71437	47.85613
r≤2	r=3	9.674687	11.36063	11.20765	10.3493	9.345323	29.79707
r≤3	r=4	3.898876	4.944517	4.828964	4.410076	3.875131	15.49471
r≤4	r=5	0.208291	0.271083	0.187184	0.161871	0.176486	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Technology, MSCI, EUR/USD,WTI, GOLD

		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	51.0057	46.09325	54.44623	56.81034	50.3607	69.81889
r≤1	r=2	23.36875	24.20891	25.64416	28.10551	21.44865	47.85613
r≤2	r=3	11.13382	12.38653	13.00584	12.19289	11.17232	29.79707
r≤3	r=4	5.488724	6.062106	6.09217	4.785864	5.45368	15.49471
r≤4	r=5	0.196971	0.195278	0.23602	0.101806	0.18042	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Telecommunications, MSCI, EUR/USD,WTI, GOLD

		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	55.94207	51.04005	60.94611	60.06006	53.92262	69.81889
r≤1	r=2	27.19109	26.35232	26.64358	32.07888	23.79899	47.85613
r≤2	r=3	12.19836	13.12916	13.52094	11.5019	11.5088	29.79707
r≤3	r=4	5.38795	4.441699	4.318799	4.370854	5.692933	15.49471
r≤4	r=5	0.10279	0.116073	0.034362	0.005071	0.044587	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Var model: Utilities, MSCI, EUR/USD,WTI, GOLD

		Model1	Model2	Model3	Model4	Model5	
Ho	HA	λtrace test	λtrace test	λtrace test	λtrace test	λtrace test	λtrace (0.95)
r=0	r=1	54.65894	51.2018	67.82459***	62.35942	57.11549	69.81889
r≤1	r=2	28.74294	29.53799	35.77328	34.73078	30.37782	47.85613
r≤2	r=3	14.7852	16.47847	18.64302	17.28328	16.22108	29.79707
r≤3	r=4	6.288701	6.329274	6.445346	5.891804	5.983368	15.49471
r≤4	r=5	0.360411	0.407588	0.38036	0.207865	0.356099	3.841466

Notes: Var model1: FX = EUR/USD, Var model2: FX = JYD/USD, Var model3: FX = CAD/USD, Var model4: FX = AUD/USD, Var model5: FX = NEER. *,**,*** denote rejection of the null hypothesis at the 1%,5%,10% level respectively.

Table 13. Generalized Impulse Responses

Response of DLSP:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLSP	p*	n*	n	p**	n*	p	p	n	p	p
	DLMSCI	p*	n*	n	p**	n*	p	p	n	p	n
	DLEUR_USD	p**	n	n**	p**	n	n	p	n	p	p
	DLWTI	p*	n**	p*	n	n	p	n	n	p	n
	DLGOLD	n	p*	n***	n	p	n	p	p	n	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLSP	p*	p*	n*	p**	p	n***	p**	n	n	p
	DLMSCI	p*	p*	n*	p**	p	n***	p**	n	n	p
	DLEUR_USD	n*	n	n**	n	p***	n**	p	p	n	p
	DLWTI	p*	n	n	p**	n**	p	p	n	p	n
	DLGOLD	p*	p**	p**	n**	p***	n	n	p	n	n
Response of DLEUR_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLSP	p**	n*	n	p	n	n	p	n	p	p
	DLMSCI	n*	n*	n	p	n	n	p	n	p	p
	DLEUR_USD	p*	p	p	p	p	n	p	n	n	p
	DLWTI	n*	n	n	p	n	p	n	n	p	n
	DLGOLD	n*	n	n	n	p	n	n	p	n	p
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLSP	p*	p*	n*	p	p	n***	p	n	n	p
	DLMSCI	p*	p**	n*	p	p	n***	p	n	n	p
	DLEUR_USD	n*	p	n	n	p***	n	p	p	n	p
	DLWTI	p*	n	n	p**	n***	p	p	n	p	p
	DLGOLD	p*	n	p	n***	p	p	n	p	n	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLSP	n	n*	p*	n**	p	p	n***	p	n	n
	DLMSCI	p*	p***	p*	n**	p***	p	n***	p***	n	n
	DLEUR_USD	n*	n*	p*	n***	n	p***	n***	p	p	n
	DLWTI	p*	p*	n***	n	p**	n***	p	p	n	p
	DLGOLD	p*	n*	p	p	n***	p	p	n	p	n

Var Model: S&P 500, MSCI, EUR/USD, WTI, GOLD.

Response of DLSP:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLSP	0.011681*	-0.000799*	-1.09E-04	5.82E-05**	-1.00E-05*	4.29E-07	2.41E-07	-7.29E-08	9.35E-09	2.46E-10
	DLMSCI	0.010295*	-7.92E-04*	-5.01E-05	4.49E-05**	-8.78E-06*	5.95E-07	1.59E-07	-5.88E-08	8.75E-09	-9.39E-11
	DLEUR_USD	0.000386**	-8.97E-05	-7.48E-05**	1.38E-05**	-1.02E-06	-2.52E-07	9.53E-08	-1.45E-08	2.19E-10	4.44E-10
	DLWTI	0.001229*	-0.000417**	8.84E-05*	-3.11E-06	-2.15E-06	6.38E-07	-8.00E-08	-2.53E-09	3.36E-09	-7.25E-10
	DLGOLD	-0.00015	0.000414*	-4.26E-05***	-1.08E-06	1.89E-06	-4.13E-07	3.51E-08	5.71E-09	-2.58E-09	4.29E-10
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLSP	0.008161*	0.001739*	-0.0004*	4.72E-05**	3.35E-06	-2.41E-06***	4.70E-07**	-3.09E-08	-8.69E-09	3.16E-09
	DLMSCI	0.009259*	0.00136*	-3.25E-04*	4.63E-05**	1.04E-06	-1.81E-06***	4.04E-07**	-3.55E-08	-5.29E-09	2.50E-09
	DLEUR_USD	-0.001499*	-9.06E-05	-7.28E-05**	-3.62E-06	2.94E-06***	-6.69E-07**	6.02E-08	8.15E-09	-4.03E-09	6.94E-10
	DLWTI	0.00143*	-5.97E-05	-3.11E-05	2.24E-05**	-4.09E-06**	2.60E-07	7.80E-08	-2.76E-08	4.00E-09	-1.58E-11
	DLGOLD	0.00054*	0.000281**	5.45E-05**	-1.53E-05**	2.33E-06***	-1.79E-08	-7.43E-08	1.86E-08	-1.94E-09	-1.71E-10
Response of DLEUR_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLSP	0.000206**	-0.000274*	-5.69E-05	1.08E-05	-9.49E-07	-1.83E-07	7.63E-08	-1.23E-08	3.52E-10	3.37E-10
	DLMSCI	-0.001007*	-3.12E-04*	-4.74E-05	9.10E-06	-1.04E-06	-1.03E-07	5.94E-08	-1.10E-08	6.04E-10	2.30E-10
	DLEUR_USD	0.00622*	3.89E-05	1.32E-05	1.19E-06	2.67E-07	-9.94E-08	1.84E-08	-1.07E-09	-3.61E-10	1.24E-10
	DLWTI	-0.000569*	-0.000104	-7.12E-06	1.84E-06	-7.27E-07	1.08E-07	-2.88E-09	-2.99E-09	8.15E-10	-9.40E-11
	DLGOLD	-0.001287*	-8.12E-05	-5.55E-06	-2.13E-06	4.56E-07	-5.60E-08	-2.74E-09	2.53E-09	-5.18E-10	3.81E-11
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLSP	0.002523*	0.001189*	-0.000452*	4.44E-05	4.42E-06	-2.67E-06***	4.94E-07	-2.78E-08	-1.03E-08	3.43E-09
	DLMSCI	0.003702*	0.0007**	-3.86E-04*	4.44E-05	1.76E-06	-2.03E-06***	4.28E-07	-3.40E-08	-6.50E-09	2.74E-09
	DLEUR_USD	-0.002194*	0.000411	-1.32E-05	-4.14E-06	3.51E-06***	-7.11E-07	5.88E-08	1.01E-08	-4.42E-09	7.22E-10
	DLWTI	0.023976*	-0.000322	-7.30E-05	2.42E-05**	-4.40E-06***	2.32E-07	9.13E-08	-3.00E-08	4.09E-09	4.16E-11
	DLGOLD	0.001499*	-0.000137	4.51E-05	-1.79E-05***	2.35E-06	1.01E-08	-8.42E-08	1.99E-08	-1.91E-09	-2.21E-10
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLSP	-0.000127	-0.00041*	0.000569*	-1.13E-04**	9.32E-06	1.66E-06	-7.16E-07***	1.16E-07	-3.41E-09	-3.16E-09
	DLMSCI	0.000575*	0.000264***	0.000424*	-9.53E-05**	9.90E-06***	9.19E-07	-5.57E-07***	1.03E-07***	-5.76E-09	-2.15E-09
	DLEUR_USD	-0.002041*	-0.001695*	1.77E-04*	-2.06E-05***	-1.26E-06	8.82E-07***	-1.69E-07***	9.95E-09	3.40E-09	-1.17E-09
	DLWTI	0.000617*	0.00153*	-8.56E-05***	-1.29E-05	6.22E-06**	-9.91E-07***	2.54E-08	2.82E-08	-7.68E-09	8.90E-10
	DLGOLD	0.009864*	-0.000441*	3.33E-05	1.59E-05	-4.30E-06***	5.15E-07	2.54E-08	-2.38E-08	4.88E-09	-3.63E-10

Var Model: S&P 500, MSCI, EUR/USD, WTI, GOLD.

Response of DLAO:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	p*	n*	p	n**	p	n	p	n	p	n
	DLMSCI	p*	n*	n	n**	n	n	p	n	p	n
	DLJYD_USD	p*	p	n**	p	n	p	n	p	n	p
	DLWTI	p*	n	p***	n***	p	n	p	n	p	n
	DLGOLD	p*	p***	n***	n	n	n	n	p	n	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	p*	p*	p*	p	p	p	n	n	n	n
	DLMSCI	p*	p*	p**	p	p	p	n	n	n	n
	DLJYD_USD	p	p**	n	n	p	n	p	n	p	n
	DLWTI	p*	n	p	p**	p	p	p	n	n	n
	DLGOLD	p*	p**	p*	p	p	p	n	n	n	n
Response of DLJYD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	p*	p***	n	n	n	n	n	p	n	p
	DLMSCI	p	p	n	n	n	n	n	p	p	p
	DLJYD_USD	p*	p	n**	p	p	n	p	n	p	n
	DLWTI	p**	n	p**	n	n	p	n	n	n	p
	DLGOLD	n*	p**	n	n	n	n	n	n	p	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	p*	p*	n	p	n***	p	n	p	n	p
	DLMSCI	p*	p***	n	n	n***	p	n	p	n	p
	DLJYD_USD	p**	p**	p	n	p	n	p	n	p	n
	DLWTI	p*	n	n	p***	n	p	n	p	n	p
	DLGOLD	p*	n	p***	n	n	n	p	n	p	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	p*	p*	n*	p	n	p	n	p	n	p
	DLMSCI	p*	p*	n**	p	n	p	n	p	n	p
	DLJYD_USD	n*	n*	p*	n	p	n	p	n	p	n
	DLWTI	p*	p*	n*	p	n	p	n	p	n	p
	DLGOLD	p*	n*	p	n	p	n	p	n	p	n

Var Model: Amex Oil, MSCI, JYD/USD, WTI, GOLD.

Response of DLAO:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	0.014986*	-0.000738*	2.06E-05	-1.36E-05**	7.04E-08	-6.85E-08	2.13E-09	-2.78E-10	2.97E-11	-1.42E-12
	DLMSCI	0.009578*	-8.32E-04*	-2.63E-05	-1.12E-05**	-7.96E-08	-5.09E-08	1.59E-09	-1.49E-10	2.29E-11	-6.80E-13
	DLJYD_USD	0.001045*	1.80E-04	-6.58E-05**	5.71E-06	-4.10E-07	2.45E-08	-1.84E-09	1.87E-10	-1.63E-11	1.44E-12
	DLWTI	0.005667*	-0.0000522	7.23E-05***	-8.22E-06***	1.55E-07	-3.82E-08	9.10E-10	-2.28E-10	1.76E-11	-1.25E-12
	DLGOLD	0.000605*	0.000408***	-4.79E-05***	-4.45E-07	-2.46E-07	-3.27E-10	-1.33E-09	8.52E-11	-5.17E-12	7.11E-13
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	0.005971*	0.001039*	9.51E-05*	7.77E-06	1.83E-07	1.63E-08	-1.13E-09	-6.82E-11	-1.36E-11	-3.18E-13
	DLMSCI	0.009342*	0.001256*	9.59E-05**	6.32E-06	1.46E-07	6.44E-09	-1.42E-09	-9.61E-11	-1.23E-11	-3.74E-13
	DLJYD_USD	0.000205	3.22E-04**	-1.56E-06	-1.20E-06	1.29E-07	-8.12E-09	1.41E-10	-2.24E-11	2.00E-12	-2.73E-13
	DLWTI	0.001476*	-8.59E-05	3.57E-05	5.16E-06**	7.57E-08	1.65E-08	1.35E-10	-5.23E-12	-6.30E-12	-4.37E-14
	DLGOLD	0.000396*	0.000299**	4.26E-05*	1.42E-06	1.24E-07	2.66E-09	-9.75E-11	-4.81E-11	-1.66E-12	-3.25E-13
Response of DLJYD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	0.000486*	0.000188***	-9.36E-06	-2.39E-06	-3.44E-07	-3.42E-09	-1.49E-09	2.56E-11	-1.67E-12	5.67E-13
	DLMSCI	0.000153	9.66E-05	-2.54E-05	-2.90E-06	-2.82E-07	-6.26E-09	-1.05E-09	3.26E-11	2.12E-13	4.91E-13
	DLJYD_USD	0.006975*	9.46E-05	-2.76E-05**	2.33E-07	1.12E-07	-1.23E-08	6.00E-10	-1.45E-11	1.41E-12	-1.83E-13
	DLWTI	0.000211**	-0.000134	3.45E-05**	-3.36E-07	-2.59E-07	5.07E-09	-9.57E-10	-1.86E-11	-1.72E-12	2.84E-13
	DLGOLD	-0.000604*	1.98E-04**	-1.76E-07	-1.86E-06	-1.26E-08	-6.19E-09	-2.60E-10	-1.22E-11	1.73E-12	-5.10E-14
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	0.00907*	0.000903*	-7.75E-05	3.87E-06	-1.45E-06***	2.47E-08	-6.64E-09	2.70E-10	-2.98E-11	3.30E-12
	DLMSCI	0.003789*	0.000619***	-8.08E-05	-1.40E-06	-1.13E-06***	7.35E-09	-4.89E-09	2.03E-10	-1.63E-11	2.45E-12
	DLJYD_USD	0.000727**	0.000724**	4.25E-06	-8.44E-06	7.81E-07	-4.87E-08	2.48E-09	-1.82E-10	2.05E-11	-1.93E-12
	DLWTI	0.023986*	-0.000342	-1.41E-05	9.92E-06***	-1.03E-06	2.31E-08	-3.34E-09	1.07E-10	-2.44E-11	2.13E-12
	DLGOLD	0.001321*	-0.00011	5.66E-05***	-5.75E-06	-1.49E-08	-2.02E-08	1.50E-10	-1.39E-10	1.07E-11	-6.29E-13
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	0.000403*	0.001046*	-0.000129*	4.13E-06	-6.63E-07	2.02E-08	-3.76E-09	2.93E-10	-2.26E-11	2.25E-12
	DLMSCI	0.000423*	0.000387*	-9.59E-05**	1.80E-06	-5.38E-07	1.23E-08	-2.39E-09	2.03E-10	-1.32E-11	1.63E-12
	DLJYD_USD	-0.000863*	-0.001053*	9.75E-05*	-5.36E-06	2.06E-07	-1.61E-08	2.08E-09	-2.13E-10	1.81E-11	-1.30E-12
	DLWTI	0.000549*	0.001565*	-1.05E-04*	3.36E-06	-2.35E-07	8.15E-09	-2.79E-09	2.14E-10	-1.80E-11	1.34E-12
	DLGOLD	0.009967*	-0.000491*	6.36E-06	-1.24E-06	6.65E-09	-1.69E-08	9.84E-10	-8.56E-11	6.40E-12	-3.64E-13

Var Model: Amex Oil, MSCI, JYD/USD, WTI, GOLD.

Response of DLAO:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	p*	n*	p	p	n	p	n	p	n	n
	DLMSCI	p*	n*	n	p	n***	p	n	p	n	n
	DLAUD_USD	n*	p	n	p**	n	p	n	n	p	n
	DLWTI	p*	n	p**	n***	p	p	n	p	n	p
	DLGOLD	p*	p***	n**	p	n	n	p	n	p	n
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	p*	p*	p	p**	n	p	n	n	p	n
	DLMSCI	p*	p*	p	p**	n	p	n	n	p	n
	DLAUD_USD	n*	n	n*	p	n	n	p	n	p	n
	DLWTI	p*	n	p	p**	n	p***	n	p	n	n
	DLGOLD	p*	p**	p**	n	p	n	p	n	n	p
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	n*	n*	p*	n**	p	p	n	p	n	p
	DLMSCI	n*	n*	p*	n**	p	p	n	p	n	p
	DLAUD_USD	p*	n**	p***	p	n	p	n	p	n	n
	DLWTI	n*	n*	p	n**	p***	n***	p	p	n	p
	DLGOLD	n*	n	n**	p***	n	p	n	n	p	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	p*	p**	n**	p***	n	p	p	n	p	n
	DLMSCI	p*	p***	n**	p	n	n	p	n	p	n
	DLAUD_USD	n*	p	n	p	p	n	p	n	p	n
	DLWTI	p*	n	n	p	n***	p	n	n	p	n
	DLGOLD	p*	n	p	n***	p	n	p	p	n	p
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	p*	p*	p*	n**	p*	n**	p	n	n	p
	DLMSCI	p*	p**	p*	n**	p*	n**	p	n	n	p
	DLAUD_USD	n*	n*	p*	n**	p	n	n	p	n	p
	DLWTI	p*	p*	n**	p	p	n***	p***	n	p	n
	DLGOLD	p*	n*	p	p	n	p***	n	p	n	n

Var Model: Amex Oil, MSCI, AUD/USD, WTI, GOLD.

