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Efficient Market Hypothesis: The Cases of Six European Stock Markets

Abstract:

The efficient market hypothesis is of high importance in order to predict and function properly a stock market. The purpose of this paper is to examine the efficiency of different stock markets from around Europe, taking into consideration the different and unique elements of each market. In the early stages, we tried to examine each stock market from Europe individually, so as to find out which of them are efficient. The analysis we implemented is based on the Random Walk Theory and some other supporting tools. Also, we attempt to create a portfolio consisting of all markets we had examine in order to observe if a portfolio with inefficient elements could be efficient.

Keywords: Stock Markets, Random Walk, Efficient Market Hypothesis
JEL Classification: G1, G14, G15

1. INTRODUCTION

A lot of academic scientific research is based on the conditions of market efficiency in different stock places and under various financial components and circumstances in order to examine, on the one hand the power of the market, and on the other hand to discover the weaknesses of each financial stock market. The theory of market efficiency or Efficient Market Hypothesis (E.M.H.), was found by Eugene Fama in 1970, suggesting that at any given time, prices fully reflect all available information on a particular stock and/or market. The rational result of this hypothesis is that no investor has an advantage in predicting a return on a stock price because no one has access to information not already available to everyone else. According to the EMH, stocks always trade at their fair value on stock exchanges, making it impossible for investors to either purchase undervalued stocks or sell stocks for inflated prices. The EMH is based on some specific prerequisites, assumptions and lead to some individual results in each case, which explain the investor's behaviour with proposed criteria and try to predict financial movements and investments in different time series. Because of its assumptions, this hypothesis is highly controversial and there are a lot of professors that support that is pointless to search for undervalued stocks or to try to predict trends in the market through either fundamental or technical analysis. However we should bear in mind that financial theories are not objective and have been developed according to subjunctive criteria and ways of understanding the market structure, with the only purpose to be successive indicators of future market movements and profitable investments. Financial is one of the sectors in which there are no proven laws in market movements, so we cannot be sure for the efficiency of a theory and we have to focus on the corresponding applications in the different markets.

First of all we should have a look on the

fundamental components of the EMH and the disagreements that are related with this theory. Firstly, the efficient market hypothesis assumes that all investors perceive all available information in an identical manner, so the value of information is the same for each investor and the profits of each investor are correlated with the analyzing method that has been chosen. However there is a variety of estimating values that are used in order to explain or predict stock movements and this parameter poses a main problem on the credibility of the EMH. So one main contra indicator against EMH is that because of the fact that the balance of investors value stocks differently, it is impossible to ascertain what a stock should be worth under an efficient market. Secondly, by following the rules of the market efficiency we are led to the conclusion that no single investor is ever able to gain greater profitability than another with the same amount of invested funds, and the reason why happens this is the following: their equal possession of information means that they can only achieve identical returns, as a result of the identical financial investing behaviour. To be more specific, according to the EMH, if one investor is profitable, it means the entire universe of investors is profitable. Nevertheless, as we can see, this is not necessarily the case in the real world. Thirdly, under the efficient market hypothesis, no investor should ever be able to beat the market, or the average annual returns that all investors and funds are able to achieve using their best efforts and the appropriate knowledge. That means the absolute best investment strategy is simply to place all of one's investment funds into an index fund, which would increase or decrease according to the overall level of corporate profitability or losses. But, there are several examples of investors who have consistently beaten the market and one of the greatest examples is Warren Buffett. The following sector of our paper, includes the literature review that focuses on the EMH, then we describe the methodology we used in order to test the random walk hypothesis and

further the EMH. Finally, we expose the empirical results from our analysis and comment the conclusions of the whole paper.

2. LITERATURE REVIEW

The examination of the Efficient Market Hypothesis (EMH) is an object that certainly has troubled many researchers around the world. The EMH is closely related to the Random Walk Hypothesis. Therefore, in order to examine the EMH, researchers usually are contented to examine the Random Walk Hypothesis (RW). It is commonly accepted that if a time series proved to follow the process of RW then this time series is efficient. Generally speaking, we can claim that if a market (for example the stock market of Germany or Tokyo) is following the procedure of the RW, this stock market is efficient and the EMH is true.

The random walk hypothesis states that past stock prices are of no value in forecasting future prices because past, current, and future prices merely reflect market responses to information that comes into the market at random. In short, price movements are no more predictable than the pattern of the walk of a drunk. This controversial hypothesis implies that technical analysis is useless in its attempts to predict future price movements in the market. It has been described as 'jibing' with the efficient-market hypothesis. Economists have historically accepted the random walk hypothesis. They have run several tests and continue to believe that stock prices are completely random because of the efficiency of the market. In 1953 Milton Friedman pointed out that, due to arbitrage, the case for the EMH can be made even in situations where the trading strategies of investors are correlated (Friedman, 1953). Kendall (1953) analysed 22 price-series at weekly intervals and found to his surprise that they were essentially random. Also, he was the first to note the time dependence of the empirical variance (nonstationarity). The concept was first conceived by Massachusetts Institute of Technology professor Paul Cootner in his

book The Random Character of Stock Market Prices (1964). The term was popularized by the book, A Random Walk Down Wall Street, (1973) by Burton Malkiel currently a Professor of Economics and Finance at Princeton University, and was used earlier in Eugen Fama's 1965 article Random Walks in Stock Market Prices. The theory that stock prices move randomly was earlier proposed by Maurice Kendall in his 1953 paper, The Analytics of Economic Time Series, Part 1: Prices. However the major criticism of this theory is that stocks do maintain price trends over time - in other words, that it is possible to outperform the market by carefully selecting entry and exit points for equity investments.

3. METHODOLOGY

The random walk is a simple discrete stochastic process which changes shape white noise process. In other words Random Walk Theory means that stock price changes have the same distribution and are independent of each other, so the past movement or trend of a stock price or market cannot be used to predict its future movement. The process is called discrete random walk (or a series of random walk) if the changes are a series of white noise.

$$\Delta Y_t = \varepsilon_t \ iiD(0, \sigma^2) \quad \Leftrightarrow \quad Y_t = Y_{t-1} + \varepsilon_t$$

In an attempt to examine the Random Walk Hypothesis, we have to make clear which type of Random Walk (RW-1, RW-2, or RW-3) we want to examine. For the different types of RW there are different tests. However, in each case, we have to establish two hypothesizes the Ho and H1. More specifically, the Ho assumes that the variables do not have autocorrelation and the H1 hypothesis, the opposite view, that variables have autocorrelations. Respectively, if Ho hypothesis is accepted, the time sere confirm the hypothesis of Random Walk and if the hypothesis H1 is accepted, the time sere do not confirm the Random Walk hypothesis. Among methodologies available to test RWH we can distinguish

the Runs Tests which use a simple statistic in order to test Ho and H1, the Portmanteau Tests and variance ratio tests. In our analysis, we adopt the Portmanteau tests, using the Q-statistic of Ljung-Box, which is defined as follows:

$$\hat{Q}(k) = T(T+2) \sum_{i=1}^{k} \frac{\rho^2(i)}{T-i}$$

Then, we have to compare this Q-statistic to the critical value. In our test k is equal to 6 and the critical value Q is known from the x2 distribution with 6 rates of freedom and equals to 12, 59. The Random Walk Hypothesis is confirmed if the Q-statistic is less than the critical value 12,59.

4. DATA AND EMPIRICAL RESULTS

The data set used in this paper consists of six indices from six European countries. In particularly, we used the index CAC40 for France, DAX for Germany, IBEX35 for Spain, PSI20 for Portugal, FTSE100 for UK, and Athens General Index (AGI) for Greece. The time period we used in our analysis is for five years, May 2007 to May 2012, for daily observations.

The following table shows the descriptive statistics for each country. As we can notice, for the examined period, Greece, Portugal and Spain, countries with the major economic problems, had negative mean return in their main stock index. This fact proves the deterioration that exists in these three countries and of course their unattractive stock market. Beside the average return, the most risky market tends to be the Greek market, having the highest std.dev rate. Again, this is a sign of the economic conditions which prevail in Greece in the current period.

Also, in terms of normality, none of the six indices is distributed normally, as the Jarque-Bera index indicates that.

	UK	FRANCE	GERMANY	GREECE	PORTUGAL	SPAIN
Mean	1.45E-05	-0.000209	0.000193	-0.000820	-7.43E-05	-8.59E-05
Median	0.000302	0.000000	0.000862	0.000263	0.000296	0.000906
Maximum	0.093842	0.106242	0.107954	0.091359	0.125320	0.134857
Minimum	-0.092717	-0.094771	-0.074339	-0.102231	-0.137753	-0.095835
Std. Dev.	0.015234	0.017066	0.015969	0.019228	0.014486	0.017643
Skewness	-0.075332	0.182540	0.186681	-0.190375	-0.077240	0.261540
Kurtosis	9.621294	9.559112	10.46950	6.021469	22.78027	10.20669
Jarque-Bera	2068.930	2035.489	2638.167	437.4353	18455.52	2462.570
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	0.016415	-0.236557	0.218145	-0.928661	-0.084120	-0.097231
Sum Sq. Dev.	0.262467	0.329387	0.288410	0.418142	0.237336	0.352041
Observations	1132	1132	1132	1132	1132	1132

   As we have already mentioned, our aim in this paper is to examine the Efficient Market Hypothesis, by checking the Random Walk condition. The following table represents the results from the Portmanteau test, using the Q-statistic of Ljung-Box.

	UK	FRANCE	GERMANY	GREECE	PORTUGAL	SPAIN
Ljung-Box	50.54	32.03	16.77	16.88	11.84	14.99
p-value	0.000	0.000	0.010	0.010	0.065	0.02

   Noticing the above table, we can observe that all countries seem not to follow the Random Walk Hypothesis, and so, they are not efficient. Only Portugal has a Q-statistic below the critical value, and for this reason we can claim that the Portuguese market is efficient, which means that the stock prices reflect all the available information.

   An important issue that should be subjected to further analysis is what is happening with a portfolio consisting of inefficient parties.

More specific, we created a portfolio consisting of our six countries, which are all inefficient apart from Portugal. The participation of its country in our portfolio was decided by the capitalization of its stock market.

		UK	FRANCE	GERMANY	GREECE	PORTUGAL	SPAIN
Average Return		1,45E-05	-0,000209	0,000193	-0,00082	-7,43E-05	-8,59E-05
Wage (per market)		39,08%	21,29%	25,00%	1,48%	5,69%	7,50%
Total Average Return	-1,34E-05						
Ljung-Box	11,71						

From the above table we can make clear that, based on the Q-statistic of Ljung-Box a portfolio which is composed by entities that all are not efficient, despite that fact, the combination of inefficient parties is efficient. In other words, a merged market with the examined six markets, these of UK, Germany, France, Greece, Portugal and Spain, could be efficient and function according to the theory.

4. CONCLUSIONS

The aim of this paper is to examine in a simplified, although scientific, way the Efficient Market Hypothesis. The investors want to maximize the return of their investments. However, according to the theory, in the market all parties must have the same possibilities to earn the same amount of money. In practice, as we found out from our analysis in six European markets, this is very difficult to achieve because the majority of the markets are not efficient. Only one market of our sample seems to follow the Random Walk Hypothesis, and consequently to be an efficient market. Even well developed markets such as UK, France and Germany, seem not to reflect in the stock prices all the information and adapt them rapidly.

