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The Effect of Crude Oil Price Moments on Socially Responsible Firms in Eurozone

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ABSTRACT

The present study examines the effect of moments of crude oil prices including the variance, skewness and kurtosis, on the returns of the Dow Jones Sustainability Index (DJSI) of the Eurozone. The GARCH model is employed to examine the relationship of these moments with the DJSI of the Eurozone, for the time period from November 2001 until March 2015. According to our findings, an increase in the oil returns, as well as in the oil price volatility, leads to a decrease in the value of the Index employed. It was also found that asymmetry affects positively the stock price of the Eurozone social responsibility companies, because the more the asymmetry increases, the less the concentration of the prices to the right side of the distribution, consequently the more the investors feel that the related risk is reduced, as the frequency of oil prices is below the average oil price. On the contrary, it was found that the interaction of asymmetry and kurtosis of oil prices affect negatively the DJSI of the Eurozone, a fact that is attributed to the kind of the oil price distribution for the above mentioned time period.

Keywords: Volatility, Stock Exchange Market, GARCH Model, Eurozone Dow Jones Sustainability Index
JEL Classifications: C58, Q40, Q50, M21

1. INTRODUCTION

Oil is the most crucial input in the production process contributing significantly to the economic growth of an economy (Rafiq et al., 2009; Pradhan et al., 2015). Oil prices influences the aggregate price levels (Bloch et al., 2006; Tsai, 2015), production activity and corporate earnings by affecting the marginal production cost and household demand for companies' output (Hamilton, 2008). The importance of oil prices is a stylized fact, documented empirically, since nine out of 10 U.S. recession periods, after World War II, were related to an increase in oil prices, with one exception recorded in the year 1960 (Hamilton, 2003).

Based on the above, the impact of oil prices on stock returns has become a familiar topic in the literature (i.e., Al-Mudhaf and Goodwin, 1993; Sadorsky, 1999; Ciner, 2001; Odusami, 2007; Lee et al., 2012). The impact of oil prices on stock returns has been a subject of extended survey in different geographical entities and regions including Europe (Cunado and Perez de Gracia, 2014; Degiannakis et al., 2013; Scholtens and Yurtsever, 2012), US (Elyasiani et al., 2011; Narayan and Gupta, 2015), South Africa (Gupta and Modise, 2013) and China (Caporale et al., 2015; Zhua et al., 2015). In addition, two strands of literature can be identified regarding the impact of oil prices on stock returns; the first one focuses on stock returns of industry sectors (i.e., Arouri, 2011; Scholtens and Yurtsever, 2012; Xu, 2015), whilst the second on aggregate-national stock indices (i.e., Chang et al., 2013; Choi and Hammoudeh, 2010).

The aim of this study is to investigate the role of oil prices on stock returns, taking into account a European aggregate stock index that incorporates socially responsible firms. Socially Responsible Investments (SRI) within the last two decades is one of the fastest growing areas of investment (Sadorsky, 2014; Ortas et al., 2013). Unlikely to conventional investments, SRI refers to an investment process that incorporates social, environmental and governance considerations, along with financial ones, in

pursuit of enhanced long-term returns and lower investment risk (Sparkes, 2002; Eurosif, 2014; Bilbao-Terol et al., 2016). Eurosif (2014) distinguishes seven SRI approaches, and record growth for all approaches ranging from 22.6% to 131.6%, for the period 2011-2013, including 13 European countries. Finally, a number of SRI indices, such as Dow Jones Sustainability Index (DJSI), FTSE4Good and KLD index, have been developed to assist investors to incorporate non-financial criteria, in their decisions, leading to a rise in SRI. The present study does not take into consideration only the effect of the oil prices on stock returns, but also the influence of the other moments including the variance, skewness and kurtosis of oil prices.

The data employed in our study refer to Eurozone economies that comprise an economic entity, with common currency, though it suffers from financial fragility since 2011 (Ciccarelli et al, 2013). We employ the Dow Jones Sustainability Eurozone Index (DJSI Eurozone) in order to capture the performance of firms based on economic, social, and environmental criteria, as a proxy of socially responsible companies. The econometric framework used in our study, involves a GARCH model by incorporating two control variables; the consumer sentiment index and the exchange rate of Euro/U.S. Dollar, during the period from November 2001 to March 2015. In our study, an effort is made, for the first time, to address how socially responsible stock indices respond to oil price moments, refining investment theories and making the investors' decision more effective. In particular, it points out how SRI investors' behavior is formulated by oil price moments in stock returns.

