SYSTEMATIC RISK AND SENTIMENT: ANTECEDENTS AND MEDIATORS

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SYSTEMATIC RISK AND SENTIMENT: ANTECEDENTS AND MEDIATORS

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This research gave me a great chance to become a part of scientific community and I will make all my best efforts to keep on track.

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Thesis abstract

The main objective of this work is to study the connection between the systematic equity risk of companies located in the tourism industry and a set of information from inside of the company and the market information including investor sentiment. The purpose of the research is to analyze the connection between the main measurement of risk and a set of information among which is the investor sentiment as a representative variable of behavioral finance line of research, which is an active field of recent findings that investigates effect on the valuation of financial assets.

Comparing the explaining power of the standard CAPM model with sentiment-updated models, the latter are able to give a better explanation of risk return dynamics. This thesis investigates the role that information and investor sentiment play in asset pricing and risk measure. Below presented papers are focused on the relationship that came from the point that a firm stock level is a derivative not only of a fundamental rational environment but at the same time is a part of a human mental being, reflexing personal sentiment and group narratives. We seek to know what information explain the equity risk in order to extract this information to estimate a pattern of behaviour, especially for those not listed companies don't have beta. Our research showed that business size and growth along with three indicators of business efficiency, Consumer Prices and the Stoxx Europe 50 index explain the equity risk. The financial crisis of 2008 does not alter the behaviour of the model. In the second paper we analyzed 58 companies in US tourism industry of total set of 72 companies specifying sectors of Arts, Entertainment, Recreation and Accommodation and Food Services. The results show that the level of regression between systematic risk coefficient (β) and sentiment is dependent on high-low period of sentiment, it is stronger during high and low sentiment period and weak during neutral. We also found that high-low period of sentiment affects differently on companies from different clusters and sentiment affected companies are companies belonging to the cluster with low level of financial stability. In the third paper we made an international study of six economic areas and analyzed two large sectors of the tourism industry - Hotel and Entertainment Services and Passenger Transportation Services. Database of 673 companies was constructed and we investigated whether the investor sentiment and other information could explain systematic risk. We confirmed that the size of the database allows us to obtain a statistical model with greater explanatory power and the results show that the investor sentiment together with a combination of accounting and macroeconomic

information are risk explanatory variables, except for USA, Japan and India and for the subsectors of Hotels, Motels & Cruise Lines and Airlines. The investor sentiment shows a negative sign of relation to risk and other explanatory variables vary for each sector and area. Our findings are very useful for tourism enterprises management in different countries, it provides information which explain the equity risk.to facilitate efficient business management and help to objectively quantify the risk without having beta.

List of original articles

1**. Risk management: comparative analysis of systematic risk and effect of the financial crisis on U.S. Tourism industry. Panel data research.**

Kirill Angel, Carlota Menendez-Plans, Neus Orgaz-Guerrero; International Journal of Contemporary Hospitality Management, 2018, Vol. 30 Issue: 3, pp.1920-1938

2. **Systematic risk coefficient and sentiment: peculiarities of sentiment affected companies in US Tourism Industry**

Kirill Angel, Carlota Menendez-Plans; Business and economics journal, 2018, vol.9 (4):378

3. **Investor sentiment and determinants of systematic risk in tourism industry. International study and panel data estimation. (2008-2017)**

Kirill Angel, Carlota Menendez-Plans, Teresa Orbis; working paper

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INTRODUCTION

The core concept of the research is based on relationship between information, sentiment and risk. We analyze tourism industry around the world to be able to estimate systematic risk better. For the first, we go through standard Capital Asset Pricing Model (CAPM) trying to define the variables, which influence on systematic risk coefficient (β), so far understanding the antecedents of risk level and cost of capital. Second, we add behavioral finance mediators to measure stock volatility in relation to market in USA. And finally, we combine sentiment and market/internal information to measure beta in different countries and economic areas, providing the mix of most reliable mediators and model. The dissertation is structured as an essay of three papers.

Our first work is departing from the study of the existent relationship between β and flow of information, influencing portfolio management decision through risk level. The main objective of this work was to study the connection between the systematic equity risk of American companies located in the touristm industry and a set of information from inside of the company and the market. We seek to know what information explains the equity risk in order to extract this information to estimate a pattern of the capital cost of shares behavior. This work provides a good road map for those companies that have a beta, but knowing such information will facilitate efficient management even for companies, which do not have beta. Knowledge what information determines the risk can help to quantify the risk objectively. The research results are very useful particularly for tourism enterprises management of the US market as it provides information explaining the equity risk.

In the first paper we established 3 hyphothesis and found that equity risk is explained by businesses' size and growth, along with three indicators of business efficiency and consumer price and Stoxx Europe 50 indices. The 2008 financial crisis did not alter the behavior of the estimated model, and no difference was found between the two sectors.

In the second chapter we focused on the relationship that came from the point that a firm stock level is a derivative not only of a fundamental rational environment but at the same time is a part of a human mental being, reflexing personal sentiment and group narratives.

This paper investigated the role that investor sentiment plays in asset pricing. While behavioral finance is a relatively new approach in finance research, one of the important areas that researchers have developed is the role that noise traders play in determining asset prices. (Ho et al, 2012) One of the prominent examples of behavioral incorporation into classical pricing model theory is behavioral SDF (b-SDF) developed be Hersh Shefrin. Some

other prominent works confirm the behavioral approach, Hachicha (2008) used indirect sentiment measures, to provide evidence that sentiment levels and changes have important predictive power for stock returns. Antoniou (2012) analyzed how sentiment affects the profitability of price momentum strategies. Results supports this argument by showing that momentum profits arise only under optimism, he found that beta is strongly and positively significant in pessimistic periods. The evidence prove that rational asset pricing models work only when the populace of agents trading in the market is more likely to be predominantly rational.

In the second paper we incorporated behavioral sentiment variables into beta model analyzing cluster peculiarities of sentiment dependent companies. We wanted to understand which companies are mostly affected by sentiment.

We found that the level of regression between systematic risk coefficient (β) and sentiment is dependent on high-low period of sentiment, it is stronger during high and low sentiment period and weak during neutral. We also found that high-low period of sentiment affects differently on companies from different clusters and sentiment affected companies are companies belonging to the cluster with low level of financial stability.

Third paper allowed us to increase the dataset and improve the number of countries and variables to be tested. We followed some recent works in the similar area. Coulton, Dinh and Jackson (2016) analyzed the relationship between sentiment and price formation. The research of Wu, Hao and Lu (2017) focuses on shares listed on the American market but originally from China, France, Germany, Hong Kong, Japan and the United Kingdom and showed that sentiment in the US market has a positive relationship with the deviation in the price between ADR and market, but with a very small economic importance.Piccoli, Da Costa, Da Silva and Cruz (2018) showed that investor sentiment influences the relationship between risk and profitability in the Brazilian stock market. Lin, Chou and Wang (2018) showed that investor sentiment in US market, measured by the index constructed by Baker and Wurgler (2006), has a positive impact on price volatility and the bid-ask spread but that the impact is higher in the future market than the spot market.

Following the findings of the recent papers we increased our sample to 673 companies in the tourism sector from 6 different economies: the United States, Europe, China, Hong Kong, India and Japan. The choice of geographical areas has been determined by the initial number of companies, therefore, some areas had to be eliminated due to the lack of

representativeness. All the companies from the sample are listed on stock market and having accounting information for at least for the last three years of the period under consideration, 2008-2017. The dependent variablewas the systematic risk. To measure the sentiment we have used two indexes: one is the Conference Board Consumer Conficende Index (CCI) and the other one is a Compund Sentiment Index (COSI)) based on CCI (Consumer Confidence Index), BCI (Business Confidence Index), CLI (Composite Leading Indicator) and VIX (Volatility Index), lso we used 24 explanatory variables from inside and outside of the company. To generalize the results of this study we can conclude that investor sentiment, macroeconomic variables and information coming from the company always take part in a model that explains risk for the each zone and sector. There is a difference between US companies and European companies and there is a difference between Europe and Asia.

Concluding we can say that despite the relationship among beta (β) and stock fluctuations have been widely studied in the academic literature, most of the works have focused on CAPM as itself. However, the study of the literature revealed the current concern about the relationship between equity risk and available information. Proof of this interest is the recent work of Babencko, Boguth and Tserlukevich (2016), Boz Menendez-Plans and Orgaz-Guerrero (2015). The necessity to find out the antecedents of β as the informational source had been underlined in the works of some authors. For example, the study of Chiang, Huguan and Sagi (2015) shows the importance of risk determination factors for investors as a raw material.

At the same time, the other wing of researchers provided papers on the topic of correlation between stock return and emotional sentiment of investors. Antoniou (2012) consider whether sentiment affects the validity of CAPM. H.Shefrin (2014), Baker and Wurgler (2006) provided some models for interrelations. But all researches still remain rudimental and need to be combined providing relevant and reliable data.

Our papers are depeen the understanding of systematic risk and its mediators and pushing scientific community for further research in mentioned areas.

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CHAPTER I.

"Risk management: comparative analysis of systematic risk and effect of the financial crisis on U.S. Tourism industry. Panel data research."

INTRODUCTION

The cost of capital is a fundamental variable used to manage companies' finances efficiently. Many decisions and processes depend on this variable, such as analyzing investment feasibility, calculating shares and company market value, and determining optimal level of debt. The value of the cost of capital influences these decisions, and, therefore, this value needs to be determined objectively and rationally. The cost of capital is a fundamental variable used to determine the discount rate in any valuation process. This variable's value clearly influences this process's outcome, and variations in the variable's value naturally make companies' market value fluctuate substantially. Arbitrariness in determining the cost of capital makes the process of making financial decisions irrational and unscientific, so having a methodology to determine the cost of capital at any stage—free of subjectivity—is extremely important.

Damodaran (2012) showed how the cost of capital is determined by the risk level of the asset analyzed. If what is being calculated is the market value of a share, the risk to use is the risk of that stock, which, according to capital asset pricing model (CAPM) theory, is determined by the company's systematic risk or its beta. While beta has been criticized in various articles, further explanation and utilization of betas is highlighted in Brealey *et al.*'s (2013) latest study, as well as research by Babenko *et al.* (2016), Youn *et al.* (2015), Baele *et al.* (2015), Da *et al.* (2012), Wang *et al.* (2012). Therefore, the beta is still a valid, objective, and systematic equity risk measure that allows researchers to calculate the minimum required return or the cost of capital of publicly-traded companies' shares.

However, not all companies have a beta. Therefore, knowing which information explains equity risk constitutes an extremely useful management tool because it indicates how to estimate the cost of capital rationally and what information must be observed to anticipate movements of risk. These last have a significant influence on the market value of shares, and maximizing this value is the main objective of all companies.

The present research's primary goal to analyze the connection between systematic equity risk of American tourism industry companies and the set of inside information from these firms and their markets. We sought to understand which information explains equity risk in order to identify patterns of behavior - especially for those companies without a beta—in terms of the cost of share capital for small and medium-sized enterprises (SMEs). Companies' financial management is more efficient and precise when their cost of capital calculation is exact and accurate.

Since systematic risk is not the same for all economic sectors or markets, as shown by Foster *et al.* (2012), we decided to study the connection between the beta and information using data from US markets, with a focus on data on businesses in the tourism industry. We selected the US market because of its importance as a financial market and the tourist industry, in particular, for its economic significance. The direct contribution of the travel and tourism sectors to the US gross domestic product (GDP) was 2,7% in 2013 and 3,5% in 2014, and they contributed 5 426 500 direct jobs in 2014, 3,8% of total employment. In addition, Park and Jang's (2014) recent study highlighted the need to continue research combining hospitality with the fields of finance and/or accounting.

To carry out the present research, we used a panel data technique and combined accounting information from the selected companies with macroeconomic information from the market to develop our independent variables. We can conclude that some previous papers had shown statistically significant relationship between risk and company information while CAPM theory states that systematic risk is only determined by macroeconomic factors only. For example, Kim *et al.*'s (2012) research revealed that size gives a negative effect on the risk of shares while debt level and entrepreneurial growth show positive effect. Chen (2013), in turn, found that there is a positive effect on systematic risk because of a correlation between debt ratio and state ownership positively, while Boz *et al.* (2015) showed that company size is a variable with a high explanatory power for systematic risk.

The current research considered companies' beta (i.e., systematic equity risk) a dependent variable, estimating this using the ordinary least squares between daily returns on stocks and daily returns of the Dow Jones stock index. Fourteen financial indicators (i.e., accounting information) and six macroeconomic parameters were used as independent variables.

The sample consisted of 79 American tourism sector firms, which fall within Categories 71 (i.e., Arts, Entertainment, and Recreation) (AER) and 72 (i.e., Accommodation and Food

Services) (AFS) from the North American Industry Classification System (NAICS). We used two dummy variables. The first separates the sample into two periods - before and after 2008 - when the current financial and economic crisis started. The second dummy variable differentiates between the sampled companies according to their NAICS categories.

The study's purpose was to test the following four hypotheses:

1. The information that determines systematic equity risk in the American tourism industry is different from the information that explains market risk in the same sector for the European stock market.
2. Macroeconomic information plays an important role in explaining systematic equity risk.
3. Differences exist between the two sectors in the sample.
4. The current financial crisis influences the relationship between systematic risk and information.

This study constitutes a research breakthrough for five reasons:

1. A panel data technique was applied.
2. Accounting and macroeconomic information were used together.
3. Large tourism, restaurant, and hotel sector companies have rarely been analyzed in previous research.
4. This research analyzed the differences between the sample's two sectors (i.e.,Arts, Entertainment and Recreation vs. Accommodation and Food Services).
5. The study examined whether the financial crisis starting in 2008 has affected the relationship between systematic risk and information.

Jang and Park's (2011) literature review showed that the aforementioned sectors have seldom been researched - only six studies out of 113. The above mentioned paper indicates that regression analysis is used frequently by hospitality finance researchers for their research models estimations, and different types of regression shape 43,3% of these studies. In addition, Law *et al.* (2012) confirmed that the most popular models are content analysis and regression. The research described in the following paper, therefore, constitutes a breakthrough because it applies a panel data technique and combines accounting and macroeconomic information.

The present research contributes significantly to the literature because this study's results are more accurate than those offered by previous studies. The method applied improves on

previous studies because a more extensive database was analyzed (Dogru and Sirakaya-Turk, 2017), in this case, information from two significant sectors of the tourism industry keep significant but at the same time with different characteristics, in terms of the investment needs and the return on investment. Because systematic risk is not the same in all sectors (Damodaran, 2012), the relationship between systematic risk and relevant information needed to be studied separately for the two sectors sampled to attain greater precision in the results.

This study's benefits arise from its retrieval of more precise data since this accuracy makes the proposed approach extremely useful. Including the two sectors meant that a larger quantity of data could be processed, which benefitted this research, while studying the two sectors separately resulted in a more precise model of the relationship between systematic risk and significant information. As a result, the information obtained is more accurate for each sector.

LITERATURE REVIEW AND HYPHOTHESES

Our review of the relevant literature revealed that researchers are currently focusing on the relationship between equity risk and available information. This interest is evident in recent studies by, among others, Arfaoui and Abaoub (2010); Babencko *et al*. (2016), Boz *et al*. (2015), Driessen *et al*. (2012), Morelli (2012), Park *et al*. (2017). Park *et al*. (2017) study the relationship between systematic risk and CSR and show that there is no relationship between the two variables. Babenko *et al.* (2016) analyzed the relationship between systematic equity risk and idiosyncratic cash flows and showed that, under general assumptions, firms' conditional betas depend directly on their history of idiosyncratic shocks. Boz *et al.* (2015) found that a combination of accounting and macroeconomic information explains systematic equity risk. Morelli (2012) explored the relationship between cross-sectional security returns and companies' beta, size, and book-to-market equity. Driessen *et al*. (2012) developed a new cash flow methodology for econometric estimation the risk and return of assets. Arfaoui and Abaoub (2010), in turn, studied the influence of risk factors on local equity systematic risk, including inflation, trade openness, local investment, budget surplus, and financial development.

While Chiang *et al*.'s (2015) research did not focus on studying information explaining equity risk, their study showed the importance of risk determination factors as raw material for investors' analyses. The cited work developed a new methodology for estimating the risk

factors of oil (i.e., energy risk) based on equity information and derivative markets. These authors' model reveals that energy risk volatility is related to GDP and unemployment rates.

In addition, Engle *et al.*'s (2015) study confirmed the scientific community's interest in systematic risk. More specifically, researchers have investigated this risk for European financial institutions through an econometric approach designed to measure systematic risk.

Another stream in the existing literature that justifies the present research consists of articles that analyze the determinants of equity risk for a sample of companies in the tourism sector. Recent papers include Boz *et al.* (2015), Chen (2013), Kim *et al.* (2012), Lee and Hooy (2012), Lee and Jang (2012), Nicolau and Sellers (2011), Park and Kim (2016), and Seok *et al*. (2015). Studies like these of particular sectors can provide more accurate results on risk assessment, especially since specific countries and industries need to be included as important factors in share valuation processes if researchers want to explain systematic equity risk. Along these lines, Engle *et al*. (2015) researched the contribution of each country and industry to the systematic risk of European financial firms.

