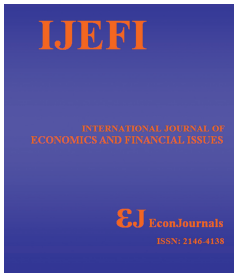

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The Effect of Baltic Dry Index, Gold, Oil and USA Trade Balance on Dow Jones Sustainability Index World

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ABSTRACT

The predictability of stock returns by investors has been a crucial issue updating over the time. The aim of this study is to investigate the effect of economic leading indicator of Baltic dry index (BDI) on stock returns of socially responsible stock index. For the purpose of the study, Dow jones sustainability index world (DJSIW) is employed in the proposed model so as to detect the world's leading companies that incorporate business initiatives consistent to sustainable development. It incorporates the generalized autoregressive conditional heteroskeasticity model in methodology for the period of October 1999-July 2016 using monthly data. The empirical results revealed that BDI affect positively DJSIW implying that the maritime shipping cost as a proxy of economic growth affects the stock returns of socially responsible companies. In addition, gold, oil and the US trade balance tend to affect positively the DSJIW. The results are useful to investors in order to set their investment portfolio and management risk strategy.

Keywords: Stock Returns, Baltic Dry Index, Gold, Oil
JEL Classifications: G1, F2, Q40, M21

1. INTRODUCTION

A number of studies have intended to examine and explain the effect of macroeconomic variables on stock market returns (Samitas and Kenourgios, 2007; Maio and Philip, 2015). Until today, most of the published research has focused on determinants on conventional investment neglecting socially responsible investment (SRI) which considered as the fastest growing areas of investment (Sadorsky, 2014). In general, sustainable investments have risen significantly in recent years, increasing from $13.3 trillion in 2012 to $21.4 trillion in 2014. The majority of these type of investment concerns Europe and the US with 63.7% and 30.8% respectively, while the rest percentage concerns Canada, Australia/New Zealand and Asia (Global Sustainable Investment Alliance, 2014). At the company level, during the last few decades, socially responsible companies have gathered significant momentum in attracting the interest of investors. Unlike the conventional investments, SRI concerns investments that not only take into account financial criteria but also social and environmental ones (Lean et al., 2015).

A number of stock market indexes have been developed in order to assist investors to examine and select companies under both financial and non-financial criteria such as environmental, social and governance criteria. Dow jones sustainability index (DJSI), KLD and FTSE4 good are among the most well-known SRI indexes which proposed a methodology that assists investors to select socially responsible companies under preselected criteria.

As few studies have examined the determinants of socially responsible indexes, this study intends to examine whether maritime transportation cost, gold, oil and trade balance of goods and services can affect stock returns of socially responsible companies. In addition, this study intends to understand the volatility of SRI (Sadorsky, 1999).

For the purpose of the study, the Baltic dry index (BDI) is employed to depict the maritime transportation cost as a proxy of global economic activity. Smith (1776) pointed out the significant role of maritime transportation to global economy presenting the

economic benefits offered by sea transportation. For the year 2015, the estimated world seaborne trade volumes surpassed 10 billion tons which marginally increased for 2016. In addition, the growth of dry cargo sector, bulk commodities and containerized trade in commodities, fell short expectations, while dry cargo shipments in 2015 were estimated as a 70.7% of the total seaborne trade volumes[1]. The BDI is considered among the most pivotal indicators of the utilizing dry bulk carriers and worldwide trade and manufacturing growth. The BDI was launched for the first time in 1985 by the Baltic Exchange in London (Lin and Sim, 2013; Bildiricia et al., 2015). It is an indicator of shipment rates of dry bulk cargoes such as grain, iron and other major raw material by sea (Lin and Sim, 2013). The BDI is employed as a predictor of socially responsible stock returns because shipping is considered a proxy of global economic activity (Papapostolou et al., 2016). As this study incorporates socially responsible companies around the world, an advantage of BDI is that it can be used as an economic indicator on a global scale. Another significant advantage of BDI is that it is difficult to be manipulated by the government and speculators and only determined by clear force of supply and demand (Bildiricia et al., 2015). Furthermore, the BDI is composited by the average price of 23 different shipping routes daily around the world (Bildiricia et al., 2015). Grahama et al. (2016) revealed that the effect of BDI on equity markets in emerging and developed markets is controversial by employing data from 1997 to 2013. However, Baltyn (2016) could not find any significance of BDI on the US economy.