Response of DLAO:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	0.014988*	-0.000739*	2.56E-05	4.94E-07	-3.33E-06	5.68E-07	-9.81E-08	1.08E-08	-6.76E-10	-7.59E-11
	DLMSCI	0.009591*	-8.33E-04*	-2.23E-05	1.22E-06	-3.14E-06***	4.79E-07	-7.79E-08	7.86E-09	-3.35E-10	-9.46E-11
	DLAUD_USD	-0.003526*	7.51E-05	-5.13E-05	1.64E-05**	-1.92E-06	2.67E-07	-1.33E-08	-1.78E-09	8.26E-10	-1.74E-10
	DLWTI	0.005677*	-0.0000522	7.41E-05**	-8.30E-06***	2.02E-07	6.00E-08	-3.02E-08	5.66E-09	-8.56E-10	9.00E-11
	DLGOLD	0.000562*	0.000407***	-5.23E-05**	1.78E-06	-7.46E-09	-1.27E-07	2.58E-08	-4.40E-09	5.28E-10	-3.82E-11
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	0.005978*	0.001035*	3.15E-05	2.05E-05**	-1.24E-06	2.14E-07	-5.62E-09	-2.53E-09	7.98E-10	-1.56E-10
	DLMSCI	0.009341*	0.001267*	4.26E-05	1.79E-05**	-9.40E-07	1.47E-07	-9.63E-10	-2.76E-09	7.09E-10	-1.30E-10
	DLAUD_USD	-0.003007*	-1.34E-04	-8.59E-05*	2.17E-07	-4.11E-07	-7.43E-08	1.81E-08	-3.53E-09	5.04E-10	-4.87E-11
	DLWTI	0.001474*	-8.10E-05	3.13E-05	5.32E-06**	-3.64E-07	1.36E-07***	-1.46E-08	1.50E-09	-1.86E-11	-2.92E-11
	DLGOLD	0.000414*	0.000294**	3.50E-05**	-2.52E-07	7.27E-07	-7.36E-08	9.44E-09	-4.72E-10	-9.16E-11	3.36E-11
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	-0.001773*	-0.001615*	1.40E-04*	-2.51E-05**	1.84E-06	3.15E-08	-5.09E-08	1.30E-08	-2.19E-09	2.80E-10
	DLMSCI	-0.002426*	-1.43E-03*	1.14E-04*	-1.87E-05**	1.19E-06	9.24E-08	-4.91E-08	1.13E-08	-1.77E-09	2.10E-10
	DLAUD_USD	0.007537*	-2.59E-04**	6.15E-05***	1.90E-06	-1.17E-06	2.96E-07	-5.05E-08	6.27E-09	-5.04E-10	-1.49E-11
	DLWTI	-0.001248*	-0.000331*	2.58E-05	-1.14E-05**	1.55E-06***	-1.99E-07***	1.40E-08	8.94E-10	-5.47E-10	1.25E-10
	DLGOLD	-0.00181*	-1.29E-05	-5.63E-05**	7.37E-06***	-1.11E-06	1.00E-07	-8.35E-10	-2.00E-09	5.58E-10	-9.91E-11
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	0.009085*	0.000894**	-0.000216**	2.41E-05***	-2.94E-06	2.49E-08	4.55E-08	-1.36E-08	2.47E-09	-3.36E-10
	DLMSCI	0.003785*	0.000643***	-1.95E-04**	1.72E-05	-2.08E-06	-5.12E-08	4.67E-08	-1.20E-08	2.03E-09	-2.57E-10
	DLAUD_USD	-0.003972*	0.000513	-4.58E-05	2.43E-06	1.27E-06	-3.00E-07	5.73E-08	-7.58E-09	6.98E-10	-7.14E-12
	DLWTI	0.023984*	-0.000332	-2.31E-05	9.55E-06	-1.94E-06***	2.28E-07	-2.11E-08	-2.78E-10	5.21E-10	-1.33E-10
	DLGOLD	0.001361*	-0.000122	3.97E-05	-9.91E-06***	1.19E-06	-1.40E-07	4.40E-09	1.73E-09	-5.76E-10	1.11E-10
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLAO	0.000372*	0.001067*	0.000163*	-5.83E-05**	1.03E-05*	-1.58E-06**	1.54E-07	-5.97E-09	-2.14E-09	6.93E-10
	DLMSCI	0.00044*	0.000338**	0.000152*	-5.41E-05**	8.43E-06*	-1.24E-06**	1.07E-07	-1.13E-09	-2.28E-09	6.19E-10
	DLAUD_USD	-0.002381*	-0.001554*	2.44E-04*	-3.36E-05**	3.74E-06	-9.95E-08	-4.88E-08	1.61E-08	-3.03E-09	4.28E-10
	DLWTI	0.000563*	0.001546*	-8.28E-05**	2.13E-06	1.82E-06	-5.61E-07***	9.82E-08***	-1.36E-08	1.24E-09	-1.64E-11
	DLGOLD	0.009916*	-0.000472*	3.65E-05	4.76E-06	-2.43E-06	4.63E-07***	-7.25E-08	7.75E-09	-4.03E-10	-7.55E-11

Var Model: Amex Oil, MSCI, AUD/USD, WTI, GOLD.

Response of DLBM:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p*	n	p	n***	p	n	p	n	p	n
	DLMSCI	p*	n	p	n***	p	n	p	n	p	n
	DLJYD_USD	p*	p	n**	p	n	p	n	p	n	p
	DLWTI	p*	n	p**	n	p	n	p	n	p	n
	DLGOLD	p**	p**	n	p	n	p	n	p	n	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p*	p*	p*	p	n	n	n	p	p	p
	DLMSCI	p*	p*	p***	p	n	n	n	p	p	p
	DLJYD_USD	p	p**	n	n	n	n	p	p	p	n
	DLWTI	p*	n	p	p***	n	p	n	p	n	p
	DLGOLD	p**	p**	p*	p	n	n	n	n	p	p
Response of DLJYD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p*	p*	n	n	n	p	p	p	p	p
	DLMSCI	p	p	n	n***	n	p	p	p	n	n
	DLJYD_USD	p*	p	n**	n	p	p	p	n	n	n
	DLWTI	p**	n	p	p	n	n	n	p	p	p
	DLGOLD	n*	p**	p	n	n	n	p	p	p	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p*	p*	n	p	n**	p	n	p	n	p
	DLMSCI	p*	p***	n	n	n**	p	n	p	n	p
	DLJYD_USD	p**	p**	n	n***	p	n	p	n	p	n
	DLWTI	p*	n	n	p***	n	p	n	p	n	p
	DLGOLD	p*	n	p***	n	n	n	p	n	p	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p**	p*	n*	p	n	p	n	p	n	p
	DLMSCI	p**	p*	n*	p	n	p	n	p	n	p
	DLJYD_USD	n*	n*	p**	n	p	n	p	n	p	n
	DLWTI	p*	p*	n*	p	n	p	n	p	n	p
	DLGOLD	p*	n*	p	n	p	n	p	n	p	n

Var Model: Basic Materials, MSCI, JYD/USD, WTI, GOLD.

Response of DLBM:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.015379*	-0.000094	5.60E-05	-1.22E-05***	3.00E-07	-6.32E-08	6.89E-09	-3.49E-10	5.34E-11	-4.55E-12
	DLMSCI	0.010824*	-8.69E-05	1.64E-05	-8.67E-06***	1.58E-07	-3.34E-08	4.71E-09	-1.84E-10	3.16E-11	-2.94E-12
	DLJYD_USD	0.001162*	1.21E-04	-6.61E-05**	4.09E-06	-3.00E-07	4.17E-08	-2.86E-09	2.83E-10	-3.00E-11	2.32E-12
	DLWTI	0.002293*	-0.000277	9.02E-05**	-6.47E-06	4.05E-07	-5.99E-08	4.40E-09	-3.94E-10	4.40E-11	-3.44E-12
	DLGOLD	0.000493**	0.000519**	-2.27E-05	2.72E-07	-2.90E-07	1.26E-08	-1.10E-09	1.85E-10	-9.72E-12	1.13E-12
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.006562*	0.001411*	0.000106*	4.52E-06	-5.56E-07	-3.83E-08	-3.79E-09	1.53E-10	7.11E-12	2.38E-12
	DLMSCI	0.009323*	0.001257*	7.72E-05***	1.48E-06	-5.21E-07	-3.32E-08	-2.22E-09	1.53E-10	9.52E-12	1.59E-12
	DLJYD_USD	0.000182	3.20E-04**	-9.54E-06	-3.79E-06	-3.30E-08	-5.34E-09	1.57E-09	2.47E-12	7.76E-12	-7.85E-13
	DLWTI	0.001453*	-8.75E-05	2.13E-05	5.27E-06***	-1.88E-08	1.72E-09	-2.45E-09	1.45E-11	-8.79E-12	1.28E-12
	DLGOLD	0.000329**	0.000296**	4.85E-05*	1.08E-06	-5.81E-08	-1.98E-08	-6.71E-10	-3.51E-11	7.77E-12	2.26E-13
Response of DLJYD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.000527*	0.000318*	-1.98E-05	-5.03E-06	-4.29E-07	5.58E-09	1.14E-09	2.19E-10	1.06E-12	1.24E-13
	DLMSCI	0.000136	9.71E-05	-2.91E-05	-4.40E-06***	-2.75E-07	9.21E-09	1.29E-09	1.57E-10	-3.27E-13	-1.50E-13
	DLJYD_USD	0.00697*	9.42E-05	-3.06E-05**	-5.19E-07	1.47E-07	3.95E-09	6.13E-10	-4.78E-11	-2.30E-13	-4.67E-13
	DLWTI	0.000201**	-0.000135	2.75E-05	2.87E-07	-2.35E-07	-4.80E-09	-6.22E-10	8.74E-11	4.84E-13	6.00E-13
	DLGOLD	-0.00064*	2.00E-04**	2.61E-06	-2.04E-06	-1.11E-07	-3.84E-09	6.08E-10	4.03E-11	3.96E-12	-1.78E-13
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.003574*	0.00134*	-0.0001	2.06E-06	-2.18E-06**	8.49E-08	-7.16E-09	1.31E-09	-6.48E-11	7.73E-12
	DLMSCI	0.003737*	0.000624***	-8.98E-05	-2.23E-06	-1.43E-06**	6.00E-08	-2.93E-09	8.68E-10	-3.90E-11	4.23E-12
	DLJYD_USD	0.000692**	0.000725**	-6.32E-06	-1.00E-05***	9.00E-07	-4.42E-08	6.73E-09	-5.46E-10	4.35E-11	-5.14E-12
	DLWTI	0.023968*	-0.00034	-3.99E-05	1.31E-05***	-1.36E-06	6.38E-08	-9.28E-09	8.43E-10	-6.20E-11	7.35E-12
	DLGOLD	0.001218*	-0.000103	6.47E-05***	-6.68E-06	-3.01E-08	-4.01E-08	3.27E-09	-1.27E-10	3.06E-11	-2.03E-12
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.000317**	0.001172*	-0.000224*	7.30E-06	-1.40E-06	1.33E-07	-7.88E-09	1.11E-09	-9.14E-11	7.45E-12
	DLMSCI	0.00035**	0.000407*	-0.000158*	3.72E-06	-7.82E-07	8.96E-08	-4.21E-09	6.70E-10	-5.81E-11	4.22E-12
	DLJYD_USD	-0.000909*	-0.001047*	8.05E-05**	-7.08E-06	8.49E-07	-5.94E-08	6.05E-09	-6.11E-10	4.89E-11	-4.95E-12
	DLWTI	0.000503*	0.001575*	-1.30E-04*	9.58E-06	-1.23E-06	9.01E-08	-8.50E-09	8.99E-10	-7.20E-11	7.08E-12
	DLGOLD	0.009902*	-0.000473*	1.72E-05	-5.63E-06	2.45E-07	-2.61E-08	3.63E-09	-2.06E-10	2.44E-11	-2.46E-12

Var Model: Basic Materials, MSCI, JYD/USD, WTI, GOLD.

Response of DLBM:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p*	n	p	p	n***	p	n	n	p	n
	DLMSCI	p*	n	p	p	n***	p	n	n	p	n
	DLCAD_USD	n*	n	n**	p***	n	p	p	n	p	n
	DLWTI	p*	n	p**	n	n	p	n	p	n	n
	DLGOLD	p**	p**	n	p	p	n	p	n	p	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p*	p*	p	p**	p	n	p	n	p	n
	DLMSCI	p*	p*	p	p	p	n	p	n	p	p
	DLCAD_USD	n*	n***	n**	n***	p	n	p	p	n	p
	DLWTI	p*	n	p	p**	n	p	p	n	p	n
	DLGOLD	p**	p**	p**	p	p	n	n	p	n	p
Response of DLCAD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	n*	n*	p	n	n	p	n	p	p	n
	DLMSCI	n*	n*	p	n	n	p	n	p	p	n
	DLCAD_USD	p*	p	p	p**	n	p	n	n	p	n
	DLWTI	n*	n*	p***	n**	p	p	n	p	n	p
	DLGOLD	n*	n	n**	p	n	n	p	n	p	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p*	p*	n*	p	n	n	p	n	p	p
	DLMSCI	p*	p***	n**	p	n	n	p	n	p	p
	DLCAD_USD	n*	p***	p	n	p***	n	p	p	n	p
	DLWTI	p*	n	n	p**	n***	p	p	n	p	n
	DLGOLD	p*	n	p	n***	p	n	n	p	n	p
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p**	p*	p***	n**	p**	n	n	p	n	p
	DLMSCI	p**	p**	p	n**	p**	n	n	p	n	p
	DLCAD_USD	n*	n*	p*	n***	p	p	n	p	n	n
	DLWTI	p*	p*	n	n	p***	n**	p	n	n	p
	DLGOLD	p*	n*	p	n	n	p	n	p	p	n

Var Model: Basic Materials, MSCI, CAD/USD, WTI, GOLD.

Response of DLBM:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.01538*	-0.000095	5.89E-05	8.11E-06	-2.05E-06***	2.11E-07	-2.00E-08	-7.98E-10	3.68E-10	-6.49E-11
	DLMSCI	0.010829*	-8.75E-05	1.99E-05	5.71E-06	-1.69E-06***	1.48E-07	-1.31E-08	-8.42E-10	3.06E-10	-4.83E-11
	DLCAD_USD	-0.003739*	-8.20E-05	-9.50E-05**	9.55E-06***	-8.06E-07	1.69E-08	1.46E-08	-2.45E-09	3.01E-10	-1.53E-11
	DLWTI	0.002301*	-0.000276	9.39E-05**	-2.89E-06	-2.72E-07	1.34E-07	-2.20E-08	1.85E-09	-4.68E-11	-2.42E-11
	DLGOLD	0.000458**	0.000517**	-2.77E-05	3.07E-06	6.93E-08	-6.97E-08	9.64E-09	-1.11E-09	2.92E-11	9.97E-12
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.006566*	0.001411*	5.72E-05	1.57E-05**	1.96E-07	-3.95E-08	1.13E-08	-2.37E-09	1.13E-10	-2.57E-12
	DLMSCI	0.009325*	0.001265*	4.45E-05	1.01E-05	1.17E-08	-5.79E-08	7.51E-09	-1.82E-09	7.10E-11	8.33E-13
	DLCAD_USD	-0.003002*	-2.35E-04***	-7.44E-05**	-6.23E-06***	1.92E-07	-9.11E-08	8.34E-09	1.34E-11	-6.48E-11	2.15E-11
	DLWTI	0.001454*	-8.31E-05	1.17E-05	8.16E-06**	-2.96E-07	6.53E-08	2.17E-09	-1.00E-09	1.56E-10	-1.82E-11
	DLGOLD	0.000327**	0.000296**	4.01E-05**	4.22E-07	4.84E-07	-1.96E-08	-6.68E-10	3.33E-10	-9.34E-11	7.82E-12
Response of DLCAD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	-0.001198*	-0.00113*	2.67E-05	-4.99E-06	-5.52E-07	1.56E-07	-1.81E-08	1.73E-09	3.34E-11	-2.76E-11
	DLMSCI	-0.001586*	-8.59E-04*	2.24E-05	-2.20E-06	-4.10E-07	1.28E-07	-1.29E-08	1.15E-09	4.57E-11	-2.31E-11
	DLCAD_USD	0.004927*	7.38E-05	8.44E-06	6.75E-06**	-7.83E-07	7.22E-08	-2.15E-09	-1.04E-09	1.96E-10	-2.51E-11
	DLWTI	-0.000899*	-0.00032*	3.47E-05***	-7.70E-06**	3.39E-07	1.38E-08	-1.02E-08	1.76E-09	-1.63E-10	5.82E-12
	DLGOLD	-0.000705*	-4.71E-05	-3.54E-05**	2.47E-06	-2.68E-07	-2.18E-09	5.11E-09	-7.92E-10	9.32E-11	-3.51E-12
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.003586*	0.001338*	-0.000269*	1.42E-05	-6.33E-07	-3.28E-07	5.79E-08	-6.75E-09	3.89E-10	3.85E-11
	DLMSCI	0.003737*	0.000651***	-2.06E-04**	8.25E-06	-1.65E-07	-2.65E-07	4.53E-08	-4.74E-09	2.35E-10	3.73E-11
	DLCAD_USD	-0.004375*	0.000566***	2.05E-07	-7.37E-06	2.58E-06***	-2.77E-07	2.18E-08	7.07E-10	-4.74E-10	7.86E-11
	DLWTI	0.023963*	-0.000328	-7.84E-05	1.78E-05**	-2.20E-06***	7.24E-08	1.47E-08	-4.61E-09	6.25E-10	-4.87E-11
	DLGOLD	0.001268*	-0.0000945	4.49E-05	-1.12E-05***	9.57E-07	-6.87E-08	-6.75E-09	2.13E-09	-3.10E-10	2.74E-11
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.000293**	0.001176*	0.000108***	-3.48E-05**	3.52E-06**	-3.93E-07	-7.61E-09	5.63E-09	-1.08E-09	1.19E-10
	DLMSCI	0.000346**	0.000356**	0.000072	-2.93E-05**	2.50E-06**	-2.63E-07	-9.58E-09	4.79E-09	-8.13E-10	8.49E-11
	DLCAD_USD	-0.001412*	-0.001661*	1.69E-04*	-1.47E-05***	6.32E-07	2.25E-07	-4.00E-08	5.33E-09	-3.22E-10	-2.05E-11
	DLWTI	0.000522*	0.001553*	-5.40E-05	-2.87E-06	2.07E-06***	-3.77E-07**	3.37E-08	-1.36E-09	-3.50E-10	8.48E-11
	DLGOLD	0.009864*	-0.000498*	5.88E-05	-2.86E-07	-1.12E-06	1.58E-07	-2.02E-08	7.49E-10	1.38E-10	-3.99E-11

Var Model: Basic Materials, MSCI, CAD/USD, WTI, GOLD.