On the other hand, the portfolio which was composed by six markets, and in other words by entities inefficient, proved to be efficient. This is a key clue to support the idea that in a portfolio we succeed in having a better diversification of the risk, and further all the abnormalities of each market maybe were minor to affect the efficiency of the whole portfolio.

The efficient market hypothesis has troubled many scientists and people of the market, so it is a very important issue that must be subjected to further and consistent analysis. Some recommendations over the topic of EMH, are to examine more markets from all over the world and the creation of a global portfolio with participants the USA market and the most important markets from the region of Asia.

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The Keys of Tax Avoidance and Tax Evasion : A Theoretical Approach of Applied Methodologies and Companies Policies

Abstract

Modern corporate strategies have to do with accounting and financial tools in order firms' value and operating activity to be maximized. A substantial parameter of companies' financial activity is the tax management and the policies that are related with the administration of the accounts and variables that are related to this liability. A great variety of techniques and patterns have been introduced in order to increase company's net value or income performance with several effects on the stock value and the behavioural investment movements of individuals. Tax planning, avoidance and evasion are becoming more and more usual within international practicum and are considered to be a crucial issue for the competitiveness and the sustainability of companies worldwide. In this paper we give an analytical theoretical framework for the practises that are implemented in order to lead in a higher, more preferable financial performance and we examine the impacts on financial environments and individuals, from the perspective of a cost – benefit analysis. We provide an appropriate literature review with the most noticeable findings regarding these taxation issues and some aspects of shadow economy in everyday financial relations. Finally we present some widely accepted ways for detection of illegal taxation patterns and efficient ways of overcoming illegal taxation management.

1. Introduction

In the modern financial environment there is a variety of financial tools in order maximization of companies' operating activity to be achieved and sustainable growth rate to be established. It is usual practice in accounting domain of companies a great portfolio of techniques to be used in order to add a further economic value to firm market value of each company and establish a more acceptable rate of return in terms of net benefits for whole company. A significant part of these techniques is based on the administration of tax perspectives with an aim of acquiring substantial benefits from an efficient implementation of legislative conditions and modern policies in order the firm market value of company to be maximized by the optimization of the firm's liabilities that are related to tax payments. For this reason tax planning from the perspective of a systematic approach of tax payment that is salutary for the company in terms of selection of the appropriate timing of tax expenditures and management of all the relevant accounts aiming at reducing the final estimated tax liabilities, is considered to be a crucial part of firms' financial activity. Apart from this, an utmost emphasis is given to

practices that are directly correlated with tax evasion and tax avoidance, because these perspectives lead to better appeared performance to financial statements and preferred financial situation regarding firm's economic stability and this has direct effects on the current stock value and is associated with a more preferable investment image for the companies that implement these practices. In this paper, we give a general theoretical framework of all practices that are related to tax payments and tax management in order to maximize firm's value and we analyze all parameters that are included in each separate technique, giving emphasis on the most significant perspectives that lead to a more desirable publicly presented economic performance.

2. Literature Review

The modern techniques of tax management have serious effects on countries economic variables and international economy. The impact of all these techniques can be concluded at the impact of shadow economies and policies in the total wealth fare and in the financial situation of nations, companies and individuals. According to Tax Justice Network (TJN) the total tax evasion in excess of US $ 3,1 trillion, or about 5.1% of the world GDP, occurs as a result of the operation of the shadow economies found in every state in the world. According to TJN report (TJN report, 2011) the existence of shadow economies has tremendous effects on healthcare spending, "as it is estimated that the international tax evasion costs on average 54.9% of health care costs, a ratio which is estimated low because the USA has the highest healthcare costs, one of the lowest tax evasion rates in the world and the highest national GDP." For this reason, it can be easily seen that the impact of shadow economies in the economic stability of individuals is more than crucial.

Another fundamental research of the impact of shadow economies and tax evasion in world economy is the scientific research of Cobham (Cobham 2005), according to whom developing countries lose US-$ 285 billion per year due to tax evasion in the domes-

tic shadow economy. The methodology of calculation of total tax evasion was based on the applied framework for estimations regarding the shadow economy sizes of Schneider (Schneider 2005, 2007). Cobham has given emphasis on the role of macroeconomic variables in order to estimate the size of shadow economies and this approach has been considered to have advantages because the data are publicly available in contrast with other equivalent methods that have as foundation to identify the national tax gasp, under research of specific macroeconomic or microeconomic variables, depended on the approach that been followed each time. Generally, approaches that are based on microeconomic fundamentals give emphasis on feedback received by the evaluation of by tax audits with a random process of tax payers' selection and are considered to be connected with more sufficient and accurate calculations and conclusions. In the other hand, approaches that are based on macro data are not considered to be so accurate but they are associated with the advantage of the variety of information that can be gathered from different resources both for developing and developed countries, a parameter that is restrictive if we take into consideration the fact that micro data are not available for all countries, especially for the developing.

Accounting actions especially designed to minimize tax liabilities and obligations are estimated to be an utmost part of every economy regarding the perspective of corporate activity. In their survey (Desai and Dharmapala, 2007) conducted that "higher quality firm governance leads to a larger effect of tax avoidance on firm value and this is supported by the an exogenous source of variation due to changes in tax regulations to construct instrumental variables for tax avoidance activity". Moreover, "the magnitude of the effect implies that changes in the book-tax gap are interpreted by the market as signals of overall tax planning ability for well-governed firms, rather than simply reflecting the use of particular tax sheltering strategies." Apart from this, in their paper, professors rejected

the assumption that the corporate tax avoidance represents a transfer of value from each state to the individuals, as this assumption had not been confirmed by the implemented tests and data. Another important conclusion that has been raised regarding tax avoidance effects (Desai and Hines, 2002), has to do with the market reaction to announcements that are relevant to tax avoidance or tax limitation facts, or even with the dimensions of tax havens policies for minimization of tax liabilities. It was conducted that in many cases stock markets reacted negatively to these events and the marginal benefits from the deduction of tax obligations was hedged by the negative interpretation of the corresponding move in the eyes of potential investors and corporate evaluations.

As corporate strategy relies on a high extent on accounting methods and practices, it is rational that a high number of tax evasions methods have been developed. In their theoretical approach (Allingham and Sandmo, 1972), the 2 professors were from the first that gave an analytical theoretical framework between the connection of shadow economy and the underground labour supply, describing conditions that could be used as assumptions for the development of market based models for tax avoidance. This research provided a strong background on the implications of underground accounting activities in special domains that directly affect economic sizes. In their investigation (Frederiksena, Graversenb and Smith, 2004), after analyzing all the previous models that have been developed for tax evasion and had as a keystone combinations of labour supply theories with a special selected portfolio, developed their own evaluating tax evasion model, based on the assumption that individuals choose the labour supply in the two sectors given a known tax rate on the regular labour income. The first one was the regular sector net wage rate, and the second one a known gross wage rate in the underground sector. They resulted that regular sector wage rates and non-labour income have significant effects on labour supply in both sectors so income taxes seem to twist the labour supply away from taxed

regular to untaxed underground supply. The applied econometric model had significant similarities with the theoretical framework for tax evasions of Cowell (1985). This allocation model can be used as an indogenous indicator for the implementation of equivalent models with other macroeconomic variables for the estimation of tax evasion.

Before continuing to some aspects of tax management it is worth mentioning some interesting results of substantial researches on the field of tax evasion and earning management. Yitzhaki in two fundamental academic approaches (2004 and 2005) found that there is a strong positive correlation between the amount of reported income under decreasing absolute risk aversion and the tax rate, but with the prerequisite that the fine that is paid in each separate case is equivalent to the evaded taxation and there are no discrepancies between the real and the reported sizes of evaded sizes. The model that was developed in order some potential characteristics of evasion to be examined, was based on the assumption that the relationship between the probability of an evading company to be caught is rationally functioned with the amount of evading tax sizes, in order logical assumptions and causality tests, if wanted to be implemented. However, as was mentioned in Yitzhaki's and other professors' researches, there is a noticeable divergence between the theoretical and the applied results of the implemented tests with the empirical results that come from market corporate reality. Most theoretical models show that there is a positive correlation between reported income increases and the tax rate, and the increase of the first parameter lead to an immediate increase to the second one, something that according to the empirical evidences is not truth.

In his research (Panades, 2004) attempted to examine this concrete contradiction in order to investigate patterns that can link the examined parameters in a more equitable justified way. He had considered an equilibrium model in which the utility function of a taxpayer was an outcome of two separate perspectives: The first one was the amount of own consumption in terms of absolute value and the second

one was the relative tax contribution, in order comparative criteria to be established. He resulted that when the tax rate increase, this may have a negative impact on individual taxpayers, as it could induce them to raise the amount of unreported income when penalties are in danger of being imposed. This, as he explained, "derives from an equilibrium point in which taxpayers act in a way that reports are noticeably low, so that to declare to financial statements more income than the rest of individuals is highly penalized."

However, both tax evasion and tax avoidance according to scientific research tend to increase inequality and to lead to greater poverty characteristics both in developed and developing countries. According to Manos Matsaganis and Maria Flevotomou (2000), there is strong evidence to suggest that "in Greece tax evasion increase inequality and poverty and reduce tax progressivity, as well as implying a considerable loss of tax receipts." According to the professors, the impact of the tax evasion should be examined in both a static and dynamic way, taking into consideration not only the effects of the decrease in disposable incomes, but also some parameters that have been examined thoroughly in different academic approaches that have been mentioned above (Yitzhaki 2002, Sandmo 2005). According to the corresponding findings, the effects that can be observed in a dynamic basis have to do with the decision approaches that are related to the market dynamics of supply and demand conditions, the allocation of disposable income between consumption and savings and the equivalent allocation between the sources that are distributes within goods and services with different total contribution to the examined size of shadow economy. Matsaganis and Flevotomou resulted that as far as Greek shadow economy is concerned, the tax evasions seem to be extremely aggressive and suggested a mixture of focused targets in order economic equality to be established. These priorities that can be followed as a chain target are "higher tax receipts, lower poverty, reduced inequality, and a more progressive tax system".

3. General Framework and Term clarifications

Tax Planning

Tax planning is a term that individuals and companies use in order to schedule and optimize the way they pay taxes to the state. More specifically, tax planning encompass all these processes that help taxpayers to distinguish the income that can be exempt from the tax liabilities, the expenses that are tax deductable under current regulations and in general planning for taxes in a manner that ensures the amount of tax due will be paid in a timely manner.

The main purpose of tax planning is the taxpayer to manage and succeed in reducing the amount of taxes that has to pay. There are two common approaches that contribute in minimizing the tax liabilities. The first one is to reduce the adjusted gross income for the current tax period. In order to do that the taxpayer should deeply understand the nature of the tax law and observe from where he can benefit in order to pay less tax. The second approach to tax planning is to increase the amount of tax deductions. Again, this means knowing current laws and applying them when appropriate to all usual and normal expenses associated with the household or the business. Since these can change from one annual period to the next, it is vital to check current regulations constantly.