For many years, energy study economics have investigated the effect of oil prices on stock returns and they were found controversial (Cuando and de Garcia, 2014; Kang et al., 2015; Sariannidis et al., 2015; Li et al., 2017). For instance, Arouri and Nguyen (2010) showed that the reactions of European stock returns to oil price changes depends on the nature of the sector by employing a autoregressive conditional heteroskedasticity (GARCH) model. Moreover, Park and Ratti (2008) illustrated that oil price shocks have a significant effect on real stock returns in the same month or within 1 month by incorporating the US and 13 European countries for the period 1986-2005. In general, higher level of oil prices have a negative impact on stock returns either aggregate or sector indexes (Sadorsky, 1999; Nandha and Haff, 2008). Meanwhile, another strand of empirical studies found no significance relationship between oil prices and stock markets (Apergis and Miller, 2009; Sukcharoen et al., 2014). Crude oil is employed in the proposed model in relation to socially responsible stock market because oil is a pivotal factor of the production process and the oil price changes affect corporate cash flow and stock market performance (Miller and Ratti, 2009).

In addition, gold is used in this study because it is considered among the precious metals and used by investors to reduce portfolio risk (Ciner, 2001; Kiohos and Sariannidis, 2010). The relationship between gold prices and stock returns is valuable because investors can use this information so as to design the financial investment portfolios (Mansor, 2011). In addition, gold is an investment hedge against the US dollar and a safe haven during market crash in the US (Joy, 2011; Nguyen et al., 2016). Although a great number of empirical studies have found a significant effect of gold price on stock return, the sign is controversial (Raza et al., 2016; Baur and McDermott, 2010; Mansor, 2011; Hillier et al., 2006). Finally, trade balance of the US goods and services is incorporated in the study and it is used as a proxy of pioneer economy health. Antonakakis et al. (2015) illustrated that the relationship between stock prices and the trade balance evolve heterogeneously over time. The effect of trade balance on stock prices is owned to the fact that the increase trade balance produces inflation leading the monetary authority to increase the interest rate, which, in turn affects the stock prices negatively (Hogan et al., 1991; Aggarwal and Schirm, 1992, 1998; Mercereau, 2003).

This study intends to investigate the impact of BDI on socially responsible companies around the world. For the purpose of this study, DJSI world (DJSIW) is employed to identify the world's leading companies that integrate business initiatives consistent to sustainable development and corporate social responsibility concept. This study contributes to the existing literature by expanding the field portfolio optimization and risk management in relation to SRI.

Moreover, investors have the opportunity to compare the results with those of conventional stock return indexes in order to clarify the differences and similarities between the two types of stock indexes.

2. METHODOLOGICAL APPROACH AND DATA

The data employed in this study consist of monthly data for DJSIW, trade balance, crude oil and gold prices for the period October 1999-July 2016. As far as DJSIW is concerned, it measures the performance of the world's leading companies under preselected criteria under three main aspects economic, environmental and governance ones. DJSI uses the best in class approach so as to identify sustainable leaders. This approach means that only the most sustainable companies, in industries that meet certain minimum sustainability requirements, are selected for index membership[2]. RobecoSAM is responsible to identify socially responsible companies through its Corporate Sustainability Assessment which was first launched in 1999. The most crucial advantage of RobecoSAM is that it proposes both general and sector specific criteria under economic, environmental and social aspects. In most cases, the importance of general and sector specific criteria is equal to sustainable score. Another important aspect of this approach is that each company receives a sustainable score ranging from 0 to 100[3]. Finally, DJSIW represents the top 10% of the largest 2.500 companies in the

1 United Nations (2016) Review of Maritime Transport 2016, United Nations Publication. Available from: http://www.unctad.org/en/PublicationsLibrary/rmt2016_en.pdf. [Last accessed on 2017 Dec 07].