Park and Kim (2016), in turn, showed that the systematic equity risk of companies in the US restaurant industry is related to their liquidity ratio, debt ratio, business size, and efficiency ratio sales and/or value of assets. Boz *et al*. (2015) found that the equity risk of European food and accommodation sector companies is characterized by business size, GDP, exchange rates between the euro and dollar, and the Dow Jones stock index. Chen (2013) further confirmed a significant relationship between systematic risk and debt ratio by studying a sample of companies in the hotel industry in the Chinese market. Kim *et al.* (2012) analyzed a sample of US hotels, and their results show that equity risk is related to total average assets, growth rate, and average long-term debt to total capitalization.

In addition, Lee and Jang (2012) had provided the research on real estate exposure of hospitality firms in the US. The paper revealed that capitalized lease on property, operating cash flows scaled by total assets, long-term liability scaled by total assets, and companies' quick ratio explain systematic equity risk. Lee and Hooy (2012), in turn, examined the airline industry and found that systematic equity risk is associated with operating debt for three samples of North American, European, and Asian companies, respectively. The cited research also indicated that this risk has a relationship with growth in the European sample and the size of Asian companies. Nicolau and Sellers (2011) analyzed variations in risk linked to a hotel chain's performance while undergoing the introduction of a new quality

control system. The results show that the introduction of a quality system increases the risk of higher costs for investors. Seok *et al.* (2015) studied the determinants of risk for a quite narrowly defined sector - online travel agencies. The cited research revealed that, in this sector, liquidity, operating profitability, size, and advertising costs reduce risk.

Other studies have analyzed the tourism sector but, while they pursued related goals, these were not directly addressed in the present research. These studies, however, are evidence of researchers' interest in learning more about risk factors. For example, Hua *et al.* (2016) also analyzed the variables that determine risk, although the risk they sought to explain was idiosyncratic risk or business risk alone. Their results reveal that five units can be distinguished among companies' financial information (i.e., cost of sales, advertising, inventory, asset turnover, and capital expenditure) that determine the unsystematic risk of US restaurants. In the present study, we did not focus on idiosyncratic risk because this risk can be eliminated through diversification.

Other relevant research includes Youn *et al.* (2015), who used beta and systematic risk as an explanatory of the relationship between financial performance and corporate social responsibility in the restaurant industry. Kim and Jang (2012) used the beta as an explanatory variable to compare the relationship between the risk and returns of two types of businesses: hotel real estate investment trusts and C-corporation hotels. The results show that the beta or systematic risk is an explanatory variable for investments' expected risk premium and that the two types of hotels sampled do not show significant differences in their relative profitability risk.

Although the above literature review may appear to confirm that the tourism sector has been extensively analyzed, Law *et al.* (2012), Park and Jang (2014), and Tsai *et al.* (2011) encourage researchers to continue these investigations to help practitioners resolve managerial and operational problems. Park and Jang (2014, p. 767) push researchers to aggregate finance/accounting with risk management issues to form a new interdisciplinary research topic in the hospitality industry sphere.

Furthermore, Jang and Park (2011) report that more rigorous and diverse statistical analysis methods should be used for hospitality finance research. Previous research has only applied a few methods in the field of hospitality finance. Logistic regression has been used in only 2.7% of studies and probit and/or tobit regression has been applied in a scant 1.8% of research. A full 75 out of the 113 studies reviewed used descriptive statistics, and 12 used

simple regression. In addition, Law *et al.* (2012) confirmed that content analysis has been the main technique applied. Fong *et al.* (2016) concluded that experimentality in hospitality and tourism research is increasing, but the cited authors recommend going beyond commonly used methods to try others, such as survey questionnaires, and applying more sophisticated methods. Fong *et al*. (2016) also state that the areas most often analyzed are marketing, psychology, and computer science and/or technology and that the most popular technique is analysis of variance.

Omerzel (2016) analyzed the research conducted in the hospitality and tourism industry, focusing specifically on issues of innovation. The cited author notes that a practical implication of the review's findings for researchers is the need to go further by applying quantitative methods to verify empirically the theoretical constructs proposed.

Despite this finding, more recent literature has already revealed a tendency to improve applied techniques by using more precise statistical study methods. For example, Aissa and Goaied (2016), Boz *et al.* (2015), Kim *et al.* (2016), and Kizildag (2015) used panel data techniques to analyze the tourism sector. Kizildag (2015) investigated financial leverage. Boz *et al.* (2015) analyzed systematic risk determinants. Kim *et al*. (2016) investigated the relationship between corporate social responsibility and equity-holder risk, and Aissa and Goaied (2016) analyzed profitability determinants (i.e., return on assets [ROA]). Outside the tourist sector, recent work includes Bouslah *et al*. (2016), De Simone (2016), and Platikanova (2016), who used panel data techniques to carry out their research.

Recently submitted journal articles, therefore, confirm:

1. An interest in identifying determinants of risk and fundamental variables that influence decisions within financial management
2. A need to analyze the behavior of the relationship between risk and information in specific sectors
3. A need for a more sophisticated and accurate technique from a statistical point of view

The studies reviewed above reflect the financial community's current interest in learning more about the determinants of systematic risk (Babenko *et al*., 2016; Boz *et al.*, 2015; Park and Kim, 2016) given that an understanding of these factors contributes to improving the financial management of companies. In an effort to gain a more accurate understanding of risk determinants, these factors have been analyzed in specific sectors. This field of research

includes Park and Kim's (2016) study of the restaurant industry, Chen's (2013) analysis of the hotel industry, Lee and Hooy's (2012) work on the airline industry, and Seok *et al*.'s (2015) research on the travel agency sector. However, Jang and Park (2011) and Omerzel (2016) recommend improving research methods in this area to achieve better results.

The results of previous research helped us to develop four hypotheses:

1. The information determining equity risk in the tourism industry in the arts, entertainment and recreation and accommodation and food services sectors in the US market may differ from the risk information relevant to the European market according to Boz et al. (2015).
2. A combination of accounting information and macroeconomic information provides a stronger understanding of the connection between equity risk and this information.
3. Differences exist between the two sectors in the sample.
4. The current financial crisis influences the relationship between systematic risk and information.

DATA AND METHOD

The sample analyzed consisted of 79 American firms in the tourism industry: 22 in the arts, entertainment, and recreation sector and 57 in the accommodation and food services sector. We wanted to work with the maximum possible panel data, but only these 79 firms showed all the necessary daily stock prices and accounting and financial information for all of the 2004 - 2013 study period (Arellano and Bover (1990) do not specify any limitations for the value of n). The data consisted of the companies' accounting information obtained from the Orbis database (i.e., the Bureau Van Dijk database) and macroeconomic data from various websites—www.bea.gov (US Bureau of Economic Analysis), www.bls.gov (US Bureau of Labor Statistics) and www.ec.europa.eu/eurostat (Eurostat). Further data on stock indices and rates were retrieved from www.stoxx.com and www.yahoo.finance.

The dependent variable of the study was the beta (i.e., the systematic equity risk of the sample companies), which was estimated using the following regression model:

$$R_{it} = \alpha_i + \beta_{iy} R_{Mt} + \mu_{it} \qquad [1]$$

Where:

- i identifies the number of companies in the sample 1……79
- t represents the number of data used to estimate the beta, 250 days
- y represents the number of scanned fiscal years, 2004…2013
- R_{it} is the return on stock i at a time t
- β_{iY} identifies the beta of stock i in year y
- R_{Mt} identifies profitability of the market portfolio in period t
- μit is the random regression residual, assuming hope = 0 and constant variance

The beta was estimated annually for all 79 companies based on daily returns calculated from every year. The use of daily returns is justified by the existing literature, we rely on finding of Kim and Kim (2014), Engle et al. (2015) and Chiu, Harris, Stoja and Chin (2018). That is also true, there are 2 ways of measurement, including excess return, but we decided to use the approach, taking into account the article of Boz et al. (2015). We pretend an excess return to be a scope of future research area. We also follow the findings that the equity risk of European food and accommodation sector companies is characterized by business size, GDP, exchange rates between the euro and dollar, and the Dow Jones stock index postulated in the paper of Boz et al. (2015). While there was a possibility to select S&P500, the paper concluded that the only index that showed an explanatory power with the European beta was the DJ, the S&P did not come out with significant result. For the reason to estimate beta of the United States in a comparable way, it was decided to use Dow Jones index:

$$Ln(I_t/I_{t-1}) \qquad [2]$$

In which:

- I_t is the value of the index at the end of the day t
- I_{t-1} is the value of the index at the end of day t-1

The independent variables used in the research were classified into two categories:

1. Company information accounting variables (F)
2. Market information macroeconomic variables (M) The first group consisted of the 16 indicators listed in Table I.

The independent variables of the model are the explanatory variables without significant correlation between each other.

Table I. Accounting independent variables

Information (F)	Calculation	Reference	Sign
Current ratio (CR)	Current assets/current liabilities	Park and Kim (2016), Brimble and Hodgson (2007), Gu and Kim (2002)	-/+
Leverage (LV)		Brimble and Hodgson (2007), Chen (2013), Park and Kim (2016)	
	LV_1=total debt/total assets		+
	LV_2= long term debt/long term financing		+
	LV_3 = long term debt/equity		+
Size (SZ)		Park and Kim(2016)	
	SZ_1= natural logarithm of total assets		-
	SZ_2 = natural logarithm of number of employees		-
	SZ_3= natural logarithm of total assets		-
Growth (GR)	Natural logarithm of total assets at the end of the business year/total assets at the beginning of the same year	Kim, *et al.* (2002)	+/-
Operating Leverage (OL)	EBIT/SALES	Brimble and Hodgson (2007)	+
Cash Flow (CF)			
	CF_1 = EBIT+ Depreciation + Financial revenue – Financial expenses ± Debtors ±Stocks ±Creditors	Boz *et al.* (2015). Menéndez-Plans *et al*. (2012)	-
	CF_2 = CF_1 ± Fixed Assets	Boz *et al.* (2015). Menéndez-Plans *et al*. (2012)	-
	CF_3 = CF_2 - Depreciation	Boz *et al.* (2015). Menéndez-Plans *et al*. (2012)	-
Income after Taxes (IAT)	EBIT –financial result – taxes	Boz *et al*. (2015)	-
Earning Before Interest and Taxes (EBIT)	EBIT	Campell *et al*. (2010)	-
Asset Turnover Ratio (AST)	Sales/Total Asset	Hua *et al.* (2016), Park and Kim (2016)	-

Financial Leverage (FL)	IAT/EBIT	Lee and Hooy (2012)	-

Source: Made by myself

Four denominators were chosen for absolute information terms transfer into relative data: total assets (AT), financial expenditures (FE), sales (SL), and book value of equity (BVE). In addition, the profitability of exploitation (i.e., ROA) and shareholder return (i.e., return on equity [ROE]) was used, among other information.

The company information included accounting information, accurate measures of the money generated as cash flow, and efficiency measures such as the asset turnover ratio, ROA (i.e., earnings before interest and taxes [EBIT]/TA), and ROE (i.e., income after tax [IAT]/BVE). In the group of market information, we used seven indicators that are presented in Table II including euro returns with currency adjustment for stock indexes.

Table II. Macroeconomic independent variables

Information (M)	Reference	Sign
US Gross Domestic Product (GDP)	Boz *et a*l. (2015)	-
US Harmonized Indices of Consumer Prices (CPI)	Chen (2007), Engle *et al*. (2015)	-
Exchange rate $/€ (EXR)	Dolde *et al*. (2011)	+
US Unemployment rate (UR)	Boz *et al*. (2015), Engle *et al*. (2015)	+
US Unemployment rate-leisure and hospitality (UH)	Chiang *et al*. (2015)	+
Standard & Poor's 500 (S&P500)	Menéndez-Plans *et al*. (2012)	-
Stoxx Europe 50 (SE50)	Brechmann and Czado (2013)	-

Source: Made by myself

As control variables, we used two dummy variables. These were sector (SC), to differentiate the two sectors within the tourism industry, and crisis (CR), to analyze the impact of the 2008 economic and financial crisis on the results.

We applied the panel data technique developed by Aissa and Goaied (2016) since this is a technique that gives more variability with less collinearity among variables. In addition, Kizildag (2015) confirmed the advantages of using panel data regression, which improves estimation of econometric models and allows researchers to include firm-specific effects that account for cross-sectional components. Hsiao (2014) also discusses advantages and states that this technique clearly increases the efficiency of econometric estimations and allows

researchers to check the impact of unobserved heterogeneity. Panel data also incorporates dual dimensions, cross-sectional dimensions, and time series into studies.

As the sample used in the present study contains data from the same companies for different years, using panel data regression helped us to study the behavior of variables over time. Hausman test (Hausman and Taylor, 1981) was taken to select fixed or random effects models. The results for Prob > chi2 are shown in Table IV. If Prob>chi2 is less than 0,05, then the zero hypotheses is rejected, and it is better to use fixed effects.

We apply the following model:

$$\beta_{i,t} = \alpha_0 + \sum_{f=1}^{F} \alpha_f \, (F_{ift}) + \sum_{m=1}^{M} \alpha_m \, (M_{mt}) + \mu_i + \varepsilon_{it} \qquad [3]$$

In which:

βit identifies the dependent variable of firm i in year t

α is the correlation coefficient of each indicator

F is the independent variables from accounting information

M is the independent variables in the market

μ represents individual specific effects

εit is the error for each firm in any period

To start with, we applied the model to the entire sample and, next, incorporated the dummy crisis (CR) followed by the dummy sector (SC).

RESULTS AND DISCUSSION

The results show that the determinants of the systematic risk of the analyzed tourism industry come from the business management and the general economic situation and that they do not vary before and after the financial crisis.

Descriptive Statistics

Table III shows the results for the descriptive statistics analysis.

Table III. Descriptive statistics

Variable	obs	Mean	Std.dev.	Min	Max	Median	25th percentil	75th percentil
β	790	0,202	0,596	-3,705	6,857	0,188	-0,001	0,384
LEV_2	790	0,542	1,099	-7,5	16,327	0,434	0,197	0,706
SZ_1	790	19,179	2,369	6,907	24,323	19,120	17,678	20,913
GR	743	-0,015	0,800	-8,907	5,214	0,008	-0,632	0,101
CF_3/AT	717	0,242	13,258	-89,05	184,47	0,052	-0,078	0,155
ROA	717	0,078	0,467	-1,87	5,777	0,071	0,016	0,132
ROE	717	0,123	1,50	-13,98	19,066	0,081	-0,033	0,204
OL	758	0,3064	4,745	-19,098	73,0625	0,074	0,135	0,185
FL	790	1,173	8,724	-70,70	165,38	1,151	0,829	1,909
AST	717	1,149	1,277	-0,1168	19,98	0,899	0,527	1,606
CPI	790	2,35	1,194	-4	3,8	2,75	1,6	3,2
SE50	790	-0,012	0,271	-0,797	0,194	0,072	0,036	0,161

β (the systematic risk of the overall sample, AER plus AFS), SZ_1 (firm size = natural logarithm of total assets), GR (growth), Cash $Flow_3$ / Total Assets, ROA (profitability), ROE (return of equity), OL (Operating leverage), FL (Financial Leverage), AST (Asset Turnover), CPI (Consumer Price Index), SE50 (Stoxx_Europe_50)

The descriptive statistics reveal several things about the analyzed sample:

1. The average beta of the sample is 0,20, which indicates that the shares of the analyzed sector show low volatility. A full 75% of the sample betas are lower than 0,384, with a median of 0,188.
2. The average debt level is 54,2%, and 75% of companies have a debt ratio below 70.6%.
3. The average business growth is negative, although the median is equal to 0,8%, close to 0, which means that half of the companies experienced negative growth and the others had positive growth.
4. The average ROA is 7,8%, with the dispersion of the values equal to 0,467. Some companies in the sample show negative profitability for this exploitation as they have a minimum value. Half of the sample has an operating profitability of up to 7,1%.
5. The mean ROE is 12,3%, although the scatter in the sample's values is high and the standard deviation is equal to 1,50. The median is 8,1%, and 25% of companies exhibiting underperformance have a performance level valued at – 3,3%.

6. The average value of operating leverage is 0,3064, and high dispersion is observable in the values of this information, as manifested by the minimum and maximum values. The median of operating leverage stands at 7,4%, including 25% of the companies sampled at a level lower than 13,5%.
7. The average value of the asset turnover ratio indicator (i.e., efficiency ratio) is equal to 1,149. The median value is 0,899, which indicates that this is less than average. Therefore, more than half of the companies sampled are characterized by low business efficiency.