This paper is structured as follows; Section 2 presents the existing literature about the impact of oil prices on stock returns, followed by a description of the Data employed and the preliminary results derived in Section 3. Section 4 provides the empirical framework and estimation results, while in the last section conclusions are presented.

2. LITERATURE REVIEW

A large literature body devoted to the investigation of the impact of oil price on sectoral and aggregate (national) stock returns (i.e., Huang et al., 1996; Sadorsky, 1999, 2008; Ciner, 2001; Park and Ratti, 2008; Elyasiani et al. 2011). This section is divided in two sub-sections: the first one presents empirical results regarding the effects of oil prices returns and volatility on stock returns, while the second one focuses on the asymmetric effect of oil prices on stock returns.

2.1. Oil Prices Effects on Stock Returns

For many years, the studies in the impact of oil price returns on stock returns were controversial. On the one hand, many authors such as Kling (1985), Jones and Kaul (1996), Sadorsky (1999), Papapetrou (2001), Shimon and Raphael (2006), Nandha and Faff (2008), Driesprong et al. (2008), Miller and Ratti (2009), Kilian (2009), Malik and Ewing (2009), Oberndorfer (2009), Filis et al. (2011), Cunado and Perez de Gracia (2014), Sim and Zhou (2015) suggested that oil price returns exert a negative effect on stock returns. They have attributed to this effect in various factors, regarding either the demand or supply side of oil, pointing out the crucial role of oil price movements in real economic activity. In particular, using vector autoregression and monthly data for the period 1947-1996, Sadorsky (1999) illustrated that both oil price returns and oil price volatility had a negative impact on the US stock returns. Shimon and Raphael (2006) claimed that the oil price return and volatility could influence the macroeconomic growth as well as the financial assets return. Both in developed and emerging countries, Driesprong et al. (2008) showed that oil returns can significantly affect the future stock returns negatively. Moreover, there is a month lag reaction of oil price changes in stock returns, because investors underestimate the importance of oil changes in the economy. Park and Ratti (2008) compared the effects of oil price volatility on stock returns, between the US and 13 European economies, using monthly data, for the period 1986-2005, employing a multivariate VAR analysis. The results showed that increase in the volatility of oil prices decrease stock returns contemporaneously or with one month lag. Kilian (2009) found that oil price shocks, created by precautionary or speculative demand for crude oil, may have a negative effect on the U.S. stock returns. Oberndorfer (2009) found that oil price volatility affects the Eurozone oil and gas stock corporations negatively, implying that a short position in energy corporations, in times of high oil volatility expectations, is profitable. Filis et al. (2011) stated that oil price shocks could affect stock markets because of the uncertainty it creates, depending on the feature of the shock, demand or supply side. Cunado and Perez de Gracia (2014) showed that oil price changes have a negative impact on the majority of the European stock market returns, confirming that oil importing economies are affected by oil prices. Sim and Zhou (2015) focused on the US market and used monthly data, from 1973 to 2007, in order to investigate the impact of oil returns on the US stock equities returns. The results showed that negative oil price shocks affect US equities positively, when the US market is performing well.

On the other hand, other empirical studies have found no evidence of a negative relationship between of oil returns and stock returns (Chen et al., 1986; Huang et al., 1996; Wei, 2003; Arouri and Nguyen, 2010; Caporale et al., 2015). In particular, Wei (2003) claimed that the oil price shock of 1973-74 had no influence on stock returns. Arouri and Nguyen (2010) investigated the impact of oil price changes and stock markets, by incorporating Dow Jones (DJ) Stoxx 600 and twelve European sector indexes, for the period 2008-2009. Based on a two-factor GARCH model, the results validated strong significant linkages between oil price changes and stock markets. However, the magnitude and the direction of the particular effect depend on the nature of the sectors. Caporale et al. (2015) employed bivariate VAR-GARCH-in-mean models for the period 1997-2014, for the Chinese stock market; found that oil price volatility, during periods characterized by demand-side shocks, affects sectoral stock returns differently.