2 Dow Jones Sustainability Indices Methodology. Available from: http://www.spindices.com/documents/methodologies/methodology-dj-sustainability-indices.pdf?force_download=true&o=pdf. [Last accessed on 2017 Dec 09].

3 CSA Guide - RobecoSAM's Corporate Sustainability Assessment Methodology. Available from: http://www.sustainability-indices.com/images/corporate-sustainability-assessment-methodology-guidebook.pdf. [Last accessed on 2017 Dec 09].

S&P Global BMI based on long term under the aforementioned sustainable aspects[4].

Regarding the international trade balance of goods and services, it measures the difference between the movement of merchandise trade leaving a country (exports) and entering a country (imports). This measure tracks the value of the merchandise trade balance in the US. Gold price is quoted as US dollar per Troy Ounce. Both trade balance and gold prices were retrieved by Bloomberg on-line platform terminal. Crude oil prices concern OK WTI spot price FOB and data are retrieved by the U.S. Energy Information Administration[5].

Monthly continuously compounded returns for the DJSI, the consumer sentiment index, the exchange rate Euro/U.S. Dollar and the crude oil are calculated as $R_t = 100*\log (p_t/p_{t-1})$ where R_t and p_t are the monthly returns and prices respectively.

This study incorporates the ARCH model to investigate the effect of BDI, gold, oil and US trade balance on DJSIW. It is developed by Engle (1982), and extended by Bollerslev (1986) and Nelson (1991), allowing the fat tails and imposes an autoregressive structure on the conditional variance, thus, it is capable of capturing not only the volatility persistence of return series over time, but also the volatility clustering as well. The estimation of GARCH model involves the joint estimation of a mean and a conditional variance equation. The GARCH (1, 1) model is stated as follows:

The mean equation $Y_t = X_t'b + u_t$.

Where X_t is a vector of exogenous variables.

The conditional variance equation $\sigma_t^2 = c_0 + c_1 u_{t-1}^2 + c_2 \sigma_{t-1}^2$.

The conditional variance equation is a function of three terms:
c_0: A constant term.
$c_1 u_{t-1}^2$ (the ARCH term): News about volatility from the previous period, measured as the lag of the squared residual u_{t-1}^2 from the mean equation.
$c_2 \sigma_{t-1}^2$ (the GARCH term): Last period's forecast variance as a function of the past residuals u_{t-2}, u_{t-3}…,
c1+c2<1: It should be noted that this constrain allows the process to remain stationary, with the upper limit c1+c2 = 1 which represents an integrated process.

3. EMPIRICAL FINDINGS

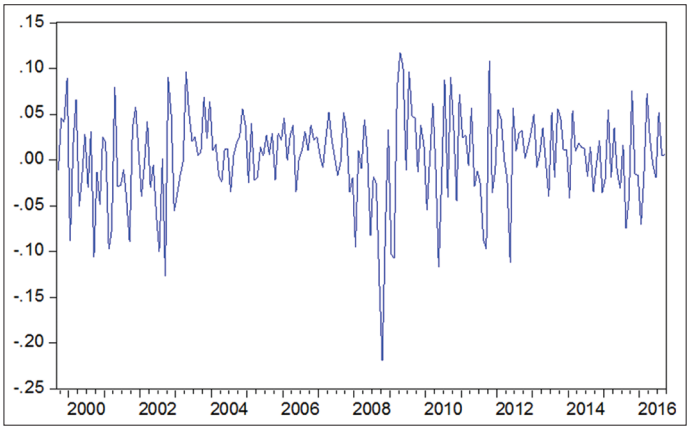
The preliminary statistical analysis of the data presented in Table 1 has aid our understanding of the nature and distributional characteristics for the following series: DJSIW returns, BDI (Baltic), crude oil returns (crude), gold (gold), US Trade Balance of Goods and Services (Trade B). The mean returns of the above series are close to zero and according to the value of the t test, with the exception the gold variable, we cannot reject the null hypothesis that the mean returns are not statistically different from zero. Also, most of the examined series present some characteristics that are known as stylized fact (Cont, 2001). Specifically, the distributions of the DJSIW, Baltic, crude and gold series returns are negatively skewed indicating that the extreme negative returns are more frequent than the extreme positive returns. Moreover, all the series are leptokurtic with fat tails (Kurtosis >3), which means that in the context of a model the normal distribution will underestimate the number and magnitude of crashes and booms. The above characteristics indicate that their distribution returns are non-normal, a fact that is also confirmed by the statistic test of Jarque Bera. Moreover, the augmented Dickey - Fuller (ADF) test, allowing for both an intercept and a time trend, showed that the sample series had been produced by stationary series.