The descriptive statistics further show that, on average, the shares of the sampled companies have both a positive operating profitability (i.e., ROA) and positive shareholder returns (i.e., ROE). The analyzed sectors are industry areas with:

1. Betas below 1, that is, a defensive sector and, therefore, not very risky
2. A large variability in company size
3. A negative average investment growth
4. A relatively low debt level
5. A not particularly high level of business efficiency

Relationship between Systematic Risk and Information

In Table IV, we present the best models obtained from the analyses of the total sample, with the highest R^2, corrected autocorrelation and heteroskedasticity, and fixed and random effects analyzed. The correlation coefficients between statistically significant variables can be seen in Appendix I. The first model is the result of analyzing the data without dummy variables. The second model is the result of analyzing the sample with the dummy CR, and the third model includes the two dummy variables: CR and SC.

Table IV. The best models (all sample)

Model	AFS and AER	AFS and AER more dummy variable	AFS and AER more two dummy variables
Dependent variable	β	β	β
α_0	-0,278 (0,112)	-0,284 (0,105)	-0,263 (0,135)
Independent variables			
SZ_1	0,031 (0,000)***	0,031 (0,000)***	0,032 (0,000)***
GR	-0,075 (0,018)*	-0,074 (0,020)*	-0,074 (0,019)*
CF3/TA	-0,003 (0,021)*	-0,003 (0,018)*	-0,003 (0,018)*
EBIT/TA	-0,109 (0,019)*	-0,108 (0,020)*	-0,110 (0,018)*
EBIT/BVE	0,021 (0,105)*	0,020 (0,119)*	0,021 (0,109)*
CPI	-0,063 (0,001)**	-0,049 (0,053)*	-0,063 (0,001)**
SE50	-0,343 (0,000)***	-0,336 (0,000)***	-0,343 (0,000)***
CR		-0,047 (0,402)	
SC			-0,032 (0,459)
R^2	0,2113	0,2141	0,2096
Peob>Chi2	0,000	0,000	0,000
n	714	714	714
Hausman test			
Chi2	9,26	8,58	9,75
Prob>Chi2	0,2346	0,3786	0,2828
	Random effects	Random effects	Random effects

β (the systematic risk of the overall sample, AER plus AFS), SZ_1 (firm size = natural logarithm of total assets), GR (growth), Cash $Flow_3$ / Total Assets, EBIT/TA (ROA, profitability), EBIT/BvE(earnings/ book value equity), CPI (Consumer Price Index), SE50 (Stoxx Europe 50), CR (dummy variable financial crisis), SC (dummy variable sector), in parenthesis (p>t), ***,**,* denote significance at the 1,5, and 10 percent levels, respectively, which are the three levels of statistical significance accepted to consider that a variable has explanatory power.

Source: made by myself

The results of the sample analyses reveal:

1. The information explaining systematic equity risk for the tourism industry in question is a combination of accounting, company, and macroeconomic information.
2. Five accounting indicators—size (SZ), growth (GR), the cash flow to TA ratio (CF3/TA), firm profitability (ROA), and the EBIT/be ratio—explain the beta and, therefore, systematic risk.

3. Two macroeconomic indicators—the consumer price index (CPI) and Stoxx Europe 50 (SE50)—explain the beta and, thus, systematic equity risk.

We noted that systematic risk in the tourism sector studied is determined, with a positive sign, by business size (SZ) and the EBIT/BVE indicator so that a larger company size and higher value of this indicator corresponds to higher beta stocks and, consequently, higher cost of capital or minimum returns required.

EBIT/BVE is an indicator measuring efficiency and effectiveness in business management for each euro invested by shareholders. Its relationship with systematic risk is different than that of EBIT/TA (ROA), and, notably, the information provided is not the same even though this indicator is considered a denominator for shareholder investment. The EBIT/BVE indicator, which is part of the decomposition of ROE, is influenced by the difference between the total investment indicator and shareholder investment (i.e., debt). Menendez-Plans *et al*. (2012) also confirmed a positive relationship between systematic risk of stocks and this indicator when the beta is estimated from the General Index of the Madrid Stock Exchange.

The variables that explain systematic risk, with a negative sign, are business growth (GR), the CF3/TA and EBIT/TA (ROA) indicators, and the CPI and SE50 indices. The CF3/TA and EBIT/TA measure the efficiency of business management and inform investors of, first, the money generated by business operations (CF3) per euro invested and, second, the overall profit generated by operating profits (EBIT) for every euro invested. The results reveal that boosting the growth rate (GR) increases economic efficiency (EBIT/TA), the CF3/TA, and the CPI and SE50 indices. A reduction also occurs in the beta of American tourism enterprises.

The results are consistent with positive investor expectations that are reflected in companies' financial indicators and macroeconomic information. If business growth exists, this results in increased investment. If this investment produces good results, an increase in EBIT/TA is expected. If an increase in inflation occurs and the European stock index increases (i.e., good economic expectations for the European economy), the systematic risk of stocks is reduced and, consequently, the cost of share capital.

In a related study, Lee and Jang (2012) found that the CF3/TA indicator is a statistically significant variable, with a negative sign. In addition, Lee and Jang's (2007) research showed that ROA is an explanatory variable for systemic risk, with a negative sign. Companies'

profitability (i.e., ROA) is also an explanatory variable for equity risk, with a negative sign, so that the higher the return on investment, the lower the equity risk faced by shareholders.

The estimated models show that neither the dummy crisis (CR) nor the dummy sector (SC) are statistically significant. This reveals that no changes occurred in the relationship between the systematic risk of stocks and independent variables due to the 2008 economic and financial crisis—or within the sectors in question. This last result shows that the performance of tourism enterprises is homogeneous in terms of their relationship with the estimated beta. This facilitates the comparison of the present study's results with previous research, such as Boz *et al.* (2015), in which a sample of European companies was analyzed.

An explanatory variable of systematic equity risk with greater explanatory power—from a statistical point of view—is business size (SZ_1), which, as shown in Table 1, corresponds to the logarithm of TA. The other variable with similar power is the SE50 index, reflecting expectations of the European economy. Accounting and macroeconomic information have a relationship with the opposite sign. A larger business size is associated with higher beta stocks and a higher stock index of the European economy, which means good economic prospects for Europe and a lower risk for US stocks. While a larger business size lowering the risk of stocks may intuitively appear logical, previous results have also provided empirical confirmation of a positive relationship between the two variables. This includes studies by Boz *et al.* (2015),

Brimble and Hodgson (2007), Kim *et al.* (2016), Lee and Jang (2007), Lee and Hooy (2012), Menendez-Plans *et al.* (2012), and Park and Kim (2016).

The models' goodness of fit is quite similar, as the R^2 stays around 0.21 for all three models, and, in all three, the best model is obtained with random effects. Thus, the research results show that seven independent variables explain systematic equity risk, with five of these variables from companies' accounting information and two from macroeconomic information. The results, thus, confirm Hypotheses 1 and 2, but they do not confirm Hypotheses 3 and 4.

The above results confirm Hypothesis 1 because they are similar to, yet different from, those obtained in Boz *et al.*'s (2015) research, as follows:

1. The information explaining risk is different in both studies' samples since seven variables explain systematic risk for the sample of US companies and only four were found for the sample of European companies.

2. In the present study, in addition to the firms' size and profitability (i.e., ROA), only accounting variables explain the systematic risk of European stocks, with business growth (GR) and the indicators of economic efficiency CF3/TA and EBIT/BVE statistically significant.
3. In the current study, two macroeconomic indicators explain the beta of the shares (i.e., SE50 and CPI) whereas Boz *et al.*'s (2015) study of European companies' macroeconomic indicators identified three: yield variation of the Dow Jones, variation of GDP, and variation of exchange rates.
4. In both studies, an explanatory variable of risk is the representative index of the other major economy—Dow Jones for European stocks and SE50 for US stocks—both with a negative relationship.
5. Business size in both studies' samples is an explanatory variable with high statistical significance and a positive relationship.
6. The R^2 obtained is somewhat better in Boz *et al.*'s (2015) study of European companies, especially for firms in the food services and drinking places sector (R^2 = 0.472).

The present results confirm hypothesis 2 because macroeconomic information was confirmed to be relevant. When explaining systematic risk, two macroeconomic variables are statistically significant: CPI and SE50.

CONCLUSIONS

The purpose of the study is to understand the determinants of the systematic risk in order to be able to estimate a capital cost of it, thus improving the efficiency of business management. Large and publicly listed companies use the CAPM model to calculate their cost of capital on equity. However, SMEs need a way to determine their cost of share capital if they are not listed. Analyses of information that determines systematic risk provide useful information to develop more efficient business management because these identify the indicators that must be observed and used to estimate a rise or fall in risk. As a result, companies can also monitor any rise or fall in their cost of capital and the market value of their shares.

This study investigated the accounting and macroeconomic information that best explains the beta of the shares of publicly listed American tourism companies and investigates whether there are differences between the two tourism sectors,to satisfy a dual purpose:

1. To identify observable variables that anticipate the evolution of risk and cost of capital
2. To provide a model for calculating SMEs' systematic risk

The results serve both purposes by identifying which independent variables explain systematic risk and which variables must be observed to estimate companies' future behavior and objectively quantify their systematic risk. The results will help to improve business management and the design of future research. The work of Seo *et al*. (2017) is an example of the importance of the knowledge of determinants for a business decision within business management.

The factor of economic sector is considered important in the study of systematicc risk determinants, based on evidence provided by Arfaoui and Abaoub (2010), Chen (2007), Mergner and Bulla (2008), and Wang and Moore (2009). This factor leads to a more accurate picture of what is happening in each sector and achieves more accurate results.

The present study, thus, examined a sample of 79 companies in the tourism industry, particularly in the US's NAICS Categories 71 (AER) and 72 (AFS), from 2004 to 2013. The results reveal that a combination of companies' accounting information and macroeconomic information from the market explains their beta of shares. The key company information is business size (SZ_1), growth (GR), ROA, and the efficiency ratios CF3/TA and EBIT/be, and the most important macroeconomic information is the CPI and SE50 indices.

The results support the conclusions that:

1. The variables with a greater explanatory power of systematic risk are business size (SZ_1) and the SE50.
2. A positive and statistically significant relationship exists between systematic risk, business size (SZ_1), and the performance indicator EBIT/BVE.
3. A negative and statistically significant relationship exists between systematic risk, business growth (GR), ROA, and the efficiency indicator CF3/TA.
4. No significant differences were found between the two sectors in the sample.
5. The 2008 economic and financial crisis has not altered the relationship between betas and independent variables.
6. The information explaining the systematic risk of US stocks is not the same as that which explains the systematic risk of European equities (Boz *et al.*, 2015), although

company size (SZ_1) is a significant explanatory variable in both the cited and present studies.

According to these findings, two companies with a different business size will have different betas and, therefore, a different cost of equity capital. The latter will decrease if investors have positive expectations of growth in returns on business investments and good prospects for the European economy.

Theoretical Implications

This paper contributes to finance and hospitaliy literature by identifying a statistically significant relationship between the information surrounding the company and the systematic risk of US tourism companies, which is independent of the sector to which the company belongs but which is not identical to the information that determines the risk of European tourism companies.

This study showed that the systematic risk of the company shares analyzed can be explained by business investments, the results of these investments, and economic forecasts for both the US and Europe. The systematic risk of tourism investments does not only depend on national economies since the results show that the systematic risk of US stocks influence forecasts for the European economy (i.e., the SE50 index). Likewise, the systematic risk of European stocks influences forecasts for the US economy (i.e., the Dow Jones index) (Boz *et al.*, 2015). Thus, the systematic risk of the US tourism sector clearly influences the European economy and vice versa - a relationship that is always negative.

Therefore, if experts forecast a rise in the International Comparison Program figures for the US economy, this translates into expectations of economic growth and predictions of a rise in the SE50. As a result, the systematic risk of tourism business stocks decreases, which means more value is created for shareholders if other significant variables do not vary.

Ultimately, estimating shareholders' cost of capital currently involves measuring the evolution of explanatory variables. Depending on the path of this evolution and the sign of relationships, the cost of capital needs to be adjusted in order to be as accurate as possible for each company's shares or business. The larger the investment is, the greater the growth and the greater the return on investment—with lower risk—while the more positive the forecasts for US and European economies are, the lower the risk becomes.

Practical implications

These results provide valuable information for business administrators as the present findings can contribute to improving business management. These results may help any company's management know which information to observe and use to manage risks better, including their effects on cost of capital and the market value of company shares. Business managers now understand that the systematic risk of shares, which determines shareholders' cost of capital, grows as companies' size increase, in other words, with the size of investment. However, this risk decreases with a more efficient management of investments and with positive forecasts for the European and national economies. Therefore, the financial management of tourism businesses can become more efficient simply by analyzing the behavior of variables that influence systematic risk. By studying this behavior, managers can anticipate how it will evolve and, thus, foresee the evolution of their companies' cost of capital or the minimum required profit. This will allow managers to act in order to minimize any negative impacts on their company's value creation.

Given that maximizing the value created for shareholders involves efficient financial and risk management, observing the behavior of significant variables will facilitate the creation of greater value for shareholders of tourism businesses. These variables explain risk, while, at the same time, they reveal the financial evolution of investments. Analyses of the evolution of operating profitability (i.e., ROA) allow the simultaneous observation of companies' financial management and the evolution of their risk. If the firms' ROA evolves in a positive direction, this means the business is generating greater profits and the associated risks are steadily decreasing.

Business administrators can make their management more accurate and precise by determining shareholders' cost of capital and anticipating changes in the latter. Risk is reduced by growth in investments, more efficient investment management, and positive forecasts for the European and national economies.

Limitations and Future Research

This research's most important limitation is the sample used. The sample size and the study period length are areas that need to be improved in future studies. By increasing the number of companies and the study period, researchers could obtain results that are more representative and that can thus be empirically extrapolated to other contexts. Nevertheless, these results contribute to empirical research as a starting point for future studies that focus

on consolidating the list of systematic risk determinants. Future lines of research could include:

1. Using other econometric models to estimate betas and studying whether the results of estimations improve
2. Using the present model to measure the risk of stocks in different ways than the CAPM model
3. Analyzing other markets to compare the results and observing the particular characteristics of the tourism sector in each economy
4. Considering other sectors of the tourism industry

All of this could contribute to improving the management of tourism businesses with the help of a consolidated list of risk determinants and establishing a pattern of objective procedures to quantify the cost of equity capital.

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Annex I. Coefficients between significant independent variables in the best models

	β	SZ_1	GR	CF_3/AT	ROA	ROE	CPI	Stoxx_Europe_50
β	1							
SZ_1	0,1384	1						
GR	-0,0087	0,2665	1					
CF_3/AT	-0,0692	-0,0242	-0,2377	1				
ROA	-0,0804	-0,1642	-0,4159	0,0042	1			
ROE	0,0506	0,0424	0,0496	-0,0240	0,0270	1		
CPI	-0,0508	-0,0129	0,0633	-0,0204	-0,0122	-0,0056	1	
Stoxx_Europe_50	-0,1052	-0,0231	-0,0093	0,0246	0,0452	0,0536	-0,5550	1

β (the systematic risk of the overall sample, AER plus AFS), SZ_1 (firm size = natural logarithm of total assets), GR (growth), Cash $Flow_3$ / Total Assets, ROA (profitability), ROE (return of equity), CPI (Consumer Price Index), SE50 (Stoxx_Europe_50)

CHAPTER II

"Systematic risk coefficient and sentiment: peculiarities of sentiment affected companies in US Tourism Industry"

INTRODUCTION

Academic society and professional traders put a serious attention to the efficient market hypothesis (EMH) for a long time. They tend to shed the light to the routes of profitability increase for both private and institutional investors. Degutis (2014) notices that there is a multiple reason for such research and one of them is that understanding of market efficiency will help corporate executives to provide decisions and actions which increase value of companies.

While the efficient market hypothesis (EMH) started to be the core of finance since the 1960s, nowadays the significance of the EMH moved to a subject of discussion. Shiller (2013) in his work named the EMH to be "half-true". If EMH can perfectly describe modern stock market movements in general, there are still some patterns in prices, which the EMH fails to explain.

Following the notion that markets are essentially rational, modern academic finance built the initial model of market rationality which was called the capital asset pricing model (CAPM) being developed by Sharpe (1964) and Lintner (1965). The mathematical model allows to quantify risk and provides a methodology to estimate expected return on equity and is based on the model of portfolio choice developed by Markowitz (1952). The main assumptions of the model are its main limitations: risk adverse of investors and high attention to the mean and variance of one-period investment return.

The CAPM considers beta (β) to be a systematic risk and a numeric value that measures the fluctuations of a stock to changes in the overall stock market. Beta measures the responsiveness of a stock's price to changes in the overall stock market. In the paper of Damodaran (2012) we can find how the risk level of the analyzed asset determines the cost of capital and is strictly related to systematic risk or beta.

While beta is currently under consideration we can pretend it to be still a valid objective and systematic equity risk measure, which allows to calculate the required minimum return of capital of publicly traded shares. Classical Capital Asset Pricing Model (CAPM) defines the

variables, which influence on systematic risk coefficient (β) from EMH point of view, remembering the market and traders being rational and leaving no space for emotions and sentiment existing on the market which narrow and limit the appliance of the theory.