Tax Evasion

Tax evasion in general, refers to illegal and fraudulent actions which lead to escape from taxation. In other words, tax evasion can be defined as the deliberate effort by companies, institutions, organizations, individuals and other entities to evade tax by illegal methods. This illegal activity can be operated by a false declaration or no declaration at all of taxes due to the relevant tax authorities, or by the deliberate misrepresentation or conceal of the true state of affairs by destroying or fabricating records, keeping parallel accounts, failing to report income, or smuggling. Tax evasion is a crime and, therefore, a vital component of the underground economy.

Tax avoidance

Tax avoidance on the other hand, encompass the use of legal activities in order the taxpayer to avoid paying taxes or reduce the tax liabilities by implementing methods that take advantage of the tax code and exploit the loopholes of the relative legislation. The practice of tax avoidance takes place at these sections and areas of the tax code which are ambiguous and in need of further interpretation. The most important difference between tax evasion and tax avoidance is that the former is related to illegal activities, whereas, tax avoidance succeeds in minimizing tax liabilities by actions that are in accordance to the tax law. However, the distinction between tax avoidance and tax evasion is blurred in cases where countries change the tax regulations concerning tax loopholes retroactively.

Tax mitigation

The concept of tax mitigation is synonym for tax avoidance and consequently, the distinction between tax mitigation and tax avoidance is not so obvious. There are many legitimate ways that will lead to reduction of the taxes, and therefore, determining which of those are acceptable tax mitigation and which are abusive tax avoidance is a really a tough task.

Generally speaking, there are two kinds of tax reduction that could be characterized as acceptable tax mitigation.

• The first type of acceptable tax mitigation involves transactions which are accompanied with specific economic sacrifices by the taxpayer. For instance, taxpayers who incur costs to acquire capital assets are permitted to deduct an allowance for the capital cost of that asset from income. However, taxpayers who arrange for someone else (such as a spouse) to receive their income but still benefit from it, or taxpayers who purchase capital assets with borrowed money that is immediately re-paid so that they assume no economic risk of loss, have not made the corresponding sacrifices in order to escape taxation.

• A second type of legitimate tax mitigation occurs when taxpayers engage in tax reducing transactions in reliance on legisla-

tive provisions that specially authorize, or even encourage, such activities. Permitting taxpayers to benefit from such provisions demands that the relevant tax legislation encompass numerous tax expenditures and other incentives enacted specifically to encourage taxpayers to do certain things.

4. Tax avoidance and tax evasion measures-The case of Greece

New research findings show that the developing countries lose approximately almost $900 billion each year, by illicit flows of capital. Illicit financial flows, according to GFI definition, generally, involve the transfer of money earned through illegal activities such as corruption, transactions involving contraband goods, criminal activities, and efforts to shelter wealth from a country's tax authorities.

Although there are insufficient data to calculate the amount of tax invasion, throughout the world, and also different methods of estimation related to tax avoidance and tax evasion, the Tax Justice Network estimates that total tax evasion of in excess of $3.1 trillion, or about 5.1% of the world GDP, occurs as a result of the operation of shadow economies found in every state in the world. Also the same study indicates that tax evasion costs, approximately the 54.1% of the total healthcare spending in the world. By the numbers above we realize that the activities of tax evasion and tax avoidance are very harmful not only for the local economy of a country, but also for the whole economy of the world.

Besides that, corporate income shifting, a technique for tax evasion, causes a tax revenue lost between US$35 billion and US$160 billion per year, whereas tax evasion by wealthy individuals is estimated to cause additional revenue losses in developing countries ranging from US$15 billion to US$124 billion annually. Global Financial Integrity (GFI) calculates that developing countries loose between $859 billion to $1.06 trillion a year through illicit financial flows.

The table below shows us the Shadow economy in European countries as a percentage of GDP. It is remarkable to note that in an economic environment that is characterized by high rates of Shadow Economy, tax evasion and tax avoidance are more possible to be

occurred. From the data presented to the table, we can notice that the biggest rate among the European countries is that of Bulgaria. Moreover, the origin of Eastern Europe seems to have also a big shadow economy. The same situation is confirmed for the countries of the Mediterranean, Cyprus, Greece, Italy, Spain and Portugal. Apart from that, these countries with big shadow economy face, nowadays, the biggest financial problems in Europe and as a consequence of this situation we could consider the black economy and the avoidance of paying taxes.

Through years Greece seems to have a stable rate of Shadow Economy, approximately 25% of its GDP. In other words, we could claim that one out of four transactions in Greece take place violating the relevant legislation and more specific the tax law. According to a report by the Hellenic Foundation for European & Foreign Policy (ELIAMEP), the Greek state is losing 13 billion euros annually in tax evasion and corruption. In spite of increased taxes that have been imposed through Value Added Tax, property tax, taxes on petrol and central heating oil, and other taxes which are collected directly through spending, tax evasion through business remains rife.

Shadow Economy (in % of GDP) using the DYMINING and Currency Demand Method				
Country	**2008**	**2009**	**2010**	**2011**
Austria	8.10	8.50	8.20	8.00
Belgium	17.50	17.80	17.40	17.10
Bulgaria	32.10	32.50	32.60	32.30
Cyprus	26.00	26.50	26.20	26.00
Czech Republic	16.60	16.90	16.70	16.40
Denmark	13.90	14.30	14.00	13.80
Estonia	29.00	29.60	29.30	28.60
Finland	13.80	14.20	14.00	13.70
France	11.10	11.60	11.30	11.00
Germany	14.20	14.60	13.90	13.70
Greece	24.30	25.00	25.40	24.30
Hungary	23.00	23.50	23.30	22.80
Ireland	12.20	13.10	13.00	12.80
Italy	21.40	22.00	21.80	21.20
Latvia	26.50	27.10	27.30	26.50
Lithuania	29.10	29.60	29.70	29.00
Luxemburg	8.50	8.80	8.40	8.20
Malta	25.80	25.90	26.00	25.80
Netherlands	9.60	10.20	10.00	9.80
Poland	25.30	25.90	25.40	25.00
Portugal	18.70	19.50	19.20	19.40
Romania	29.40	29.40	29.80	29.60
Slovenia	24.00	24.60	24.30	24.10
Spain	18.70	19.50	19.40	19.20
Slovakia	16.00	16.80	16.40	16.00
Sweden	14.90	15.40	15.00	14.70
United Kingdom	10.10	10.90	10.70	11.00
Subtotal (EU-27)	19.30	19.80		19.20
Sources: Dr. Friedrich Schneider, Johannes Kepler University of Linz, Austria; A.T. Kearney analysis				

The following table represents the tax lost as a result of the Shadow economy, and also the total cost of tax evasion for each country. From the data we can notice that bigger size of shadow economy leads to more tax lost because of this situation. As far as Greek economy is concerned, we have to mention that despite the small size of the total economy, in terms of the total GDP, the size of shadow economy is meaningful, and consequently the tax lost is bigger, with the cost of tax evasion to burden the government program and debt.

According to a remarkable presentation that a member of Greece's central bank gave last fall, the gap between what Greek taxpayers owed last year and what they paid was about a third of total tax revenue, roughly the size of the country's budget deficit. Transparency International recently put Greece in a three-way tie, with Bulgaria and Romania, as the most corrupt country in Europe.

Country	GDP ($ million)	Size of Shadow Economy (% of GDP)	Tax lost as result of Shadow Economy ($ millions)	Cost of tax evasion (local currency)
Albania	11,786	34.3	982	104,483
Austria	376,162	9.7	15,653	12,053
Belgium	467,472	21.9	47,605	36,656
Bulgaria	47,714	35.3	5,609	8,413
Cyprus	25,039	28	2,748	2,116
Czech Republic	192,152	18.4	12,799	238,571
Denmark	310,405	17.7	26,921	153,991
Finland	238,801	17.7	18,26	14,06
France	2,560,002	15	171,264	131,873
Germany	3,309,669	16	214,996	165,547
Greece	304,865	27.5	29,427	22,659
Hungary	130,419	24.4	12,888	2,798,244
Ireland	203,892	15.8	9,922	7,64
Italy	2,051,412	27	238,723	183,817
Latvia	24,01	29.2	2,04	1,102
Lithuania	36,306	32	3,555	9,421
Luxembourg	55,096	9.7	1,951	1,502
Netherlands	783,413	13.2	41,157	31,691
Portugal	228,538	23	19,817	15,259
Romania	161,624	32.6	15,016	49,404
Slovakia	89,034	18.1	4,722	3,636
Slovenia	47,763	26.2	4,705	3,623
Spain	1,407,405	22.5	107,35	82,659
Sweden	458,004	18.8	41,244	290,359
Switzerland	523,772	8.5	13,089	13,089
Turkey	735,264	31.3	54,082	81,664
United Kingdom	2,246,079	12.5	109,216	69,898
Sources: The cost of tax abuse, TJN 2011				

5. Reasons for Tax evasion and Tax avoidance

A brief scanning of the relevant literature review, will show many reasons which entail in tax evasion and tax avoidance and in order the authorities to tackle these major problems for the integrity of the tax system, in the early stages have to clearly understand the factors that enforce such activities as tax evasion and tax avoidance.

Generally speaking, the reasons leading in tax evasion and tax avoidance could be classified in two major categories. The first category includes factors that negatively affect the taxpayers' compliance with tax legislation resulting in a low level of tax compliance. The other category concerns factors that affect the ability of tax authorities and fiscal policy to treat effectively and enforce tax liabilities. Below the two categories are analyzed in more details.

Low level of tax compliance

Low level of tax compliance means that taxpayers avoid paying taxes or disobey to the tax legislation by having a behavior that stems from the following factors:

- Low tax morale
- Low quality of the service in return for taxes
- Tax system and perception of fairness
- Low transparency and accountability of public institutions
- High level of corruption
- Lack of rule of law and weak fiscal jurisdiction
- High compliance costs

Weaknesses of tax system and tax laws

In an economic and social environment which is characterized by high rates of corruption and lack of transparency, the tax authorities face many obstacles that prevent them from operating their functions properly. The factors that indicate such distractions can be presented below:

- Insufficiencies in tax collection
- Weak capacity in detecting and prosecuting inappropriate tax practices

6. Ways for Tax evasion and Tax avoidance

There are different ways that not only individuals but also businesses have at their disposal in order to minimize their tax liabilities. Therefore, in order the authorities to be able to tackle these major problems for the economy, in the early stages, must understand the different modes of tax evasion and tax avoidance.

Modes of tax evasion

Tax evasion is related to international falsification of tax relevant information, and among the different modes of evading tax obligations we distinguish these that violate national tax laws. This situation can be reinforced by the non-declaration of the personal income or corporate profits in order to avoid the direct income taxation or the tax obligations resulting from the operations of the company. Consequently, by holding offshore financial accounts, the taxpayers manage to conceal taxable income from tax authorities in the country of residence, allowing them simultaneously to benefit from low or zero taxes abroad.

Another way to evade tax obligations is by trade mispricing using fake or dummy invoices. These fake invoices are used by importers and exporters so as to illegally transfer money to offshore financial accounts abroad with the intention of evading taxes.

In addition, the increasing rates of VAT of goods and services, force businesses to utilize false statements of their transactions subjected to VAT. This misrepresentation of VAT is defined as VAT fraud and is a type of tax evasion. VAT fraud can take different forms relying on the principle that all registered companies are able to credit VAT expenses from purchasing input goods against VAT due on their sales.