Regarding the distribution of the dependent variable, the DJSIW index (Figure 1), the Ljung-Box statistics applied on returns and squared returns (Table 2) provide evidence of autocorrelation on monthly returns and present strong evidence of autocorrelations in the squared monthly returns, indicating conditional heteroskedasticity (Bollerslev, 1987).

Stock returns series tend to exhibit leptokurtosis, non-linearity, volatility clustering and leverage effect (Fama, 1963, 1965; Akgiray, 1989; Bollerslev et al., 1992). Jacobsen and Dannenburg (2003) used stock market data from various developed countries and showed that this characteristic is not only present in high frequency data, but also in time series of lower frequencies such as monthly data. Among these properties, the phenomenon of volatility clustering has intrigued many researchers and oriented in a major way the development of stochastic models in finance - GARCH models and stochastic volatility models are intended primarily to model this phenomenon. GARCH models introduced by Engle (1982) and extended by Bollerslev (1986) take into account much of the distributional form of the stock returns.

As far as the methodological consideration of the literature review concerns and the preliminary results cited above, the GARCH model renders a very good choice for modeling the DJSIW

Figure 1: Dow jones sustainability index world series return



4 Dow Jones Sustainability™ World Index. Available from: http://www.djindexes.com/mdsidx/downloads/fact_info/Dow_Jones_Sustainability_World_Index_Fact_Sheet.pdf. [Last accessed on 2017 Dec 09].

5 Independent Statistics & Analysis - U.S. Energy Information Administration. Available from: https://www.eia.gov/dnav/pet/pet_pri_spt_s1_m.htm. [Last accessed on 2017 Dec 09].

Table 1: Sample statistics

Statistical measures	DJSIW	Baltic	Crude	Gold	Trade_B
Mean	0.0025	−0.0008	0.0037	0.008	−0.0655
Median	0.0077	0.0140	0.0143	0.0066	−0.325
Maximum	0.1177	0.6711	0.2139	0.1557	15.467
Minimum	−0.2187	−1.3298	−0.332	−0.185	−11.921
SD	0.0500	0.2342	0.0891	0.0504	3.39
Skewness	−0.7349	−1.2537	−0.84	−0.12	0.5951
t-statistic for the hypothesis test: Mean = 0	0.7074	−0.0509	−0.0509	2.271	−0.2765
Kurtosis	4.5744	9.1465	4.4464	3.6809	5.1921
Jarque-Bera	39.6224	376.4	41.979	4.4524	53.144
Observations	205	205	205	205	205
ADF	−12.51	−12.07	−10.61	−16.40	−7.50

DJSIW: Dow jones sustainability index world

Table 2: Test for serial dependence in first and second moments of DJSIW variable