But sentiment reflects incorrect probability beliefs about market events, and lead by emotions. As far as the "motion" is the core of "emotion" we can conclude that our psychological aspects push us to provide actions which are completely or partially driven by pure sentiment without any mathematical modeling and forecasting. For example, excessive optimism makes us to overestimate the probabilities of favorable events and underestimating the probability of unfavorable events. As a result, excessive optimism implies upward bias when computing expected value. (Shefrin, 2008)

Current research will focus on the relationship that came from the point that a firm stock level is a derivative not only of a fundamental rational environment but at the same time is a part of a human mental being, reflexing personal sentiment and group narratives.

This paper investigates the role that investor sentiment plays in asset pricing. While behavioral finance is a relatively new approach in finance research, one of the important areas that researchers have developed is the role that noise traders play in determining asset prices. (Ho et al, 2012) One of the prominent examples of behavioral incorporation into classical pricing model theory is behavioral SDF (b-SDF) developed be Hersh Shefrin.

Modern asset pricing theory relies on a stochastic discount factor, and the sentiment, introduced inside, reflects a percentage error in probability density at the level of market and at the level of the private investor. (Shefrin, 2008)

In the recent paper we will try to incorporate behavioral sentiment variables into beta model analyzing cluster peculiarities of sentiment dependent companies.

LITERATURE REVIEW AND HYPHOTHESES

In this part we will provide a brief outlook of the literature relevant to the research, from the general theory point of view, and from exact research topics.

The efficiency theory has been the starting point of many asset valuation models that have incorporated different types of risk. Generally, we should admit that these risks present a micro-structural aspect, such as the case of the original version of the CAPM model, which considers the systematic risk as the single risk factor. However, it is obvious that there are a

myriad of risk factors facing companies today. Some of these factors are bankruptcy risk, currency risk, supplier risk, etc.

As a result of the many hypotheses regarding various risk factors, and the abundance of data available regarding publicly traded stocks, a great deal of research has been performed with the goal of identifying additional risk factors that have robust predictive capability. In this area, Fama and French (1992) have done extensive research and found factors describing "value" and "size" to be the most significant factors, outside of market risk, for explaining the realized returns of publicly traded stocks. The researchers first published their findings on these factors in 1992 and have continued to refine their work since. Similarly, in order to develop an extension of the original CAPM, Acharya and Pederson (2005) have introduced a recent risk factor called systematic risk adjusted to liquidity risk.

Nevertheless, at the same time the study of the literature reveals the current concern about the relationship between equity risk and available information. Proof of this interest is the recent work of Arfaoui and Abaoub (2010), Morelli (2012), Driessen, Lin and Phalippou (2012), Boz Menendez-Plans and Orgaz-Guerrero (2015), Babencko, Boguth and Tserlukevich (2016), etc. Arfaoui and Abaoub (2010) studied the influence of risk factors on the local equity systematic risk: such as inflation, trade openness, local investment, budget surplus and financial development. Morelli (2012) explores the relationship between cross-sectional security returns and beta, size and book-to-market equity. Driessen et al. (2012) developed a new econometric methodology to estimate the risk and return of an asset using cash flow data. Boz et al. (2015) analyze whether Financial Reporting Standard (IFRS) has affected determinants of stock risk. Babenko et al. (2016) provided results that any economic variable correlated with the history of idiosyncratic shocks would help to explain expected stock returns.

Another group of existing literature, which justifies the interest of our research, consists of articles that analyze the determinants of equity risk for a sample of companies in the tourism sector. Here are several recent papers: Nicolau and Sellers (2011), Kim, Kim and Gu (2012), Lee and Jang (2012), Lee and Hooy (2012), Chen (2013), Boz, Menendez-Plans and Orgaz-Guerrero (2015) and Park and Kim (2016). We must admit that going down to a sector level can provide more accurate results on risk assessment. It should be remembered that the country and industry are important factors of the share valuation process if we want to explain the systematic equity risk. Engle, Jondeau and Rockinger (2015) study the contribution of each country and industry to the systematic risk of the European financial

firms. Mar-Molinero, Menendez-Plans, Orgaz-Guerrero (2017) showed that the factors determining risk are different before and after 2008. Growth, business productivity, liquidity and the size of the business, became the main factors to explaining risk.

Obviously we must admit that different sectors of economy keep different systematic risk levels (Foster, Kasznik and Sidhu ,2012), in following paper we continue research of Angel, Menendez-Plans and Orgaz-Guerrero (2018) using the data set of companies from US tourism industry. The importance to variate between industry and country was analyzed in the work of Engle, Jondeau and Rokinger (2015) and showed that the country and industry are important factors of the share valuation process within systematic risk explanation. We chose hospitality because it covers more than 3% of US GDP and plays important role in economic power together with reflexing economic trends. The importance to combine finance with hospitality was underlined by Park and Jung (2014). Some recent papers analyze the determinants of equity risk for a sample of companies in the tourism sector: Nicolau and Sellers (2011), Park, and Kim (2015), Boz Menendez-Plans and Orgaz-Guerrero (2015), Angel, Menendez-Plans and Orgaz-Guerrero (2018).

The other field of knowledge appeared on the frontier of social psychology and finance in parallel to efficient market theory. Selden (1912) wrote Psychology of the Stock Market. He based the book upon the belief that the movements of prices depends on the mental attitude of the investing and trading public. In 1956, the US psychologist Leon Festinger introduced a new concept in social psychology: the theory of cognitive dissonance (Festinger, Riecken and Schachter 1956). Pratt (1964) considers utility functions, risk aversion and risks considered as a proportion of total assets. Tversky and Kahneman (1973) introduced the availability heuristic: a judgmental heuristic in which a person evaluates the frequency of classes or the probability of events by availability. In 1974 they described three heuristics that are employed when making judgments under uncertainty: representativeness, availability and anchoring. They also present a critique of expected utility theory. In another important paper a framing concept was introduced. Kahneman, Knetsch and Thaler (1990) report several experiments that demonstrate that loss aversion and the endowment effect persist even in market settings with opportunities to learn and conclude that they are fundamental characteristics of preferences. Daniel, Hirshleifer and Subrahmanyam (1998) propose a theory of security markets based on investor overconfidence (about the precision of private information) and biased self-attribution (which causes changes in investors' confidence as a function of their investment outcomes) which leads to market under- and overreactions.

Shleifer (2003) publishes Inefficient Markets: An Introduction to Behavioral Finance, a quality book that considers behavioral finance. Shefrin (2002) wrote "Beyond Greed and Fear", an excellent book on behavioral finance and the psychology of investing.

The context for these insights is the asset-pricing framework described in Cochrane (2005). And some later Baker and Wurgler (2006) report that sentiment mediates the relationship between realized returns and characteristics such as size and B/M. Shefrin (2008) proposed a behavioral approach to asset pricing through behavioral SDF model based on research of behavioral capital asset pricing theory (1994). Antoniu (2012) consider whether sentiment affects the validity of CAPM.

A wide range of literature appeared on the fringe of sentiment variables, stock fluctuations and risk measurement at the beginning of XXI century. Bandopadhyaya (2005) developed an Equity Market Sentiment Index from publicly available data, and showed how it could be used in a stock market setting by studying the price movements of a group of firms, which represent a stock market index. Sentiment measurement through news events and changing investor sentiment is capable of explaining a significant proportion of the changes in the stock market index. Baker, Wurgler (2006) provided a well-known index taking a "top down" approach to behavioral finance and the stock market, whereby they took the origin of investor sentiment as exogenous and instead focus on its empirical effects. In addition, show that it is quite possible to measure investor sentiment, and that waves of sentiment have important effects on individual firms and on the stock market as a whole. Hwang (2006) found clear evidence of beta herding (moving together in the same direction) when the market is evolving smoothly, either rising or falling, rather than when the market is in crisis. Actually, they noticed that crises lead investors to seek out fundamental value rather than herd. They examine the relationship between market wide sentiment and beta herding and show that there are separate forces. The evidence on herding provides an explanation for why we have different impacts in cross-sectional asset returns after periods of negative and positive sentiment.

Chang (2008) provided similar research in the field of idiosyncratic risk which has positive correlation with overconfidence, the result were equal both for individuals and market level. Moreover, he found that controlling for investor overconfidence reduces the positive time trend in idiosyncratic risk. Hachicha (2008) used indirect sentiment measures, to provide evidence that sentiment levels and changes have important predictive power for stock returns. Most of our sentiment measures cause volatility rather than vice versa. Ling (2010) using

vector autoregressive models captured the short-run dynamics between returns and investor sentiment, found a positive relation between investor sentiment and returns in both public and private real estate markets.

Finter (2010) developed a sentiment indicator for Germany and investigated whether investor sentiment can explain stock returns on the German stock market. Based on a principal component analysis, constructed a sentiment indicator that condenses information of several well-known sentiment proxies. Boido, Fasano (2011) define investor sentiment as the inclination to speculate, so when sentiment is high, investor demand for speculative investment is high, and on the other hand, when low, investor demand for speculative investments is low. It is correct to assert that some stocks are more sensitive to speculative demand and those, which are more difficult to value, tend to be the riskiest to arbitrage. Antoniou (2012) analyzed whether sentiment affects the profitability of price momentum strategies. Results supports this argument by showing that momentum profits arise only under optimism, and are driven principally by strong momentum in losing stocks. An analysis of net order flows from small and large trades indicates that small (but not large) investors are slow to sell losers during optimistic periods. He used a standard Fama and French approach; found that beta is strongly and positively significant in pessimistic periods. The evidence survives several robustness checks and supports the notion that rational asset pricing holds when the populace of agents trading in the market is more likely to be predominantly rational. Stambaugh (2012) explores the role which plays investor sentiment in the range of anomalies referring to stock return.

Chung (2012) examine the asymmetry in the predictive power of investor sentiment in the cross-section of stock returns across economic expansion and recession states. The evidence suggests that only in the expansion state does sentiment perform both in sample and out-of-sample predictive power for the returns of portfolio. In a recession state, however, the predictive power of sentiment is generally insignificant. Antoniou (2013) investigate whether the pricing of market beta varies with sentiment. Beta is positively priced in pessimistic periods (but not in optimistic ones), with a reasonable estimate of the market risk premium. There is some evidence that beta is negatively priced during optimistic periods, but this evidence is less robust. Chow (2013) showed that both positively and negatively sentiment sensitive stocks are conditionally and stochastically dominated by sentiment insensitive stocks. Moreover, we find dominance among sentiment-arbitrage portfolios.

Brilliant and key researcher in the field of behavioral finance, Shefrin (2014) used data from 1999-2014 presented evidence suggesting that most investors' judgments of risk are negatively related to size and positively related to book-to-market equity (B/M) and to market beta. Fong, Toh (2014) showed that the MAX (related to investors' desire for stocks with lottery-like payoffs) effect is strongly dependent on investor sentiment and is mainly due to the poor performance of high MAX stocks rather than high returns of low MAX stocks. Boido, Fassano (2015) researched a link between returns and sentiment indexes, using a CAPM framework., trying to provide a better explanation of asset prices and their deviations from standard theories by means of sentiment indicators.

Some other recent papers which defend the relevance of the following research are Yu and Yuan (2011) who found that the stock market's expected excess return is positively related to the market's conditional variance in low sentiment periods. Stambaugh , Yu and Yuan (2012) analyzed a range of anomalies and the level of sentiment and found that each anomaly is stronger following high levels of sentiment, the short leg of each strategy is more profitable during high sentiment, and that sentiment provides no relation to returns within long legs of the strategies. Mclean and Zhao (2014) analyzed the sensitivity between investments, sentiment and financial information. Jurek and Stafford (2015) researched the rate of return referring to alternative investments bearing downside market risk. Habib and Hasan (2017) examine how equity overvaluation moderates business strategy and future stock-price crash risk. They found that firms with innovative business strategies are more prone to future crash risk than defenders.

The other papers which underline the cross-relation between risk management, sentiment and applied methodology are works of Deeney et al (2015) who made a novelty attempt to make a sentiment index for crude oil market showing that sentiment affects risk not only financial markets but a commodity market also. Authors developed variables similar to Baker and Wurgler sentiment index but relevant to oil market. Using principal component analysis they demonstrated that sentiment influence WTI (West Texas Intermediate) and BRENT markets. Antoniou, Doukas, Subrahmanyam (2015) provided a regression analysis and found a very important implication of sentiment variable. They had indicated that company management can use CAPM to provide capital budgeting decisions only in pessimistic periods, but nor for optimistic ones. It was assumed to happen because periods of optimism attract equity investment by unsophisticated, overconfident, traders in risky opportunities (high beta stocks) and high beta stocks become overpriced in optimistic periods, but during pessimistic periods,

noise trading is reduced, so that traditional beta pricing prevails. This paper highlights the interrelation between behavioral finance, sentiment and risk management and underline the possibility to use beta as the measurement of risk. Frugier (2016) provided a comparative analysis of forty-six shares from EURO STOXX using State Street Investor Confidence Index as sentiment variable and he found that portfolios managed with investor sentiment have better returns and involve less risk under certain conditions, so far taking into account the imperfect rationality of investors, it can help offer a better comprehension of financial markets. Results also confirm that the market sentiment is a promising concept in operationalizing behavioral finance, but the measure should not be limited to optimism or pessimism, and must be improved.

Basing the previous papers on the topic of sentiment and risk we will conduct our research to measure correlation between sentiment coefficients and beta.

As far as beta is a numeric value that measures the fluctuations of a stock to changes in the overall stock market we can conclude that beta measures the responsiveness of a stock's price to changes in the overall stock market, so we can see if beta is responsive to sentiment fluctuations on the market. Cederburg, O'Doherty (2016) found that the conditional beta for the high minus low beta portfolio covaries negatively with the equity premium and positively with market volatility.

By this, we will find which companies are more subjected to sentiment. We will be able to understand which company has a risk measure, which is mostly affected by sentiment, and who fluctuate mostly because of sentiment changes. So-called sentiment affected risk.

The more beta of the stock is correlated to sentiment - the more sentiment affects the evaluation of the risk of the stock by investor.

Sentiment coefficient and company's data are taken for American market to continue research of Angel, Menendez-Plans and Orgaz-Guerrero (2018) in which the beta and available information were analyzed. In the current research we will analyze the peculiarities of the companies with high regression between beta and sentiment, so called sentiment affected companies through regression and cluster analysis, defining the specific of such companies.

Claessens et al. (2000) define one of the peculiarities of firm specific weakness is high level of leverage as the part of firm financial instability. Berkmen et al. (2012) proved that countries with more leveraged domestic financial systems, stronger credit growth, and more

short-term debt tended to suffer a larger effect on economic activity. We hypothesis that companies with low level of financial stability have stronger dependence between beta and sentiment, so far reflecting sentiment situation on market. From methodological point of view, cluster analysis will provide us the basis to differentiate the group of companies depending level of regression between beta and sentiment. Hollenstein (2003) grouped firms into clusters which are similar in terms of a large set of innovation indicators and identified five clusters which exhibit clearly different configurations of a large number of innovation-related factors. Tola et al (2008) proved the analytical importance of cluster analysis using it for portfolio optimization technique.

Below we provide the recent papers in a table manner reflecting main findings, methodology and field of knowledge, highlighting the importance of our research and justify the interest of the investigation and applied mathematical models through contribution to the topics of previous streams of knowledge. Table 1 shows the recent and most referent papers to behavioral finance which cover the same stream of knowledge and research as the following paper, the table 2 gives the parallel to risk management papers and the table 3 provides evidence for applied methodology.

Table 1. FIELD OF KNOWLEDGE**: BEHAVIORAL FINANCE**

AUTHOR	JOURNAL	METHOD	DATA	RESULT
Stambaugh, Yu and Yuan (2012)	Journal of Financial Economics	Regression: based on Fama and French CAPM aproach	11 anomalies observed, special portfolio, Baker and Wurgler's sentiment proxies. 1965-2007 year	1) Each anomaly is stronger following high levels of sentiment 2) The short leg of each strategy is more profitable following high sentiment. 3) Sentiment exhibits no relation to returns on the long legs of the strategies.
Baker, Wurgler, Yuan (2012)	Journal of Financial Economics	Time series regressions	Six stock markets, 1980 - 2005 year, siam companies, Baker and Wurgler's sentiment proxies	1) Relative sentiment is correlated with the relative prices of dual-listed companies. 2) Global sentiment is a contrarian predictor of country-level returns. 3) When sentiment is high, future returns are low on relatively difficult to arbitrage and difficult to value stocks.
Chang, Hung (2012)	Journal of Empirical Finance	Regressions analysis, multivariate Markov-switching model, correlation coefficient	economic states according to the NBER business cycles, monthly orthogonalized sentiment index, 1966 - 2007 year	1) In the expansion state sentiment perform both in-sample and out-of-sample predictive power for the returns of portfolio 2) In a recession state the predictive power of sentiment is generally insignificant.
Huang, Zhiang (2015)	The Review of Financial Studies	Partial least squares regression (PLS) method, Principal component analysis,	Baker and Wurgler's sentiment proxies, 1965 - 2010, S&P 500 index	1) Adjusted BW index with higher R square and predictability is both statistically and economically significant. 2) Driving force of the predictive power of investor sentiment come from investors' biased belief about future cash flow.