Response of DLBM:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p*	n	p***	p	n	p	n	p	n	p
	DLMSCI	p*	n	p	p	n	p	n	p	n	p
	DLAUD_USD	n*	n***	n	p	n	p	n	p	p	n
	DLWTI	p*	n	p*	n***	p	p	n	p	n	p
	DLGOLD	p***	p**	n	p	n	n	p	n	p	n
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p*	p*	p	p**	n	p	n	n	p	n
	DLMSCI	p*	p*	p	p**	n	p	n	n	p	n
	DLAUD_USD	n*	n	n*	p	n	n	p	n	p	n
	DLWTI	p*	n	p	p**	n	p**	n	p	n	n
	DLGOLD	p*	p**	p**	n	p	n	p	n	p	p
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	n*	n*	p*	n**	p	n	n	p	n	p
	DLMSCI	n*	n*	p*	n**	p	n	n	p	n	p
	DLAUD_USD	p*	n**	p*	n	n	p	n	p	n	p
	DLWTI	n*	n*	p	n**	p**	n***	p	n	n	p
	DLGOLD	n*	n	n**	p	n	p	n	n	p	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p*	p*	n**	p**	n	p	p	n	p	n
	DLMSCI	p*	p***	n**	p**	n	p	p	n	p	n
	DLAUD_USD	n*	p	n	p	p	n	p	n	p	n
	DLWTI	p*	n	n	p**	n**	p	n	p	p	n
	DLGOLD	p*	n	p	n***	p	n	p	n	n	p
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	p***	p*	p*	n**	p*	n*	p	n	p	p
	DLMSCI	p*	p**	p**	n**	p*	n*	p	n	p	p
	DLAUD_USD	n*	n*	p*	n**	p**	n	p	p	n	p
	DLWTI	p*	p*	n**	p	p	n**	p**	n***	p	n
	DLGOLD	p*	n*	p	p	n	p	n	p	n	p

Var Model: Basic Materials, MSCI, AUD/USD, WTI, GOLD.

Response of DLBM:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.015375*	-0.000095	1.17E-04***	1.68E-06	-1.66E-06	4.00E-07	-8.19E-08	1.14E-08	-1.40E-09	1.09E-10
	DLMSCI	0.010843*	-9.65E-05	6.21E-05	5.27E-07	-1.43E-06	2.84E-07	-5.84E-08	7.91E-09	-9.33E-10	6.71E-11
	DLAUD_USD	-0.003313*	-4.00E-04***	-6.19E-05	7.30E-06	-1.66E-06	2.56E-07	-2.81E-08	2.55E-09	2.67E-11	-5.71E-11
	DLWTI	0.002309*	-0.000281	9.55E-05*	-7.57E-06***	7.02E-07	2.91E-08	-2.25E-08	5.22E-09	-9.35E-10	1.31E-10
	DLGOLD	0.000408***	0.000517**	-2.58E-05	4.60E-06	-1.58E-07	-5.18E-08	1.52E-08	-3.32E-09	5.11E-10	-6.65E-11
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.006574*	0.001409*	3.26E-05	2.54E-05**	-1.73E-06	2.93E-07	-2.27E-08	-7.01E-10	5.36E-10	-1.51E-10
	DLMSCI	0.009322*	0.001271*	2.64E-05	1.69E-05**	-1.38E-06	1.75E-07	-1.58E-08	-9.22E-10	4.13E-10	-1.09E-10
	DLAUD_USD	-0.002953*	-1.38E-04	-1.07E-04*	4.72E-07	-8.50E-07	-2.32E-08	1.17E-08	-2.92E-09	5.77E-10	-7.97E-11
	DLWTI	0.001452*	-8.08E-05	1.64E-05	7.10E-06**	-8.14E-07	2.02E-07**	-2.52E-08	2.86E-09	-1.92E-10	-1.48E-11
	DLGOLD	0.000347*	0.000291**	4.05E-05**	-4.60E-07	8.35E-07	-9.45E-08	1.30E-08	-1.30E-09	2.52E-11	1.68E-11
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	-0.001611*	-0.001971*	1.51E-04*	-3.27E-05**	3.00E-06	-1.76E-07	-1.77E-08	9.74E-09	-2.08E-09	3.55E-10
	DLMSCI	-0.002368*	-1.44E-03*	1.13E-04*	-2.12E-05**	2.10E-06	-8.52E-08	-1.58E-08	7.35E-09	-1.50E-09	2.49E-10
	DLAUD_USD	0.007477*	-2.49E-04**	1.00E-04*	-1.80E-06	-2.68E-07	1.94E-07	-4.47E-08	7.31E-09	-1.03E-09	1.06E-10
	DLWTI	-0.001212*	-0.000334*	5.44E-05	-1.65E-05**	2.33E-06**	-3.25E-07***	3.15E-08	-1.26E-09	-3.49E-10	1.25E-10
	DLGOLD	-0.001705*	-1.76E-05	-6.50E-05**	7.73E-06	-1.36E-06	1.56E-07	-1.17E-08	-1.19E-10	3.29E-10	-8.22E-11
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.003599*	0.001336*	-0.000265**	3.23E-05**	-4.57E-06	2.78E-07	7.36E-09	-9.62E-09	2.36E-09	-4.18E-10
	DLMSCI	0.003732*	0.000654***	-2.01E-04**	2.12E-05**	-3.08E-06	1.67E-07	1.07E-08	-7.30E-09	1.72E-09	-2.95E-10
	DLAUD_USD	-0.003886*	0.000496	-8.09E-05	8.27E-06	3.54E-07	-1.76E-07	5.02E-08	-8.72E-09	1.27E-09	-1.45E-10
	DLWTI	0.023966*	-0.000326	-4.98E-05	1.61E-05**	-2.96E-06**	3.94E-07	-4.42E-08	2.58E-09	2.59E-10	-1.30E-10
	DLGOLD	0.001258*	-0.000111	4.84E-05	-1.12E-05***	1.50E-06	-2.11E-07	1.76E-08	-4.27E-10	-3.02E-10	9.03E-11
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLBM	0.000261***	0.001182*	0.000154*	-5.55E-05**	1.02E-05*	-1.79E-06*	2.20E-07	-2.19E-08	7.76E-10	2.74E-10
	DLMSCI	0.000367*	0.000344**	0.000099**	-4.35E-05**	7.22E-06*	-1.26E-06*	1.50E-07	-1.40E-08	3.29E-10	2.25E-10
	DLAUD_USD	-0.002246*	-0.001579*	2.11E-04*	-3.58E-05**	5.01E-06**	-4.39E-07	2.14E-08	5.61E-09	-1.87E-09	3.84E-10
	DLWTI	0.000517*	0.001549*	-1.06E-04**	3.16E-06	2.23E-06	-6.81E-07**	1.28E-07**	-1.99E-08***	2.42E-09	-2.10E-10
	DLGOLD	0.009851*	-0.000486*	5.33E-05	2.37E-06	-1.98E-06	4.16E-07	-7.59E-08	1.03E-08	-1.13E-09	7.02E-11

Var Model: Basic Materials, MSCI, AUD/USD, WTI, GOLD.

Response of DLFS:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	p*	n*	p	p	n	n	p	n	p	p
	DLMSCI	p*	n*	p	p	n	n	p	n	p	p
	DLJYD_USD	p*	n	n	p	n	n	p	n	n	p
	DLWTI	p*	n**	p*	n***	p	p	n	n	p	n
	DLGOLD	n	p***	n	p	p	n	p	p	n	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	p*	p*	n	p	p	n	p	p	n	p
	DLMSCI	p*	p*	n	p***	p	n	p	p	n	p
	DLJYD_USD	p	p**	n	n	p	n	p	p	n	p
	DLWTI	p*	n	p	p**	n***	p	p	n	p	p
	DLGOLD	p*	p**	p***	n	p	p	n	p	p	n
Response of DLJYD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	p*	p*	n*	p**	n	n	p	p	n	p
	DLMSCI	p	p	n*	p**	n	n	p	n	n	p
	DLJYD_USD	p*	p	n*	p	p	n	p	p	n	p
	DLWTI	p**	n	p	p	n**	p***	n	n	p	p
	DLGOLD	n*	p***	n	n	p	n	n	p	n	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	p*	p**	p	n	p	n	n	p	n	n
	DLMSCI	p*	p***	p	n	p	n	n	p	n	n
	DLJYD_USD	p**	p**	p	n	p	p	n	p	p	n
	DLWTI	p*	n	n	p	p	n	p	n	n	p
	DLGOLD	p*	n	p	n	n	p	n	n	p	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	n	n*	p*	n	n	p	n	n	p	n
	DLMSCI	p*	p**	p*	n	p	p	n	p	p	n
	DLJYD_USD	n*	n*	p*	n	n	p***	n	n	p	n
	DLWTI	p*	p*	n***	n	p**	n	n	p	n	n
	DLGOLD	p*	n*	p	p***	n	p	p	n	p	p

Var Model: Financials, MSCI, JYD/USD, WTI, GOLD.

Response of DLFS:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	0.0169*	-0.001050*	5.51E-05	8.99E-06	-6.12E-07	-6.07E-08	2.62E-08	-2.68E-09	5.35E-11	2.69E-11
	DLMSCI	0.012376*	-7.42E-04*	7.52E-05	4.55E-06	-4.25E-07	-2.70E-09	1.54E-08	-1.97E-09	1.05E-10	1.23E-11
	DLJYD_USD	0.002101*	-6.66E-05	-5.52E-05	9.76E-06	-6.68E-07	-3.26E-08	1.12E-08	-7.45E-10	-8.28E-11	2.25E-11
	DLWTI	0.000702*	-0.000549**	1.14E-04*	-1.02E-05***	3.24E-07	6.19E-08	-6.48E-09	-4.64E-10	1.99E-10	-2.24E-11
	DLGOLD	-0.000319	0.000451***	-4.17E-05	2.41E-06	3.28E-07	-4.73E-08	1.25E-09	7.13E-10	-1.10E-10	5.50E-12
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	0.006805*	0.001659*	-7.88E-05	1.19E-05	9.35E-07	-1.07E-07	7.55E-09	1.78E-09	-2.90E-10	2.04E-11
	DLMSCI	0.009293*	0.001291*	-3.08E-05	1.23E-05***	4.83E-07	-5.09E-08	8.89E-09	8.51E-10	-1.78E-10	1.91E-11
	DLJYD_USD	0.000126	3.34E-04**	-3.94E-05	-1.42E-06	8.22E-07	-9.70E-08	1.68E-09	1.00E-09	-1.37E-10	1.86E-12
	DLWTI	0.001472*	-7.91E-05	1.72E-06	8.25E-06**	-1.01E-06***	6.85E-08	4.81E-09	-1.08E-09	5.37E-11	1.22E-11
	DLGOLD	0.00055*	0.000297**	3.59E-05***	-3.39E-06	4.80E-07	1.86E-08	-5.12E-09	5.54E-10	2.93E-11	-1.04E-11
Response of DLJYD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	0.000864*	0.000503*	-1.71E-04*	1.61E-05**	-5.54E-07	-1.25E-07	1.54E-08	2.00E-10	-3.06E-10	3.93E-11
	DLMSCI	9.41E-05	1.23E-04	-1.08E-04*	1.18E-05**	-7.81E-07	-5.23E-08	1.06E-08	-3.60E-10	-1.59E-10	2.75E-11
	DLJYD_USD	0.006951*	1.08E-04	-5.18E-05*	3.18E-06	5.25E-07	-1.28E-07	1.05E-08	2.94E-10	-1.64E-10	1.45E-11
	DLWTI	0.000209**	-0.00013	1.39E-05	4.31E-06	-1.26E-06**	1.37E-07***	-4.42E-09	-9.51E-10	1.34E-10	5.84E-13
	DLGOLD	-0.000518*	1.85E-04***	-3.44E-06	-4.46E-06	6.23E-07	-3.47E-08	-3.83E-09	7.96E-10	-3.88E-11	-7.60E-12
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	0.000997*	0.00083**	3.69E-05	-1.79E-05	2.50E-06	-9.21E-08	-1.65E-08	2.97E-09	-8.02E-11	-3.51E-11
	DLMSCI	0.003801*	0.000603***	3.97E-06	-9.17E-06	1.78E-06	-1.09E-07	-5.34E-09	1.95E-09	-1.19E-10	-1.49E-11
	DLJYD_USD	0.00072**	0.000719**	6.67E-06	-8.45E-06	7.79E-07	3.73E-08	-1.71E-08	1.77E-09	2.00E-12	-2.32E-11
	DLWTI	0.023997*	-0.000346	-3.29E-05	6.25E-06	1.57E-07	-1.43E-07	1.99E-08	-8.50E-10	-1.30E-10	2.43E-11
	DLGOLD	0.00143*	-0.000106	4.40E-05	-1.74E-06	-4.25E-07	9.30E-08	-6.18E-09	-3.87E-10	1.27E-10	-9.21E-12
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	-0.000187	-0.000742*	0.000387*	-1.96E-05	-1.08E-06	5.14E-07	-3.62E-08	-2.01E-09	8.39E-10	-7.28E-11
	DLMSCI	0.000587*	0.000308**	0.000263*	-1.61E-05	3.31E-07	3.10E-07	-2.98E-08	1.67E-10	4.84E-10	-5.78E-11
	DLJYD_USD	-0.000739*	-0.001088*	1.67E-04*	-4.99E-06	-1.79E-06	2.97E-07***	-1.28E-08	-2.47E-09	4.76E-10	-2.42E-11
	DLWTI	0.000591*	0.001547*	-7.54E-05***	-9.56E-06	2.74E-06**	-1.98E-07	-9.56E-09	3.94E-09	-3.26E-10	-1.47E-11
	DLGOLD	0.009915*	-0.000469*	9.31E-07	1.27E-05***	-1.17E-06	1.06E-08	1.74E-08	-2.02E-09	2.48E-11	2.69E-11

Var Model: Financials, MSCI, JYD/USD, WTI, GOLD.

Response of DLFS:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	p*	n*	p	p	n	p	n	p	p	n
	DLMSCI	p*	n*	p	p	n	p	n	p	p	n
	DLAUD_USD	n*	n	n	p	n	p	n	n	p	n
	DLWTI	p*	n**	p*	n***	p	p	n	p	n	p
	DLGOLD	n	p***	n	p	p	n	p	n	p	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	p*	p*	n**	p**	n	n	p	n	p	n
	DLMSCI	p*	p*	n	p**	n	p	p	n	p	n
	DLAUD_USD	n*	n	n**	p	n	n	p	n	p	n
	DLWTI	p*	n	p	p**	n***	p	n	n	p	n
	DLGOLD	p*	p**	p	n	p	n	p	p	n	p
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	n*	n*	p*	n	n	p	n	p	n	p
	DLMSCI	n*	n*	p**	n**	p	p	n	p	n	p
	DLAUD_USD	p*	n**	p**	p	n	p	n	p	n	n
	DLWTI	n*	n*	p***	n**	p**	n	n	p	n	p
	DLGOLD	n*	n	n***	p	n	p	p	n	p	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	p*	p**	n	p	n	n	p	n	p	n
	DLMSCI	p*	p***	n	p	n	n	p	n	p	n
	DLAUD_USD	n*	p	n	p	p	n	p	n	p	p
	DLWTI	p*	n	n	p	n	p	p	n	p	n
	DLGOLD	p*	n	p	n	p	n	n	p	n	p
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	n	n*	p*	n**	p**	n	n	p	n	p
	DLMSCI	p*	p***	p*	n**	p*	n	n	p	n	p
	DLAUD_USD	n*	n*	p*	n**	p	p	n	p	n	p
	DLWTI	p*	p*	n	n	p**	n**	p***	n	n	p
	DLGOLD	p*	n*	p	p	n	p	n	p	p	n

Var Model: Financials, MSCI, AUD/USD, WTI, GOLD.