The different forms of VAT fraud can be classified as follow:
- Missing trader fraud
  This is the simplest case of VAT fraud according to which the businesses present low sales by falsifying records and accounts, and this allows the fraudsters to collect taxes but without conveying

them to the tax authorities. On the other hand, by overstating and showing dummy invoices, fraudsters are able to increase the amount of VAT refunds.

• Carousel fraud
This case of VAT fraud can take place at an international level and exploit the fact that exports are free of VAT in order the international trade to be developed seamlessly. Consequently, multi-country trade operations are more vulnerable to VAT fraud as they occur across national borders and affect different tax systems. Carousel fraud consists of tow parts. The one is, as we have already mentioned, the missing trader fraud, where taxes are collected but without remitting to the tax authorities, and the other part contains an illegitimately claiming a tax refund for the good that is exported.

• Misclassification of commodities
For different categories of commodities there are different VAT rates, and tax evaders may exploit the misclassification of commodities in order to reduce their tax liabilities or to claim further tax refunds.

• Smuggling of goods
Smuggling of goods across borders is a common practice of tax evasion not only by evading VAT liabilities, but also other forms of indirect taxes such as customs and excise duties.

In addition to the above modes of tax evasion, we could add the practice of bribing tax officials. The lack of transparency and the corruption among tax authorities strengthen the inefficiencies of the administration and facilitate the tax evasion.

Modes of tax avoidance
There are two modes of tax avoidance. The first one is related to profit shifting and refers to the legal exploitation of loopholes in the tax code, and the second one, refers to the exploitation of selectively granted tax incentives reducing the tax base immediately.

Profit shifting is strategy for tax avoidance mainly followed by companies with international activity. In fact, subsidiaries are treated as separate entities by tax authorities, and this allow international businesses on the one hand to avoid double taxation as profits of the parent company are taxed once in the residence country of the subsidiary, and on the other hand to minimize their tax liabilities by transferring them from high tax to low tax countries.

Profit shifting can be achieved by the following techniques:

• Manipulation of transfer prices of goods and services traded within the group
Transfer prices are the prices that exist for goods, services, tangible and intangible financial assets, which are traded through intercompany transactions, between affiliated companies. In that way, they manage to create a legitimate and also functional corporate tool in order to operate the intra-group transactions, assign profits correctly to the relevant affiliate, identify profitable parts within the group and avoid double taxation. This mechanism, in terms of minimizing the total tax liabilities functions by setting higher transfer prices for products which direct to high tax countries, whereas low prices are used for transactions with low tax countries.

• Increase in intercompany debt
Provided that subsidiaries maintain a high debt to equity ratio, they can avoid paying taxes because of the increased interest payments. A common practice in profit shifting is the subsidiary to receive company loans or other financing derived from the parent company or other affiliate parties. Doing that, and having a thin capitalization, all profits generated by the subsidiary are absorbed by interest payments which are subjected only to a small tax, if taxed at all.

• Location of central services and intangible assets

By the deliberate choice of location for certain intangible assets and other services, the business manages to optimize its overall tax liabilities in a legal manner. Intangible assets such as patents, trademarks and copyrights that generate further profits through license payments are property of subsidiaries that are located in low tax countries, whereas intensive units or central services are located in high tax countries. In this way, the group benefits from low taxed income in low tax countries and from tax refunds in high tax countries.

The other mode of tax avoidance is the exploitation of tax incentives and tax expenditures. Tax incentives provide tax exemptions or tax subsidiaries from the tax code. These exemptions are usually used by governments in order to promote specific economic, social and various political goals.

7. Strategies to alleviate tax evasion and tax avoidance

It is a matter of fact that tax evasion and tax avoidance are an aftereffect of the taxpayers' behavior who do not act in compliance with the tax law. On the other hand, such phenomena can be occurred due to the disability of the tax code to cover the existed loopholes, which are exploited in order to avoid paying taxes. Consequently, the tax authorities in cooperation with the government should take measures over the above mentioned fields of illegality.

In order to improve tax compliance the authorities could adopt the following recommendations:
• Improve citizens' tax morale by ensuring and visualizing that the state is acting in a transparent, accountable and efficient manner, with the ultimate aim of providing services for its citizens

• Improve and increase taxpayer education by informing and educating them over topics related to the tax system, the tax code and relevant legislation, and also by assisting them in their attempts to comply with the tax system.

• Reduce taxpayer's costs of fulfilling their tax liabilities and also the administrative costs in order both the taxpayers and administration to be more flexible and effective.

On the other hand, the key issue in combating tax evasion and tax avoidance is an unimpeachable and fair tax law, with any if possible loopholes. Of course, in order to move to this direction some measurements should be taken.
• The tax legislation functions under the supervision of the tax administration. Therefore, tax authorities should apply and maintain effective strategies in order to strengthen the tax law firstly at a national level. This can be happened by the creation of semi-autonomous revenue authorities, setting up of large taxpayer units as well as capacity development such as trainings and courses on selected topics.

• Tax evasion can easily be occurred due to weak judiciary. It is commonly believed that higher penalties and sufficient punishment for tax criminal can act as a deterrent helping to improve tax compliance. Consequently, the rule of law and also the method of investigations by tax authorities should be strengthened along with the greater support by the politicians to auditors and judges, in order to deal with this demanding issue.

• As we have already mentioned above, tax evasion and tax avoidance can be occurred without important obstacles at an international level, exploiting the fact that not only one country's legislation can be implemented so as to regulate tax liabilities of international corporations. To the direction of international endeavors to strengthen national tax law enforcement,

Tax Information Exchange Agreements (TIEA) could be proved one part of the solution to tax evasion. TIEAs constitute non-binding bilateral agreements in which contracting countries commit to exchange information on tax matters upon request, conditional on the relevance of the requested information to enforce national tax laws. Mutual exchange occurs on a strictly confidential basis and the protection of taxpayers' rights. Currently, 360 TIEAs have been signed, others are still being negotiated.

• The lack of transparency is a vital problem that leads in tax evasion. By introducing financial accounting standards for both domestic and international firms, the transparency in bookkeeping could be increased. The Global Task Force on Financial Integrity and Development proposed a new system of accounting rules for multinational enterprises based on the country-by-country reporting (CBC) principles to enhance transparency in financial reporting and reduce the scope for tax evasion and avoidance practices for international companies. CBC involves the disaggregation of financial reports to single countries including detailed information on sales, purchases, costs of financing, wages and salaries, numbers of employees, pre-tax income, local taxes paid, etc. This procedure would facilitate the identification of illegitimate profit shifting activities. The proposal requires the revision of the current accounting standards of the International Accounting Standards Board (IASB) and introduction of CBC as an International Financial Reporting standard for multinational enterprises.

8. Conclusions

Given that Greece's tax-to-GDP ratio is relatively low by EU standards and that tax evasion is firmly entrenched, a key priority is to continue with efforts to simplify the tax system, broaden the tax base, and to strengthen tax administration. The mission would encourage the authorities to phase out distortionary exemptions for all major taxes and simplify the rate structure of personal income tax and the VAT. On the tax administration front, the recent strengthening of procedures—in particular, more intensive auditing and cross-verification—has produced some positive results, but much remains to be done. The incentives offered to taxpayers under the new law on tax evasion will have only a small impact on overall compliance. The mission would recommend that the National Council should focus on increasing tax compliance through simplifying tax laws and regulations, improving taxpayer services, streamlining basic tax procedures, adapting organization structure to the business needs, further intensifying risk-based auditing, and providing training for tax officials.

Tax avoidance and tax evasion are expected to be fundamental factors of entrepreneurship accounting tools in order maximization of companies net value to be established. The extent in which these tools can lead the size of shadow economy in irretrievable size is an issue that should be investigated in order a national implemented framework to be developed for the protection of economic cycles and financial relations among individuals, either people or firms. The structure and the determination of this framework is directly correlated to the dedication of each national or not systematic campaign in order national economic situation to be secured and social wealth fare to be achieved.

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Cyber-Insurance for Financial Management of Cyber Risk[1]

Introduction

Nowadays, the interdependence of networked assets renders the need for an up-to-date form of insurance imperative. This need refers to a concept similar to the one of common insurances, but in this case agents are insured against a variety of threats stemming from the Internet or the possession of computerized assets or intellectual property. Examples include technical malfunctions, hacking attacks, denial-of-service attacks, malicious intrusions, worms and viruses, which may entail a wide range of nefarious repercussions, be it mere online libel, data privacy loss or even the destruction of IT systems of an enterprise.

Like any insurance, there are two perspectives to be examined: the insurer and the insured. The insurer intends to maximize his profit from premiums surpassing losses. He tries to accomplish that by disseminating the risk of potential loss incidents across a plethora of independent clients. His fundamental task is to achieve an accurate quantification of the risk to which the clients are exposed. The insured (either an individual or an organization) seeks to optimize its utility by handling with potential threats and thus trying to accomplish risk diversification. He has four alternatives regarding his confrontation with the risk:

1. Avoiding the risk: the insured refrains from any exposure to cyber-risks by not being dependent on computers, networked devices, or any Internet website presence. For some people/organizations this is sustainable, however, for the vast majority of profit organizations this is not attainable, given the demands of modern economy.

2. Retaining the risk: refers to a self-consistent decision that it is more profitable not to pay for any means of averting or preventing the risk but cover any possible loss within the organization instead.

3. Mitigating the risk: entails the investing in both people and technical means who serve as precautionary measures and defense mechanisms against it. As it is inferred, this is a method which tries to deal with incidents in advance.

4. Transferring the risk for a fee: involves the transfer of the risk to another organization for a fee, as long as this unit operates as a licensed insurance company. Such an action enables the individual to alleviate its paying for the occurrence of uncertain events by turning them into foreseeable periodic payouts.

Given the interests of the insurer and the insured, the combination of those leads to a market solution which satisfies both sides. As we can infer, cyber insurance should be regarded as only one of the available alternatives concerning cyber risk management. It would be optimal for each firm or agency to cover its whole hazard through cyber insurance. However, since such an option is not economically possible, a combination of the aforementioned alternatives is preferred so that expected utility is maximized.

Development of cyber insurance in the recent years

The main reason why cyber insurance was created was the inability of the already existing types of insurance to cover internet risks, as they are designed to cover traditional and more conventional perils. As a result, the first cyber insurance policies were introduced in the late 1990s, which in fact offered only rudimentary services (limited coverage and first party insurance). With the advent of time they gradually developed more and became more prominent. Two factors actually boosted this development. First of all, a plethora of serious - cyber or not - attacks against major US corporations and agencies occurred in the beginning of the new millennium (and mainly the attack on September 11th), shaking off the pre-2000 image of cyber risk. However, increased risk is not only a result of intensified cyber assaults but also of the widespread use of internet and technology advancements in the recent years, which increase the number of possible perpetrators of a cyber assault. The second reason why cyber insurance has rapidly developed is regulated legislation (HIPAA, Gramm Leach Bliley), requiring advanced security standards for computerized property. Today's much more sophisticated policies offer higher coverage which includes first and third party insurance. Insurance companies are also able to differentiate their products and determine each policy according to each client's specific needs. This advance-

ment of cyber insurance has led to higher recognition recently, the number of insurance contracts having increased to an important extent.