Kadilli (2015)	Journal of Financial Stability	Panel Threshold Regression (PTR) model of Hansen (1999) and the Panel Smooth Transition Regression (PSTR) model of Gonzalez, Terasvirta and van Dijk (2005),	Consumer Confidence Indices (CCI), Economic Sentiment Index (ESI), 20 developed countries, 1999 - 2011, Datastream Financials Index (DFI)	1) Evidence of sentiment predictability during normal times when sentiment is high 2) While stock returns in general are found to be predictable by close lags of investor sentiment, financial stock returns seem to be predictable by further lags. 3) Financial stock returns appear to contain a larger predictable component in longer horizons then in short horizons.
Deeney, Cummins (2015)	International Review of Financial Analysis	Principal component analysis	West Texas Intermediate (WTI) and Brent futures prices, 2002 - 2013 year , Baker and Wurgler [2006] changed to volume of trades of oil futures and relevant variables to oil market	1) Sentiment influences prices in the professionally-traded oil markets by measuring sentiment using indices constructed from a suite of appropriate financial oil market proxies.
Barberis, Greenwood (2015)	Journal of Financial Economics	Regression framework	Traders survey	1) Many investors form beliefs about future stock market returns by extrapolating past returns
Cornell, Landsman (2017)	Journal of Law, Finance, and Accounting	Cross-sectional regressions of subsequent abnormal stock returns on investor sentiment and a composite measure of valuation difficulty.	334,836 firm-quarter observations, 1973-2014 year, Compustat quarterly database. Baker and Wurgler's sentiment index	1) Sentiment-related mispricing is diminished in the subset of firms with high-quality accounting information 2) When sentiment is high, analysts issue more favorable recommendations for firms that are more difficult to value, even though these firms appear to be overpriced and exhibit negative subsequent abnormal stock returns. However, this behavior is concentrated in the subset of difficult-to-value firms with low quality accounting information
Habib and Hasan (2017)	Research in International Business and Finance	Regression: ordinary least squares (OLS) regression analysis	68k firm observations from different industries excluding regulated, 1974-2012 year	1) Firms that follow innovative business strategies, are more prone to future crash risk than defenders. 2) Prospectors are more prone to equity overvaluation which, increases future crash risk.

Table 2. FIELD OF KNOWLEDGE**: RISK MANAGEMENT**

AUTHOR	JOURNAL	METHOD	DATA	RESULT
Yu, Yuan (2011)	Journal of Financial Economics	Mean-variance relation analyze: through the rolling window model (RW), the mixed data sampling approach (MIDAS), GARCH(1,1), and asymmetric GARCH	NYSE-AMEX returns, 1963 - 2004 year, Baker and Wurgler's sentiment proxies	1) Stock market's expected excess return is positively related to the market's conditional variance in low sentiment periods but unrelated to variance in high-sentiment periods 2) Negative correlation between returns and contemporaneous volatility innovations is much stronger in the low-sentiment periods
Chong, Phillips (2012)	The Journal of finance	Net present value	hypothetical earnings stream of US$100,000 per year for 10 years.	1) Equity rates based on CAPM betas can be quite different from those based on down-market beta, leading to significantly different value estimates. 2) Valuations based on CAPM betas would lead to excessive value when there was greater downside risk and lower values when there was less downside risk.
McLean, Zhao (2014)	The Journal of finance	Regression framework	U.S. firms in the Compustat database (with some limitations), 1965-2010, Baker and Wurgler's sentiment index, Financial variables as debt, share issuance, employment and other affecting financial cost	1)both the business cycle and investor sentiment have significant and independent effects on the cost of external finance.
Kearney, Liu (2014)	International Review of Financial Analysis	Linear regression models, Vector autoregression models	Corporate disclosures, news articles or internet messages	1) Textual sentiment or the tone of qualitative information has been found to have important effects on stock prices and returns. 2) Both the media-expressed and the internet-expressed sentiment literatures have found strong evidence of the immediate effects of sentiment. 3) Negative sentiment has proved to be the strongest influence. Negative sentiment or a large increase in negative sentiment causes downward pressure on market prices immediately.

Jurek, Stafford (2015)	Journal of Banking & Finance	Regression framework	Single S&P 500 index put option portfolio , 1996 - 2012, time series of required rates of return	1) The high excess returns to hedge funds and put writing are consistent with an equilibrium in which a small subset of investors specialize in bearing downside market risks. 2) Required rates of return in such an equilibrium can dramatically exceed those suggested by traditional models, affecting inference about the attractiveness of these investments.
Frugier (2016)	Research in International Business and Finance	Comparative analysis with normal distribution	46 shares composing the Euro Stoxx 50 index in , 2006-2012 year, State Street Investor Confidence Index as sentiment variable	1) Portfolios managed with investor sentiment have better returns and involve less risk under certain conditions.

Table 3. FIELD OF KNOWLEDGE**: METHODOLOGY**

AUTHOR	JOURNAL	METHOD	DATA	RESULT
Tola et al (2008)	Journal of Economic Dynamics and Control	cluster analysis	Idealized conditions of perfect forecast ability for the future return and volatility of stocks and short selling	1) portfolio optimization by using filtered correlation coefficient matrices
Antoniou, Doukas (2013)	Journal of Financial and Quantitative Analysis	Time series regressions	NYSE and AMEX common stocks, 1967 - 2008 year, consumer confidence sentiment by the CB	1) Underpricing of losers under optimism and underpricing of winners under pessimism. 2) Momentum profits arise only under optimism, and are driven principally by strong momentum in losing stocks 3) Small (but not large) investors are slow to sell losers during optimistic periods. Momentum-based hedge portfolios formed during optimistic periods experience long run reversals.
Ni, Wang, Xue (2015)	Economic Modelling	Panel quantile regression model	Shanghai Stock Exchange (SSE) Large & Mid & Small Cap Index,2005-2013 year, opening accounts number and turnover rate in the Shanghai A-share stock market to constitute the investor sentiment.	1) The influence of investor sentiment is significant 2) Its effect is asymmetric and reversal, that is, it is positive and large for stocks with high returns in the short term while negative and small in the long term 3) Chinese investors have notable cognitive bias and speculation tendency
Antoniou, Doukas (2016)	Journal of the Institute for operations research and the management sciences	Regression: based on Fama and French CAPM aproach	Baker and Wurgler's sentiment index, 1966-2010 year, common stocks (share codes 10 and 11) listed on the NYSE, AMEX, and NASDAQ	1) Evidence that noise traders are more bullish about high beta stocks when sentiment is optimistic, while investor behavior appears to accord more closely with rationality during pessimistic periods,
Wahyudin, Djatna (2016)	Journal of Corporate Treasury Management	cluster analysis (K-mean cluster, TF-IDF and Sentiment Weighting	519 risk analysis documents in private bank of Indonesia	1) Provided optimal number of clusters 2) Risk measurement by calculating term-importance scores

Sibley, Wang, Xing, Zhang (2016)	Journal of Banking & Finance	Regression of sentiment index on a variety of macroeconomic variables, business cycle indicators and risk factors. And predictive regression on stock	Baker and Wurgler's sentiment proxies decomposed to risk/business cycle component and others, 28 spread and short-leg portfolios	1) power of the sentiment index to predict cross-sectional stock returns is mainly driven by the risk/business cycle component, while the residual component has little significance in predicting cross-sectional stock returns.
Shen, Yu , Zhao(2017)	Journal of Monetary Economics	Regression analysis, average return and beta-sorted portfolio	Baker and Wurgler's sentiment proxies., 1965 -2010 years, 10 macroeconomic variables (inflation, consumption growth), NYSE/AMES/NASDAQ stocks	1) Portfolios with higher risk exposure do not earn higher returns 2) Striking two-regime pattern for all 10 macro-related factors: high-risk portfolios earn significantly higher returns than low-risk portfolios following low-sentiment periods, opposite occurs following high-sentiment periods.

Taking into account the conducted literature review we can establish two hypotheses contrasting our paper:

H1: High-low period of sentiment influence on the value of systematic risk coefficient (β).

H2: Relationship between systematic risk coefficient (β) and sentiment is stronger in the group of companies with low level of financial stability comparing to the full sample of companies.

Our study offers new findings to several branches of literature, it contributes to a branch of behavioral finance that studies how mispricing affects real investment and to the growing literature on risk management, providing additional information for the behavioral versus neoclassical finance debate. We contribute to such specify topics as: sentiment effect on cost of capital and investor risk measure.

Our research provides additional data to the above mentioned fields of research, opens new topics for discussion and future development. It will help to build new questions for future: does the high sentiment push the beta to grow? If beta and sentiment are positively correlated, does it mean that fluctuation of company stock converge to market fluctuation in the period of positive sentiment, does traders avoid risk and tend to herding in that period?We would like the researches to dive deep into the direction of the questions mentioned above, trying to understand better the specific of stock market risk evaluation.

Our paper developed as following: in chapter 2 we provide the model and methodology, in chapter 3 we discuss results and chapter 4 continues with conclusion, limitation and future research routes.

METHODOLOGY

In this chapter we provide the methodological part of our research, following the structural logic, at first, we explain and provide the beta calculation, later we estimate sentiment through the construction of compound sentiment index, on the next step we study relation between sentiment and systematic risk and finally provide cluster analysis to understand the economic and financial characteristic of companies which show the significant relation between beta and sentiment.

Systematic risk (β) estimation

To continue our previous research (Menendez-Plans et al, 2018) we conduct the methodological part based on the data used before, we proceed with sample of 79 American firms in the tourism industry, specifying sectors of Arts, Entertainment, Recreation and Accommodation and Food Services. We proceed to use period of years 2004-2013. Data have been obtained from Bureau Van Dijk database (the Orbis data base) for all company accounting information and from sites, www.bea.gov (Bureau of Economic analysis), www.bls.gov (Bureau of Labor Statistics) y www.ec.europa.eu/eurostat (Eurostat) for the macroeconomic data and www.stoxx.com and www.yahoo.finance data for stock indices and rates. Beta (β) is the dependent variable of the study (the systematic equity risk of the sampled companies) is estimated by the following regression model:

$$R_{it} = \alpha_i + \beta_{iy} R_{Mt} + \mu_{it} \qquad [1]$$

Where:

i identifies the number of companies in the sample 1……79

t represents the number of data used to estimate the beta, 250 days

y represents the number of scanned fiscal years, 2004…2013

R_{it} is the return on stock i at a time t

β_{iY} identifies the beta of stock i in period y

R_{Mt} identifies profitability of the market portfolio in period t

μit is the random regression residual, assuming hope = 0 and constant variance

Beta is estimated monthly for each of the 79 companies, from daily returns. Dow Jones Industrial Average Index is the market portfolio used to estimate betas, from which daily returns is calculated according to the equation:

$$\mathrm{Ln}(I_t/I_{t-1}) \qquad [2]$$

On which:

I_t is the value of the index at the end of the day t

I_{t-1} is the value of the index at the end of day t-1

In the following table 4, we can see the descriptive statistics of the beta calculation.

Table 4. Beta descriptive statistics

Frequency:		**HIGH**
	№ years	10
	№ companies	58
	№ observations	6960
Central tendency:		
	MEAN	0,865
	MEDIAN	0,901
Variation		
	Highest var.	12,713
	Highest var.	-35,747
	ST.DEV	1,351
Position		
	PERCENTILE 75%	1,405
	PERCENTILE 50%	0,901
	PERCENTILE 25%	0,383
	PERCENTILE 13,5%	0,000

Descriptive statistics demonstrate the characteristics of the analyzed sample:

1) Total number of observations is 58 vs 72 in full scope, as far as 14 companies were chosen to be not relevant due to lack of data and its representativeness.
2) We observed 10 years and received 6960 monthly beta values
3) Average beta is 0,865 and median is 0,901 that means that most of the companies in the sample are less volatile than the market .
4) Highest beta is 12,713 and lowest is -35,747, that shows some extremums during period under consideration

5) Quantile data shows that 13,5% of observations were negative providing inverse relation to market volatility, showing opposite direction to the market

Compound sentiment index construction

To analyze the relation between beta and sentiment, we need to construct a sentiment index in SPSS software as far as no pure sentiment measure reflect all market peculiarities at the exact time, but using sentiment index we approximate to the real matter of state.

In the last years have appeared a number of studies on the influence of investor sentiment on stock market. But there is no decision on investor sentiment measure. There are mostly 2 main categories: down-top (survey-based and direct measure of sentiment) and top-down (market sentiment indices). (Baker and Wurgler, 2006).

A top-down approach is calculated based on stock market transaction activities. For example, Baker and Wurgler (2006) develop a composite index of sentiment (S) based on six proxies for sentiment: NYSE share turnover, the closed end fund discount, the equity share in new issues, the number and average first-day returns on IPOs and the dividend premium. The other reliable indexes are VIX (CBOE volatility index), put-call ratio etc. From the other side all down-top investor sentiment indices are gathered from household or expert reports, answers and opinions. The respondents need to express their prediction of stock market or any future feelings on the prospect of the economy or personal financial expectations on monthly or weekly base. Good example of survey-based sentiment indices are all kinds of Consumer Confidence indexes like Conference Board Consumer Confidence Index, the Investors Intelligence sentiment index or the University of Michigan Consumer Sentiment Index which will be used in our research. (Deeney and Cummins, 2015)

We must admit that the selection of sentiment index or surveys are mainly matter of personal chose, it is an arbitrary work to capture different information on the purpose of the study and data. This thesis employs both survey-based and market-based investor sentiment indices to reflect as much sentiment peculiarities as possible.

From a top-down approach we rely on sentiment definition appeared in Baker and Wurgler (2006). The idea is that most of the down-top approaches reflect mass psychological effects while the top-down approach aggregate sentiment and its effects to market returns and individual stocks. Every year the information is published on the Jeffrey Wurgler web page http://people.stern.nyu.edu/jwurgler/ . He provides a monthly sentiment index which is

constructed on a base of the six proxies: trading volume as measured by NYSE turnover; the dividend premium; the closed-end fund discount; the number and first-day returns on IPOs; and the equity share in new issues.

The second top-down index was chosen to be CBOE Volatility Index (VIX) which is based on the S&P 500 Index (SPX) and estimates expected volatility by averaging the weighted prices of puts and calls over a wide range of strike prices. The data was taken from: http://www.cboe.com/vix.

Kadili (2015) proposed to use a down-top sentiment variables for USA confidence index from OECD as the most used index data to measure field sentiment within final consumers and business, including business, consumer confidence index composite leading indicator, and also Michigan university confidence index and American association individual investor index.

Using these indicators will help us to use partial down-top approach reflecting individual and mass psychology.

More precisely the indexes from OECD database (http://www.oecd.org):

CLI - The composite leading indicator (CLI) is designed to provide early signals of turning points in business cycles showing fluctuation of the economic activity around its long term potential level.

BCI - The business confidence index (BCI) is based on enterprises' assessment of production, orders and stocks, as well as its current position and expectations for the immediate future. Opinions compared to a “normal” state are collected and the difference between positive and negative answers provides an index

CCI - The consumer confidence index (CCI) is based on households' plans for major purchases and their economic situation, both currently and their expectations for the immediate future. Opinions compared to a “normal” state are collected and the difference between positive and negative answers provides an index

In the following diagram 1, we can see the fluctuations of Consumer Confidence Index, which showed the negative inclination from 2003 to 2009 and then light growth from 2009 to 2013.

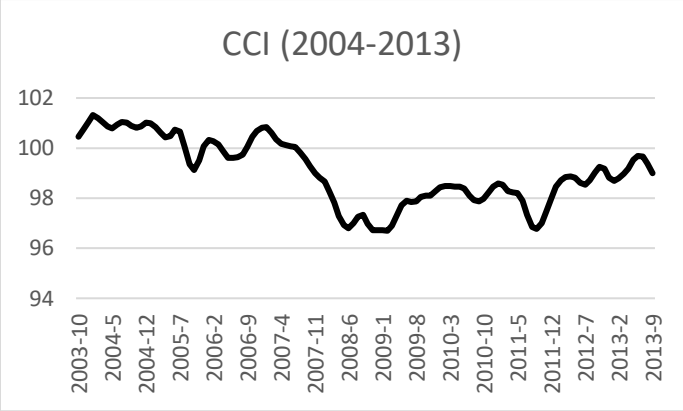

diagram 1. CCI index 2004-2013

UMCSent - The University of Michigan sentiment index is a monthly survey of U.S. consumer confidence levels conducted by the University of Michigan. It is based on telephone surveys that gather information on consumer expectations regarding the overall economy.

AAII- American Association individual investor index measures the mood of individual investors, defining bullish-bearish-neutral feeling about stock market in 6 months.

Below, in diagram 2, we observe the example of the weekly diagram on American Association individual investor index, showing the percent of responses to measure market in 6 months questioned in April 2018.