Response of DLFS:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	0.0169*	-0.001049*	7.35E-05	2.11E-05	-5.40E-06	9.66E-07	-1.06E-07	5.44E-09	1.09E-09	-3.80E-10
	DLMSCI	0.012379*	-7.46E-04*	8.94E-05	1.21E-05	-3.56E-06	7.22E-07	-8.73E-08	6.19E-09	4.89E-10	-2.50E-10
	DLAUD_USD	-0.00169*	-1.43E-04	-5.59E-05	1.15E-05	-2.28E-06	2.54E-07	-1.62E-08	-2.03E-09	8.19E-10	-1.58E-10
	DLWTI	0.000711*	-0.00055**	1.15E-04*	-1.05E-05***	1.49E-07	2.24E-07	-5.63E-08	8.94E-09	-9.25E-10	2.91E-11
	DLGOLD	-0.00036	0.000455***	-4.15E-05	4.07E-06	3.17E-07	-1.36E-07	2.89E-08	-3.82E-09	3.11E-10	1.01E-11
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	0.006808*	0.001656*	-0.000111**	2.98E-05**	-1.54E-06	-2.01E-09	5.82E-08	-1.21E-08	1.84E-09	-1.67E-10
	DLMSCI	0.009294*	0.001297*	-5.23E-05	2.45E-05**	-1.33E-06	7.28E-08	3.64E-08	-8.40E-09	1.42E-09	-1.46E-10
	DLAUD_USD	-0.002936*	-1.65E-04	-7.65E-05**	2.04E-06	-1.95E-07	-1.33E-07	2.62E-08	-4.38E-09	4.11E-10	-1.03E-11
	DLWTI	0.001474*	-7.67E-05	3.73E-08	9.38E-06**	-1.58E-06***	2.24E-07	-1.48E-08	-9.70E-10	5.97E-10	-1.21E-10
	DLGOLD	0.000549*	0.000287**	3.42E-05	-3.24E-06	9.17E-07	-7.30E-08	4.05E-09	1.18E-09	-3.31E-10	5.85E-11
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	-0.000754*	-0.001727*	1.27E-04*	-1.87E-05	-4.41E-07	3.35E-07	-8.77E-08	1.26E-08	-1.26E-09	1.78E-11
	DLMSCI	-0.002383*	-1.44E-03*	8.90E-05**	-1.74E-05**	1.79E-08	1.85E-07	-6.18E-08	9.58E-09	-1.09E-09	4.39E-11
	DLAUD_USD	0.007544*	-2.65E-04**	6.33E-05**	1.09E-06	-5.87E-07	2.02E-07	-2.88E-08	3.17E-09	-8.54E-11	-4.48E-11
	DLWTI	-0.001269*	-0.000327*	5.77E-05***	-1.28E-05**	1.51E-06**	-1.24E-07	-5.92E-09	3.92E-09	-8.44E-10	1.17E-10
	DLGOLD	-0.001968*	-3.20E-06	-4.68E-05***	4.56E-06	-7.02E-07	1.94E-08	6.36E-09	-2.35E-09	4.00E-10	-4.83E-11
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	0.00101*	0.00082**	-0.000118	1.34E-05	-2.29E-07	-2.10E-07	5.90E-08	-9.51E-09	1.03E-09	-4.05E-11
	DLMSCI	0.003805*	0.000632***	-9.42E-05	1.20E-05	-4.87E-07	-1.11E-07	4.02E-08	-7.11E-09	8.64E-10	-5.19E-11
	DLAUD_USD	-0.004035*	0.000542	-5.45E-05	1.92E-06	3.48E-07	-1.28E-07	2.17E-08	-2.53E-09	1.26E-10	2.43E-11
	DLWTI	0.023997*	-0.000339	-3.95E-05	9.27E-06	-1.24E-06	1.10E-07	3.25E-10	-2.43E-09	5.87E-10	-8.89E-11
	DLGOLD	0.001455*	-0.000133	2.95E-05	-4.12E-06	5.17E-07	-2.95E-08	-3.33E-09	1.52E-09	-2.91E-10	3.78E-11
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFS	-0.00021	-0.00072*	0.000659*	-1.08E-04**	1.50E-05**	-9.96E-07	-6.42E-08	3.96E-08	-8.06E-09	1.10E-09
	DLMSCI	0.000584*	0.000257***	0.000447*	-7.60E-05**	1.20E-05*	-9.59E-07	-7.02E-09	2.49E-08	-5.74E-09	8.64E-10
	DLAUD_USD	-0.002578*	-0.001458*	2.15E-04*	-3.63E-05**	2.50E-06	7.61E-08	-8.46E-08	1.81E-08	-2.61E-09	2.31E-10
	DLWTI	0.000599*	0.001534*	-6.08E-05	-1.72E-05	6.19E-06**	-1.07E-06**	1.29E-07***	-7.35E-09	-1.03E-09	4.15E-10
	DLGOLD	0.009883*	-0.000417*	1.61E-05	1.52E-05	-3.12E-06	5.00E-07	-4.64E-08	8.18E-10	8.70E-10	-2.26E-10

Var Model: Financials, MSCI, AUD/USD, WTI, GOLD.

Response of DLFB:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	n**	n*	n	p	p	n	n	p	p
	DLMSCI	p*	n*	n*	p	p	p	n	n	p	p
	DLEUR_USD	n	n	n***	p**	p	n	n	p	p	p
	DLWTI	p	n**	p**	n	n	n	p	p	n	n
	DLGOLD	p	p**	n***	n	p	p	n	n	n	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	p*	p***	n	n	p	p	n	n	p
	DLMSCI	p*	p*	p	n	n	p	p	n	n	p
	DLEUR_USD	n*	n	n**	n***	p	p	n	n	n	p
	DLWTI	p*	n	p	p	p	n	n	p	p	n
	DLGOLD	p*	p**	p**	p	n	n	p	p	n	n
Response of DLEUR_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	n	n	n*	n	p	p	n	n	p	p
	DLMSCI	n*	n*	n**	n	p	p	n	n	p	p
	DLEUR_USD	p*	p	p	p	p	n	n	n	p	p
	DLWTI	n*	n	n	p	n	n	n	p	n	n
	DLGOLD	n*	n	n	n***	n	p	p	n	n	p
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p	p**	p	n	n	p	p	n	n	p
	DLMSCI	p*	p***	n	n	n	p	p	n	n	p
	DLEUR_USD	n*	p	n	n	p	p	p	n	p	p
	DLWTI	p*	n	n	p	p	n	n	p	p	n
	DLGOLD	p*	n	p	n	n	n	p	p	n	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p	n*	p*	p	n	n	p	p	p	n
	DLMSCI	p*	p**	p*	p	n	n	p	p	n	n
	DLEUR_USD	n*	n*	p*	n**	p	n	p	n	p	n
	DLWTI	p*	p*	n*	p	n	p	n	p	n	p
	DLGOLD	p*	n*	p	p	p	n	n	p	p	n

Var Model: Food & Beverage, MSCI, EUR/USD, WTI, GOLD.

Response of DLFB:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.010132*	-0.000319**	-1.75E-04*	-3.29E-06	1.53E-06	8.38E-08	-1.55E-08	-1.30E-09	1.18E-10	1.83E-11
	DLMSCI	0.005372*	-8.67E-04*	-1.36E-04*	3.17E-06	1.35E-06	3.31E-09	-1.54E-08	-4.70E-10	1.47E-10	9.83E-12
	DLEUR_USD	-0.000226	-1.12E-04	-5.09E-05***	1.15E-05**	2.47E-07	-3.09E-08	-1.03E-08	7.34E-10	7.07E-11	2.72E-13
	DLWTI	0.000142	-0.000313**	5.63E-05**	-2.76E-06	-1.93E-07	-3.52E-08	5.92E-09	5.91E-11	-1.75E-11	-5.48E-12
	DLGOLD	0.000134	0.000288**	-3.71E-05***	-3.58E-06	8.94E-09	5.34E-08	-5.45E-10	-4.38E-10	-2.38E-11	5.48E-12
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.004938*	0.001443*	6.12E-05***	-9.39E-06	-7.16E-07	9.39E-08	1.12E-08	-6.35E-10	-1.38E-10	2.93E-12
	DLMSCI	0.009313*	0.001267*	1.15E-05	-8.91E-06	-1.54E-07	1.05E-07	5.49E-09	-9.30E-10	-8.52E-11	7.66E-12
	DLEUR_USD	-0.001504*	-7.45E-05	-7.04E-05**	-5.48E-06***	2.66E-07	5.86E-08	-2.51E-09	-6.98E-10	-1.25E-12	7.85E-12
	DLWTI	0.001481*	-8.24E-05	7.46E-06	3.11E-06	1.90E-07	-2.50E-08	-1.99E-09	1.94E-10	3.21E-11	-1.42E-12
	DLGOLD	0.000465*	0.000303**	4.02E-05**	4.62E-07	-3.07E-07	-5.53E-09	3.40E-09	1.96E-10	-3.10E-11	-2.86E-12
Response of DLEUR_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	-0.000139	-0.000133	-5.01E-05*	-3.87E-06	2.78E-07	3.64E-08	-2.15E-09	-5.19E-10	9.00E-12	5.50E-12
	DLMSCI	-0.001005*	-3.13E-04*	-5.04E-05**	-1.84E-06	3.19E-07	1.69E-08	-3.34E-09	-3.31E-10	2.60E-11	4.11E-12
	DLEUR_USD	0.00622*	3.87E-05	1.25E-05	1.04E-06	3.75E-07	-1.36E-08	-1.45E-09	-8.39E-11	3.60E-11	1.18E-13
	DLWTI	-0.000569*	-0.000106	-7.50E-06	8.54E-07	-1.88E-07	-2.71E-09	-5.07E-11	1.69E-10	-1.03E-11	-7.79E-13
	DLGOLD	-0.001282*	-7.86E-05	-5.69E-06	-1.92E-06***	-3.19E-08	7.95E-09	8.58E-10	-1.33E-10	-8.97E-12	6.24E-13
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000337	0.000728**	3.93E-05	-1.01E-05	-8.15E-07	7.21E-08	1.10E-08	-5.20E-10	-1.31E-10	1.23E-12
	DLMSCI	0.003816*	0.000605***	-9.99E-06	-1.00E-05	-3.09E-07	8.85E-08	5.78E-09	-8.32E-10	-8.64E-11	6.12E-12
	DLEUR_USD	-0.002196*	0.00043	-9.10E-06	-5.45E-06	4.79E-07	4.62E-08	7.74E-11	-7.87E-10	7.12E-12	5.98E-12
	DLWTI	0.024003*	-0.000346	-2.56E-05	3.21E-06	2.44E-08	-1.28E-08	-3.30E-09	2.53E-10	2.11E-11	-1.40E-13
	DLGOLD	0.001408*	-0.000114	2.65E-05	-6.57E-07	-2.90E-07	-1.48E-08	3.29E-09	1.66E-10	-2.39E-11	-3.24E-12
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000131	-0.000453*	0.000173*	1.22E-05	-6.51E-07	-1.73E-07	7.12E-09	1.77E-09	1.54E-11	-2.18E-11
	DLMSCI	0.000494*	0.000342**	0.000171*	6.06E-06	-1.02E-06	-9.71E-08	1.16E-08	1.25E-09	-6.44E-11	-1.71E-11
	DLEUR_USD	-0.002039*	-0.001707*	1.78E-04*	-1.90E-05**	3.31E-07	-1.17E-07	2.05E-08	-9.19E-10	2.87E-12	-1.42E-11
	DLWTI	0.00058*	0.001553*	-1.18E-04*	8.27E-06	-5.82E-07	1.24E-07	-9.89E-09	3.36E-10	-6.28E-11	1.17E-11
	DLGOLD	0.009891*	-0.00047*	4.81E-05	1.81E-06	5.58E-07	-6.71E-08	-2.22E-10	8.07E-11	7.01E-11	-4.63E-12

Var Model: Food & Beverage, MSCI, EUR/USD, WTI, GOLD.

Response of DLFB:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	n**	n*	n	p***	p	n	n	p	p
	DLMSCI	p*	n*	n*	n	p***	p	n	n	p	p
	DLJYD_USD	p*	n	n*	p	p***	n	n	n	p	p
	DLWTI	p	n**	p**	n	n	p	p	p	n	n
	DLGOLD	p	p**	n**	n***	p	p	n	n	n	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	p*	p**	n	n	p	p	n	n	n
	DLMSCI	p*	p*	p	n	n	p	p	n	n	p
	DLJYD_USD	p	p**	n	n**	n	p	p	n	n	p
	DLWTI	p*	n	p	p	p	n	n	p	p	n
	DLGOLD	p*	p**	p**	n	n***	n	p	p	n	n
Response of DLJYD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	p*	n**	n**	p	p	p	n	n	p
	DLMSCI	p	p	n**	n***	p	p	n	n	n	p
	DLJYD_USD	p*	p	n**	n	p	p	n	n	p	p
	DLWTI	p**	n	p	p	n	n	p	p	n	n
	DLGOLD	n*	p**	p	n**	n	p	p	n	n	p
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p	p**	p	n	n	p	p	n	n	n
	DLMSCI	p*	p***	p	n	n	p	p	n	n	p
	DLJYD_USD	p**	p**	p	n	n	p	p	n	n	p
	DLWTI	p*	n	n	p	p	n	n	p	p	n
	DLGOLD	p*	n	p***	n	n	n	p	p	n	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p	n*	p**	p**	n	n	p	p	p	n
	DLMSCI	p*	p**	p*	p***	n	n	p	p	n	n
	DLJYD_USD	n*	n*	p*	p	n	n	p	p	n	n
	DLWTI	p*	p*	n**	n	p	p	n	n	p	p
	DLGOLD	p*	n*	n	p**	p	n	n	p	p	n

Var Model: Food & Beverage, MSCI, JYD/USD, WTI, GOLD.

Response of DLFB:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.010134*	-0.000317**	-1.75E-04*	-7.96E-06	1.83E-06***	1.47E-07	-1.57E-08	-2.13E-09	1.07E-10	2.69E-11
	DLMSCI	0.005372*	-8.66E-04*	-1.37E-04*	-3.46E-07	1.66E-06***	5.73E-08	-1.65E-08	-1.16E-09	1.47E-10	1.75E-11
	DLJYD_USD	0.000722*	-3.61E-05	-7.55E-05*	4.17E-06	8.61E-07***	-1.96E-08	-1.02E-08	-1.02E-10	1.10E-10	4.58E-12
	DLWTI	0.000138	-0.000313**	5.93E-05**	-2.46E-06	-6.61E-07	7.89E-09	7.62E-09	1.51E-10	-7.97E-11	-4.18E-12
	DLGOLD	0.00017	0.000289**	-4.29E-05**	-6.30E-06***	3.24E-07	8.09E-08	-1.05E-09	-9.30E-10	-1.77E-11	9.74E-12
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.004935*	0.001444*	7.74E-05**	-1.12E-05	-1.30E-06	8.27E-08	1.70E-08	-3.81E-10	-2.00E-10	-2.09E-12
	DLMSCI	0.00931*	0.001264*	1.97E-05	-1.13E-05	-6.55E-07	1.03E-07	1.05E-08	-8.11E-10	-1.42E-10	4.50E-12
	DLJYD_USD	0.000163	3.19E-04**	-1.31E-05	-6.47E-06**	-4.76E-09	7.22E-08	2.33E-09	-7.28E-10	-4.87E-11	6.53E-12
	DLWTI	0.001476*	-8.37E-05	5.49E-06	4.80E-06	5.13E-08	-5.30E-08	-2.25E-09	5.17E-10	4.12E-11	-4.43E-12
	DLGOLD	0.000473*	0.000312**	4.81E-05**	-1.22E-06	-6.01E-07***	-5.87E-09	6.48E-09	2.70E-10	-6.33E-11	-4.98E-12
Response of DLJYD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000496*	0.000437*	-4.98E-05**	-8.95E-06**	2.05E-07	1.08E-07	1.16E-09	-1.16E-09	-4.95E-11	1.13E-11
	DLMSCI	0.000122	1.03E-04	-6.05E-05**	-5.48E-06***	4.38E-07	7.68E-08	-2.40E-09	-9.27E-10	-2.63E-12	1.02E-11
	DLJYD_USD	0.006965*	9.58E-05	-3.28E-05**	-1.41E-06	3.90E-07	2.64E-08	-3.51E-09	-4.03E-10	2.62E-11	5.30E-12
	DLWTI	0.000212**	-0.000133	1.91E-05	1.33E-06	-2.75E-07	-2.23E-08	2.38E-09	3.23E-10	-1.62E-11	-4.08E-12
	DLGOLD	-0.000565*	1.99E-04**	1.58E-06	-3.41E-06**	-1.46E-07	3.41E-08	2.70E-09	-2.93E-10	-3.91E-11	2.01E-12
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000327	0.000729**	8.08E-05	-1.17E-05	-1.64E-06	8.30E-08	2.10E-08	-2.57E-10	-2.41E-10	-4.74E-12
	DLMSCI	0.003803*	0.000598***	1.27E-05	-1.23E-05	-8.89E-07	1.14E-07	1.36E-08	-8.39E-10	-1.77E-10	3.71E-12
	DLJYD_USD	0.000731**	0.000716**	1.44E-05	-8.23E-06	-8.90E-08	8.53E-08	3.58E-09	-8.34E-10	-6.59E-11	7.17E-12
	DLWTI	0.023998*	-0.000347	-3.33E-05	5.98E-06	1.31E-07	-6.19E-08	-3.27E-09	5.86E-10	5.46E-11	-4.77E-12
	DLGOLD	0.001396*	-0.000106	5.13E-05***	-6.24E-07	-7.18E-07	-1.38E-08	7.59E-09	3.93E-10	-7.18E-11	-6.61E-12
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000167	-0.000459*	0.000108**	2.14E-05**	-8.94E-07	-2.68E-07	1.49E-09	3.02E-09	7.86E-11	-3.10E-11
	DLMSCI	0.000507*	0.000352**	0.000123*	1.20E-05***	-1.35E-06	-1.78E-07	9.33E-09	2.28E-09	-3.17E-11	-2.62E-11
	DLJYD_USD	-0.000808*	-0.001061*	1.25E-04*	1.77E-06	-1.05E-06	-5.18E-08	1.01E-08	8.88E-10	-8.38E-11	-1.25E-11
	DLWTI	0.00058*	0.001555*	-9.34E-05**	-2.32E-06	7.57E-07	4.61E-08	-7.02E-09	-7.28E-10	5.49E-11	9.79E-12
	DLGOLD	0.00997*	-0.000496**	-6.33E-06	8.93E-06**	2.34E-07	-9.33E-08	-5.50E-09	8.62E-10	8.81E-11	-6.77E-12

Var Model: Food & Beverage, MSCI, JYD/USD, WTI, GOLD.