Returns				Squared returns			
Lags	Autocorrelation	Partial correlation	LB (n)	Lags	Autocorrelation	Partial correlation	LB (n)
1	0.126	0.126	3.3049	1	0.274	0.274	15.571
2	−0.033	−0.05	3.5348	2	0.096	0.022	17.482
3	0.129	0.142	7.0356	3	0.137	0.114	21.43
4	0.098	0.062	9.0476	4	0.192	0.137	29.185
5	0.041	0.035	9.4028	5	0.072	−0.022	30.288
6	−0.032	−0.052	9.6164	6	0.146	0.124	34.842
12	0.02	0.069	14.585	12	−0.001	0.01	43.33
24	0.043	0.031	24.463	24	0.009	−0.013	48.543
36	−0.032	0.013	34.599	36	0.061	0.028	53.219

LB(n) are the n-lag Ljung-Box statistics for DJSIW and $DJSIW_t^2$ respectively. LB(n) follows Chi-square distribution with n degree of freedom; the sample period contains 205 monthly returns, DJSIW: Dow jones sustainability index world

index return volatility. The Akaike information criterion and the Schwartz Bayesian criterion suggested the following specification:

Mean equation:

$$DJSIW_t = b_1+b_2Baltic_t+b_3Crude_t+b_4Gold_t+b_5Trade\_B_t+u_t$$

Variance equation:

$$\sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \alpha_2 \sigma_{t-1}^2$$

Where $u_t \sim GED(0, \sigma_t^2)$, i.e., residuals which we assume to follow the GED (generalized error distribution). We employ the GED because of its ability to accommodate the fatter tails of the empirical distributions.

Some diagnostic tests were performed to establish goodness of fit and appropriateness of the model. First, it was examined whether the standardized residuals and squared standardized residuals of the estimated model are free from serial correlation. As we can see from Table 3, the LB(n) statistics for standardized residuals are not statistically significant and the LB(n) statistics for standardized squared residuals show no ARCH remaining structure. Furthermore, the coefficient estimation v = 1.65 for tail thickness regulator with 0.273 standard error, confirms the adoption of the GED assumption, as the distribution of the residuals is leptokurtic with fat tails (GED is leptokurtic when $1< v <2$). Specifically, the assumption of normal distribution is rejected, a fact that verifies the theory for thick tails in the stock returns. An LR test of the restriction v = 2 (for v = 2 GED distribution is essentially the normal distribution) against the unrestricted models clearly supports this conclusion.

In Table 4 the results for the mean equation are presented. The coefficient of BDI is statistically significant in 10% level (P = 0.086) suggesting the important role of real economy at the formation of the mean return of the DJSI variable. Moreover, the statistical significance of the oil coefficient indicates that the increase of energy prices, crude oil, exert positive effect on the stock market. Additionally, the statistically significance and the sign of the gold coefficient imply that even though the gold has been used as a safe haven of market uncertainty or stress, investors seem to invest to stock market as they can reduce whichever losses from stocks equities. In recent years, in the context of modern portfolio management, investors and fund managers feel safe when they hold gold. This leads investors to invest in stock market as gold can be used as investment hedge affecting positively the stock prices. Finally, the positive surplus (trade balance) of the USA by positively affecting the global society has a positive impact on the stock purchase.

In Table 5 the results for the variance equation are presented. The value of the a_1 coefficient (0.183), which reflects the influence of the previous month shock, is statistically significant at 5% level. The value of the a_2 coefficient (0.794), which reflects the series of older shocks (information) is statistically significant at 1% level implying that news causing shocks are slowly assimilated or decaying to the particular market (Figure 2). The rate of variance decay is generally defined by the coefficients $\alpha_1+\alpha_2 = 0.183+0.794 = 0.977$ and is quite large, because the closer