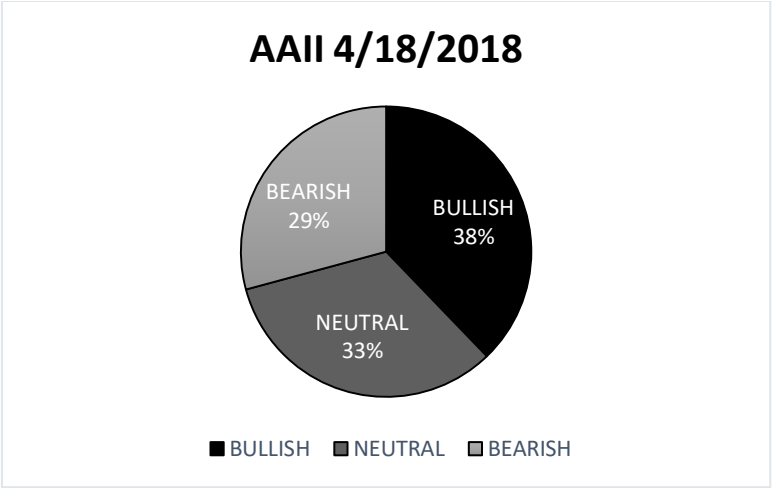

diagram 2. AAII index week 18 April 2018

To be able to measure and compare AAII index to the other indexes, we decided to give weight "1" to bearish, "0" to neutral and "-1" to bearish voice in AAII data, transferring answers into scale datum.

In the current research we use PCA (principal component analysis) to produce a linear combination of the proxies. The first principal component is the linear combination of the proxies which captures the maximum variance compared with other linear combinations subject to normalization. Deeney (2014) found that sentiment influences prices in the professionally-traded oil markets by measuring sentiment constructed through PCA using indices constructed from a suite of appropriate financial oil market proxies.

We follow the research of Wold et al (1987), who described the technique of principal component analysis, he postulates that data should be centralized and normalized before being used. To prepare data we conducted a mean correction by subtracting a mean from each variable to centralize (equation 3) and at the next stage we normalized each data variable by dividing variables to its standard deviation by which we avoid scaling and weight issues (equation 4).

$$m_j = (x_{1j} + \cdots + x_{ij})/I \quad [3]$$

$$s_j = \sqrt{\sum_{i=1}^{I}(x_{ij} - m_j)^2 / I} \quad [4]$$

The full equation for auto-scaling is below, we subtract a mean from each variable and divide by its standard deviation:

$$\tilde{x}_{ij} = (x_{ij} - m_j)/s_j \quad [5]$$

On which:

X_{ij} is the value of each variable t

m_j is mean of data set

s_j is the standard deviation of data set

Abdi et al. (2010) provide a methodology to receive proper results for principal component analysis in SPSS. We need to follow the main assumptions of statistical methodology, we must confirm the existence of linear relationship between all variables, check the sampling adequacy and make a test of sphericity to have suitable data for reduction. To determine the appropriate procedure for the dimension reduction we confirm the mixture of stationary and non-stationary variables, the chosen methodology is the attempt to capture the proper results, while we agree that better methodology could be chosen and remain a key focus for future area researchers which will allow them to compare results with the ones presented in the current paper.

Below, in table 5 we provide the correlation coefficients between variables to check linear relationship between all sentiment variables.

Table 5. Correlations of variables for PCA

		S	CCI	BCI	CLI	UMCSENT	AAII	VIX
S	Pearson Correlation	1	,409**	,118	,707**	,391**	,033	-,515**
	Sig. (2-tailed)		,000	,192	,000	,000	,714	,000
	N	123	123	123	123	123	123	123
CCI	Pearson Correlation	,409**	1	,575**	,657**	,981**	,395**	-,712**
	Sig. (2-tailed)	,000		,000	,000	,000	,000	,000
	N	123	123	123	123	123	123	123
BCI	Pearson Correlation	,118	,575**	1	,630**	,553**	,444**	-,682**
	Sig. (2-tailed)	,192	,000		,000	,000	,000	,000
	N	123	123	123	123	123	123	123
CLI	Pearson Correlation	,707**	,657**	,630**	1	,633**	,291**	-,750**
	Sig. (2-tailed)	,000	,000	,000		,000	,001	,000
	N	123	123	123	123	123	123	123
UMCSENT	Pearson Correlation	,391**	,981**	,553**	,633**	1	,393**	-,705**
	Sig. (2-tailed)	,000	,000	,000	,000		,000	,000
	N	123	123	123	123	123	123	123
AAII	Pearson Correlation	,033	,395**	,444**	,291**	,393**	1	-,381**
	Sig. (2-tailed)	,714	,000	,000	,001	,000		,000
	N	123	123	123	123	123	123	123
VIX	Pearson Correlation	-,515**	-,712**	-,682**	-,750**	-,705**	-,381**	1
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	
	N	123	123	123	123	123	123	123

**. Correlation is significant at the 0.01 level (2-tailed).

The data in table 5 shows that:

a) There is small correlation between top-down (S, VIX) and down-top approaches, S correlate from 0,118 to 0,409 comparing to confidence indexes.
b) Consumer Confidence index (CCI) highly correlate to University of Michigan index by 0,981
c) Volatility index (VIX) has negative correlation to all other indexes
d) American Investor index (AAII) had lowest correlation to all other indexes
e) Business confidence index (BCI) is highly correlated to all index, but very low correlation to consumer index (CCI). If we look at the diagram 3, we can conclude that at the stage of 2008 crisis, business was late to expect it and earlier reveal growth comparing to consumers. It is an interesting observation, which push us to define business to be more optimistic comparing to consumers. And we tend future researches to analyze such phenomenon. (diagr. 3)

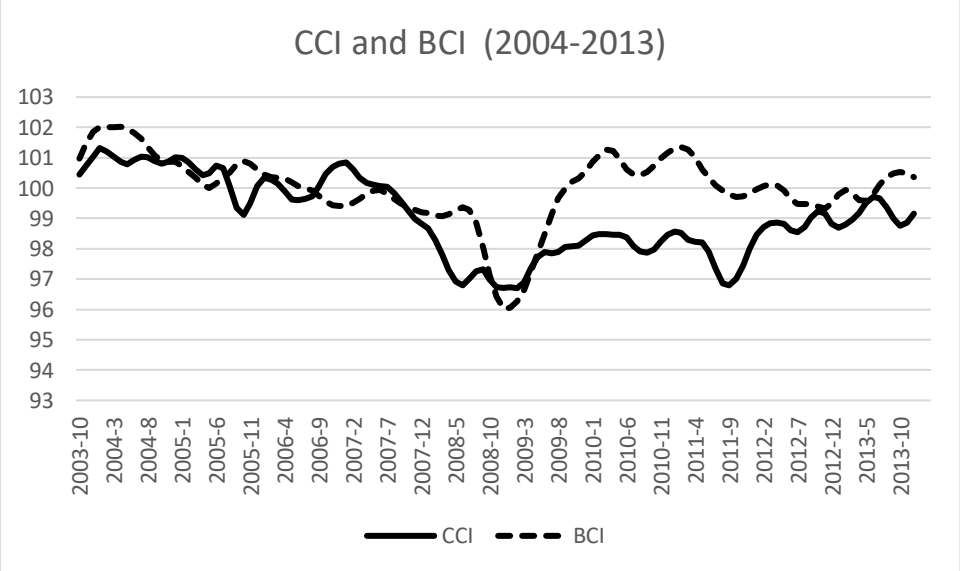

diagram 3. CCI and BCI cross section in 2004-2013

According to correlation matrix and due to interest of research we avoid CCI index and use only UMCSENT index, we keep other indexes for PCA to achieve compound result reflecting both top-down and down-top approaches.

Following Leech et al (2007), the assumptions for principal component analysis include sample size issues, we need to determine factorability of the data set matrix at whole. We make the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity to have suitable data for reduction.

Sampling adequacy is done through the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for the overall data set. Kaiser (1974) provided 0,5 (value for KMO) as minimum, values between 0,7-0,8 acceptable, and values above 0,9 are perfect. Looking at the table 6, the KMO measure is 0,707, which is close of 0,8 and therefore can be completely accepted. Bartlett's test of sphericity is provided to have suitable data for reduction. From the table 6, we can see that the Bartlett's test of sphericity is significant (0,00). That is, significance is less than 0,05. In fact, it is actually 0,00, i.e. the significance level is enough to reject the null hypothesis. This means that correlation matrix is not an identity matrix.

Table 6 .KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,707
Bartlett's Test of Sphericity	Approx. Chi-Square	447,571
	df	15
	Sig.	,000

.

Following Wold et al (1987) we demonstrate the values in table 7, which indicate the proportion of each variable's variance that can be explained by the principal components. Variables with high values are well represented in the common factor space, while variables with low values are not well represented.

Table 7. Data reduction test for PCA

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,520	58,668	58,668	3,520	58,668	58,668
2	1,146	19,094	77,762	1,146	19,094	77,762
3	,583	9,724	87,486			
4	,419	6,988	94,474			
5	,227	3,788	98,262			
6	,104	1,738	100,000			

The data in table 7 shows:

a. Component: There are as many components extracted during a principal components analysis as there are variables that are put into it. In our research we use 6 components: S, CLI, BCI, UMCSENT AAII, VIX

b. Initial Eigenvalues: Eigenvalues are the variances of the principal components. Because we conducted our principal components analysis on the correlation matrix, the variables are standardized, which means that each variable has a variance of 1, and the total variance is equal to the number of variables

c. Total: This column contains the eigenvalues. The first component will always account for the most variance (and hence have the highest eigenvalue), and the next component will account for as much of the left over variance as it can, and so on.

d. % of Variance: This column contains the percent of variance accounted for by each principal component.

e. Cumulative %: This column contains the cumulative percentage of variance accounted for by the current and all preceding principal components.

f. Extraction Sums of Squared Loadings: data reproduce the values given on the same row on the left side of the table. The number of rows reproduced on the right side of the table is determined by the number of principal components whose eigenvalues are 1 or greater

Obviously, the procedure of constructing the sentiment index is not perfect and has no universal rule, however, but the advantage of constructing a composite index for sentiment versus examining the component series separately is that the composite index allows the relative strength of the components to change over time. To be able to produce a compound index we continue approach developed by Wold et al (1987). In table 8 we check for relevance and select the first component variation to represent compound sentiment index.

Table 8 .Component Score Coefficient Matrix

	Component					
	1	2	3	4	5	6
S	**1,185**	,214	-,127	,070	-,432	-1,326
BCI	**,161**	1,419	-,167	-,143	-,580	-1,003
CLI	**-,076**	-,169	-,128	-,024	-,145	2,300
UMCSENT	**-,136**	-,187	1,368	-,126	-,431	-,225
AAII	**,063**	-,202	-,167	1,112	-,106	-,021
VIX	**,244**	,341	,269	,076	-1,811	,082

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Component Scores.

Regarding the results obtained in the table 8, we can construct a compound index using the coefficients in the column 1 of table 8. The PCA model provide the following compound sentiment index:

$$CI = 1{,}185 * S + 0{,}161 * BCI - 0{,}076 * CLI - 0{,}136 * UMCSent + 0{,}063 * AAII + 0{,}244 * VIX$$

In the diagram 4 we show the fluctuation of compound index within period of consideration, we see that CI was negative during world financial crisis of 2008 and neutrally positive within other periods.

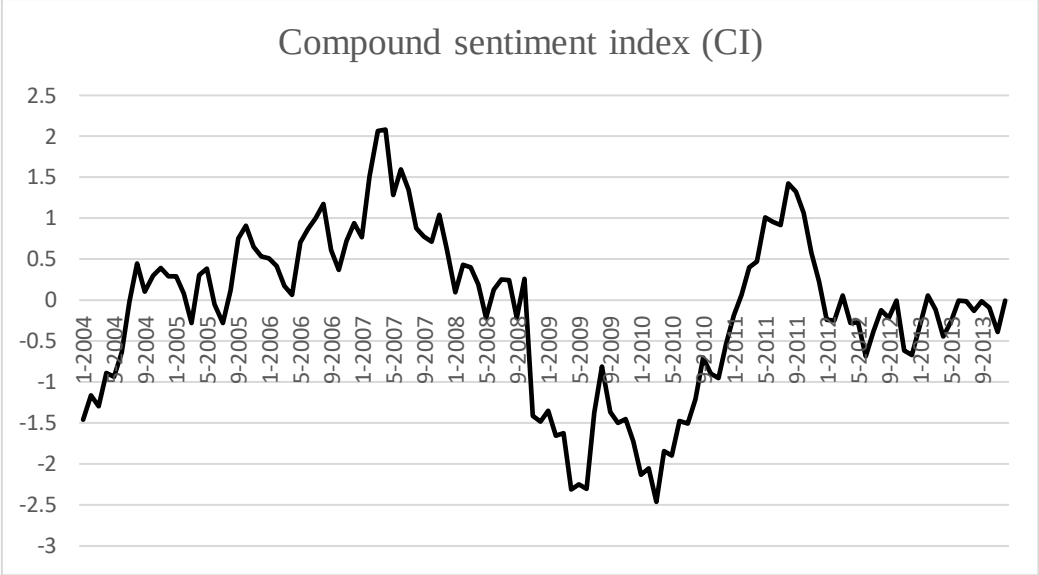

diagram 4. Compound index 2004-2013

To identify whether a particular formation period is optimistic or pessimistic we use an equation 6, where we calculate a weighted rolling average of the compound index (WMA(CI)) of the sentiment level for the three months prior to the end of the formation period. On the back of the approach developed by Antoniou (2013), we give a weight of three to sentiment in the prior month, two to the one in the month prior to that and one to the month three months prior to the current month. A formation period is classified as optimistic (pessimistic) if the three-month rolling average ending in month t belongs in the top (bottom) 30% of the three-month rolling average sentiment time series. At the end we have 3 periods of high, low and neutral sentiment.

$$\boldsymbol{WMA(CI)} = \frac{\mathbf{3} * \boldsymbol{CI_{t-1}} + \mathbf{2} * \boldsymbol{CI_{t-2}} + \mathbf{1} * \boldsymbol{CI_{t-3}}}{\mathbf{6}}$$

[6]

Below, we present the diagram 5 reflecting high-neutral-low period of weighted moving average compound sentiment index. Most of the time sentiment kept in neutral period, it was high before crisis 2008 and low after it, in 2011 we also found signals of high sentiment. WMA (CI) provide us more accurate data comparing to pure compound index showed on the diagram 5.

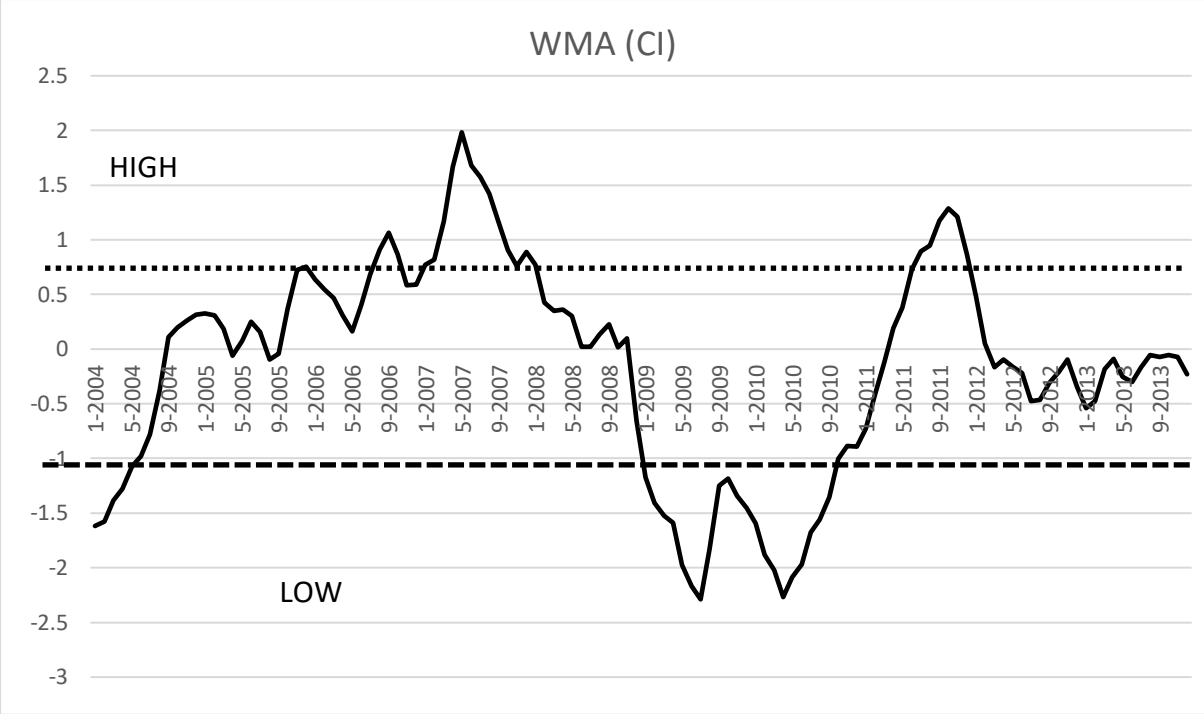

diagram 5. Weighted moving average compound index 2004-2013

Regression between beta and compound sentiment index

For the research we apply the regression approach which was used in Cornell et al (2017).