Response of DLFB:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	n**	n*	p	p	n	p	p	n	p
	DLMSCI	p*	n*	n*	p	n	n	p	n	n	p
	DLCAD_USD	n*	p	n	p**	p	n	p	p	n	p
	DLWTI	p	n**	p**	p	n***	p	p	n	p	p
	DLGOLD	p	p**	n**	n	p	n	n	p	n	n
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	p*	p	n	p	n	n	p	p	n
	DLMSCI	p*	p*	n	n	p	n	n	p	n	n
	DLCAD_USD	n*	n**	n**	n	p	p	n	p	n	n
	DLWTI	p*	n	p	p**	n	n	p	n	n	p
	DLGOLD	p*	p**	p**	n	n	p	n	n	p	n
Response of DLCAD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	n*	n*	n**	p	n	n	p	n	n	p
	DLMSCI	n*	n*	n	p	n	n	p	n	n	p
	DLCAD_USD	p*	p	p	p	n	n	p	n	n	p
	DLWTI	n*	n*	p**	n	n	p	n	n	p	n
	DLGOLD	n*	n	n**	n	p	n	n	p	n	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p	p**	n	n	p	p	n	p	p	n
	DLMSCI	p*	p***	n	n	p	n	n	p	n	n
	DLCAD_USD	n*	p***	n	n	p	n	n	p	n	n
	DLWTI	p*	n	n	p***	n	n	p	p	n	p
	DLGOLD	p*	n	p	n	n	p	n	n	p	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p	n*	p*	n	n	p	n	n	p	p
	DLMSCI	p*	p**	p*	n***	n	p	n	n	p	n
	DLCAD_USD	n*	n*	p*	n	n	p	n	n	p	n
	DLWTI	p*	p*	n	n***	p**	n	n	p	p	n
	DLGOLD	p*	n*	p	p	n	n	p	n	n	p

Var Model: Food & Beverage, MSCI, CAD/USD, WTI, GOLD.

Response of DLFB:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.010133*	-0.000317**	-1.60E-04*	4.10E-06	3.62E-07	-1.05E-07	8.62E-09	7.23E-10	-1.50E-10	6.09E-12
	DLMSCI	0.005372*	-8.69E-04*	-1.25E-04*	9.28E-06	-1.75E-07	-8.58E-08	1.35E-08	-3.02E-11	-1.42E-10	1.35E-11
	DLCAD_USD	-0.001046*	1.48E-04	-3.02E-05	9.66E-06**	9.62E-08	-9.24E-08	6.87E-09	2.05E-10	-1.11E-10	8.06E-12
	DLWTI	0.000143	-0.000313**	6.50E-05**	2.51E-08	-1.29E-06***	8.35E-08	5.09E-09	-1.39E-09	8.65E-11	8.39E-12
	DLGOLD	0.000151	0.000288**	-4.05E-05**	-3.70E-06	3.90E-07	-9.80E-09	-2.99E-09	5.15E-10	-7.49E-12	-5.03E-12
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.004937*	0.001442*	4.94E-05	-3.99E-06	2.55E-07	-1.96E-08	-6.57E-09	5.52E-10	2.09E-11	-7.07E-12
	DLMSCI	0.009313*	0.001269*	-1.32E-06	-3.40E-06	3.54E-07	-4.62E-08	-4.09E-09	7.57E-10	-1.97E-11	-5.51E-12
	DLCAD_USD	-0.003023*	-2.41E-04**	-5.48E-05**	-3.50E-06	5.17E-07	1.86E-09	-3.02E-09	4.84E-10	-6.72E-12	-5.42E-12
	DLWTI	0.001479*	-8.14E-05	3.49E-07	7.43E-06**	-1.05E-08	-5.75E-08	4.94E-09	-2.34E-12	-6.93E-11	6.36E-12
	DLGOLD	0.000463*	0.000305**	4.12E-05**	-8.64E-07	-1.26E-07	1.42E-08	-1.76E-09	-1.21E-10	2.89E-11	-1.06E-12
Response of DLCAD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	-0.000513*	-0.000769*	-5.42E-05**	5.57E-06	-4.87E-08	-3.26E-08	6.60E-09	-1.23E-10	-6.50E-11	6.90E-12
	DLMSCI	-0.001612*	-8.48E-04*	-1.55E-05	6.14E-06	-3.39E-07	-8.37E-09	6.92E-09	-5.03E-10	-3.55E-11	8.47E-12
	DLCAD_USD	0.004968*	5.99E-05	6.80E-06	4.42E-06	-3.16E-07	-2.99E-08	4.79E-09	-2.21E-10	-3.51E-11	6.23E-12
	DLWTI	-0.000933*	-0.000316*	3.34E-05**	-3.76E-06	-3.71E-07	6.74E-08	-1.62E-09	-5.13E-10	7.40E-11	-1.14E-12
	DLGOLD	-0.000811*	-4.91E-05	-2.86E-05**	-6.81E-08	2.28E-07	-1.50E-08	-1.66E-10	2.48E-10	-2.11E-11	-1.03E-12
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000338	0.000721**	-4.12E-05	-1.17E-05	9.49E-07	1.54E-08	-1.17E-08	1.12E-09	3.91E-11	-1.62E-11
	DLMSCI	0.003812*	0.00062***	-9.02E-05	-6.98E-06	1.26E-06	-5.26E-08	-7.99E-09	1.53E-09	-4.65E-11	-1.30E-11
	DLCAD_USD	-0.004504*	0.000609***	-9.31E-06	-4.23E-06	9.42E-07	-2.09E-08	-8.61E-09	9.74E-10	-3.11E-12	-1.12E-11
	DLWTI	0.023995*	-0.000342	-6.82E-05	9.25E-06***	-1.74E-07	-1.17E-07	1.19E-08	1.79E-10	-1.48E-10	1.26E-11
	DLGOLD	0.001438*	-0.000114	2.89E-05	-3.76E-06	-1.91E-07	4.79E-08	-2.43E-09	-2.61E-10	5.78E-11	-2.36E-12
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000148	-0.000442*	0.000327*	-2.69E-06	-2.39E-06	2.38E-07	-1.96E-09	-3.02E-09	2.99E-10	6.95E-12
	DLMSCI	0.000493*	0.000314**	0.000318*	-1.86E-05***	-1.33E-06	2.91E-07	-1.85E-08	-1.87E-09	3.90E-10	-1.46E-11
	DLCAD_USD	-0.00162*	-0.001603*	1.37E-04*	-1.16E-05	-1.22E-06	2.41E-07	-5.86E-09	-1.88E-09	2.60E-10	-3.69E-12
	DLWTI	0.000595*	0.001545*	-2.54E-05	-1.59E-05***	2.93E-06**	-5.53E-08	-2.76E-08	3.07E-09	2.66E-12	-3.62E-11
	DLGOLD	0.009926*	-0.000478*	2.95E-05	1.03E-05	-7.99E-07	-3.95E-08	1.10E-08	-7.88E-10	-5.76E-11	1.47E-11

Var Model: Food & Beverage, MSCI, CAD/USD, WTI, GOLD.

Response of DLFB:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	n**	n*	p	p	n	p	p	n	p
	DLMSCI	p*	n*	n*	p	n	n	p	n	n	p
	DLAUD_USD	n*	p	n	p**	n***	p	p	n	n	p
	DLWTI	p	n**	p**	n	n	p	n	n	p	n
	DLGOLD	p	p**	n**	n	p	n	n	p	n	n
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	p*	p	n	p	p	n	p	p	n
	DLMSCI	p*	p*	n	n	p	n	n	p	n	n
	DLAUD_USD	n*	n	n**	p	p	n	p	p	n	p
	DLWTI	p*	n	p	p***	n	n	p	n	n	p
	DLGOLD	p*	p**	p**	n	n	p	n	n	p	n
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	n*	n*	n**	p	p	n	p	n	n	p
	DLMSCI	n*	n*	n	p	n	n	p	n	p	p
	DLAUD_USD	p*	n*	p**	p	n	p	p	n	p	p
	DLWTI	n*	n*	p	n	p	p	n	n	p	n
	DLGOLD	n*	n	n***	p	p	n	n	p	n	p
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p	p**	n	n	p	p	n	p	p	n
	DLMSCI	p*	p***	n	n	p	n	n	p	n	n
	DLAUD_USD	n*	p	n	p	p	n	p	p	n	p
	DLWTI	p*	n	n	p	n	n	p	n	n	p
	DLGOLD	p*	n	p	n	n	p	n	n	p	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p	n*	p*	n	n	p	n	n	p	n
	DLMSCI	p*	p**	p*	n**	p	p	n	n	p	n
	DLAUD_USD	n*	n*	p*	n**	p	n	n	n	p	n
	DLWTI	p*	p*	n	n	p	n	p	p	n	n
	DLGOLD	p*	n*	p	p	n	p	p	n	n	p

Var Model: Food & Beverage, MSCI, AUD/USD, WTI, GOLD.

Response of DLFB:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.010133*	-0.000317**	-1.60E-04*	4.65E-06	4.03E-07	-5.70E-08	3.47E-09	2.04E-10	-4.41E-11	2.07E-12
	DLMSCI	0.005375*	-8.69E-04*	-1.23E-04*	1.12E-05	-4.72E-07	-5.43E-09	3.37E-09	-4.06E-11	-3.71E-11	4.49E-12
	DLAUD_USD	-0.000976*	1.12E-04	-2.88E-05	1.29E-05**	-1.07E-06***	3.39E-08	8.16E-10	-7.41E-11	-2.52E-11	4.96E-12
	DLWTI	0.000142	-0.000313**	6.01E-05**	-2.05E-06	-8.36E-07	9.44E-08	-3.60E-09	-1.86E-10	3.08E-11	-5.38E-14
	DLGOLD	0.00015	0.000288**	-4.00E-05**	-3.97E-06	5.00E-07	-1.84E-08	-9.95E-10	2.11E-10	-6.52E-12	-1.40E-12
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.004939*	0.001441*	0.000037	-5.01E-06	1.18E-07	4.68E-11	-2.39E-09	1.90E-10	4.91E-12	-1.56E-12
	DLMSCI	0.00931*	0.001274*	-1.92E-05	-2.47E-06	1.80E-07	-1.90E-08	-8.25E-10	2.31E-10	-1.13E-11	-4.76E-13
	DLAUD_USD	-0.002999*	-1.42E-04	-6.61E-05**	1.47E-06	2.67E-07	-1.86E-08	2.67E-10	1.54E-10	-1.83E-11	4.38E-13
	DLWTI	0.001476*	-8.06E-05	2.81E-06	5.73E-06***	-2.43E-07	-1.77E-08	2.49E-09	-1.16E-10	-1.04E-11	1.90E-12
	DLGOLD	0.000483*	0.000303**	4.17E-05**	-1.64E-06	-1.12E-07	1.23E-08	-8.59E-10	-3.56E-11	1.06E-11	-5.62E-13
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	-0.000731*	-0.001107*	-7.87E-05**	6.09E-06	5.00E-08	-2.54E-08	3.28E-09	-7.36E-11	-2.07E-11	2.06E-12
	DLMSCI	-0.002444*	-1.41E-03*	-4.93E-06	4.86E-06	-2.15E-07	-5.86E-10	3.01E-09	-2.89E-10	2.39E-12	1.50E-12
	DLAUD_USD	0.007588*	-2.98E-04*	6.70E-05**	8.35E-07	-3.87E-07	8.24E-09	1.99E-09	-3.12E-10	1.82E-11	4.29E-13
	DLWTI	-0.001276*	-0.000321*	4.39E-05	-6.57E-06	9.97E-09	3.96E-08	-2.48E-09	-6.95E-11	2.81E-11	-2.18E-12
	DLGOLD	-0.001885*	-1.82E-05	-4.86E-05***	3.61E-07	2.46E-07	-1.48E-08	-1.63E-11	1.36E-10	-1.31E-11	7.74E-14
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000337	0.00072**	-3.09E-05	-1.02E-05	5.55E-07	1.67E-08	-4.61E-09	3.52E-10	6.68E-12	-3.26E-12
	DLMSCI	0.003803*	0.000621***	-9.24E-05	-4.37E-06	7.16E-07	-3.48E-08	-1.06E-09	3.81E-10	-2.11E-11	-1.33E-12
	DLAUD_USD	-0.004036*	0.000548	-5.03E-05	2.39E-06	5.47E-07	-6.10E-08	1.43E-09	2.35E-10	-2.81E-11	3.18E-13
	DLWTI	0.023997*	-0.000341	-4.02E-05	7.42E-06	-4.66E-07	-3.45E-08	6.21E-09	-2.83E-10	-1.70E-11	3.42E-12
	DLGOLD	0.001431*	-0.000123	3.25E-05	-3.89E-06	-1.46E-07	3.47E-08	-1.75E-09	-6.58E-11	1.93E-11	-1.11E-12
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000147	-0.000439*	0.000319*	-6.30E-06	-1.48E-06	1.35E-07	-3.12E-09	-8.30E-10	9.94E-11	-2.11E-12
	DLMSCI	0.000515*	0.000306**	0.000339*	-2.87E-05**	8.03E-07	3.54E-08	-4.66E-09	-4.39E-10	1.23E-10	-1.10E-11
	DLAUD_USD	-0.002465*	-0.001515*	2.29E-04*	-3.60E-05**	2.58E-06	-7.04E-08	-3.36E-10	-3.54E-10	1.14E-10	-1.45E-11
	DLWTI	0.000592*	0.001541*	-7.67E-05	-7.71E-06	2.58E-06	-2.19E-07	5.04E-09	5.80E-10	-4.38E-11	-4.40E-12
	DLGOLD	0.009924*	-0.000456*	2.08E-05	1.20E-05	-1.17E-06	2.22E-08	3.91E-09	-3.96E-10	-6.96E-12	4.75E-12

Var Model: Food & Beverage, MSCI, AUD/USD, WTI, GOLD.

Response of DLFB:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	n**	n*	p	p	n	n	p	p	n
	DLMSCI	p*	n*	n*	p	p	n	n	p	n	n
	DLNEER	n	n	n***	p**	n	n	p	p	n	n
	DLWTI	p	n**	p**	n	n	p	p	n	n	p
	DLGOLD	p	p**	n**	n	p	p	n	n	p	n
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p*	p*	p***	n	p	p	n	n	p	p
	DLMSCI	p*	p*	p	n	p	p	n	n	p	p
	DLNEER	n*	n	n**	n	p	p	n	p	p	n
	DLWTI	p*	n	p	p***	p	n	p	p	n	n
	DLGOLD	p*	p**	p**	n	n	p	p	n	n	p
Response of DLNEER:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	n	n*	n*	p	p	n	n	p	p	n
	DLMSCI	n*	n*	n**	p	p	n	n	p	n	n
	DLNEER	p*	n	p	p	n	n	p	p	n	n
	DLWTI	n*	n*	p	n	n	p	p	n	n	p
	DLGOLD	n*	n	n***	n	p	p	n	n	p	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p	p**	p	n	n	p	n	n	p	p
	DLMSCI	p*	p***	n	n	p	p	n	n	p	p
	DLNEER	n*	p**	n	n	p	p	n	p	p	n
	DLWTI	p*	n	n	p	p	n	p	p	n	n
	DLGOLD	p*	n	p	n	n	p	p	n	n	p
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	p	n*	p*	p	n	n	p	n	n	p
	DLMSCI	p*	p**	p*	n	n	p	p	n	n	p
	DLNEER	n*	n*	p*	n**	p	p	p	n	p	p
	DLWTI	p*	p*	n	n	p	p	n	p	p	n
	DLGOLD	p*	n*	p	p	p	n	p	p	n	n

Var Model: Food & Beverage, MSCI, NEER, WTI, GOLD.

Response of DLFB:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.010132*	-0.000318**	-1.67E-04*	8.68E-07	1.14E-06	-5.96E-08	-9.54E-09	9.18E-10	6.15E-11	-1.08E-11
	DLMSCI	0.005371*	-8.68E-04*	-1.28E-04*	7.69E-06	4.85E-07	-8.78E-08	-3.12E-09	1.06E-09	-1.29E-11	-9.11E-12
	DLNEER	-0.000235	-2.32E-06	-6.46E-05***	1.78E-05**	-3.35E-07	-8.17E-08	9.42E-10	1.22E-09	-8.90E-11	-5.59E-12
	DLWTI	0.000146	-0.000312**	6.15E-05**	-1.10E-06	-8.77E-07	2.86E-08	6.73E-09	-4.89E-10	-5.07E-11	6.64E-12
	DLGOLD	0.000129	0.000282**	-3.78E-05**	-3.86E-06	2.40E-07	2.76E-08	-3.91E-09	-9.62E-11	3.80E-11	-2.86E-14
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.004937*	0.001442*	5.84E-05***	-6.22E-06	4.29E-08	6.93E-08	-2.70E-09	-5.99E-10	4.50E-11	4.24E-12
	DLMSCI	0.009314*	0.001268*	7.37E-06	-4.69E-06	3.92E-07	3.88E-08	-5.11E-09	-2.24E-10	5.63E-11	2.30E-13
	DLNEER	-0.002161*	-1.44E-04	-8.78E-05**	-4.52E-06	6.40E-07	8.79E-09	-6.45E-09	1.28E-10	6.05E-11	-3.31E-12
	DLWTI	0.00148*	-7.99E-05	4.68E-06	5.85E-06***	9.46E-08	-4.61E-08	1.00E-09	4.14E-10	-2.41E-11	-3.25E-12
	DLGOLD	0.000472*	0.000297**	4.16E-05**	-1.56E-07	-2.08E-07	1.40E-08	1.63E-09	-1.97E-10	-9.59E-12	2.19E-12
Response of DLNEER:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	-9.98E-05	-0.000337*	-5.74E-05*	4.00E-07	3.33E-07	-2.09E-08	-2.58E-09	2.97E-10	1.56E-11	-3.37E-12
	DLMSCI	-0.000998*	-4.87E-04*	-3.91E-05**	2.13E-06	1.44E-07	-2.91E-08	-4.55E-10	3.07E-10	-5.59E-12	-2.75E-12
	DLNEER	0.004302*	-1.70E-05	6.40E-06	4.34E-06	-2.82E-08	-3.31E-08	1.33E-09	2.83E-10	-2.39E-11	-1.89E-12
	DLWTI	-0.000561*	-0.000192*	1.28E-05	-9.12E-07	-2.59E-07	1.03E-08	1.95E-09	-1.66E-10	-1.31E-11	2.08E-12
	DLGOLD	-0.000889*	-1.97E-05	-1.49E-05***	-1.30E-06	8.94E-08	6.61E-09	-1.15E-09	-2.24E-11	1.20E-11	-1.64E-13
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000345	0.000723**	3.3E-06	-1.37E-05	-7.16E-08	1.12E-07	-3.72E-09	-9.71E-10	6.95E-11	7.12E-12
	DLMSCI	0.003813*	0.000613***	-5.90E-05	-1.08E-05	5.51E-07	6.42E-08	-7.69E-09	-3.94E-10	9.05E-11	6.63E-13
	DLNEER	-0.003127*	0.000872**	-4.27E-05	-4.83E-06	1.20E-06	1.27E-08	-9.90E-09	1.07E-10	1.02E-10	-5.31E-12
	DLWTI	0.023988*	-0.000342	-4.78E-05	5.96E-06	5.27E-08	-7.77E-08	1.35E-09	6.77E-10	-3.55E-11	-5.39E-12
	DLGOLD	0.001576*	-0.000125	2.70E-05	-1.99E-06	-3.87E-07	2.01E-08	2.82E-09	-3.06E-10	-1.61E-11	3.45E-12
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLFB	0.000124	-0.000441*	0.000261*	1.13E-05	-2.07E-06	-2.62E-08	2.18E-08	-5.52E-10	-1.90E-10	1.12E-11
	DLMSCI	0.000495*	0.000323**	0.000287*	-5.67E-06	-1.43E-06	6.86E-08	1.58E-08	-1.57E-09	-7.23E-11	1.50E-11
	DLNEER	-0.002016*	-0.002371*	3.07E-04*	-3.34E-05**	1.06E-07	7.10E-08	1.53E-08	-2.80E-09	8.31E-11	1.29E-11
	DLWTI	0.000641*	0.00154*	-5.47E-05	-6.80E-06	1.48E-06	3.07E-08	-1.36E-08	7.89E-11	1.35E-10	-5.96E-12
	DLGOLD	0.009758*	-0.000431*	3.17E-05	7.36E-06	2.80E-08	-8.05E-08	4.29E-09	4.88E-10	-4.67E-11	-4.22E-12

Var Model: Food & Beverage, MSCI, NEER, WTI, GOLD.