2.2. Asymmetric Effects of Oil Prices on Stock Returns

Another branch of studies focuses on the asymmetric effects of oil prices on stock market returns. Park and Ratti (2008) demonstrate that oil price shocks do not have asymmetric effects on stock returns in the European oil importing countries, while some evidence of asymmetric effects on stock returns was found

for oil importing and exporting countries such as the U.S. and Norway. By using a feasible generalized least squares model for the period 1990-2006, Sadorsky (2008) illustrated that oil prices have an asymmetric effect on stock prices. In particular, oil price increases present a greater effect on stock returns than decreases do in oil prices. Arouri (2011) investigated the relationship between oil prices and sector stock returns in Europe for the period 1998-2010. Oil price increases and decreases were adopted as two different variables, as they may have different effects on stock returns. The results confirmed that changes in the price of oil have a strong asymmetry effect on sector stock returns. Mohanty et al. (2011) focused on the period 2005-2009, taking into account Gulf Cooperation Council countries, suggested that oil price changes have asymmetric effects on stock market returns both at country and industrial level. Lee and Chiou (2011) focused on the US stock market for the period 1992-2008 confirming the negative relationship between oil prices and stock returns. In addition, the results suggested that changes both in oil price dynamics and oil price volatility shocks may have asymmetric effects on stock returns Narayan and Sharma (2011) in their study based on 560 US firms, listed in the NYSE, divided into 14 sectors, revealed that there is an asymmetric effect on stock returns for food, banking, financial, chemical, manufacturing, and real estate sector. Tsai (2015) based on firm-level data for the period 1990-2012 found that positive and negative oil price shocks have asymmetric effects on US stock returns, both during and after the crisis of 2008. Based on NYSE, NASDAQ and S&P 500 US companies, Phan et al. (2015), suggest that the oil price returns affect asymmetrically the stock returns. It was found that firm size is a crucial factor for the lagged and asymmetric effects of crude oil on stock returns.

To sum up, some remarks could be made, regarding the selective literature review. There are few studies that emphasize the effect of oil prices moments, including asymmetry and kurtosis, on the stock market returns. Also, in regard to asymmetry, although there are some studies that researched the asymmetric effect of oil price changes on stock market, they do not focus on how the asymmetric distribution of oil price influences the stock market.

In our study we assessed the main moments of oil prices and examined their effect on the stock market, a fact that stands as an innovation in our study. Also, we have put emphasis on the aggregate European Socially Responsible Stock Market in contrast to most of the empirical studies, which refer mainly to the conventional stock markets.

3. DATA AND PRELIMINARY RESULTS

Our data set consists of monthly data from the DJSI Eurozone, the consumer sentiment index, the exchange rate Euro/U.S. Dollar and the crude oil prices. We have also used the daily oil prices in order to calculate the monthly variables of variance, skewness and kurtosis for the oil prices. These data have been obtained from the Thomson Reuters DataStream database and the European Commission for the period between January 1996 and July 2015.

The DJSI is considered the first global sustainability benchmark. By incorporating objective benchmarks, investors can be informed in order to manage their sustainability investment portfolios. Apart from the global version of DJSI, there are regional ones for North America, Europe, Asia-Pacific, Korea, Australia and Emerging Markets. The assessment methodology consists of an in-depth analysis featuring approximately 80-120 questions on financially in relation to economic, environmental and social factors that could affect companies' financial success formulating the total sustainable score. The total maximum score is 100 points by adding the weighted sum of question scores.

The DJSI is selected because it incorporates in its methodology both general and sector based criteria in order to assess the sustainability performance in accordance to environmental, social and governance criteria. In addition, a firm's information is under a verification process by crosschecking companies' answers with the supporting documentation that company provide, checking publicly available information and by verifying a company's track record on crisis management with media and stakeholder reports. Furthermore, DJSI does not follow an equal importance of assessment questions as the majority of the methodologies that develop CSR index do (Robeco, 2015; S&P Dow Jones Indices, 2015).

As far as the control variables are concerned, a series of empirical studies pointed out the importance of sentiment on judgment (Danbolt et al., 2015). Regarding consumer sentiment, it is considered as indicator of the degree to which consumers are optimistic or pessimistic for the near-term future prospects. In particular, sentiment referred to consumer attitudes on the business climate, personal finance, and spending. Therefore, the perception of consumers for the future economic condition is able to change the consumers' purchase behavior (Akhtar et al., 2012). In case of negative sentiment, investors and fund managers respond by selling stocks because they believe that the market will fall in the near future (Akhtar et al. 2012). Thus, a consumer sentiment index is incorporated in the study in order to capture the impact of consumer sentiment announcement on the stock price movements. Therefore, it is pre - determined whether consumer sentiment announcements affect investors' reaction to investment decisions. For the purpose of the study, the University of Michigan US consumer sentiment index (CSI) can be used as a good proxy for investor sentiment (Akhtar et al. 2011).