We apply the following model:

$$\beta_{i,t} = \alpha_0 + \sum_{f=1}^{CI} \alpha_f \, CI_{ift} + \varepsilon_t \qquad [7]$$

Where:

β_{it} identifies beta as dependent variable of firm i in month t

α_f is the correlation coefficient of each indicator

CI is independent variables from compound sentiment index

ε_{it} is error for each firm in any period

We applied linear regression analysis for a set of data, analyzing each pair of regression results.

At first stage we conducted a regression analysis for full range of data, and then divided it for high, low and neutral period according to methodology from Antoniou (2013) mentioned in paragraph 2.1. We regress beta to both Compound index and to weighted moving average

index to check for the better model response. The full results are provided in Appendix 1. We noticed that some companies are better react to CI while the other better react to WMA. As far as some companies are better regress to weighted moving average sentiment index and others to direct sentiment index, we made a weighted average for both indexes given a weight of 50% to weighted moving average compound index (WMA (CI)) and 50% to pure compound index (CI), by this we average the result and decrease the possibility of mistake due respect to calculation method. The full results could be found in Appendix 2.

In the following table 9, we provide the descriptive statistics of the regression part of the research referring to R^2.

Table 9. Regression R^2 descriptive statistics

		Sentiment period				
Frequency:		**HIGH**	**NEUTRAL**	**LOW**		**FULL**
	COUNT	58	58	58		58
Central tendency:						
	MEAN	4,8%	2,3%	4,8%		3,6%
	MEDIAN	2,7%	1,0%	3,8%		2,1%
Variation						
	Highest var.	25,0%	16,0%	20,0%		20,0%
	ST.DEV	4,9%	3,0%	4,7%		4,5%
Position						
	PERCENTILE 75%	6,9%	3,4%	6,1%		4,6%
	PERCENTILE 50%	2,7%	1,0%	3,8%		2,1%
	PERCENTILE 25%	1,4%	0,4%	1,3%		0,5%
Significance						
	Significance F.	<0,05	<0,05	<0,05		<0,05

Descriptive statistics shows the specific of the analyzed sample and provide the support for the hypothesis 1:

1) Total number of company observations is 58 vs 72 in full scope, as far as 14 companies were chosen to be not relevant due to lack of data and its representativeness.
2) Average regression between beta and sentiment is twice higher during high emotional periods (high (low) sentiment period R^2mean is 4,8% vs 2,3% during neutral period.
3) Regression range variate from 0% up to R^2= 25% analyzing full period
4) Maximum R^2= 25% during high sentiment period
5) Standard deviation (σ) is higher during emotional periods (high/low vs neutral), grow from 3% to 4,9%. I.e. grow of variation to the median.
6) Percentile variation confirm that during neutral sentiment period R^2 is lower

Here we confirm the hypothesis 1, that sentiment period influences the value of the systematic risk coefficient (β) and it depends on high-low period of sentiment, it is proved by the regression analysis and descriptive results. The level of R^2 does not allow us to postulate that sentiment is the main antecedent of the systematic risk coefficient , but we see that R^2 mean is twice higher during high and low sentiment periods, making a support to the idea that during emotional periods the referent shares follow the volatility of the benchmark market stronger, comparing to the neutral period, so far giving a support to the hypothesis 1. Our results help to establish the strategy for traders within different emotional periods, for example during high or low sentiment periods is better to follow beta rather than trading against beta could be more profitable during neutral period.

Cluster analysis

To check the hypothesis 2 we provided a 2-steps K-mean clustering, basing Madhulatha (2012) comparative research. Cluster analysis was chosen as method for dividing data into groups that are meaningful. It is used for sentiment dependent company computation and finding its peculiarities. A simple partitional clustering divides data into non-overlapping groups. A prominent algorithm for partitional clustering is K-means where data are grouped into a predetermined number of clusters specified by user.

We used the following algorithm:

1) We chose 5 clusters for each of sentiment period (full, high, neutral, low)
2) We range clusters in each sentiment period (full, high, neutral, low) by giving the name of "1" to the less sentiment affected cluster and "5" to the most sentiment affected
3) We gave weights to each company, weight of 1 to cluster 1 and weight of 5 to cluster 5, so far weighting them by the level of sentiment dependence, the more value – in the higher cluster company were settled before.
4) We made the second K-mean cluster analysis using the total weights received on the previous step.
5) We form 3 clusters, where "1" cluster name to the group of low affected companies and "3" to the most affected.

The complete results of the step by step cluster process could be found in Appendix 3. We also provide the full list of companies in the appendix 4 depending on the cluster. Most of the companies got into the low sentiment affected group - 25 companies, 7 companies were put into high sentiment affected cluster and 26 into neutral.

Claessens et al. (2000) provide a firm specific weakness. He postulates that high level of leverage is the part of firm financial instability. Berkmen et al. (2012) showed that countries with more leveraged financial systems, stronger credit growth, and more short-term debt tended to suffer a larger effect on economic activity, showing financial instability. We hypothesis that companies with low level of financial stability have stronger dependence between beta and sentiment, so far reflecting sentiment situation on market and should be inside of the cluster of high sentiment affect companies (cluster "3").

To analyze the accounting and financial stability of each cluster we base our research on the findings of Claessens et al (2000) and Berkmen et al. (2012). We use the ratios of size, financial leverage and other financial rates from Angel, Menendez-Plans and Orgaz-Guerrero (2018).

- Current ratio (CR)
- Financial leverage (FL)
- Asset turnover ratio (AST)
- Total debt to assert ratio (LV_1)
- Long-term debt to equity (LV_2)
- Size (SZ_1) as natural logarithm to total assets

- Income after taxes (IAT)
- Operational leverage (OL)

In the table 10 we provide the results of cluster accounting and financial statistics, we have 3 groups of companies with high, neutral and low level of regression between beta and sentiment. We provide the mean values for current ratio (CR), financial leverage (FL), asset turnover ratio (AST), total debt to assert ratio (LV_1), long-term debt to equity (LV_2) size (SZ_1) as natural logarithm to total assets, income after taxes (IAT) and operational leverage (OL) by this we are able to define the peculiarities of every cluster.

Table 10. Cluster analysis results

Sentiment affect	Count	CR	FL	AST	LV_1	LV_2	SZ_1	IAT	OL
High ("3")	7	1,09	3,98	0,62	0,71	3,35	7,80	173,59	0,12
Neutral ("2")	26	1,09	3,46	1,18	0,62	1,92	7,02	320,35	0,09
Low ("1")	25	1,33	3,49	1,22	0,56	2,28	5,64	49,31	0,09
Total	58	1,21	3,55	1,12	0,60	2,30	6,44	163,86	0,09

* Number of companies (Count), Current ratio (CR), Financial leverage (FL), Asset turnover ratio (AST), Total debt to assert ratio (LV_1), Long-term debt to equity (LV_2), Size (SZ_1) as natural logarithm to total assets, Income after taxes (IAT), Operational leverage (OL)

Analyzed sample in table 10 provide us following results:

1) High sentiment affected companies have low level of current ratio, that means low ability to pay back its liabilities (debt and accounts payable) CR=1,09
2) High level of AST means low efficiency with which a company of high sentiment is deploying its assets in generating revenue AST=0,62
3) High level of FL means that companies are using debt and other liabilities to finance its assets FL=3,98
4) LV_1 and LV_2 are high for sentiment affected companies, i.e. that total amount of debt relatively high to assets
5) Sentiment affected companies are using more fixed to variable costs, so far having more operating leverage OL=0,12
6) Comparing to others sentiment affected companies are relatively big on the market,SZ_1

7) No special feature regarding to income, profit or EBIT were found

In the table 10 we grouped the companies by the level of regression between beta and sentiment and proved that relationship between systematic risk coefficient (β) and sentiment is stronger in the group of companies with low level of financial stability comparing to the full sample of companies confirming the hypothesis 2. Group of companies whose beta is stronger affected by sentiment (high"3") keep the features of big unstable companies with not effective financial control, high level of leverage and less possibility to pay debts.

CONCLUSION

This paper put the aim to investigate the role that investor sentiment plays in systematic risk. Current research focused on the idea that a firm stock level has the antecedents not only of a fundamental rational environment but at the same time is a part of a human behavior, reflexing personal group narratives and sentiment.

In our research beta (β) plays a role of a valid objective and systematic equity risk measure, which allows to calculate the return of capital. Classical Capital Asset Pricing Model (CAPM) defines the variables, which influence on systematic risk coefficient (β) from efficient market hypothesis (EMH) point of view, i.e. traders being rational and leaving no space for sentiment existing on the market. (Shiller, 2013)

We decided to test if the level of systematic risk depends on the sentiment level and varies within group of different companies. Evidence on the validity of our research will help the stock market players to pay attention to sentiment levels and choose the proper group of companies to invest depending on the period of high-low sentiment and characteristics of chosen company.

We chose the hospitality sector because the importance to variate between industry and country was proved in work of Engle, Jondeau and Rokinger (2015) and Foster, et al (2012) found that different sectors of economy keep different systematic risk levels. Hospitality covers more than 3% of US GDP and plays important role in economic power together with reflexing economic trends, we follow the paper of Angel, Menendez-Plans and Orgaz-Guerrero (2018) using the data set of companies from US tourism industry.

In this paper we test 2 hypotheses, the first hypothesis postulate that high-low period of sentiment influence on the value of systematic risk coefficient (β), i.e. that beta of each company will have different value depending the state of sentiment environment on market.

The second hypothesis posits that relationship between systematic risk coefficient and sentiment is stronger in the group of companies with low level of financial stability comparing to the full sample of companies, i.e. that companies with low level of financial stability bearing stronger pressure during emotional explosion on the market. To say the simple words, if sentimental situation on the market aims to the negative or positive extremum, the companies with low level of financial stability will strongly follow market trend comparing to more stable companies.

Our results support all hypothesis, showing that that systematic risk coefficient (β) is dependent on high-low period of sentiment. We found that average R^2 between beta and sentiment is twice higher during high emotional periods (high (low) sentiment period, R^2mean is 4,8% vs 2,3% during neutral period. While the difference is negligible, it show show the general tendency and confirm the hyphorhesis. At the same time and we ask future researchers for deeper analysis in the part of comparison and measure of economical or statistical difference. The second hypothesis was also confirmed, companies which are strongly affected by sentiment keep the features of big unstable companies with not effective financial control, high level of leverage and less possibility to pay debts. (Table 10). Our paper also confirm possibility to differentiate companies into different groups due to their reaction on sentiment and it postulate that high-low period of sentiment affect differently on companies from different clusters.

We would like to underline the main finding of the research, we found that:

a) period of sentiment influence on the value of systematic risk coefficient (β),

b) relationship between systematic risk coefficient and sentiment is stronger in the group of companies with low level of financial stability

The results of our research is in line with findings of Daniel et al (2001), they found that traders are more likely to be prone to behavioral biases such as overconfidence, which can cause them to under-assess risk during optimistic periods. It also partially in line with Antoniou (2013) who hypothesize that periods of optimism attract equity investment by unsophisticated and overconfident traders who under-assess risk.

The limitation of our research could be gathered into 4 main groups - related to data, methodology and framework of the research. More precisely are:

a) the database could be expanded,

b) the other sentiment index could be found due to change in sentiment compounds and other variables chosen,
c) the other ways to measure connection could be used, for example panel threshold regression, time series regression or mean variance analysis, cluster analysis technic might be improved.
d) the other ways to the measure the financial stability, more indicators and factors could be used.

This paper shed the light to cross relation of beta and sentiment in the market, our findings expand the knowledge of peculiarities of sentiment affected companies, and provide deeper understanding of risk assessment during different emotional periods of the market. But future researchers should put the effort on the stronger deep dive analysis: we ask them to understand better and find more antecedents of sentiment affected companies, to make a comparative analysis within different sectors of economy and different countries, increase the time factor under consideration, the more important is to understand the route of dependence – is it general sentiment who affect companies or vice versa. This latter investigation would be beneficial to stock market actors, policy makers and researchers seeking to control irrational fluctuation and speculation with its associated impact on the special company or on economy in general.

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APPENDIX

Appendix 1. Full regression between beta and sentiment

		Sentiment period							
		HIGH		NEUTRAL		LOW		FULL	
CODE	NAME	CI R^2	WMA R^2	CI R^2	WMA R^2	CI R^2	WMA R^2	CI R^2	WMA R^2
1	MCD	2,2%	3,2%	5,9%	1,0%	7,2%	14,7%	4,0%	2,8%
2	SBX	4,2%	8,1%	0,1%	0,2%	10,2%	1,0%	0,3%	0,1%
3	LVS	1,0%	12,7%	0,0%	1,1%	0,2%	0,6%	7,2%	10,5%
4	YUM	2,2%	3,2%	5,9%	1,0%	7,2%	14,7%	4,0%	2,8%
5	MAR	0,3%	5,1%	6,9%	3,0%	2,8%	0,0%	4,5%	4,3%
6	MGM	0,5%	22,8%	0,9%	0,9%	8,2%	0,4%	10,6%	11,5%
7	DRI	0,0%	1,4%	0,5%	1,9%	0,9%	3,0%	2,5%	3,1%
8	LYV	0,8%	3,1%	2,5%	1,2%	14,1%	0,7%	4,1%	5,2%
9	STWD	49,4%	0,3%	0,9%	0,7%	11,4%	0,1%	15,2%	11,5%
10	WYNN	0,1%	5,0%	0,0%	0,1%	2,0%	6,0%	4,3%	5,1%
11	WYN	1,7%	0,0%	20,4%	12,4%	0,0%	2,2%	14,4%	11,0%
12	CMG	0,0%	0,0%	0,1%	0,7%	11,3%	0,8%	1,1%	1,3%
13	PENN	0,4%	6,5%	2,1%	0,5%	1,8%	0,1%	0,0%	0,8%
14	EAT	3,3%	2,9%	1,6%	0,0%	4,2%	0,1%	0,1%	0,4%
15	CBRL	0,4%	1,0%	0,9%	0,0%	1,0%	2,2%	1,7%	3,6%
16	WEN	0,0%	0,2%	0,2%	0,7%	0,0%	0,5%	3,5%	5,9%

17	BOBE	2,4%	2,5%	0,3%	0,8%	2,8%	0,8%	1,1%	1,2%
18	JACK	0,2%	1,3%	4,4%	1,5%	0,2%	0,0%	4,9%	4,2%
19	PZZA	0,4%	1,6%	2,0%	5,6%	5,8%	1,4%	2,1%	3,1%
20	TXRH	0,3%	0,1%	1,5%	0,0%	12,0%	0,3%	5,2%	3,7%
21	BLWD	0,6%	0,3%	1,9%	5,1%	11,1%	14,0%	4,8%	5,7%
22	RT	0,2%	2,1%	0,3%	0,1%	2,9%	2,2%	4,5%	3,4%
23	LCUT	11,3%	11,0%	3,7%	5,4%	1,0%	0,0%	2,4%	3,4%
24	FUN	4,6%	0,5%	2,2%	9,4%	0,6%	1,3%	0,3%	0,8%
25	SIX	0,0%	31,6%	0,7%	3,6%	27,8%	0,1%	15,0%	19,8%
26	SGMS	1,3%	1,1%	2,1%	0,3%	12,3%	15,0%	2,5%	1,6%
27	RRGB	0,6%	2,2%	0,0%	0,2%	3,1%	4,8%	1,1%	1,1%
28	CHDN	0,1%	1,0%	2,9%	2,3%	6,0%	4,2%	1,6%	1,6%
29	BJRI	0,0%	2,1%	2,3%	0,6%	23,5%	15,8%	2,4%	1,2%
30	BH	1,6%	2,7%	5,1%	1,3%	2,7%	5,5%	1,5%	1,7%
31	CHH	3,2%	4,5%	0,0%	0,0%	8,2%	8,1%	0,2%	0,3%
32	TAST	16,7%	5,5%	0,1%	0,5%	21,5%	7,9%	0,5%	0,7%
33	DIN	4,6%	2,1%	0,6%	0,6%	1,7%	5,1%	4,5%	2,8%
34	ISCA	3,8%	6,1%	4,4%	2,9%	0,5%	7,5%	0,8%	0,2%
35	SONC	0,8%	9,0%	0,4%	1,3%	1,5%	8,6%	0,9%	1,2%
36	TRK	3,1%	0,2%	1,2%	1,6%	3,3%	4,5%	1,4%	1,1%
37	CLUB	11,9%	7,4%	9,9%	3,6%	0,2%	0,1%	9,8%	6,6%
38	DENN	0,7%	7,4%	0,1%	0,1%	0,0%	1,8%	0,0%	0,1%
39	RUTH	1,6%	3,2%	9,9%	2,4%	0,0%	0,0%	20,8%	18,3%
40	LUB	4,4%	1,8%	0,0%	0,0%	6,3%	0,4%	1,3%	2,3%
41	DOV	2,7%	11,6%	0,1%	1,6%	0,2%	0,9%	5,1%	7,3%
42	MCRI	3,3%	6,2%	4,3%	3,8%	24,3%	15,9%	0,0%	0,0%
43	DAVE	8,7%	1,8%	3,3%	1,0%	0,0%	3,2%	0,2%	0,2%
44	FLL	1,0%	13,6%	0,8%	0,1%	0,6%	0,2%	0,1%	0,0%
45	GCFB	1,9%	3,5%	0,0%	2,0%	5,7%	3,0%	4,2%	5,5%
46	EACO	0,2%	5,1%	0,0%	0,0%	2,5%	4,2%	0,0%	0,0%
47	RLH	0,0%	0,7%	4,3%	6,4%	1,2%	0,8%	3,4%	4,3%
48	FOX	4,3%	9,1%	12,6%	13,3%	2,9%	2,0%	16,0%	14,6%
49	KONA	6,3%	17,8%	0,4%	0,0%	1,9%	3,7%	2,3%	2,1%
50	BDL	5,4%	5,4%	0,0%	0,8%	0,8%	1,9%	2,8%	2,4%
51	NATH	2,6%	1,0%	1,3%	3,9%	11,9%	5,6%	0,0%	0,1%
52	NYNY	10,2%	6,5%	1,8%	0,3%	5,0%	0,3%	0,0%	0,5%
53	UWN	4,3%	0,0%	0,0%	0,2%	8,4%	11,9%	0,0%	0,3%
54	GPIC	1,1%	15,1%	0,6%	1,0%	0,9%	10,5%	0,9%	2,1%
55	CPHC	36,0%	0,1%	1,6%	0,1%	0,5%	12,8%	0,8%	3,0%
56	DVD	0,2%	2,8%	0,2%	2,0%	1,0%	0,8%	3,1%	1,7%
57	TIXC	16,1%	5,0%	6,7%	5,3%	4,1%	6,2%	0,0%	0,0%
58	GTIM	3,3%	18,1%	1,6%	3,4%	7,4%	1,0%	0,1%	0,0%