Response of DLHC:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLHC	p*	p***	n*	n	n	p	p	p	n	n
	DLMSCI	p*	n**	n*	n	n	p	n	p	n	p
	DLAUD_USD	n*	p	n	p**	n	p	n	p	n	p
	DLWTI	p	n*	p	p	n	p	n	p	n	p
	DLGOLD	p	p	n***	n	p	n	p	n	p	n
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLHC	p*	p*	p**	n	n	n	n	p	p	p
	DLMSCI	p*	p*	p	n	n	n	n	p	n	p
	DLAUD_USD	n*	n	n***	p	n	p	n	p	n	p
	DLWTI	p*	n	n	p	n	p	n	p	n	p
	DLGOLD	p*	p**	p***	n	n	n	p	n	p	n
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLHC	n*	n*	n*	n	p	p	p	n	n	n
	DLMSCI	n*	n*	n**	n	p	p	p	n	p	n
	DLAUD_USD	p*	n*	p*	n	p	n	p	n	p	n
	DLWTI	n*	n*	p	n	p	n	p	n	p	n
	DLGOLD	n*	n	n***	n	p	p	p	p	n	p
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLHC	p	p	p	n	n	n	p	p	p	n
	DLMSCI	p*	p***	n	p	n	p	n	p	n	p
	DLAUD_USD	n*	p***	n	p	n	p	n	p	n	p
	DLWTI	p*	n	n	p	n	p	n	p	n	p
	DLGOLD	p*	n	p	n	p	n	p	n	p	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLHC	p	n*	p*	p***	n	n	n	p	n	p
	DLMSCI	p*	p**	p*	n	p	n	p	n	p	n
	DLAUD_USD	n*	n*	p*	n**	p	n	p	n	p	n
	DLWTI	p*	p*	n	n	p	n	p	n	p	n
	DLGOLD	p*	n*	p	p	n	p	n	p	n	p

Var Model: Health Care, MSCI, AUD/USD, WTI, GOLD.

Response of DLHC:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLHC	0.011792*	0.000295***	-1.50E-04*	-1.12E-05	-4.15E-08	3.86E-08	5.30E-09	6.31E-11	-6.10E-12	-2.65E-12
	DLMSCI	0.007289*	-4.20E-04**	-1.60E-04*	-2.68E-06	-2.37E-07	8.67E-08	-1.15E-09	4.58E-10	-6.31E-11	3.57E-12
	DLAUD_USD	-0.001009*	2.53E-04	-3.05E-05	1.17E-05**	-8.54E-07	8.10E-08	-1.11E-08	9.77E-10	-1.04E-10	1.19E-11
	DLWTI	9.96E-05	-0.000464*	2.86E-05	6.39E-07	-2.89E-07	2.37E-08	-2.66E-09	2.99E-10	-2.75E-11	3.05E-12
	DLGOLD	0.0001	0.000259	-2.51E-05***	-4.57E-06	7.10E-08	-5.41E-09	2.78E-09	-1.04E-10	1.43E-11	-2.24E-12
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLHC	0.005761*	0.001426*	0.000084**	-1.24E-06	-4.89E-07	-4.06E-08	-1.86E-10	1.46E-10	1.94E-11	1.92E-13
	DLMSCI	0.00932*	0.001263*	2.71E-05	-1.58E-06	-5.94E-07	-8.14E-09	-9.68E-10	3.31E-10	-5.73E-12	1.81E-12
	DLAUD_USD	-0.003042*	-1.34E-04	-5.48E-05***	3.22E-06	-1.75E-07	4.45E-08	-3.31E-09	3.21E-10	-4.35E-11	3.91E-12
	DLWTI	0.001494*	-8.14E-05	-1.05E-06	1.41E-06	-7.40E-08	8.01E-09	-1.15E-09	8.81E-11	-1.02E-11	1.17E-12
	DLGOLD	0.0005*	0.00031**	3.11E-05***	-3.13E-07	-6.87E-08	-1.63E-08	2.43E-10	-2.10E-11	1.06E-11	-4.38E-13
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLHC	-0.00065*	-0.000914*	-1.40E-04*	-3.53E-06	3.40E-07	5.33E-08	2.08E-09	-4.67E-11	-2.28E-11	-8.47E-13
	DLMSCI	-0.00248*	-1.40E-03*	-7.14E-05**	-2.10E-06	6.04E-07	2.04E-08	2.83E-09	-3.34E-10	5.15E-12	-2.87E-12
	DLAUD_USD	0.007597*	-3.05E-04*	8.02E-05*	-2.44E-06	2.88E-07	-5.54E-08	3.61E-09	-4.42E-10	5.39E-11	-4.74E-12
	DLWTI	-0.001282*	-0.000322*	3.17E-05	-2.41E-06	7.74E-08	-1.08E-08	1.31E-09	-1.04E-10	1.34E-11	-1.43E-12
	DLGOLD	-0.001867*	-2.13E-05	-4.46E-05***	-9.86E-07	6.87E-09	1.92E-08	1.28E-10	6.62E-11	-1.22E-11	4.22E-13
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLHC	0.000203	0.000368	4.84E-05	-2.28E-06	-1.91E-07	-1.65E-08	4.58E-10	4.97E-11	1.03E-11	-3.45E-13
	DLMSCI	0.003848*	0.000606***	-9.04E-06	1.70E-07	-3.95E-07	1.49E-08	-1.79E-09	3.14E-10	-2.12E-11	2.54E-12
	DLAUD_USD	-0.004048*	0.000562***	-7.08E-05	5.35E-06	-4.02E-07	5.23E-08	-5.12E-09	5.17E-10	-5.90E-11	5.98E-12
	DLWTI	0.023999*	-0.000342	-2.30E-05	2.90E-06	-1.84E-07	1.37E-08	-1.45E-09	1.39E-10	-1.50E-11	1.65E-12
	DLGOLD	0.001402*	-0.000122	2.81E-05	-1.19E-06	1.45E-08	-1.13E-08	7.30E-10	-6.34E-11	1.07E-11	-8.83E-13
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLHC	8.44E-05	-0.000671*	0.00028*	1.90E-05***	-3.10E-07	-5.95E-08	-1.03E-08	1.28E-10	-1.07E-12	6.25E-12
	DLMSCI	0.000531*	0.000315**	0.000352*	-5.20E-06	1.09E-06	-2.41E-07	1.19E-08	-1.71E-09	2.15E-10	-1.72E-11
	DLAUD_USD	-0.002434*	-0.001518*	2.09E-04*	-3.84E-05**	3.50E-06	-3.41E-07	4.03E-08	-3.95E-09	4.14E-10	-4.53E-11
	DLWTI	0.000579*	0.001544*	-6.23E-05	-4.17E-06	1.02E-06	-9.87E-08	1.04E-08	-1.12E-09	1.11E-10	-1.19E-11
	DLGOLD	0.009907*	-0.000466*	2.83E-05	1.07E-05	-5.02E-07	3.86E-08	-8.07E-09	5.46E-10	-5.97E-11	7.72E-12

Var Model: Health Care, MSCI, AUD/USD, WTI, GOLD.

Response of DLIS:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLIS	p*	n	p	p***	n***	p	n	n	p	n
	DLMSCI	p*	n	p	p***	n	p	n	n	p	n
	DLAUD_USD	n*	n	n**	p***	n***	p	n	n	p	n
	DLWTI	p*	n	p**	n	n	p	n	p	n	n
	DLGOLD	n	p**	n	p	p	n	p	n	n	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLIS	p*	p*	n***	p**	n	n	p	n	p	p
	DLMSCI	p*	p*	n	p**	n	n	p	n	p	n
	DLAUD_USD	n*	n	n***	n	p	n	p	n	p	p
	DLWTI	p*	n	p	p***	n	p	n	n	p	n
	DLGOLD	p*	p**	p***	n	p	n	n	p	n	p
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLIS	n*	n*	p	n	n	p	n	p	p	n
	DLMSCI	n*	n*	p	n	n	p	n	p	n	n
	DLAUD_USD	p*	n**	p***	p	n	p	n	p	p	n
	DLWTI	n*	n*	p	n**	p***	n	n	p	n	p
	DLGOLD	n*	n	n***	p	n	n	p	n	p	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLIS	p*	p*	n	p	p	n	p	n	p	p
	DLMSCI	p*	p***	n	p	p	n	p	n	p	p
	DLAUD_USD	n*	p	n	p	p	n	p	n	n	p
	DLWTI	p*	n	n	p	n	p	p	n	p	n
	DLGOLD	p*	n	p	n	p	n	n	p	n	p
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLIS	n	n	p*	n**	p***	n	n	p	n	p
	DLMSCI	p*	p***	p*	n**	p**	n	n	p	n	p
	DLAUD_USD	n*	n*	p*	n**	p	p	n	p	n	p
	DLWTI	p*	p*	n**	n	p	n***	p	n	n	p
	DLGOLD	p*	n*	p	p	n	p	n	n	p	n

Var Model: Industrials, MSCI, AUD/USD, WTI, GOLD.

Response of DLIS:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLIS	0.012801*	-0.000261	9.58E-06	1.83E-05***	-3.02E-06***	3.80E-07	-1.84E-08	-2.85E-09	9.87E-10	-1.55E-10
	DLMSCI	0.010322*	-1.60E-04	2.45E-05	1.32E-05***	-2.30E-06	3.25E-07	-2.08E-08	-1.26E-09	6.89E-10	-1.21E-10
	DLAUD_USD	-0.001675*	-1.46E-05	-6.94E-05**	1.07E-05***	-1.60E-06***	1.24E-07	-3.32E-11	-2.36E-09	4.76E-10	-5.65E-11
	DLWTI	0.000874*	-0.000212	6.69E-05**	-4.43E-06	-5.08E-08	1.28E-07	-2.53E-08	3.17E-09	-1.95E-10	-1.73E-11
	DLGOLD	-0.000132	0.000381**	-2.24E-05	1.59E-06	4.02E-07	-9.56E-08	1.45E-08	-1.19E-09	-1.28E-11	2.58E-11
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLIS	0.007489*	0.001697*	-0.000101***	2.15E-05**	-3.21E-07	-1.74E-07	5.59E-08	-7.78E-09	6.69E-10	9.23E-12
	DLMSCI	0.009287*	0.001299*	-5.63E-05	1.81E-05**	-4.34E-07	-9.43E-08	4.12E-08	-6.23E-09	6.21E-10	-1.04E-11
	DLAUD_USD	-0.002944*	-1.61E-04	-6.02E-05***	-3.25E-08	4.11E-07	-1.81E-07	2.78E-08	-3.10E-09	1.27E-10	2.79E-11
	DLWTI	0.001464*	-7.56E-05	2.38E-05	6.85E-06***	-1.08E-06	1.45E-07	-5.69E-09	-1.34E-09	4.25E-10	-6.46E-11
	DLGOLD	0.000487*	0.000291**	3.52E-05***	-3.81E-06	7.73E-07	-4.39E-08	-2.04E-09	1.54E-09	-2.73E-10	3.07E-11
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLIS	-0.000989*	-0.001663*	6.89E-05	-6.74E-06	-1.55E-06	3.36E-07	-5.11E-08	3.89E-09	9.28E-11	-9.73E-11
	DLMSCI	-0.002397*	-1.43E-03*	5.73E-05	-8.26E-06	-9.43E-07	2.35E-07	-4.09E-08	3.60E-09	-3.68E-11	-6.41E-11
	DLAUD_USD	0.00756*	-2.79E-04**	5.59E-05***	2.32E-06	-7.70E-07	1.65E-07	-1.61E-08	5.11E-10	2.23E-10	-5.65E-11
	DLWTI	-0.001265*	-0.000326*	3.60E-05	-9.81E-06**	9.05E-07***	-5.02E-08	-9.05E-09	2.65E-09	-4.06E-10	3.52E-11
	DLGOLD	-0.001898*	-1.01E-05	-4.67E-05***	3.71E-06	-3.83E-07	-2.23E-08	9.50E-09	-1.78E-09	1.87E-10	-7.00E-12
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLIS	0.001638*	0.000938*	-0.000152	9.86E-06	5.41E-07	-3.21E-07	5.72E-08	-6.21E-09	2.35E-10	6.72E-11
	DLMSCI	0.003783*	0.000639***	-1.24E-04	9.52E-06	8.66E-08	-2.18E-07	4.37E-08	-5.30E-09	2.97E-10	3.67E-11
	DLAUD_USD	-0.004014*	0.000536	-4.41E-05	8.36E-07	7.76E-07	-1.75E-07	2.35E-08	-1.65E-09	-8.82E-11	5.03E-11
	DLWTI	0.023993*	-0.000337	-3.19E-05	8.31E-06	-1.21E-06	9.36E-08	2.58E-09	-2.37E-09	4.55E-10	-5.25E-11
	DLGOLD	0.001435*	-0.00013	3.05E-05	-5.44E-06	5.18E-07	-1.23E-08	-7.58E-09	1.83E-09	-2.49E-10	1.84E-11
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLIS	-0.000103	-0.000235	0.000465*	-6.91E-05**	7.89E-06***	-2.37E-07	-8.88E-08	2.42E-08	-3.43E-09	2.78E-10
	DLMSCI	0.00052*	0.000289***	0.000338*	-5.30E-05**	6.87E-06**	-3.32E-07	-4.89E-08	1.74E-08	-2.74E-09	2.57E-10
	DLAUD_USD	-0.002492*	-0.001503*	2.26E-04*	-3.26E-05**	2.05E-06	1.04E-07	-6.39E-08	1.12E-08	-1.19E-09	3.83E-11
	DLWTI	0.000594*	0.001538*	-8.73E-05**	-4.06E-06	3.24E-06	-5.78E-07***	6.60E-08	-2.96E-09	-5.97E-10	1.85E-10
	DLGOLD	0.009926*	-0.000448*	2.24E-05	1.11E-05	-2.28E-06	3.16E-07	-2.16E-08	-1.17E-09	6.74E-10	-1.21E-10

Var Model: Industrials, MSCI, AUD/USD, WTI, GOLD.

Response of DLO_G:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLO_G	p*	n*	p**	n	n	p	n	p	n	p
	DLMSCI	p*	n**	p***	n	n	p	n	p	n	p
	DLAUD_USD	n*	p	n	p	n	p	n	p	p	n
	DLWTI	p*	p	p	n	p	n	n	p	n	p
	DLGOLD	p**	p***	n***	p	n	p	p	n	p	n
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLO_G	p*	p*	p	p**	n	p**	n	p	p	n
	DLMSCI	p*	p*	p	p**	n	p***	p	p	p	n
	DLAUD_USD	n*	n	n*	n	n	n	p	n	p	n
	DLWTI	p*	n	p	p	n	p	n	p	n	p
	DLGOLD	p*	p**	p**	p	p***	n	p	n	p	p
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLO_G	n*	n*	p*	n**	p	n	n	p	n	p
	DLMSCI	n*	n*	p***	n**	p	n	n	p	n	p
	DLAUD_USD	p*	n**	p**	p	n	p	n	p	n	p
	DLWTI	n*	n*	p	n	p	n	p	n	n	p
	DLGOLD	n*	n	n***	p	n***	p	n	n	p	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLO_G	p*	p*	n**	p**	n	p	n	n	p	n
	DLMSCI	p*	p***	n***	p**	n	p	p	n	p	n
	DLAUD_USD	n*	p	n	p	p	n	p	n	p	n
	DLWTI	p*	n	n	p	n	p	n	p	p	n
	DLGOLD	p*	n	p	n	p	n	p	n	n	p
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLO_G	p**	p*	p*	n**	p*	n*	p***	n	p	p
	DLMSCI	p*	p**	p*	n**	p*	n**	p	n	n	p
	DLAUD_USD	n*	n*	p*	n**	p	n	n	p	n	p
	DLWTI	p*	p*	n***	p	p	n	p	n	p	n
	DLGOLD	p*	n*	p	p	n	p	n	p	n	p

Var Model: Oil & Gas, MSCI, AUD/USD, WTI, GOLD.