Table 3: Diagnostics on standardized and squared standardized residuals

Residuals				Squared residuals			
Lags	Autocorrelation	Partial correlation	LB (n)	Lags	Autocorrelation	Partial correlation	LB (n)
1	0.071	0.071	1.0478	1	−0.003	−0.003	0.0014
2	−0.053	−0.059	1.6411	2	0.037	0.037	0.2866
3	0.07	0.079	2.6625	3	0.008	0.008	0.2985
4	0.039	0.025	2.9875	4	0.001	−0.001	0.2986
5	0.115	0.12	5.7923	5	0.094	0.093	2.1599
6	0.014	−0.006	5.8317	6	−0.082	−0.082	3.5852
12	0.066	0.082	8.0902	12	−0.065	−0.067	8.7323
24	0.072	0.042	20.68	24	0.081	0.046	17.169
36	−0.018	0.032	31.633	36	−0.056	−0.008	24.72

LB(n) are the n-lag Ljung-Box statistics for the residual series. LB(n) follows the Chi-square variable with n degrees of freedom; the series of residuals contains 205 elements

Table 4: Mean equation

$DJSI_t=b_1+b_2Baltic_t+b_3Crude_t+b_4Gold_t+b_5Trade\_B_t+u_t$				
b_1	b_2	b_3	b_4	b_5
0.006816**	0.021427***	0.079208**	0.131896**	0.001733**
(0.002849)	(0.01251)	(0.033531)	(0.052683)	(0.000892)

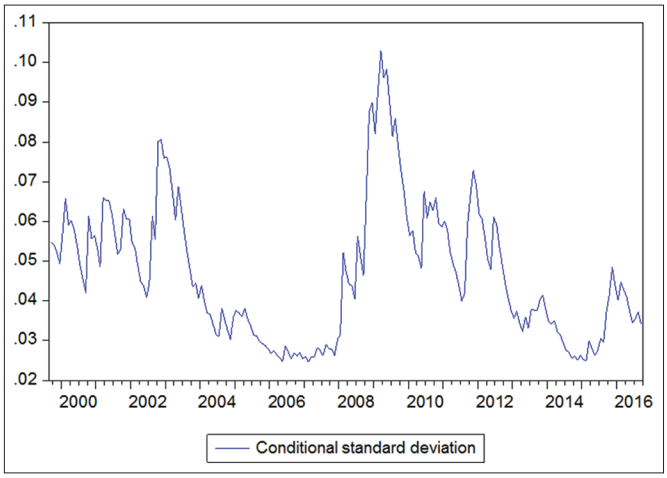
Standard errors are shown in parentheses. *Indicates statistical significance at the 1% level. **Indicates statistical significance at the 5% level. ***Indicates statistical significance at the 10% level

Table 5: Variance equation

$\sigma_t^2=\alpha_0+\alpha_1u^2_{t-1}+\alpha_2\sigma^2_{t-1}$		
a_0	a_1	a_2
6.92E-05	0.183026**	0.793938*
(6.32E-05)	(0.078839)	(0.064823)

Standard errors are shown in parentheses. *Indicates statistical significance at the 1% level. **Indicates statistical significance at the 5% level

Figure 2: Dow jones sustainability index world volatility



of $\alpha_1+\alpha_2$ to 1, the slower the decay of the variance autocorrelation. The summation constrain $\alpha_1+\alpha_2=0.909<1$ allows for the existence of a stationary solution.

4. CONCLUSION

The scope of this study is to investigate the effect of BDI on stock returns. During the last decades, investors and other organization bodies have increased their interest in identifying companies that operate in socially responsible manner consistent with the concept of sustainable development. The increased tension for SRI has triggered the interest of authors to employ a socially responsible stock index in the proposed model. Thus, the innovation of this study stands on the fact that it employs the companies that incorporate economic, environmental and social initiatives consistent to the concept of corporate social responsibility and sustainable development.

For the purpose of the study, data form DJSIW is retrieved as it is considered among the most reliable and well-known socially responsible stock index in order to identify socially responsible companies around the world. A GARCH model is used in order to examine whether or not the BDI affects the DJSIW for the period October 1999-July 2016 using monthly data. Obtained results illustrated that BDI affects positively the DJSIW implying that higher levels of maritime shipping cost affects positively the stock returns.