Another variable employed is the exchange rate of Euro/U.S. Dollar, given an extensive former survey of the relationship between exchange rate and stock returns (i.e., Du, 2014; Chkili and Nguyen, 2014; Kasman et al., 2011). It is considered that exchange rates can affect the value of companies and it is a major source of uncertainty for multinational ones (Jorion, 1991). In case of investing internationally, investors must not avoid the exchange rate risk because it can affect or can improve the value of their investment significantly (Tudor and Popescu-Dutaa, 2012). As United States still remains the most important trading partners of European Union (Eurostat Newsrelease, 2015), thus, the exchange rate of Euro/U.S. Dollar returns is used as a proxy of exchange rate risk.

Monthly continuously compounded returns for the DJSI Eurozone, the consumer sentiment index, the exchange rate Euro/U.S. Dollar and the crude oil prices 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.

The preliminary statistical analysis of the data presented in Table 1 has aided our understanding of the nature and distributional characteristics for the following series: The DJSI Eurozone, the CSI returns, the exchange rate Euro/U.S. Dollar returns (E/D), the crude oil returns (Oil), the variance of oil prices (Voil), the skewness of oil prices (Soil) and the kurtosis of oil prices (Koil). The sample mean returns of these series, with the exception of skewness and kurtosis series (Soil and Koil), are close to zero and we cannot reject the null hypothesis that the mean returns are not statistically different from zero. The returns distributions of the DJSI, ICS, E/D and Oil variables have negative skewness, while the respective ones of the oil price moments (Voil, Soil and Koil) have positive skewness. Also, the returns distribution of the ICS and E/D variables are slightly leptokurtic, while the distributions of the DJSI, Oil and Soil variables present even higher leptokurtosis, but the distribution of Voil and Koil variables exhibit particularly high leptokurtosis. 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.

The Ljung-Box statistics applied on returns (denoted by LB (n)) and squared returns (denoted by LB^2(n)) indicate time dependence only for the second moments, a fact that indicates the adoption of GARCH models (Table 2).

4. EMPIRICAL FRAMEWORK AND ESTIMATION RESULTS

Stock returns series tend to exhibit leptokurtosis, non-linearity, volatility clustering and leverage effect (Fama 1963, 1965, Akgiray, 1989, Larrain 1991, Bollerslev et al., 1992). Jacobsen and Dannenburg (2003) collected stock market data across various countries and proved that this characteristics does not exist only in high frequency data, but also in lower frequencies series such as monthly data. Among these properties, the volatility clustering has triggered many researchers to develop stochastic models in finance such as GARCH models. GARCH models introduced by Engle (1982) and extended by Bollerslev (1986) take into account much of distributional form of the stock returns.

Taking into account the methodological consideration of the literature review and the preliminary results cited above, the GARCH model is a very good choice for modeling the DJSI return volatility (Odusami, 2007; Cochrana and Mansur, 2015). The Akaike Information Criterion and the Schwartz Bayesian Criterion have indicated the use of the following specification:

Mean equation

$$DJSI_t = b_1 + b_2ICS_t + b_3E/D_t + b_4Oil_t + b_5Voil_t + b_6Soil_t + b_7Soil_t * Koil_t + u_t \quad (4.1)$$

Variance equation

$$\sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \alpha_1 \sigma_{t-1}^2 \quad (4.2)$$

Table 1: Preliminary statistical results

Statistics	DJSI	ICS	E/D	Oil	VOil	SOil	KOil
Observations	161	161	161	161	161	161	161
Mean	0.0033	0.0007	0.0011	0.0047	0.00059	–0.0451	0.5287
Median	0.0124	0.0000	0.0021	0.0092	0.00036	–0.0331	0.0351
Maximum	0.1532	0.1276	0.0619	0.2734	0.00566	2.6469	9.4522
Minimum	–0.2389	–0.1992	–0.0780	–0.4295	0.00005	–2.2977	–1.3116
Standard deviation	0.0570	0.0571	0.0244	0.0974	0.00076	0.7009	1.7453
Skewness	–0.9407	–0.3803	–0.1977	–0.7486	3.7549	0.1039	2.4353
Kurtosis	5.4647	3.5565	3.4527	4.9906	19.6773	4.4710	10.4526
Jarque–Bera	64.4965	5.9594	2.4233	41.6179	2244.1	14.806	531.73
ADF	–11.42	–10.99	–9.28	–10.69	–4.33	–13.93	–11.72