Response of DLO_G:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLO_G	0.015785*	-0.001026*	1.53E-04**	-1.06E-05	-3.07E-07	3.64E-07	-8.94E-08	1.64E-08	-2.41E-09	2.84E-10
	DLMSCI	0.009289*	-5.92E-04**	8.36E-05***	-2.54E-06	-8.60E-07	3.36E-07	-6.82E-08	1.14E-08	-1.50E-09	1.52E-10
	DLAUD_USD	-0.003127*	3.82E-05	-5.68E-05	1.31E-05	-2.48E-06	3.63E-07	-4.40E-08	3.52E-09	3.13E-11	-9.15E-11
	DLWTI	0.005879*	0.0000814	5.09E-05	-7.33E-06	8.57E-07	-5.00E-08	-5.19E-09	2.69E-09	-6.06E-10	1.05E-10
	DLGOLD	0.000493**	0.000408***	-5.33E-05***	6.89E-06	-5.49E-07	1.53E-09	1.32E-08	-3.56E-09	6.80E-10	-1.03E-10
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLO_G	0.005498*	0.000984*	2.96E-05	2.36E-05**	-1.23E-06	3.97E-07**	-1.82E-08	2.22E-09	4.68E-10	-1.12E-10
	DLMSCI	0.009342*	0.001265*	6.41E-05	2.20E-05**	-2.19E-07	2.97E-07***	1.51E-10	9.60E-10	5.40E-10	-8.72E-11
	DLAUD_USD	-0.003009*	-1.31E-04	-8.79E-05*	-2.24E-07	-6.78E-07	-9.78E-08	1.29E-08	-4.32E-09	5.74E-10	-8.96E-11
	DLWTI	0.001474*	-8.11E-05	3.62E-05	4.45E-06	-1.50E-07	1.23E-07	-1.07E-08	2.08E-09	-1.18E-10	5.55E-12
	DLGOLD	0.000414*	0.000294**	3.46E-05**	2.86E-07	8.65E-07***	-6.39E-08	1.60E-08	-1.02E-09	1.05E-10	1.47E-11
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLO_G	-0.001495*	-0.001552*	1.29E-04*	-3.23E-05**	2.63E-06	-3.10E-07	-9.76E-09	6.30E-09	-1.86E-09	3.28E-10
	DLMSCI	-0.00243*	-1.43E-03*	6.13E-05***	-2.34E-05**	1.03E-06	-1.53E-07	-2.39E-08	5.75E-09	-1.47E-09	2.24E-10
	DLAUD_USD	0.007545*	-2.67E-04**	6.66E-05**	2.69E-06	-7.16E-07	2.91E-07	-4.71E-08	7.85E-09	-8.94E-10	8.15E-11
	DLWTI	-0.00125*	-0.00033*	1.59E-05	-8.49E-06	9.93E-07	-1.82E-07	1.64E-08	-1.40E-09	-1.07E-10	5.01E-11
	DLGOLD	-0.001812*	-1.42E-05	-5.47E-05***	5.88E-06	-1.31E-06***	1.25E-07	-1.42E-08	-3.69E-11	2.30E-10	-7.31E-11
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLO_G	0.008933*	0.000924*	-0.000215**	3.17E-05**	-4.28E-06	3.67E-07	-9.30E-09	-6.69E-09	1.97E-09	-3.93E-10
	DLMSCI	0.003785*	0.000639***	-1.57E-04***	1.96E-05**	-2.49E-06	1.40E-07	1.00E-08	-6.92E-09	1.57E-09	-2.80E-10
	DLAUD_USD	-0.003973*	0.000518	-5.00E-05	2.07E-06	9.77E-07	-2.84E-07	5.88E-08	-9.22E-09	1.21E-09	-1.14E-10
	DLWTI	0.023983*	-0.000332	-1.26E-05	6.46E-06	-1.39E-06	2.00E-07	-2.47E-08	1.91E-09	2.18E-11	-5.26E-11
	DLGOLD	0.001358*	-0.000121	3.92E-05	-9.03E-06	1.37E-06	-1.87E-07	1.76E-08	-7.41E-10	-2.27E-10	7.68E-11
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLO_G	0.000309**	0.001061*	0.000152*	-4.82E-05**	1.06E-05*	-1.70E-06*	2.30E-07***	-2.28E-08	1.06E-09	2.46E-10
	DLMSCI	0.00044*	0.000336**	0.000176*	-3.91E-05**	7.77E-06*	-1.10E-06**	1.36E-07	-1.04E-08	-1.40E-10	2.92E-10
	DLAUD_USD	-0.002381*	-0.001553*	2.44E-04*	-3.53E-05**	3.51E-06	-1.90E-07	-3.36E-08	1.31E-08	-2.86E-09	4.77E-10
	DLWTI	0.000561*	0.001547*	-7.54E-05***	2.33E-06	1.22E-06	-3.46E-07	6.93E-08	-1.07E-08	1.36E-09	-1.23E-10
	DLGOLD	0.009915*	-0.00047*	3.65E-05	4.90E-06	-1.88E-06	4.30E-07	-7.16E-08	9.99E-09	-1.06E-09	6.27E-11

Var Model: Oil & Gas, MSCI, AUD/USD, WTI, GOLD.

Response of DLPHG:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLPHG	p*	n*	n	p**	n	n	p	n	p	p
	DLMSCI	p*	n*	n	p**	n***	p	p	n	p	n
	DLAUD_USD	n*	p	n	p***	n	p	p	n	p	n
	DLWTI	p	n*	p**	n	n	p	n	p	p	n
	DLGOLD	n***	p	n	p	p	n	p	p	n	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLPHG	p*	p*	n	p	p	n	p	p	n	p
	DLMSCI	p*	p*	n	p	p	n	p	n	n	p
	DLAUD_USD	n*	n	n**	p	n	n	p	n	n	p
	DLWTI	p*	n	n	p***	n	p	p	n	p	p
	DLGOLD	p*	p**	p	n	p	p	n	p	n	n
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLPHG	n*	n*	n	p	n	p	p	n	p	n
	DLMSCI	n*	n*	n	n	n	p	n	n	p	n
	DLAUD_USD	p*	n*	p**	p	n	p	n	n	p	n
	DLWTI	n*	n*	p	n	p	p	n	p	p	n
	DLGOLD	n*	n	n***	p	n	n	p	n	n	p
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLPHG	p	p*	n	n	p	n	p	p	n	p
	DLMSCI	p*	p***	n***	p	p	n	p	p	n	p
	DLAUD_USD	n*	p	n	p	p	n	p	n	n	p
	DLWTI	p*	n	n	p***	n	n	p	n	p	p
	DLGOLD	p*	n	p	n	p	p	n	p	n	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLPHG	n***	n*	p*	n**	p	p	n	p	p	n
	DLMSCI	p*	p***	p*	n**	p	p	n	p	n	n
	DLAUD_USD	n*	n*	p*	n**	p	n	n	p	n	n
	DLWTI	p*	p*	n	n	p***	n	p	p	n	p
	DLGOLD	p*	n*	p	p	n	p	p	n	p	n

Var Model: Personal & Household Goods, MSCI, AUD/USD, WTI, GOLD.

Response of DLPHG:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLPHG	0.01051*	-0.000486*	-6.56E-05	1.74E-05**	-1.63E-06	-1.14E-08	2.76E-08	-4.23E-09	2.56E-10	2.36E-11
	DLMSCI	0.006822*	-5.53E-04*	-2.11E-05	1.34E-05**	-1.86E-06***	1.03E-07	1.14E-08	-3.28E-09	3.39E-10	-2.80E-12
	DLAUD_USD	-0.001081*	1.75E-05	-3.47E-05	9.09E-06***	-1.30E-06	1.00E-07	7.44E-10	-1.37E-09	1.77E-10	-4.91E-12
	DLWTI	0.000244	-0.000434*	6.24E-05**	-2.60E-06	-5.92E-07	1.39E-07	-1.34E-08	4.84E-11	1.93E-10	-3.08E-11
	DLGOLD	-0.000289***	0.00024	-2.65E-05	2.32E-07	4.17E-07	-7.22E-08	5.47E-09	2.12E-10	-1.14E-10	1.45E-11
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLPHG	0.006042*	0.001527*	-2.51E-05	7.93E-06	1.34E-06	-1.55E-07	1.87E-08	5.79E-10	-2.79E-10	4.32E-11
	DLMSCI	0.009308*	0.001281*	-1.59E-05	1.19E-05	6.73E-07	-9.74E-08	2.04E-08	-4.83E-10	-1.34E-10	3.69E-11
	DLAUD_USD	-0.002997*	-1.46E-04	-7.58E-05**	2.08E-06	-2.35E-07	-7.30E-08	8.03E-09	-6.70E-10	-6.42E-11	1.70E-11
	DLWTI	0.001462*	-7.92E-05	-4.10E-06	6.29E-06***	-6.17E-07	2.89E-08	6.93E-09	-1.36E-09	1.23E-10	2.47E-12
	DLGOLD	0.000514*	0.000297**	3.01E-05	-1.57E-06	4.19E-07	8.14E-09	-3.50E-09	7.62E-10	-3.96E-11	-3.17E-12
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLPHG	-0.00078*	-0.001264*	-5.16E-05	6.16E-06	-1.99E-06	8.10E-08	5.50E-09	-3.02E-09	3.14E-10	-9.68E-12
	DLMSCI	-0.002443*	-1.41E-03*	-7.77E-06	-6.77E-07	-1.57E-06	1.04E-07	-4.28E-09	-1.95E-09	2.96E-10	-2.40E-11
	DLAUD_USD	0.007588*	-2.97E-04*	7.17E-05**	1.18E-06	-2.84E-07	7.61E-08	-7.96E-10	-7.40E-10	1.78E-10	-1.51E-11
	DLWTI	-0.001271*	-0.000321*	4.65E-05	-6.06E-06	1.96E-08	6.56E-08	-1.22E-08	7.62E-10	5.54E-11	-2.15E-11
	DLGOLD	-0.001902*	-1.84E-05	-4.30E-05***	1.13E-06	-4.12E-08	-4.95E-08	4.99E-09	-2.90E-10	-5.35E-11	1.12E-11
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLPHG	0.000558	0.001054*	-0.00013	-6.28E-06	2.18E-06	-3.11E-07	1.05E-08	2.67E-09	-6.19E-10	5.46E-11
	DLMSCI	0.003769*	0.000635***	-1.45E-04***	1.58E-06	1.18E-06	-2.81E-07	2.13E-08	4.41E-10	-4.28E-10	5.78E-11
	DLAUD_USD	-0.004018*	0.000534	-4.76E-05	3.36E-06	6.69E-07	-1.38E-07	1.51E-08	-1.74E-10	-1.78E-10	3.14E-11
	DLWTI	0.023989*	-0.000338	-5.53E-05	9.97E-06***	-8.13E-07	-3.46E-08	1.73E-08	-2.28E-09	9.37E-11	1.94E-11
	DLGOLD	0.001474*	-0.000128	2.73E-05	-5.54E-06	2.28E-07	3.13E-08	-1.00E-08	9.95E-10	-1.56E-11	-1.34E-11
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLPHG	-0.000272***	-0.000625*	0.000473*	-3.66E-05**	4.79E-07	6.81E-07	-1.03E-07	7.27E-09	4.96E-10	-1.80E-10
	DLMSCI	0.000547*	0.000288***	0.00039*	-4.23E-05**	3.36E-06	2.67E-07	-7.55E-08	8.85E-09	-1.26E-10	-1.09E-10
	DLAUD_USD	-0.002482*	-0.001499*	2.26E-04*	-3.78E-05**	2.75E-06	-4.89E-08	-3.07E-08	4.14E-09	-1.46E-10	-5.13E-11
	DLWTI	0.000609*	0.001535*	-6.11E-05	-1.28E-05	3.47E-06***	-3.45E-07	5.22E-09	4.46E-09	-7.58E-10	5.19E-11
	DLGOLD	0.009903*	-0.000443*	2.57E-05	1.13E-05	-1.70E-06	1.57E-07	4.06E-09	-2.61E-09	3.68E-10	-1.56E-11

Var Model: Personal & Household Goods, MSCI, AUD/USD, WTI, GOLD.

Response of DLTY:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTY	p*	n	n*	n	n	p	p	n	p	n
	DLMSCI	p*	n*	n*	p	n	p	p	n	p	n
	DLAUD_USD	n*	p	n	p***	n***	p	n	n	p	n
	DLWTI	p*	n	p	n	n	p	n	p	n	n
	DLGOLD	n	p	n**	n	p	n	p	n	n	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTY	p*	p*	p	n	n	n	p	p	p	p
	DLMSCI	p*	p*	n	n	n	n	p	p	p	p
	DLAUD_USD	n*	n	n***	p	n	p	p	n	p	n
	DLWTI	p*	n	p	p	n	p	n	p	p	n
	DLGOLD	p*	p**	p	n	n	n	p	p	n	p
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTY	n*	n*	n**	p	p	p	p	n	n	n
	DLMSCI	n*	n*	n	p	p	p	n	n	n	n
	DLAUD_USD	p*	n*	p**	n	n	p	n	p	p	n
	DLWTI	n*	n*	p	n	p	p	n	p	n	p
	DLGOLD	n*	n	n	p	p	p	p	n	n	p
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTY	p*	p*	n	n	p	n	p	p	n	p
	DLMSCI	p*	p***	n***	n	p	n	p	p	n	p
	DLAUD_USD	n*	p	n	p	p	n	p	n	p	p
	DLWTI	p*	n	n	p	n	p	p	n	p	n
	DLGOLD	p*	n	p	n	p	p	n	p	n	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTY	n	n**	p*	n	n	p	n	p	n	n
	DLMSCI	p*	p**	p*	n**	p	n	n	p	n	p
	DLAUD_USD	n*	n*	p*	n**	p	n	p	p	n	p
	DLWTI	p*	p*	n**	p	p	n	p	n	p	p
	DLGOLD	p*	n*	p	p	n	p	n	n	p	n

Var Model: Technology, MSCI, AUD/USD, WTI, GOLD.

Response of DLTY:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTY	0.019093*	-0.000142	-2.54E-04*	-3.18E-06	-4.19E-07	6.31E-08	1.78E-08	-6.41E-10	1.54E-11	-7.68E-12
	DLMSCI	0.012672*	-8.81E-04*	-2.24E-04*	2.39E-06	-6.03E-07	1.41E-07	9.24E-09	-6.01E-10	1.37E-11	-1.03E-11
	DLAUD_USD	-0.001591*	2.91E-04	-1.63E-05	1.58E-05***	-1.38E-06***	6.95E-08	-6.55E-09	-3.58E-10	8.43E-11	-4.39E-12
	DLWTI	0.00101*	-0.0000469	6.40E-05	-7.11E-06	-8.89E-07	1.14E-07	-1.13E-08	1.30E-09	-2.02E-11	-5.22E-12
	DLGOLD	-0.000209	0.000276	-5.16E-05**	-4.23E-06	3.97E-07	-2.90E-08	5.66E-09	-2.16E-11	-2.71E-11	1.69E-12
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTY	0.006178*	0.001538*	2.89E-05	-2.64E-06	-6.32E-07	-8.39E-08	3.33E-09	3.17E-10	4.16E-11	2.78E-12
	DLMSCI	0.009309*	0.001274*	-9.64E-06	-2.53E-06	-8.02E-07	-4.62E-08	4.37E-09	2.57E-10	4.42E-11	1.53E-13
	DLAUD_USD	-0.003*	-1.38E-04	-5.46E-05***	5.34E-06	-3.02E-09	1.92E-08	1.28E-09	-4.05E-10	6.51E-12	-7.56E-13
	DLWTI	0.001459*	-8.20E-05	4.04E-05	3.99E-06	-4.77E-07	2.06E-08	-4.29E-09	9.78E-12	3.24E-11	-1.59E-12
	DLGOLD	0.000477*	0.000297**	2.02E-05	-2.14E-06	-1.78E-08	-2.13E-08	4.62E-11	1.80E-10	-1.29E-12	1.11E-12
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTY	-0.000632*	-0.00129*	-7.73E-05**	6.31E-06	1.68E-07	8.61E-08	2.37E-10	-6.38E-10	-3.41E-12	-4.57E-12
	DLMSCI	-0.002446*	-1.41E-03*	-1.37E-05	5.07E-06	2.78E-07	7.73E-08	-3.58E-09	-4.17E-10	-9.66E-12	-3.49E-12
	DLAUD_USD	0.007589*	-3.00E-04*	6.33E-05**	-1.99E-06	-4.48E-07	2.60E-08	-3.82E-09	3.01E-10	2.32E-11	-2.72E-12
	DLWTI	-0.001271*	-0.000319*	2.82E-05	-8.83E-06	5.23E-07	7.34E-09	-1.17E-09	5.13E-10	-5.37E-11	7.14E-13
	DLGOLD	-0.001881*	-1.58E-05	-3.93E-05	2.13E-06	1.11E-07	8.53E-10	1.99E-09	-2.45E-10	-2.23E-12	1.57E-13
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTY	0.001268*	0.001132*	-0.000108	-1.72E-05	4.37E-07	-2.96E-08	1.02E-08	8.18E-10	-8.22E-11	2.18E-12
	DLMSCI	0.00376*	0.000633***	-1.54E-04***	-1.04E-05	4.95E-07	-2.54E-08	1.35E-08	6.46E-11	-5.37E-11	8.56E-13
	DLAUD_USD	-0.004015*	0.000537	-2.64E-05	5.08E-06	5.66E-07	-1.05E-07	6.96E-09	-7.55E-10	1.41E-11	5.62E-12
	DLWTI	0.023986*	-0.000339	-1.79E-05	6.45E-06	-1.17E-06	1.35E-08	5.29E-09	-7.23E-10	1.16E-10	-6.65E-12
	DLGOLD	0.001445*	-0.000127	1.87E-05	-6.01E-06	2.30E-08	2.39E-08	-1.74E-09	4.78E-10	-2.52E-11	-9.97E-13
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTY	-0.000109	-0.000331**	0.000365*	-1.72E-05	-5.82E-07	5.69E-08	-2.65E-08	2.51E-09	-3.89E-11	-7.84E-13
	DLMSCI	0.000509*	0.000307**	0.000322*	-2.97E-05**	1.08E-06	-1.13E-07	-1.08E-08	2.26E-09	-1.05E-10	8.33E-12
	DLAUD_USD	-0.00246*	-0.001519*	2.27E-04*	-3.53E-05**	3.56E-06	-1.70E-07	2.60E-09	1.13E-09	-2.00E-10	1.24E-11
	DLWTI	0.000598*	0.00154*	-9.62E-05**	3.28E-07	2.36E-06	-3.70E-07	3.07E-08	-2.01E-09	4.48E-12	1.78E-11
	DLGOLD	0.009927*	-0.000454*	3.06E-05	7.76E-06	-1.39E-06	9.71E-08	-7.08E-09	-5.73E-12	7.88E-11	-7.59E-12

Var Model: Technology, MSCI, AUD/USD, WTI, GOLD.