Investors tend to buy gold for two main reasons: As safe haven whenever the real economy seems fragile and as hedge to financial uncertainty. Thus, this twofold use of gold commodity can lead investors who buy gold to start investing in stock market leading to higher level of stock prices as they can minimize whichever losses from stock equities. The increased value of crude oil can be a signal to investors that economy has started expanding leading them to invest in stock prices. Thus, investors are able to enhance their management risk and portfolio strategy. Future studies could employ regional socially responsible indexes such as DJSI Europe or US to clarify the relationship between BDI and socially responsible stock returns. Finally, alternative maritime cost index could be employed, such as Baltic Handysize Index in order to confirm the above relationship.

REFERENCES

Aggarwal, R., Schirm, D.C. (1992), Balance of trade announcements and asset prices: Influence on equity prices, exchange rates, and interest rates. Journal of International Money and Finance, 11(1), 80-95.

Aggarwal, R., Schirm, D.C. (1998), Asymmetric impact of trade balance news on asset prices. Journal of International Financial Markets, Institutions and Money, 8(1), 83-100.

Akgiray, V. (1989), Conditional heteroskedasticity in time series of stock returns: Evidence and forecasts. Journal of Business, 62, 55-80.

Apergis, N., Miller, S. (2009), Do structural oil-market shocks affect stock prices? Energy Economics, 31(4), 569-575.

Arouri, M.E.H., Nguyen, D.K. (2010), Oil prices, stock markets and portfolio investment: Evidence from sector analysis in Europe over