Benefits of cyber insurance

Cyber insurance is nowadays of the utmost importance through its double role in reimbursing in case of an incident and constantly giving feedback on methods to prevent attacks or loss. An efficient funding mechanism is created so as to pay for financial losses caused by cyber incidents, disseminating financial risk in a way that it is absorbed among interdependent policyholders. Insured businesses are also required to take self-defense measures, which are recommended by an insurance company's agent and lead to advanced IT security. In addition, in light of the fact that the expert agents set the security standards that an insured enterprise has to meet, security resources are used in a wise and effective manner. If we want to summarize its benefits we definitely have to take those into consideration:

- combination of private benefits and social welfare/good.

- motivation for someone to invest in information security, which reduces hazard not only for the investing business but for the whole network as well, since risk is usually interdependent

- quantitative tools for the appraisal and the assessment of security

- market-oriented IT risk management, through a mechanism for disseminating risk among participating stakeholders

- data accumulation and annunciation - implementation of best practices

- development of infrastructure suitable for the support of IT management

- moderation of cyber terror risk

Cyber Insurance Coverage for businesses

Categorizing cyber risk

The increased rate of cyber-crime and cyber

risk in general has led companies, governments and individuals to seek new methods beyond the classical ones (antivirus, cryptography, etc) in order to get protection, namely cyber-insurance. The first step for a successive cyber insurance strategy is the classification of cyber risk. There are two major classifications: 1. by the nature of the disaster and 2. by the nature of the assets. By the nature of the disaster the risk is divided into:

- Hardware Hazard: HH is caused by accidental incidents that can be predicted by the company and are relatively easy to confront with.

- Software Hazard: SH is associated with cyber-crime and internet/network risk

Nevertheless, the Computer Security Organization proceeded to a more accurate categorization than the already existing so as to solve the issue of what risk is predictable and what is not. Thus, according to CSI, we can divide the assets of an enterprise and thus its possible threatens-risk into:

- Networks: Resources shared by a plethora of devices through LAN or online systems

- Software: Anything stored electronically

- Data: Information transformed into binary digital form

- Physical components: Machines or part of machines
These risks affect the company or the individual in a different manner. A further categorization gives us two different kinds of loss therefore mentioned threatens may lead to:

- Immediate losses: affect directly a major activity of a company or an individual (e.g. shrunk productivity)

- Indirect losses: are the side effects of immediate losses (e.g. data breaches)

Cyber insurance coverage
All the previous information implies the way coverage should be planned. Cyber insurance is categorized into 3 fundamental insurance policies.

- First party: This coverage refers to any financial loss which is related to the company itself. The company suffers from losses which affect its production process, internal function such us distribution of information between the departments of the company computer network. First party examples include: Security business interruption, public relations, loss of IP system, disruption lost or damaged data, invasion of privacy

- Third party: A company's legal liabilities to others. In other words third party insurance offered by the insurer (2nd party) protects the insured company (1st party) against the claims of another enterprise or individual (3rd party). Some of the most common third-party problems are: Trademark violation, Network security liability, Dos attacks, Downstream network, Cyber piracy (music, movies), Copyright, Media liability

- Reputation risk: the less quantifiable damages such as those arising from a loss of reputation and brand identity

Third party and first party cyber insurance can be combined with other third party insurance policies like CGL, E&O, D&O or EPL.

Cyber Insurance Issues
1) Pricing: The procedure of pricing is actually based on actuarial tables which are linked to historical data. However, internet is relatively new and the information of security breaches is even less. In addition, many firms hide information from the insurance companies, relative to a security breach. The insurance companies have made an effort in order to set a pattern of pricing. In fact, some of them claim that they have managed to quantify the risk that other companies think is unquantifiable. The problem is that, due to the high uncertainty, the companies do not know if they charge the right premium.

2) Asymmetric Information – adverse selection: The insurance company can

face the problem of asymmetric information both before and after the sign of the contract between the two parties. Asymmetric information is the situation where the one party has private information that others lack and the cost of information is extremely high for some players in order to acquire it. This problem is linked with the adverse selection problem, in which the potential candidate can find a premium which is more attractive comparing with a customer of low risk profile and this is result of private information that the firm has and hides from the insurance company. In other words, the firm or the customer is more willing to buy an insurance product when the probability of loss is higher rather than the probability is low. Of course the insurers apply some mechanisms in order to reduce this problem, and as a result, the high risk firms cannot present themselves as low risk and a market failure is being prevented.

3) Moral hazard: When there is a full coverage of loss from the insurance company, the customer has little motivation to take precautionary actions in order to prevent loss. This is the problem of moral hazard. The insurers should take measures against this issue. The security level can be checked either ex ante or ex post. In the case of ex ante check of the firm, the cyber insurer categorizes the firm according to the risk level of it. If the firm utilizes less self-protection or is exposed to online activities and the case of a cyber-attack is more than possible, the cyber insurer categorizes the firm as high risk. In the ex post case, the insurer conducts research in order to check the company's information infrastructure, change the company's security profile or process to research when a company claims losses.

4) Externality: Internet security externalities are result of the interdependency and the interconnectivity. Because the computer systems have interdependent security, in case of a possible security event such as a virus penetration to the system, it is possible that other computer systems will be affected by this penetration even if these computer systems are not relevant to the owner.

Authors	YEAR	MODEL	TOPIC
LAMBRINOUDAKIS ET AL	2005	MARKOV MODEL	STATES OF PROBABILISTIC SYSTEM
HERATH & HERATH	2006	COPULA METHODOLOGY	MULTIVARIATE DISTRIBUTION FUNCTIONS
MUKHOPADHYAY ET AL	2006	BAYESIAN BELIEF NETWORKS (BBN)	UNCERTAIN EVENTS
BOHME & KATARIA	2006	CORRELATION	WITHIN A FIRM, AT GLOBAL LEVEL
BOJANC & JERMAN-BLAZIC	2008	QUANTITATIVE RISK METRICS	DATA ANALYSIS
PAL,GOLUBCHIK,PSOUNIS	2011	AEGIS MODEL	PARTIAL RECOVERY CONTRACTS
JOHNSON,BOHME,GROSSKLAGS	2011	BASE MODEL	NASH SYMMETRIC EQUILIBRIUMS

Table 1: Related Work on cyber insurance modeling

Conclusions and further work

As a further work we can investigate the extent of use of cyber insurance from a business perspective, their satisfaction from the coverage offered, and other ways of mitigation cyber risk. Moreover, it would be interesting to extend the literature on cyber insurance modeling with a comparative evaluation of all the existing models.

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The Human Bias Component in the Lehman Brothers Collapse

In the following paper we are going to analyze the behavioral finance aspect in the Lehman Brothers case that affected the solvency and consequently the bankruptcy of the company. The analysis is centered on the acquisition of Archstone in October 2007, which was the second largest publicly traded apartment REIT in the U.S., as measured by market capitalization and enterprise value. In the following paragraphs we are going to see the role that certain behavioral biases played, such as conservatism bias, confirmation bias, attachment bias, endowment effect and over-confidence and overinvestment in corporate settings, on the demise of Lehman Brothers in 2008.

Together with Tishman Speyer, a US based real-estate company, Lehman made a combined bid for Archstone-Smith Trust valued at $23.6 bn in May 2007. Archstone owned thousands of luxury real estate properties across the US with highly leveraged financing structures, implying leverage ratio (D/E) equal to x3.35. The Archstone equity positions were subordinated to over three-quarters (77%) of the initial capital structure. As a result, a decline in enterprise value of more than 25% would result in a complete loss in the value of the equity. Lehman expected that Archstone would sell $9.2 bn of properties prior to closing to at closing, and use the proceeds to immediately repay a portion of the acquisition financing provided by Lehman and its partner banks, which ended up selling assets for only $1.4 bn. This deal became one of the biggest mistakes of Lehman. It will later be referred to as the "Wall Street Sin", because the asset was purchased at the peak price of the bubble. In the November 2007 Level 3 assets[1] ratio over Lehman's equity has risen up to 107%.

Analysts that initially perceived the deal favorable for Lehman changed their option shortly. An article published in the Wall Street Journal on August 1, 2007 suggested that Lehman might find it advantageous to cancel the acquisition and pay Archstone a $1.5 billion break-up fee rather than "try to swallow all that debt."[2] Observing how sub-prime crisis was wiping out liquidity from the real estate market analysts were questioning if Lehman and his partner banks will be able to find enough debt financing and close the deal. A week later Citigroup analysts Jonathan Litt and Craig Melcher mentioned that deterioration of the REIT market could result

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[1] According to classification system of FASB Statement 157, assets whose fair value cannot be determined by using observable measures, such as market prices or models. The values are based on prices or valuation techniques that require inputs that are both unobservable and significant to the overall fair value measurement. These inputs reflect management's own assumptions about the assumptions a market participant would use in pricing the asset or liability; examples include certain private equity investments, certain residential and commercial mortgage related assets (including loans, securities and derivatives).

[2] Alex Frangos, If It Actually Happens, Wall St. J., Aug. 18, 2007, at p. A2.

in the deal being re-priced or paying out the break-up fee will cost Lehman shareholders cheaper than processing it[3]. On July 27, 2007, Mark A. Walsh, Head of Global Real Estate Group in Lehman reported that the institutional market for investments backed by commercial real estate was "virtually closed"[4], some private equity acquirers were ending up walking away from real estate deals or negotiating high discount. Despite those red flags, Lehman didn't cancel the deal and proceeded further. This is an indication of confirmation, as well as, conservatism bias, since in this case Lehman's management was too conservative in altering its beliefs in response to new information. Lehman could not admit that there were significant deviations from its future projections of the acquirer's valuation and was strongly attached to its previous estimates, even if it knew that it was beneficial for the company to cancel this deal. In addition, Lehman persistently ignored the evidence which was contrary to the acquisition. We have to mention that conservatism bias does not always have negative repercussions. In many cases, change is not beneficial and can result in less utility than that of the previous condition. However, it is apparent that Lehman was conservative at exactly the wrong moment, after buying the assets of Archstone, and not before its risky bet.

On September 26, 2007, S&P downgraded its expected ratings for Archstone's acquisition debt from BBB+ to BB-, noting that Archstone company credit rating remained on CreditWatch with negative implications. S&P explained that the expected downgrade was due to the "more aggressive financial profile," "weak" debt protections (measures to insure payment of debt), and the risk associated with Archstone's plan to increase development.[5] S&P noted that the purchase price implied a 4% capitalization rate[6] and that an increase in capitalization rates to a "more conservative" 7% would reduce Archstone's equity value to zero.

On January 21, 2008, Barron's published an article titled "Apartment House Blues" that questioned the value of Archstone's equity. According to the article, "with apartment REITs down 30% since October", Lehman was using too low capitalization ratio of 4.3% while its closest comparable AvalonBay was valued at 6.3%. "Privately held Archstone has five times the debt of AvalonBay, a comparable publicly traded real-estate investment trust"[7] was stated by analyst. Application of 6% capitalization rate would have destroyed $5 bn equity and arrive at $14 bn valuation which was lower that face value of the debt at the moment.