Response of DLTS:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTS	p*	n**	n	p***	n	p	p	n	p	n
	DLMSCI	p*	n**	n	p**	n***	p	p	n	p	n
	DLAUD_USD	n*	p	n**	p**	n***	p	n	n	p	p
	DLWTI	p*	n	p***	n	n	p	n	p	p	n
	DLGOLD	n	p	n	n	p	n	p	n	n	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTS	p*	p*	p	p***	p	p	p	p	p	p
	DLMSCI	p*	p*	p	p***	p	p	p	p	p	p
	DLAUD_USD	n*	n	n**	n	n	n	p	n	n	p
	DLWTI	p*	n	p	p	n	p	p	n	p	n
	DLGOLD	p*	p**	p***	p	p	p	p	p	n	p
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTS	n*	n*	n***	n	n	p	n	n	p	n
	DLMSCI	n*	n*	n	n	n	n	n	n	p	n
	DLAUD_USD	p*	n*	p**	p	p	p	p	n	p	n
	DLWTI	n*	n*	p	n***	p	n	n	p	n	n
	DLGOLD	n*	n	n***	p	n	n	p	n	n	p
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTS	p*	p*	n***	n	p	n	p	p	n	p
	DLMSCI	p*	p***	n***	n	p	n	p	n	n	p
	DLAUD_USD	n*	p	n	n	p	n	p	n	n	p
	DLWTI	p*	n	n	p	n	p	p	n	p	n
	DLGOLD	p*	n	p	n	p	p	n	p	n	n
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTS	n	n*	p*	n**	p	p	n	p	n	n
	DLMSCI	p*	p**	p*	n**	p***	p	n	p	n	n
	DLAUD_USD	n*	n*	p*	n**	p	n	n	p	n	n
	DLWTI	p*	p*	n**	n	p***	n	p	p	n	p
	DLGOLD	p*	n*	p	p	n	p	n	n	p	n

Var Model: Telecommunications, MSCI, AUD/USD, WTI, GOLD.

Response of DLTS:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTS	0.014491*	-0.000536**	-7.47E-05	1.69E-05***	-1.75E-06	2.80E-08	1.81E-08	-3.49E-09	3.04E-10	-4.35E-12
	DLMSCI	0.009094*	-4.74E-04**	-5.18E-05	1.49E-05**	-2.07E-06***	1.32E-07	2.30E-09	-2.09E-09	2.54E-10	-1.20E-11
	DLAUD_USD	-0.001525*	3.43E-04	-8.96E-05**	1.52E-05**	-1.67E-06***	1.23E-07	-2.17E-09	-6.42E-10	7.71E-11	3.26E-12
	DLWTI	0.000633*	-0.000299	6.17E-05***	-3.57E-06	-5.08E-07	1.48E-07	-1.93E-08	1.30E-09	2.12E-11	-1.84E-11
	DLGOLD	-0.000325	0.000314	-2.97E-05	-4.38E-07	4.86E-07	-8.25E-08	6.82E-09	-1.03E-10	-7.15E-11	1.14E-11
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTS	0.005859*	0.001231*	2.74E-05	1.24E-05***	1.06E-06	8.82E-09	1.92E-08	3.52E-10	4.55E-11	2.40E-11
	DLMSCI	0.009336*	0.001265*	5.60E-05	1.54E-05***	9.61E-07	6.64E-08	1.92E-08	4.18E-10	1.14E-10	2.10E-11
	DLAUD_USD	-0.003025*	-1.28E-04	-6.81E-05**	-6.39E-07	-4.13E-07	-6.13E-08	6.02E-10	-6.63E-10	-5.28E-11	3.00E-12
	DLWTI	0.001468*	-8.23E-05	2.30E-05	4.00E-06	-2.85E-07	6.19E-08	7.07E-10	-2.16E-10	9.34E-11	-4.52E-12
	DLGOLD	0.000476*	0.000298**	2.97E-05***	6.01E-07	4.65E-07	1.41E-08	1.39E-09	5.74E-10	-8.66E-12	3.80E-12
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTS	-0.000799*	-0.001108*	-6.06E-05***	-6.51E-07	-1.69E-06	2.03E-08	-7.40E-09	-1.73E-09	9.72E-11	-1.93E-11
	DLMSCI	-0.00246*	-1.40E-03*	-3.93E-05	-7.24E-06	-1.40E-06	-1.20E-08	-1.09E-08	-1.51E-09	6.11E-11	-2.44E-11
	DLAUD_USD	0.007595*	-3.02E-04*	6.78E-05**	1.41E-06	1.51E-07	3.98E-08	4.87E-09	-4.65E-10	1.45E-10	-8.31E-12
	DLWTI	-0.001274*	-0.00032*	3.51E-05	-7.22E-06***	2.61E-07	-7.24E-09	-6.53E-09	4.90E-10	-3.33E-11	-7.84E-12
	DLGOLD	-0.001882*	-1.62E-05	-4.31E-05***	1.94E-07	-2.09E-07	-3.97E-08	1.34E-09	-4.02E-10	-3.35E-11	3.28E-12
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTS	0.001047*	0.001239*	-0.00015***	-6.41E-06	1.39E-06	-2.93E-07	1.11E-08	5.18E-10	-4.01E-10	3.99E-11
	DLMSCI	0.003771*	0.000634***	-1.57E-04***	-2.56E-06	6.14E-07	-2.72E-07	1.55E-08	-9.92E-10	-2.47E-10	3.01E-11
	DLAUD_USD	-0.004024*	0.000535	-1.75E-05	-5.61E-07	1.18E-06	-1.36E-07	1.48E-08	-9.23E-11	-8.86E-11	1.96E-11
	DLWTI	0.02398*	-0.000337	-3.82E-05	8.50E-06	-1.05E-06	1.08E-08	9.92E-09	-2.14E-09	1.84E-10	-5.13E-12
	DLGOLD	0.001477*	-0.000126	2.70E-05	-6.18E-06	1.46E-07	1.64E-08	-9.43E-09	8.37E-10	-5.74E-11	-6.51E-12
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLTS	-0.000223	-0.000479*	0.000393*	-2.89E-05**	1.78E-06	3.73E-07	-5.77E-08	6.94E-09	-7.63E-11	-5.16E-11
	DLMSCI	0.000505*	0.000307**	0.000342*	-2.96E-05**	3.58E-06***	1.14E-07	-3.01E-08	6.17E-09	-2.10E-10	-1.89E-11
	DLAUD_USD	-0.002457*	-0.001516*	2.16E-04*	-3.16E-05**	1.83E-06	-5.14E-08	-1.88E-08	1.76E-09	-5.20E-11	-3.50E-11
	DLWTI	0.000611*	0.001537*	-8.45E-05**	-4.41E-06	2.65E-06***	-3.41E-07	2.74E-08	3.84E-10	-3.35E-10	4.95E-11
	DLGOLD	0.009915*	-0.000451*	2.64E-05	1.00E-05	-1.31E-06	1.56E-07	-9.62E-10	-1.07E-09	2.47E-10	-1.61E-11

Var Model: Telecommunications, MSCI, AUD/USD, WTI, GOLD.

Response of DLUT:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLUT	p*	n*	n	p	n***	p	n	p	p	n
	DLMSCI	p*	n*	n	p	n***	p	n	p	p	n
	DLAUD_USD	n*	n	n	p***	n	p	n	n	p	n
	DLWTI	p*	n	p***	n***	p	p	n	p	n	p
	DLGOLD	n	p***	n***	p	p	n	p	n	p	p
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLUT	p*	p*	p	p**	p	p	p	n	p	n
	DLMSCI	p*	p*	p	p**	p	p	p	n	p	n
	DLAUD_USD	n*	n	n*	p	n	n	p	n	p	n
	DLWTI	p*	n	p	p***	n	p	n	p	p	n
	DLGOLD	p*	p**	p**	p	p	n	p	p	n	p
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLUT	n*	n*	p	n	n	p	n	p	n	n
	DLMSCI	n*	n*	p	n***	n	p	n	p	n	n
	DLAUD_USD	p*	n*	p**	p	n	p	n	p	p	n
	DLWTI	n*	n*	p	n**	p	n	n	p	n	p
	DLGOLD	n*	n	n***	p	n	n	p	n	p	n
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLUT	p*	p*	n***	p	p	n	p	n	p	p
	DLMSCI	p*	p***	n***	p	n	n	p	n	p	n
	DLAUD_USD	n*	p	n	p	p	n	p	n	p	p
	DLWTI	p*	n	n	p	n	p	p	n	p	n
	DLGOLD	p*	n	p	n	p	n	n	p	n	p
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLUT	n	p	p*	n**	p**	n	n	p	n	p
	DLMSCI	p*	p**	p*	n**	p*	n	p	p	n	p
	DLAUD_USD	n*	n*	p*	n**	p	n	n	p	n	p
	DLWTI	p*	p*	n**	n	p***	n***	p***	n	n	p
	DLGOLD	p*	n*	p	p	n	p	n	p	p	n

Var Model: Utilities, MSCI, AUD/USD, WTI, GOLD.

Response of DLUT:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLUT	0.011459*	-0.000642*	-5.81E-06	6.90E-06	-2.00E-06***	2.29E-07	-2.22E-08	3.54E-11	2.75E-10	-6.64E-11
	DLMSCI	0.006016*	-6.31E-04*	-4.91E-06	5.03E-06	-1.96E-06***	2.29E-07	-2.59E-08	5.34E-10	2.03E-10	-6.27E-11
	DLAUD_USD	-0.001581*	-5.26E-06	-3.06E-05	1.08E-05***	-1.50E-06	1.76E-07	-8.28E-09	-7.65E-10	3.37E-10	-5.30E-11
	DLWTI	0.001194*	-0.000129	5.86E-05***	-6.53E-06***	8.44E-08	8.09E-08	-2.06E-08	2.77E-09	-2.59E-10	5.90E-12
	DLGOLD	-3.52E-05	0.000288***	-3.72E-05***	1.18E-06	1.72E-07	-7.93E-08	1.13E-08	-1.29E-09	5.56E-11	6.91E-12
Response of DLMSCI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLUT	0.004904*	0.001031*	3.03E-05	1.61E-05**	3.60E-07	1.00E-07	1.92E-08	-8.49E-10	3.60E-10	-8.60E-12
	DLMSCI	0.009341*	0.001264*	6.43E-05	1.93E-05**	5.91E-07	1.50E-07	2.08E-08	-3.63E-10	4.04E-10	-7.84E-12
	DLAUD_USD	-0.003015*	-1.29E-04	-8.79E-05*	1.49E-07	-7.19E-07	-7.81E-08	4.66E-09	-2.13E-09	1.10E-10	-1.44E-11
	DLWTI	0.001474*	-8.17E-05	2.65E-05	4.74E-06***	-3.52E-07	1.07E-07	-4.57E-09	4.16E-10	1.17E-10	-1.78E-11
	DLGOLD	0.000448*	0.000294**	3.38E-05**	6.44E-07	6.43E-07	-4.16E-09	4.87E-09	5.81E-10	-4.20E-11	1.57E-11
Response of DLAUD_USD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLUT	-0.001046*	-0.001205*	1.59E-05	-9.35E-06	-1.02E-06	8.50E-08	-3.02E-08	1.81E-09	-1.98E-10	-2.22E-11
	DLMSCI	-0.002446*	-1.41E-03*	4.73E-06	-1.28E-05***	-1.03E-06	4.59E-08	-3.20E-08	1.76E-09	-2.69E-10	-1.81E-11
	DLAUD_USD	0.00758*	-2.90E-04*	7.18E-05**	2.67E-06	-3.35E-07	1.68E-07	-1.43E-08	1.77E-09	3.23E-11	-1.89E-11
	DLWTI	-0.001264*	-0.000324*	3.49E-05	-9.31E-06**	7.05E-07	-6.73E-08	-5.06E-09	1.37E-09	-2.83E-10	2.76E-11
	DLGOLD	-0.001874*	-1.03E-05	-4.82E-05***	2.00E-06	-4.85E-07	-2.17E-08	3.14E-09	-1.27E-09	1.10E-10	-1.26E-11
Response of DLWTI:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLUT	0.002499*	0.001056*	-0.000145***	6.61E-06	2.58E-08	-2.22E-07	3.43E-08	-4.65E-09	2.77E-10	6.16E-12
	DLMSCI	0.003786*	0.000634***	-1.46E-04***	7.04E-06	-3.23E-07	-2.00E-07	3.19E-08	-4.94E-09	3.35E-10	-5.55E-12
	DLAUD_USD	-0.004001*	0.000531	-5.31E-05	2.91E-06	9.12E-07	-1.90E-07	3.06E-08	-2.65E-09	1.10E-10	2.74E-11
	DLWTI	0.023985*	-0.000336	-3.20E-05	9.62E-06	-1.44E-06	1.02E-07	3.41E-10	-2.09E-09	3.99E-10	-5.18E-11
	DLGOLD	0.001425*	-0.00013	3.60E-05	-6.87E-06	5.00E-07	-2.37E-08	-6.99E-09	1.47E-09	-2.30E-10	1.94E-11
Response of DLGOLD:		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	DLUT	-3.05E-05	0.000033	0.000298*	-4.05E-05**	5.59E-06**	-2.79E-07	-1.19E-08	9.42E-09	-1.52E-09	1.85E-10
	DLMSCI	0.000476*	0.000317**	0.000284*	-3.80E-05**	6.06E-06*	-3.49E-07	2.76E-09	8.29E-09	-1.44E-09	1.97E-10
	DLAUD_USD	-0.002455*	-0.001523*	2.40E-04*	-3.79E-05**	2.96E-06	-1.05E-07	-3.80E-08	8.43E-09	-1.25E-09	1.07E-10
	DLWTI	0.00059*	0.00154*	-8.89E-05**	-2.85E-06	2.80E-06***	-4.89E-07***	6.16E-08***	-4.18E-09	-8.47E-11	9.29E-11
	DLGOLD	0.009934*	-0.000456*	2.37E-05	9.86E-06	-1.79E-06	2.79E-07	-2.14E-08	5.85E-10	3.09E-10	-6.57E-11

Var Model: Utilities, MSCI, AUD/USD, WTI, GOLD

Appendix B

An example of the program used in order to investigate the existance of cointegrating relationships based on trace tests is presented below. Lsp, lmsci, leur_usd, lwti and lgold denotes S&P 500, MSCI index, Euro, WTI, GOLD respectively. A VAR model is estimated using different lags of the explanatory variables. The selection of the appropriate lag length was made based on Schartz's Bayesia Information Criteria (SBIC). Then the cointegration test is employed and the trace statistics are obtained from the cointegrating table. The software for the quantitative analysis used in this research is EVIEWS 7.

```
scalar lag
for !i=1 to 3744
smpl @first+!i @first+1044+!i
for !lag = 1 to 8
var var1.ls 1 !lag lsp lmsci leur_usd lwti lgold
rowvector rvector!lag
rvector!lag=var1.@sc
next
scalar length
if rvector1<rvector2 and rvector1<rvector3 and rvector1<rvector4 and
rvector1<rvector5 and rvector1<rvector6 and rvector1<rvector7 and
rvector1<rvector8 then length=1
else if rvector2<rvector3 and rvector2<rvector4 and rvector2<rvector5 and
rvector2<rvector6 and rvector2<rvector7 and rvector2<rvector8 then length=2
else if rvector3<rvector4 and rvector3<rvector5 and rvector3<rvector6 and
rvector3<rvector7 and rvector3<rvector8 then length=3
else if rvector4<rvector5 and rvector4<rvector6 and rvector4<rvector7 and
rvector4<rvector8 then  length=4
else if rvector5<rvector6 and rvector5<rvector7 and rvector5<rvector8 and then
length=5
else if rvector6<rvector7 and rvector6<rvector8 then length=6
else if rvector7<rvector8 then length=7
else length=8
endif
endif
endif
endif
endif
endif
endif
!length=length
var var2.ls 1 !length lsp lmsci leur_usd lwti lgold
var2.coint(c,!length)
matrix (1,!i) mat
```

```
mat(1,!i)=length
freeze(cointegration1) var2.coint(c,!length)
vector(1,1) trace1
trace1(1,1) = cointegration1 (13,3)
matrix (1,!i) mat1
mat1 (1,!i) = trace1(1,1)
vector(1,1) trace2
trace2(1,1) = cointegration1 (14,3)
matrix (1,!i) mat2
mat2 (1,!i) = trace2(1,1)
vector(1,1) trace3
trace3(1,1) = cointegration1 (15,3)
matrix (1,!i) mat3
mat3 (1,!i) = trace3(1,1)
vector(1,1) trace4
trace4(1,1) = cointegration1 (16,3)
matrix (1,!i) mat4
mat4 (1,!i) = trace4(1,1)
vector(1,1) trace5
trace5(1,1) = cointegration1 (17,3)
matrix (1,!i) mat5
mat5 (1,!i) = trace5(1,1)

delete cointegration1
next
```

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