ADF: Augmented Dickey–Fuller

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

Returns				Squared returns			
Lags	Autocorrelation	Partial correlation	LB (n)	Lags	Autocorrelation	Partial correlation	LB (n)
1	0.102	0.102	1.7074	1	0.131	0.131	2.7957
2	–0.006	–0.016	1.7131	2	0.258	0.245	13.766
3	0.097	0.1	3.2788	3	0.231	0.187	22.599
4	0.074	0.055	4.2052	4	0.107	0.014	24.52
5	0.036	0.027	4.4244	5	0.087	–0.023	25.781
6	–0.022	–0.036	4.5041	6	0.109	0.039	27.783
12	0.038	0.039	13.204	12	–0.005	–0.068	34.16
24	–0.075	–0.1	20.45	24	–0.056	–0.024	41.475
36	–0.138	–0.111	30.825	36	–0.03	–0.031	45.059

LB (n) are the n-lag Ljung-Box statistics for DJSI $Eurozone_t$ and DJSI $Eurozone_t^2$ respectively. LB (n) follows Chi-square distribution with n degree of freedom; the sample period contains 161 monthly returns

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	0.086	0.086	1.2191	1	0.086	0.086	1.2191
2	–0.052	–0.06	1.6594	2	–0.052	–0.06	1.6594
3	–0.006	0.004	1.6657	3	–0.006	0.004	1.6657
4	0.07	0.068	2.4869	4	0.07	0.068	2.4869
5	0.012	–0.001	2.5092	5	0.012	–0.001	2.5092
6	–0.009	–0.003	2.5239	6	–0.009	–0.003	2.5239
12	–0.064	–0.09	6.6095	12	–0.064	–0.09	6.6095
24	–0.006	–0.035	16.823	24	–0.006	–0.035	16.823
36	–0.119	–0.048	29.272	36	–0.119	–0.048	29.272

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 161 elements

Table 4: Mean equation

$DJSI_t=b_1+b_2ICS_t+b_3E/D_t+b_4Oil_t+b_5Voil_t+b_6Soil_t+b_7Soil_t*Koil_t+u_t$						
b_1	b_2	b_3	b_4	b_5	b_6	b_7
0.019394*	0.102758***	0.409966*	–0.10803*	–18.7123*	0.022228*	–0.00279**
(0.00397)	(0.053343)	(0.142735)	(0.037675)	(5.579096)	(0.006153)	(0.001417)

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

Where $u_t \sim GED(0, \sigma_t^2)$ are the residuals that we assume there are in line with GED (generalized error distribution). We employ the GED because of its ability to accommodate the leptokurtic distribution that is characterized by fat tails.

Some diagnostic tests were performed to establish that the model is appropriate to describe the relationship of the variables under examination. Initially, the standardized residuals and squared standardized residuals of the estimated model were tested in order to confirm that they are free from serial correlation. 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 (Table 3). Furthermore, the coefficient estimation v=1.11 for tail thickness regulator (with 0.165 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.

The results for the mean equation are presented in Table 4. The statistical significance of the oil variance (–18.7) denotes the remarkable contribution of market uncertainty or stress in the creation of the investors' sentiment, which in turn, presses the market level downward (i.e., Park and Ratti, 2008; Sadorsky, 1999). Furthermore, the positive sign of asymmetry coefficient indicates that the larger the oil asymmetry, which means that the greater the dispersion of oil prices in the left side of the distribution, the lower the DJSI returns. Finally, the interaction of oil prices asymmetry with the oil prices kurtosis seems to affect the DJSI returns positively.

In addition, the coefficient of CSI is statistically significant almost at a 5% level (P = 0.0541) suggesting the important role of consumer sentiment in the mean return of the DJSI Eurozone

Table 5: Variance equation

$\sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \alpha_1 \sigma_{t-1}^2$		
a_0	a_1	a_2
0.000281	0.21055	0.699936*
(0.000242)	(0.131707)	(0.176305)

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

variable (Chen, 2011; Jansen and Nahuis, 2003). Also, the magnitude and the statistical significance of the Euro/Dollar coefficient (0.11) imply the remarkable impact of the exchange rates in the Eurozone stock market. Moreover, the statistical significance of the oil coefficient indicates that the increase in energy prices exert a downward pressure on the stock market.