Going-In Capitalization Rate Sensitivity Analysis (Q1 2008)

Core Portfolio Cap Rate	4.11%	4.25%	4.50%	4.75%	5.00%	5.25%	5.50%	5.75%	6.00%
Reduction in Total Equity Value	0	596	1,551	2,406	3,175	3,871	4,504	5,081	5,611
Reduction in Lehman's Equity (46.8%)	0	279	726	1,127	1,487	1,813	2,109	2,379	2,627
Write-Downs Taken by Lehman as of Q1 2008	262	262	262	262	262	262	262	262	262
Incremental Write-Downs	(262)	17	464	865	1,225	1,551	1,847	2,117	2,365

Source: Valukas report.

[3] Updated - Archstone Fallout: Is the Debt Fuel Tank Running on Empty?/Randyl Drummer/ Costar.com /August 9, 2007

[4] Anton Valukas report, March 11, 2010

[5] Lehman needs to raise capital; another rating cut will hurt/Alistair Barr/MarketWatch/ June 3, 2008

[6] A capitalization rate is the ratio of income to value. As value is the denominator, the higher the capitalization rate, the lower the value of the real estate asset.

[7] Apartment-House Blues/Andrew Bary/Barron's/ January 21, 2008

In response to the article Lehman's representatives prepared the following arguments

1. "The 10 most recent sales in Archstone's markets occurred at an average going-in capitalization rate of 4.6%, which was significantly lower than the capitalization rates of 6% and higher discussed in the Barron's article"[4]

In fact: A spreadsheet circulated among Lehman employees contained two set of data: with 10 transactions of Archstone and other 27 transactions in different markets than of Archstone with average of 5.7% capitalization rate on the first page and other 250 transactions located in near Archstone's market with average capitalization rate over 6%, which was not on the printable area of the sheet.

Our comment: This indicates that Lehman looked persistently for information to confirm its existing beliefs and ignored at the same time the information that was contrary to those beliefs. This bias proved to be dangerous and undermined significantly Lehman's solvency.

2. "Underlying fundamentals, as evidenced by actual 5% rent growth in 2007 and projected rent growth of 5% for 2008, were strong".[4]

In fact: In October 07 –January 08 Case–Shiller index (CSXR)[8] fell 8% and market expectations about real estate sector were much more pessimistic.

Our comment: Anchoring bias. The management used persistently preexisting opinions and facts as anchors and adjusted slowly from those anchors with regards to the expectations of the future. That was one reason why it was difficult for Walsh to convince the management to write-off these assets early.

3. "Publicly traded apartment REITs were trading below Net Asset Value as quantified by contemporaneous analysts"[4]

In fact: Archstone CEO was arguing that public market was inefficient and could not be used as an indicator for private assets, but according to SFAS 157 such kind of asset was a subject of valuation with market comparables. Moreover, Archstone was liable to the same factors on the market as its public comparables.

Our comment: Denial bias avoids people to accept uncomfortable facts that could be painful for them. In this case Archstone CEO was refusing to believe that market quotes for REIT assets were representative and reflected real state of the demand and supply in the market.

4. "Archstone assets are more desirable than other real estate assets; Investors place a very high value on the ability to acquire these types of [Archstone's] assets, at any point in the real estate cycle. We are in a period of more limited transactional volume today, but there is still significant demand to purchase the assets we own at very attractive prices, and we will continue to consummate transactions with qualified buyers and partners as we move forward."[9]

In fact: Investors were considering Archstone as 'risky' credit with leverage at 76% and an operating business that was not covering its debt, that was the reason why Lehman still couldn't sell the debt of the asset in private market.

Our comment: This is a classical example of a branch of prospect theory, the endowment effect (Thaler) in which people tend to value a good more once they establish their property rights on it. Lehman's man-

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[8] The composite index of the home price index for the top 10 Metropolitan Statistical Areas in the United States. The index is published monthly by Standard & Poor's and uses the Karl Case and Robert Shiller method of a house price index using a modified version of the weighted-repeat sales methodology. This method is able to adjust for the quality of the homes sold, unlike simple indices based on averages./Wikipedia

[9] E-mail of R. Scot Sellers, Archstone's CEO, to Lehman, Tishman Speyer and Archstone personnel

agement formed an attachment to the specific assets they purchased. Endowment effect is contrary to the classical economic theory. Traditional theory of finance would indicate that a person's willingness to pay for a good would be equal to their willingness to accept compensation to be deprived of the good, underlying the theory of the irrational consumer and indifference curves (Wikipedia, 2006). In the case of Lehman, management assigned a disproportionately higher value in its existing assets than it would assign if it did not own them and as a result it could not perform a rational cost-benefit analysis.

In November 2007-August 2008 Lehman wrote off only 9% of the Archstone position while Case–Shiller index (CSXR) fell 18% in the same period. According to Anton Valukas, Examiner appointed by a bankruptcy court in New York in early 2009, Lehman should have written off from the Archstone position additional $800 mio in May 2008. Unfortunately, that was not the single case when Lehman stubbornly kept bad asset on its balance sheet, there were huge leveraged positions in real estate related securities and derivatives that were losing in value every day. Desperate attempts write off part of those assets in and raise additional capital in 2008 were "too little and too late". Due diligence held by BOA team in 10-12 September 2008 detected $66 bn of bad assets that made them reluctant to acquire Lehman without government support to shed those assets out.

Overconfidence was also present in the decision of Lehman to buy and hold Archstone assets. Lehman was confident that the high growth levels of Archstone during the period 2002-2007 would continue and as a result the company overinvested its capital in that risky venture, ignoring that high growth is usually short-lived (Goldstein). Lehman bought commercial real estate assets exactly at the peak of the cycle and paid a peak price, ignoring the big reversal that was imminent, since the credit crunch was already beginning to unfold. It was really hard for Lehman's management to sell their newly acquired

assets at a lower price, because their anchors from the previous growth of the assets were adjusting slowly.

Another important factor behind the realization of this troubled deal was the fact that the management of Lehman had motivations to take on more risks in order not to be fired by the board of directors. Individuals are willing to double and triple their risks if they can potentially reverse a big loss (Leeson in Barrings). It was also extremely difficult for the management to initially admit that it was wrong in its estimation on the valuation of the assets and that contributed to the reluctance of the management to sell losers before they would collapse entirely. Lehman's big bet in commercial real estate assets proved to be the primary culprit behind the firm's collapse. We admit that many other factors such as easement of credit standards, low interest rates in 2001-2004 years, development of securitization, conflict of interests of investment banks, rating agencies and insurers with investors, high leverage of the balance sheets were the key points of the current crisis but all of them were based on the decision making of human beings whose irrationality and biases build fundamentals of asymmetries in their economical behavior.

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Social Networks and Political Candidates

Introduction

The last three years, social networks have gathered mainstream attention as they keep attracting more and more users. Studies show that the average time spent on popular social networks per day is increasing. There is a widespread trend that everyone should participate. Even those with little experience on the Internet want to be a part of it, or at least they try. As a result, the quality of information shared is doubtful and therefore promotional strategies need to be more accurate.

Lately we have witnessed an increasing presence of political candidates on social networks. The start was made by well-known politicians - such as the President of the United States - leading the way for others to follow. They create accounts in popular social networks so as to promote their political campaigns. Most of the time, communication between candidate and users is established through a less formal approach regarding personal questions. Naturally, social networks are used to promote official statements as well.

Politicians and Social Networks

Social networks attract people who use them mostly for fun. This Internet activity is a part of our everyday life and helps us keep in touch with our friends and families. In most cases users do not like the presence of companies or professionals spoiling the feel of social networks. As you may imagine, politicians are not excluded and that is where a social network strategy is necessary. When a politician decides to use a social network as a promoting tool; he must be well prepared to face a huge and sudden exposure.

There are two main reasons politicians use social networks. First of all is the need to communicate in real time with citizens. In a constantly-evolving world where news spread faster than ever; a politician needs to be in the right place to express an opinion or give a piece of advice to his fellow citizens. Furthermore, a politician might want to make a statement - which reflects his personality - without the contribution of major media. The second reason for a politician to use a social network is to promote his nomination in order to be elected. A candidate's presence on a social network is an essential element in every online campaign and the politician benefits from the unlimited range of questions posed. The informal nature of social networks allows candidates to become more passionate and aggressive as the elections approach.

What they do

Politicians need to understand that people want them to be more responsible in their online activity. Personal incidents that do not agree with the politician's status, should be well considered before "sharing" with the public. The political candidate should pre-decide the attitude followed prior to "going online". It is important to be genuine and outline the whole strategy from the beginning to its end so as to trace mistakes before they even happen.

It's important not to forget that social networks possess the power of speed. Before sharing one must be sure about the shared content. Many consider a politician as a reliable source and he should not risk his credibility by "sharing" untrue or even doubtful information. People tend to recognize those who take advantage of their position to share propagandistic views and they gradually exclude them form their online community.

Listening to the voters is important when using social networks. Trying to take the pulse of users is a crucial element in every modern campaign. User feedback can lead to the modification of the promotional approach from the ground up. After all it is an easy way to examine whether changes are needed or not.

The phenomenon of parody accounts can cause serious problems in a political campaign. During a pre-election period these accounts might misinform users and lead them to false decisions. Politicians and political parties must act as soon as possible to deactivate these parody accounts and notify accordingly the users if necessary. A politician must provide credentials that prove his true identity, as people become more and more engaged in social networks.

The financial advantage of social media for a political campaign

Why should a political candidate prefer a social network presence instead of traditional advertising methods? During the pre-election period we are used to debates and political commercials as well as interviews on mainstream media such as television and newspapers. However, as the use of the Internet expands, more and more voters do not trust mass media and use the Internet as their major source for news. As a result, candidates should also focus in a digital political campaign.

Unfortunately Internet campaigns can cost huge amount if not planed correctly. Typical advertisements such as banners and emails are considered obsolete and users do not even notice them. On the other hand, social networks give users the chance to interact with a political candidate and interview him in a very casual way. A candidate can present his views and ideals without extra costs and also without the pressure of highly cost television time.

It is free, fast and rather easy to create a new account in any social network. Connections between users are created rapidly and conversation can start immediately. Except from personal communication, social networks offer candidates the necessary services to identify their supporters and monitor their reactions without having to hire a professional. Moreover, social network demographics show that adults are present in the majority of those networks. It is the most inexpensive way for a candidate to reach out and interact with undecided voters in a daily basis.

As social networks expand, a political candidate's fan base expands. Nowadays it is not difficult to discover potential voters as more and more citizens gather in social networks. Television advertisements cost a fortune and just cannot be as targeted as a digital campaign. Furthermore, the free nature of social media makes them appropriate even for candidates of smaller parties.

A candidate's opinions are the best promoting material. They should be sincere and cost free. Good writing skills are the only characteristic needed to promote them correctly. In order to create an effective campaign; a candidate should be able to demonstrate a skillful use of written language. In addition, pictures with smart messages that are not offensive have been proven very efficient for a campaign.

Social networking ROI is yet to be calculated, as the influence of social media cannot be measured easily. However, it is essential, as the candidates need to know whether the time spent is justified. To show the true value of social media for the campaign, other types of social media metrics should be used as well such as social connections (followers, friends, likes), engagement rates, retweet rates. Knowing which status update or tweet delivered the most conversions helps the candidate optimize his social media image.

Conclusion

Social networks give the opportunity to candidates to find like-minded people, reach, and interact with them. A candidate is presented in a more outspoken and open way to the public through likes, tweets, pins and posts that improve his image. Political campaigns using social media are becoming cost efficient. Printed flyers seem useless and television advertisements are nothing more than an outdated, expensive practice, effective only during prime time. Political success no longer depends only on the mass media, such as television, radio, newspapers and magazines; politicians should be a part of the social media as well.