the last decade. Energy Policy, 38(8), 4528-4539.
Baltyn, P. (2016), Baltic dry Index as Economic Leading Indicator in the United States. Management Knowledge and Learning, Joint International Conference 2016, Technology, Innovation and Industrial Management. p205-2011.
Baur, D.G., McDermott, T.K. (2010), Is gold a safe haven? International evidence. Journal of Banking and Finance, 34(8), 1886-1898.
Bildiricia, M.E., Kayıkçıb, F., Onat, I.Ş. (2015), Baltic dry index as a major economic policy indicator: The relationship with economic growth. 4th International Conference on Leadership, Technology, Innovation and Business Management, Procedia - Social and Behavioral Sciences, 210, 416-424.
Bollerslev, T., Chou, R.Y., Kroner, K.F. (1992), ARCH modeling in finance: A review of the theory and empirical evidence. Journal of Econometrics, 52, 5-59.
Bollerslev, T. (1986), Generalized autoregressive conditional heteroscedasticity. Journal of Econometrics, 31, 307-327.
Bollerslev, T. (1987), A conditional heteroscedastic time series model for speculative prices and rate of return. Review of Economics and Statistics, 9, 542-547.
Ciner, C. (2001), On the long run relationship between gold and silver prices a note. Global Finance Journal, 12, 299-303.
Cont, R. (2001), Empirical properties of asset returns: Stylized facts and statistical issues. Quantitative Finance, 1(2), 223-236.
Cuando, J., de Garcia, F.P. (2014), Oil price shocks and stock market returns: Evidence for some European countries. Energy Economics, 42, 365-377.
Engle, R.F. (1982), Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflation. Econometrica, 50, 987-1007.
Fama, E. (1963), Mandelbrot and the stable partisan distribution. Journal of Business, 36, 420-429.
Fama, E. (1965), The behavior of stock market prices. Journal of Business, 38, 34-105.
Global Sustainable Investment Alliance. (2014), Global Sustainable Investments 2012-2014. 2014 Global Sustainable Investment Review. Available from: http://www.ussif.org/Files/Publications/GSIA_Review.pdf. [Last accessed on 2017 Dec 06].
Grahama, M., Peltomäkia, J., Piljak, V. (2016), Global economic activity as an explicator of emerging market equity returns. Research in International Business and Finance, 36, 424-435.
Hillier, D., Draper, P., Faff, R. (2006), Do precious metals shine? An investment perspective. Financial Analysts Journal, 62, 98-106.
Hogan, K., Melvin, M., Roberts, D.J. (1991), Trade balance news and exchange rates: Is there a policy signal? Journal of International Money and Finance, 10 1 Supple, S90-S99.
Jacobsen, B., Dannenburg, D. (2003), Volatility clustering in monthly stock returns. Journal of Empirical Finance, 10(4), 479-503.
Joy, M. (2011), Gold and the US dollar: Hedge or haven? Finance Research Letters, 8, 120-131.
Kang, W., Ratti, R.A., Yoon, K.H. (2015), The impact of oil price shocks on the stock market return and volatility relationship. Journal of International Financial Markets, Institutions and Money, 34, 41-54.
Kiohos, A., Sariannidis, N. (2010), Determinants of the asymmetric gold market. Investment Management and Financial Innovations, 7(4), 26-33.
Lean, H.H., Ang, W.R., Smyth, R. (2015), Performance and performance persistence of socially responsible investment funds in Europe and North America. North American Journal of Economics and Finance, 34, 254-266.
Li, Q., Cheng, K., Yang, X. (2017), Response pattern of stock returns to international oil price shocks: From the perspective of China's oil industrial chain. Applied Energy, 185, 1821-1831.
Lina, F., Sim, N.C.S. (2013), Trade, income and the Baltic dry index. European Economic Review, 59, 1-18.
Maio, P., Philip, D. (2015), Macro variables and the components of stock returns. Journal of Empirical Finance, 33, 287-308.
Mansor, I.H. (2011), Financial market risk and gold investment in an emerging market: The case of Malaysia. Romanian Journal of Economic Forecasting, 14, 79-89.
Mercereau, B. (2003), The role of stock markets in current account dynamics: A time series approach. The B.E. Journal of Macroeconomics, 3(1), 1-30.
Miller, J.I., Ratti, R.A. (2009), Crude oil and stock markets: Stability, instability, and bubbles. Energy Economics, 31(4), 559-568.
Nandha, M., Haff, R. (2008), Does oil move equity prices? A global view. Energy Economics, 30(3), 986-997.
Nelson, D.B. (1991), Conditional heteroskedasticity in asset returns: A new approach. Econometrica, 59(2), 347-370.
Nguyen, C., Bhatti, M.I., Komorníková, M., Komorník, J. (2016), Gold price and stock markets nexus under mixed-copulas. Economic Modelling, 58, 283-292.
Papapostolou, N.C., Pouliasis, P.K., Nomikos, N.K., Kyriakou, I. (2016), Shipping investor sentiment and international stock return predictability. Transportation Research Part E: Logistics and Transportation Review, 96, 81-94.
Park, J., Ratti, R.A. (2008), Oil price shocks and stock markets in the U.S. and 13 European countries. Energy Economics, 30, 2587-2608.
Raza, N., Shahzad, S.J.H., Tiwari, A.K., Shahbaz, M. (2016), Asymmetric impact of gold, oil prices and their volatilities on stock prices of emerging markets. Resources Policy, 49, 290-301.
Sadorsky, P. (1999), Oil price shocks and stock market activity. Energy Economics, 21(5), 449-469.
Sadorsky, P. (2014), Modeling volatility and correlations between emerging market stock prices and the prices of copper, oil and wheat. Energy Economics, 43, 72-81.
Samitas, A., Kenourgios, D. (2007), Macroeconomic factors' influence on 'New' European countries' stock returns: The case of four transition economies. International Journal of Financial Services Management, 2(1-2), 34-49.
Sariannidis, N., Galyfianakis, G., Drimbetas, E. (2015), The effect of financial and macroeconomic factors on the oil market. International Journal of Energy Economics and Policy, 5(4), 1084-1091.
Smith, A. (1776), An Inquiry into the Nature and Causes of the Wealth of Nations. London: W. Strahan and T. Cadell.
Sukcharoen, K., Zohrabyan, T., Leathman, D., Wu, X. (2014), Interdependence of oil prices and stock market indices: A copula approach. Energy Economics, 44, 331-339.