The results of the variance equation are presented in Table 5. The value of the a_1 coefficient (0.21), which reflects the influence of the previous day shock, can be considered statistically significant as it is quiet close to 10% level (P = 0.109). The value of the a_2 coefficient (0.699), which reflects the series of the older shocks (information), is statistically significant at 1% level implying that news that triggers shocks are slowly assimilated or are decaying in the particular market. The rate of variance decay, which is generally defined by the coefficients $\alpha_1 + \alpha_2 (0.21 + 0.699 = 0.909)$, is quite large (0.909), because the closer the summation of $\alpha_1 + \alpha_2$ is to 1, the slower the decay of the variance autocorrelation. The summation constraint $\alpha_1 + \alpha_2 = 0.909 < 1$ allows for the existence of a stationary solution.

5. CONCLUSIONS

Within the last few years Eurozone goes through a time of substantial fragility in the economic activity as well as in the banking sector. In addition as the fastest growing area of investing has been recorded the corporate social responsible investing. A survey thus on the behavior of the performance of social

responsible firms in Eurozone as a function of oil prices taking into consideration the role of consumer sentiment seems to be an interesting issue. The present study provides us with an insight to the relationship between oil prices and stock returns. Unlike other empirical studies, which focused on conventional stock market, the present study makes an effort to survey a potential impact the variance, skewness and kurtosis of crude oil prices have on stock returns of Socially Responsible firms.

As a proxy for socially responsible firms the DJSI Eurozone is employed for the period November 2001 to March 2015. The results of the empirical investigation confirmed, that the consumer sentiment index, the exchange rate of the Euro/U.S. Dollar and the moments of the crude oil prices influence the value of the DJSI Eurozone.

Specifically, an increase in crude oil price affects negatively the financial performance of Eurozone firms functioning with sustainability criteria, as the Eurozone is totally dependent on oil, which not only contributes to the basic cost for the factories, but also affects the consumer income, available as well. This result is not an expected one since someone would expect an increase in the crude oil prices to affect in a limited way the financial performance of corporate responsible firms, which is not validated. The interpretation of the particular results stands on the crisis that evidently seems to be crucial for the behavior of those firms outweighing their score significance on environmental, social and governance factors. In addition, the uncertainty in oil prices, reflected in its volatility, affects the share price of the Eurozone companies particularly negatively as expected. Furthermore, the shocks in oil prices reflect a general instability in the global economy, a fact that affects the share prices negatively as well.

It was found that the third moment, asymmetry, affects positively the stock price of the Eurozone social responsibility companies, because the more the asymmetry increases, the less the concentration of the prices to the right side of the distribution, consequently the more the investors feel that the related risk is reduced, as the frequency of oil prices is below the average oil price.

Finally, the interaction between asymmetry and kurtosis was found to affect the stock prices of the Eurozone social responsibility companies negatively, a fact that is attributed to the kind of the distribution which is the result of the increase of both asymmetry and kurtosis. As the distribution is more peaked with fatter tails, then its interaction with the increased asymmetry results in feelings of increased risk to investors, because they perceive the increased frequency of extreme oil prices as not very regular, a fact that is probably a warning sign of a potential crisis or recession.

The impact of consumer sentiment on the share price of social responsibility companies could be justified for the following reasons: First of all, the consumer sentiment reflects the trend in the course of the economic activity, therefore it is expected to affect their share price also. Secondly, consumers are also investors and when they are confident in the economy they are also confident in the stock market as well. Thirdly, the increase of consumer sentiment probably results in investors being triggered to invest in more reliable companies (flight to quality) such as social responsibility companies.

Furthermore, a strong influence, deriving from the Euro/Dollar exchange rate market, was detected in the returns of the Eurozone social responsibility companies. A stronger euro gives the opportunity to the Eurozone companies to import cheap raw materials, which affects their profits, a key factor for the determination of the behavior of a company's stock price.

According to our findings the theory underpinning the impact of oil prices seems to be validated as in the case of our sample firms, that is the direct impact on the future cash flows as well as the indirect impact through affecting the interest rate used to discount the future cash flows.

The results of the study could be found interesting to governments and investors. Governments of oil importing Eurozone countries can shelter firms by enhancing the oil prices contracts with oil exporting companies minimizing the risk from oil prices shocks. Furthermore, the results should trigger investors and portfolio managers to be carefully in monitoring when they intend to buy or sell stock equities depending on oil prices and taking into consideration firms that use alternative fuels, less volatile sources, refining portfolio management theory.

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