Modern politicians should be able to interact with people but also understand their concerns. Certainly, it is an advantage for political candidates to be a part of this new trend that is becoming an active part of our modern society. In order to achieve a successful social media presence and acceptance from the users a political candidate should embrace suggestions and accept feedback. A candidate's image on social media must be consistent based on his political opinions, views and values. Overall, social media are a powerful tool for any campaign as they are able to present a candidate in the most open and sincere way.

Company Report

Valuation & Research Specialists (VRS)
Equity Research Team
info@valueinvest.gr

Common St. Price (1/8/2012)	**€ 12.84**
Preferred St. Price (1/8/2012)	**€ 5.70**
# of Com. Shares (,000)	77,064
# of Pref. Shares (,000)	7,569
Market Cap (in € mn)	1,032.64
A.D. Volume (p) (com.)	48,153
Beta (com.)	0.89

Statistical Data (Com. St.)

Max 52 week	15.40 €
Min 52 week	9.47 €
1-M Rtn	-6.75%
6-M Rtn	-1.98%
12-M Rtn	-10.83%

Shareholders' Structure (Common Stock)

(end of 2011)

Greek Instit. Inv.	5.8%
Foreign Instit. Inv.	33.0%
Other Legal Entities	16.8%
Treasury Shares	4.0%
Private Investors	42.6%

Source: The Company, Reuters, VRS.

Common Stock Price Performance (1 year, in €)
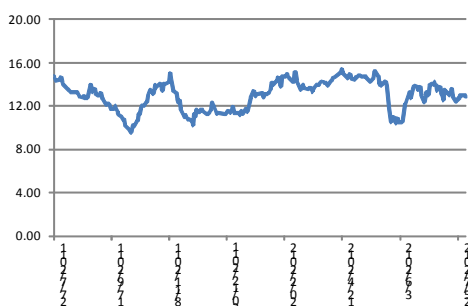
Titan Cement S.A.   [Bloomberg Ticker: TITK:GA, Reuters Ticker: TTNr.AT]

Business Sector: Cement Industries, Building Materials

Business Profile – Growth Drivers

➢ Established in 1902, Titan S.A. (the Company or the Group) is an international building materials and cement producer with operations in the US, Greece, Western Europe, South Eastern Europe and Eastern Mediterranean region. The Company is based in Athens, Greece, and is listed on Athens Exchange.

➢ As producer, Titan covers a wide spectrum of heavy building materials: cement, ready-mix concrete, concrete blocks, dry-mix mortars, fly ash and aggregates.

➢ Titan has achieved a significant geographic diversification of operations through investments of more than EUR 3.1 billion in the period 2000 – 2011.

Corporate Strategy

➢ According to the Management, Titan aims at strengthening its position as a multi-regional, vertically integrated building materials and cement producer, respecting the interests of all stakeholders, including society and environment.

➢ The Group has proceeded with a restructuring plan targeting synergies and cost reductions throughout its international operations. The Management estimates that the plan will generate recurring EBITDA savings of EUR 26 million over the period 2011 – 2013. One-off charges are expected to amount to EUR 14 million (2011 – 2013). During the period 2009 – 2011, consolidated net debt was reduced by a total EUR 406 million.

Financial Highlights 2011 (Consolidated)

➢ Group turnover breakdown on geographic basis settled as follows in 2011 (EUR million): USA 303.7, Greece and Western Europe 268.7, South Eastern Europe 241.2 and Eastern Mediterranean 277.8. Group EBITDA breakdown was the following (EUR million): USA -5.7, Greece and Western Europe 35, South Eastern Europe 85.6 and Eastern Mediterranean 127.7.

➢ As of 31 December 2011, the Group's equity settled at EUR 1,557.47 million with its outstanding long-term and short-term bank debt at EUR 1,041.66 million. Cash and cash equivalents amounted to EUR 333.94 million. Net cash flows from operating activities stood at EUR 203.56 million at year end 2011. Group net debt was reduced by EUR 69 million to EUR 708 million in 2011.

➢ Titan's profitability is significantly linked to the performance of the Euro. A rise in the value of the European currency increases the probability of weak earnings performance for the Group.

➢ As of year-end, the Group's bank debt maturity was structured as follows (EUR million): 227 below 1 year, 557 between 2 and 5 years, and 56 over 5 years.

➢ After a 58-year run of successive dividend distributions (1953 - 2010), the Shareholders' Meeting decided that the Company will not distribute dividend for the financial year 2011.

First Quarter 2012 Results (Consolidated)

➢ In 1Q 2012, sales and gross profit accounted for EUR 225.38 million (from EUR 252.90 in 1Q 2011) and EUR 58.68 million (from EUR 77.45 in 1Q 2011) respectively, with net losses settling at EUR 21.20 million versus losses of EUR 3.67 million in 1Q 2011.

➢ As of 31 March 2012, the Group's equity accounted for EUR 1,509.69 million with its outstanding long-term and short-term bank debt at EUR 1,014.09 million. Cash and cash equivalents amounted to EUR 226.21 million. Net cash flows from operating activities stood at EUR -44.77 million in 1Q 2012 versus 14.74 million in 1Q 2011.

Note: Titan SA presented financial year 2011 results at the Hellenic Fund and Asset Management Association on 20 June 2012, in Athens, Greece.

BASIC FINANCIAL INDICATORS

(in € mn)	Sales	EBITDA	EBT	EATAM	P/E (x)	P/BV (x)	EV / EBITDA (x)	DEBT / EQUITY (x)	ROE %
2009	1,360.57	332.70	158.14	121.90	8.47	0.71	6.02	0.68	8.4%
2010	1,284.03	315.09	130.03	112.09	9.21	0.66	5.74	0.54	7.1%
2011	1,043.17	242.67	37.74	21.68	47.63	0.66	7.17	0.67	1.4%

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Covered Company	Bloomberg	Reuters	Common Stock Price	Date	Disclosure
TITAN CEMENT S.A.	TITK:GA	TTNr.AT	€ 12.84	August 1, 2012	2, 3

1. VRS has acted as financial consultant for the covered company within the past 24 months.
2. VRS has sent the research report to the covered company, prior to publication or dissemination, for factual verification.
3. VRS has changed the contents of the initially sent report, with respect to: factual changes have been made.
4. VRS has received compensation from the covered company for the preparation of this research report.
5. VRS produces research reports for this company on systematic basis.
6. VRS produces research reports for this company on demand basis.
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Please contact **VALUATION & RESEARCH SPECIALISTS** for further information on Equity Research Related Fees.

by Pro-Action and Valuation & Research Specialists (VRS)

Oil Analysis Services for the European Markets

June 2012

PRO-ACTION
for business decisions

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PRESS RELEASE

June 2012

PRO-ACTION and VRS announce their collaboration for the provision of Oil Analysis Services for the European Markets. Such services include:

1.	Daily Technical and Fundamental Analysis of the European Oil futures contracts Brent Crude Oil and Gas Oil (Distillates type of products).
2.	Forecast of the Daily fluctuations of the Platts for the next day in the Mediterranean for the Gas Oil (Gasoil 0.1 Med Fob Cargos & 10ppm) and the Fuel Oil 3.5S.

The above-mentioned services address mainly to:
- Traders and Investors in oil futures. They are more convenient for the European traders & investors, since the European markets are more active from the morning till the early evening UK time.

- Any type of physical oil market participants, such as: Refineries, Major Suppliers, Traders, and Brokers.

- Maritime Companies that want to be aware of the daily oil price fluctuations in order to decide on the best short-term time point (+-2 day-interval) for the procurement of oil in order to minimize their bunker fuel costs.

PRO-ACTION with its over 10-year daily engagement in the oil market and its expertise in Technical Analysis and Forecasting is strengthening its portfolio with the contribution of VRS expertise in Fundamental Analysis and the VRS market awareness. The target of PRO-ACTION and VRS is to offer Added-Value to their Customers so that the customers take the Right Decisions at the Right Time and maximize their Benefits, in a fast-changing highly volatile market.

BRENT Crude OIL

Source: PRO-ACTION.

The following comment expressed by PRO-ACTION and VRS does not constitute an offer to sell or a solicitation of an offer to buy any currencies, shares, warrants, convertible securities or options by no means.

Period January -June 2012
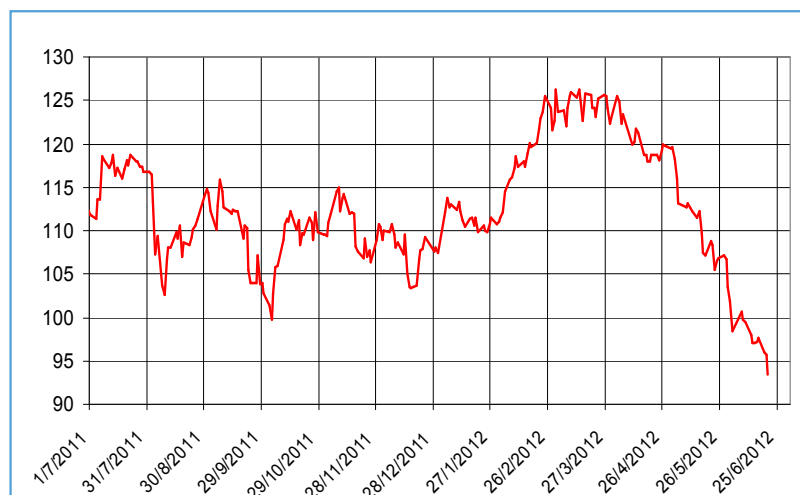
BRENT Crude OIL Overview from January 1st till June 20th, 2012

The BRENT Crude OIL prices kept increasing during the first 2 months of 2012 and moved from the 110 units ($/bbl) till the 125 units. Such increase was mainly the result of the sanctions imposed towards Iran from the US and the European Union thereafter that created major concerns of the oil availability mainly during the second quarter of 2012. In March, prices were rather stabilized around the 125 units ($/bbl) and this created further upward prospects. In parallel, the news from Iran were not at all encouraging since Iran denied any co-operation with the UN inspectors and the prospects of some major events were eminent with a significant issue being the incoming block of the straights of Hormuz from the part of Iran, which would prevent vessels passing from that point and would create serious drawback in the supply chain. However, in April and May prices showed a significant recession and in the early June they moved below the 100 units and close to the 90 units. The reasons for this recession have been on one hand the prospects from the part of Iran that would eventually co-operate with the UN-inspectors in order to avoid the imposed sanctions. On the other hand, the major economic problems in the Eurozone and the slowdown in the manufacturing activity in the US and China inhibited prices from a further upward trend. Last but not least: The weekly US oil inventory reports kept showing a surplus continuously building-up in the Crude Oil inventories and a significantly lower demand for the refined products (Gasoline and Distillates mainly). This also deterred prices from a further increase.

Now prices are in the $95/bbl area.

The technical patterns indicate that the present downward trend will soon approach the 90 units ($/bbl). This is the critical point. If prices move below that level, then they will provide a long-term downward signal. On the other hand, if prices move upwards and surpass the $125/bbl again, then they would provide a long-term upward signal with a target maximum price towards the $150/bbl, which is a new historical record high level. Still, we cannot clear up which scenario is more likely in the longer-term. We are of the opinion that after prices approach the 90 units, there will be some upward reversal but the longer-term definite trend is still unclear especially from a technical point of view. Based on the current market fundamentals and the price historical fluctuations, we estimate that a "fair value" for the BRENT Crude OIL now would be between the 65 and the 75 units ($/bbl). Therefore, the product seems to be still well inflated.

DAILY ANALYSES OF PETROLEUM PRODUCT PRICES

Prices of Petroleum Products constitute a major factor that affects the operation of many companies on a daily basis. These prices are under a constant change even during the day. As a result, the affected companies are in frequent need to reconsider their tactics and daily operation choices, in order to achieve an effective and efficient outcome, with respect to the petroleum price fluctuations.

In order to enable all those interested parties, to schedule IN TIME their appropriate actions that are affected by price changes, PRO-ACTION and VRS offer a new service for Oil Price Analyses. PRO-ACTION and VRS, specialize in Analysis Services and forecasting models for various markets. The Petroleum products are either under direct negotiation in various international exchange markets or are derivatives of other products that are negotiated in those markets. As a result, petroleum product prices mainly depend on the daily negotiations and fluctuations of the corresponding products in the international exchange markets.

PRO-ACTION and VRS offer daily analyses and forecasts for the prices of the European Futures BRENT CRUDE OIL and GAS OIL whose prices are in daily negotiation in the International Commodity Exchange of London (ICE).

As mentioned earlier, PRO-ACTION and VRS can offer daily commentary for the price evolution of the products BRENT CRUDE OIL and GAS OIL in the ICE. Moreover, they can offer FORECASTS for the Trends of the product prices (ie. whether the trend is expected to be Upward, Downward or Stable), both Short-Term (for the next day) and Medium or Long-Term (next weeks or months even).

Short-Term estimates are of interest to those involved in activities affected by small price fluctuations on a daily basis and require Decisions from their part for issues that should be implemented in 1-2 days.

Medium-term estimates are of interest to those companies that engage in inventory management and wish to properly schedule their inventories, so that they minimize their relevant costs and accordingly they maximize their profits from the operation of the corresponding activities.

The current Oil Analyses services mainly address to:

- Crude Oil and Products' Suppliers who are active in the European Markets
- Futures & Options Traders
- Bunker Suppliers and Traders
- Maritime Companies for Bunkers' Cost Regulation

Several clients have been using everyday PRO-ACTION estimates in order to make their short-or medium-term decisions related to product prices.

The exact services offered, are presented below:

DAILY PRICE ANALYSES & FORECASTS FOR EUROPEAN FUTURES PRODUCTS : BRENT CRUDE OIL AND GAS OIL

Prices of BRENT CRUDE OIL are under daily negotiation in the form of Future Contracts in the ICE, with daily closing window at 19:30 UK time. Accordingly, prices of GAS OIL are under daily negotiation in the form of Future Contracts, with daily closing window at 16:30 UK time.

PRO-ACTION and VRS, during the next morning from the closing sessions in the ICE, can provide both short term and longer term estimates for the expected trend of the above product prices.

These estimates are given in the form of a commentary that analyses the current situation as that emanates from the most recent product prices in the ICE sessions. Furthermore, this commentary provides documented predictions on the expected process of product prices during the following sessions.

All the above estimates, both for the GAS OIL and for the BRENT CRUDE OIL, are based on the most advanced technologies used in Technical Analysis of stocks, commodities, currencies and any other products traded in the various exchange markets worldwide.

As explained above, the price estimates and predictions are based on the original product future prices that are negotiated daily in the ICE. For refined products that are related to those products, price trends are usually similar, although there are minor differences that are attributed to other, product specific or local factors.

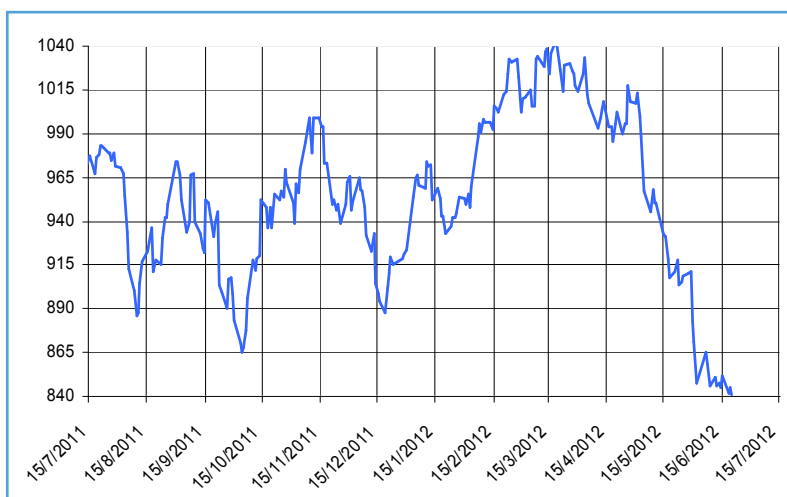## BRENT Crude OIL
Source: PRO-ACTION.

Period June 2011 - June 2012
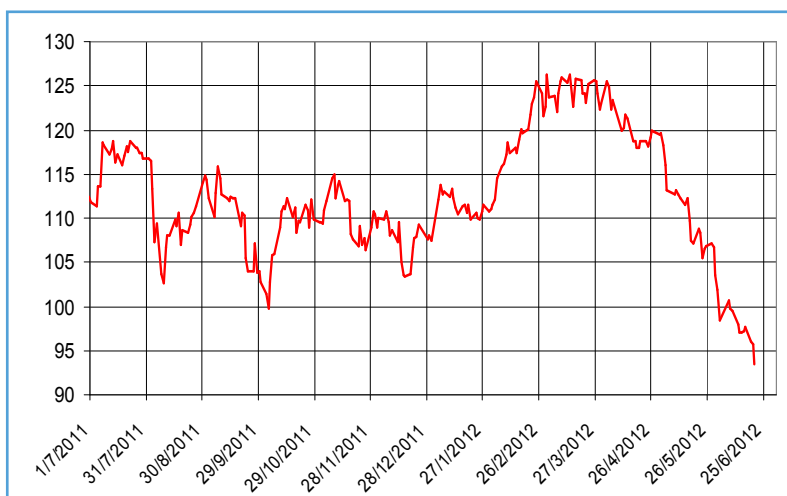
GAS OIL Close
Source: PRO-ACTION.

Period June 2011 - June 2012

PRICE FORECASTS FOR MARINE OIL PRODUCTS
(GAS OIL and FUEL OIL)

Prices used in everyday physical trades between participants in the European Markets, are based on the corresponding Daily Price Assessments issued by specific publishers and used as a Base for pricing agreements. Such Base Price Assessments are issued late every evening and are available for the physical transactions of the next day. The GAS OIL Base Assessments in Europe (NWE & Mediterranean) are directly affected by the corresponding product prices in the ICE, while the

FUEL OIL Base Assessments are affected by the BRENT Crude OIL fluctuations and by the regional traffic of physical cargoes.

PRO-ACTION has developed a Specialized Forecasting Model that can predict Every Day from the Early Afternoon (before 13:00 UK time), the likely Increase or Decrease in the prices of the Next Day for the GAS OIL and the High Sulfur FUEL OIL (3,5S).

Having available the expected trend for the next day, anyone can directly decide whether some activities that could be undertaken either on the day or on the next day, should be directly carried out or be postponed for future days.

From extensive tests carried out by PRO-ACTION with the approval of VRS, it was found out that following the above method for his/her daily decisions, a trader can gain an average of at least 75% from the Maximum Possible Gain that would emanate if he/she knew from the previous day, the real price of the next day.

DAILY Comparisons

Comparison of Actual Daily Fluctuations (Blue Color) Compared to Our Daily Predictions (Red Color)

GAS OIL 0.1S

FUEL OIL 3.5S
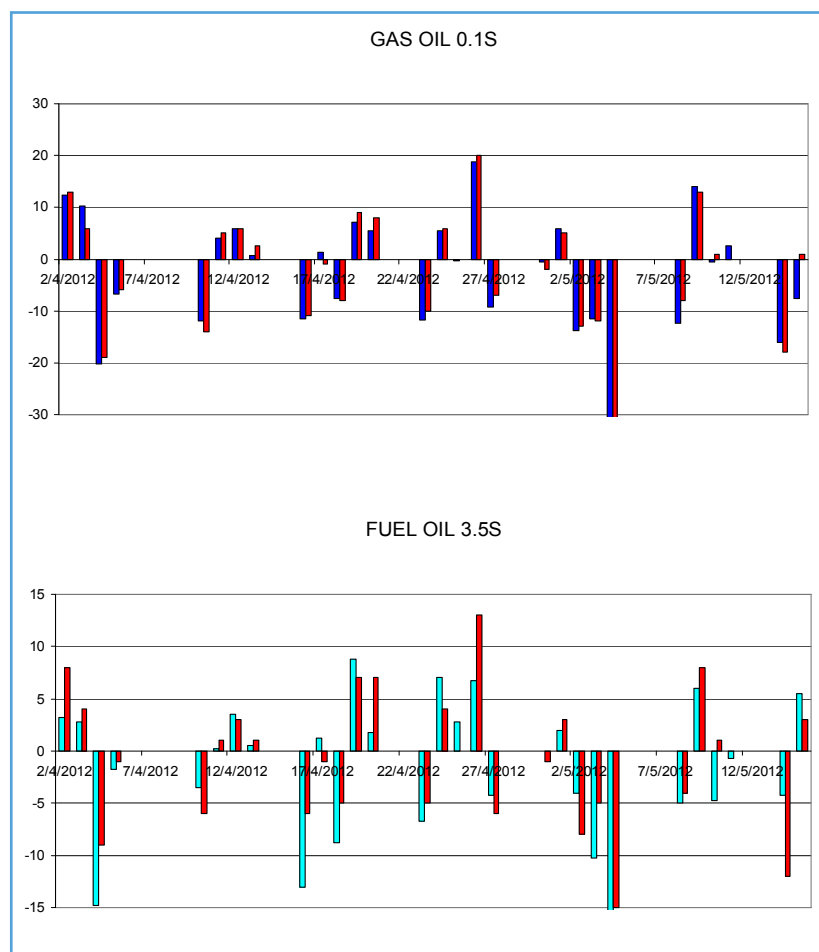
Source: PRO-ACTION.

About PRO-ACTION and VRS

PRO-ACTION is dealing with Predictive Analytics and Business Analysis Services for various sectors, such as Banks, Stock Markets, Retail, Pharmaceutical and Energy. The Oil Markets are a particular sector of interest and PRO-ACTION provides predictive analytics services related to the European Oil markets for the last 11 years with remarkable track record of successful predictions.

VALUATION & RESEARCH SPECIALISTS (VRS)

is an independent firm providing advanced equity research, quality valuations and value-related advisory services to local and international business entities and / or communities. VRS services include valuations of intangible assets, business enterprises, and fixed assets. VRS's focus business is in providing independent equity research to its institutional and retail clients / subscribers. VRS is not a brokerage firm and does not trade in securities of any kind. VRS is not an investment bank and does not act as an underwriter for any type of securities.

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appreciate it

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