Appendix 2. Weighted average regression

	Sentiment period			
Name	**FULL**	**High**	**Neutral**	**Low**
MCD	3,4%	2,7%	3,4%	10,9%
SBX	0,2%	6,1%	0,1%	5,6%
LVS	8,9%	6,8%	0,6%	0,4%
YUM	3,4%	2,7%	3,4%	10,9%
MAR	4,4%	2,7%	4,9%	1,4%
MGM	11,0%	11,7%	0,9%	4,3%
DRI	2,8%	0,7%	1,2%	1,9%
LYV	4,7%	2,0%	1,9%	7,4%
STWD	13,3%	24,8%	0,8%	5,8%
WYNN	4,7%	2,6%	0,1%	4,0%
WYN	12,7%	0,9%	16,4%	1,1%
CMG	1,2%	0,0%	0,4%	6,0%
PENN	0,4%	3,4%	1,3%	1,0%
EAT	0,2%	3,1%	0,8%	2,2%
CBRL	2,7%	0,7%	0,4%	1,6%
WEN	4,7%	0,1%	0,4%	0,3%
BOBE	1,2%	2,5%	0,5%	1,8%
JACK	4,6%	0,8%	2,9%	0,1%
PZZA	2,6%	1,0%	3,8%	3,6%
TXRH	4,4%	0,2%	0,8%	6,2%
BLWD	5,3%	0,4%	3,5%	12,6%
RT	3,9%	1,2%	0,2%	2,6%
LCUT	2,9%	11,2%	4,5%	0,5%
FUN	0,6%	2,5%	5,8%	1,0%
SIX	17,4%	15,8%	2,1%	13,9%
SGMS	2,1%	1,2%	1,2%	13,6%
RRGB	1,1%	1,4%	0,1%	3,9%
CHDN	1,6%	0,6%	2,6%	5,1%
BJRI	1,8%	1,1%	1,5%	19,6%
BH	1,6%	2,2%	3,2%	4,1%
CHH	0,3%	3,9%	0,0%	8,1%
TAST	0,6%	11,1%	0,3%	14,7%
DIN	3,6%	3,4%	0,6%	3,4%
ISCA	0,5%	5,0%	3,6%	4,0%
SONC	1,0%	4,9%	0,9%	5,0%
TRK	1,2%	1,7%	1,4%	3,9%
CLUB	8,2%	9,7%	6,8%	0,2%
DENN	0,1%	4,0%	0,1%	0,9%
RUTH	19,5%	2,4%	6,1%	0,0%
LUB	1,8%	3,1%	0,0%	3,3%
DOV	6,2%	7,2%	0,8%	0,5%
MCRI	0,0%	4,7%	4,0%	20,1%

DAVE	0,2%	5,2%	2,2%	1,6%
FLL	0,0%	7,3%	0,5%	0,4%
GCFB	4,9%	2,7%	1,0%	4,3%
EACO	0,0%	2,7%	0,0%	3,4%
RLH	3,9%	0,4%	5,3%	1,0%
FOX	15,3%	6,7%	12,9%	2,4%
KONA	2,2%	12,0%	0,2%	2,8%
BDL	2,6%	5,4%	0,4%	1,3%
NATH	0,1%	1,8%	2,6%	8,7%
NYNY	0,3%	8,3%	1,0%	2,7%
UWN	0,1%	2,1%	0,1%	10,2%
GPIC	1,5%	8,1%	0,8%	5,7%
CPHC	1,9%	18,0%	0,9%	6,6%
DVD	2,4%	1,5%	1,1%	0,9%
TIXC	0,0%	10,6%	6,0%	5,2%
GTIM	0,1%	10,7%	2,5%	4,2%

Appendix 3. Final clusters

		5 scale spss					5 scale adj					
num	NAME	FULL	HIGH	NEUTRAL	LOW		FULL	HIGH	NEUTRAL	LOW	WEIGHTS	CLUSTER SPSS
1	MCD	1	5	3	1		2	1	3	3	9	2
2	SBX	2	5	2	5		1	1	1	1	4	1
3	LVS	3	3	2	5		3	2	1	1	7	2
4	YUM	1	5	3	1		2	1	3	3	9	2
5	MAR	1	5	3	5		2	1	3	1	7	2
6	MGM	3	3	2	5		3	2	1	1	7	2
8	DRI	1	5	2	5		2	1	1	1	5	1
9	LYV	1	5	2	5		2	1	1	1	5	1
10	STWD	5	1	2	5		4	5	1	1	11	3
11	WYNN	1	5	2	4		2	1	1	2	6	2
12	WYN	5	5	4	5		4	1	5	1	11	3
13	CMG	2	5	2	5		1	1	1	1	4	1
14	PENN	2	5	2	5		1	1	1	1	4	1
15	EAT	2	5	2	5		1	1	1	1	4	1
16	CBRL	1	5	2	5		2	1	1	1	5	1
17	WEN	1	5	2	5		2	1	1	1	5	1
19	BOBE	2	5	2	5		1	1	1	1	4	1
20	JACK	1	5	2	5		2	1	1	1	5	1
22	PZZA	1	5	1	5		2	1	2	1	6	2
23	TXRH	1	5	2	5		2	1	1	1	5	1
24	BLWD	1	5	1	1		2	1	2	3	8	2
25	RT	1	5	2	5		2	1	1	1	5	1
26	LCUT	1	2	1	5		2	3	2	1	8	2
27	FUN	2	5	1	5		1	1	2	1	5	1
28	SIX	4	4	1	2		5	4	2	4	15	3
29	SGMS	1	5	2	1		2	1	1	3	7	2
30	RRGB	2	5	2	4		1	1	1	2	5	1
32	CHDN	2	5	2	5		1	1	1	1	4	1
33	BJRI	2	5	2	3		1	1	1	5	8	2
34	BH	2	5	3	4		1	1	3	2	7	2
35	CHH	2	5	2	1		1	1	1	3	6	2
37	TAST	2	2	2	3		1	3	1	5	10	3
38	DIN	1	5	2	4		2	1	1	2	6	2
39	ISCA	2	5	1	4		1	1	2	2	6	2
40	SONC	2	5	2	4		1	1	1	2	5	1
41	TRK	2	5	2	5		1	1	1	1	4	1
42	CLUB	3	2	3	5		3	3	3	1	10	3
43	DENN	2	5	2	5		1	1	1	1	4	1
46	RUTH	4	5	3	5		5	1	3	1	10	3
47	LUB	2	5	2	5		1	1	1	1	4	1
50	DOV	1	3	2	5		2	2	1	1	6	2

51	MCRI	2	5	1	3		1	1	2	5		9	2
52	DAVE	2	2	2	5		1	3	1	1		6	2
53	FLL	2	3	2	5		1	2	1	1		5	1
54	GCFB	1	5	2	5		2	1	1	1		5	1
57	EACO	2	5	2	5		1	1	1	1		4	1
58	RLH	1	5	1	5		2	1	2	1		6	2
59	FOX	5	5	5	5		4	1	4	1		10	3
60	KONA	2	3	2	5		1	2	1	1		5	1
62	BDL	1	5	2	5		2	1	1	1		5	1
63	NATH	2	5	1	1		1	1	2	3		7	2
64	NYNY	2	2	2	5		1	3	1	1		6	2
65	UWN	2	5	2	1		1	1	1	3		6	2
66	GPIC	2	3	2	4		1	2	1	2		6	2
67	CPHC	2	1	2	4		1	5	1	2		9	2
68	DVD	1	5	2	5		2	1	1	1		5	1
71	TIXC	2	2	3	4		1	3	3	2		9	2
72	GTIM	2	3	1	5		1	2	2	1		6	2

Appendix 4. List of companies inside of each cluster.

	Cluster	Name	Tik
"3"	High:	Starwood Property Trust	STWD
		Wyndham Worldwide Corporation	WYN
		Six Flags Entertainment Corporation	SIX
		Carrols Restaurant Group	TAST
		Town Sports International Holdings	CLUB
		Ruth's Hospitality Group	RUTH
		Twenty-First Century Fox	FOX
"2"	Neutral:	McDonalds	MCD
		Las Vegas Sands Corp	LVS
		YUM! Brands	YUM
		Marriott International	MAR
		MGM Resorts International	MGM
		Wynn Resorts	WYNN
		Papa John's International	PZZA
		Buffalo Wild Wings	BLWD
		Lifetime Brands	LCUT
		Scientific Games Corporation	SGMS
		BJ's Restaurants	BJRI
		Biglari Holdings	BH
		Choice Hotels International	CHH
		Dine Brands Global	DIN
		International Speedway Corporation	ISCA
		Dover Corporation	DOV
		Monarch Casino & Resort	MCRI
		Famous Dave's of America	DAVE
		Red Lion Hotels Corporation	RLH
		Nathan's Famous	NATH
		Empire Resorts	NYNY
		Nevada Gold & Casinos	UWN
		Gaming Partners International Corporation	GPIC
		Canterbury Park Holding Corporation	CPHC
		Tix Corporation	TIXC
		Good Times Restaurants	GTIM
"1"	Low:	Starbucks Corporation	SBUX
		Darden Restaurants	DRI
		Live Nation Entertainment	LYV
		Chipotle Mexican Grill	CMG
		Penn National Gaming	PENN
		Brinker International	EAT
		Cracker Barrel Old Country Store	CBRL
		The Wendy's Company	WEN

Bob Evans Farms	BOBE
Jack in the Box Inc	JACK
Texas Roadhouse	TXRH
Ruby Tuesday	RT
Cedar Fair	FUN
Red Robin Gourmet Burgers	RRGB
Churchill Downs Incorporated	CHDN
Sonic Corp	SONC
Speedway Motorsports	TRK
Denny's Corporation	DENN
Luby's	LUB
Full House Resorts	FLL
Granite City Food & Brewery	GCFB
EACO Corporation	EACO
Kona Grill	KONA
Flanigan's Enterprises	BDL
Dover Motorsports	DVD

CHAPTER III

"Investor sentiment and determinants of systematic risk in tourism industry. International study and panel data estimation. (2008-2017)"

INTRODUCTION

This paper analyzes the role that investor sentiment plays in explaining the systematic risk of stock market in the tourism sector. The works of Habid and Hasan (2017), Chau, Deesomsak and Koutmos (2016) and MClean and Zhao (2014) show the importance of investor sentiment for the risk, profitability and the cost of capital. Systematic risk influences the cost of capital and by this it has an effect on the market value of the shares. Therefore, the value of the cost of capital could be precisely updated during the process of shares estimation with risk adjustable models. That's why it is important to know more and better about the systematic risk and it is important to continue investigating its determinants to obtain consistent results on the subject of cost of capital. As in any other research area, the results obtained in previous investigations are rather disparate, since the samples and techniques seriously vary, and consequently need to be verified and contrasted to grant them greater scientific validity. Basing the international study and a broad database, we intend to obtain statistically consistent results on determinants of systematic risk trying to understand if investor sentiment could explain it.

It is evident that risk management subject has been widely analyzed. Papers of Carvalho (2018), Xing and Yan (2018), Chiu, Harris, Stoja and Chin (2018), Park, Song and Lee (2017), Park, Song and Lee (2017b) and Savor and Wilson (2016), Cederburg and O'Doherty (2016), Engle, Jondeau and Rockinger (2015) and Bolton, Chen and Wang (2011) show that the topic remains in the core of interest for the scientific community because of the results relevance to the business management of listed companies and small and medium enterprises.

Incorporating investor sentiment into the explanatory variable of systematic risk means improving research by incorporating a very important explanatory variable existed in the recent research and scientific papers, it means developing a multidisciplinary research, combining the study of financial management and the field of behavioral corporate finance. Johnman, Vanstone and Gepp (2018) find that with negative sentiment increasing volatility, Bethke, Trapp and Kempf (2017) show that bond risk increases when investor sentiment is worsens and Baker and Wurgler (2006) showed that the cross-section of future stock returns

is conditional on beginning of period proxies sentiment and therefore, it suggests incorporating the sentiment into the models that analyze the characteristics of the companies that remain under evaluation process.

We estimate the systematic risk in the tourism industry from the CAPM beta, despite the criticism which continue to rely on models with greater numbers of factors: four factor model Park, Song and Lee (2017) or five factor model Chiah, Chai, Zhong and Li (2016), there is also recent literature that defends the use of beta CAPM, following the works of Angel, Menéndez-Plans and Orgaz-Guerrero (2018), Jylhä (2018), Xing and Yan (2018).

The main objective of the study is to deepen the analysis of the information that explains the systematic risk in tourism sector in order to endow the results with greater scientific strength through: a) an international study, following Arif and Lee (2014), because we analyze six different economic classifiable in three geographical areas: USA, Europe and Asia, b) a more precise study, because we study two large sectors of the tourism industry: Hotel and Entertainemtn Services and Passenger Transportation Services, which they are divided into six subsectors, (Manoharan and Singal (2017)), c) a very broad database, 5,936 observations and 673 companies, d) a study with more independent variables than in previous studies because we incorporate investor sentiment as an explanatory variable of risk and what is measured in different ways e) panel data technique, Park, Song and Lee (2017) and d) report more homogeneous information, because all the data was obtained from the Datastream database, except measures of investor sentiment. The six geographic areas analyzed are Europe, the United States, Japan, China, India and Hong Kong, and the tourism industries included in the sample are Leisure & Recreation, Hotels, Motels & Cruise Lines, Restaurants & Bars, Casinos & Gaming for the Hotel sector and Entertainment Services and Airlines in Passenger Transportation, Ground & Sea, for the Passenger Transportation Services sector, sector classification obtained from Eikon Thonson Reuters online, https://eikon.thomsonreuters.com/index.html.

Therefore, the main contribution of the research is the breadth of the study, the size of the sample, the geographical areas under consideration, the number of analyzed tourism sectors, explanatory variables, homogeneity of the information and the panel data technique applied. All of this allows us to obtain more consistent results from the statistical point of view, and more accurate for each economy and sector, because as noted by Foster, Kasznik and Sidhu (2012) the indicators of country and industry have an important explanatory power.

The results of the analysis show us that the investor sentiment with a combination of information coming from the company and the market explains the systematic risk. The study of the total sample reveals that systematic risk of the tourism industry could be determined by the investor sentiment, the growth of the gross domestic product, the profitability of the shareholder, the business size, the investment in working capital and the efficiency ratio of asset turnover. However, we see that risk explanatory information vary for each geographical area. It is not the same for USA, Europe and Asia, nor is it the same for each of the subsectors analyzed. The results of the research show us that the average beta of the sector is equal to 0.53 and that, therefore, the stocks of the tourism sector have regressive betas, with a differentiation in profitability comparing to the market portfolio. The results also show that:

- The investor sentiment explains the beta and depending to the measure of sentiment used, the relationship between the beta and the independent variables is changing.
- The variation in the exchange rate and gross domestic product explain the systematic risk
- Business size is a relevant variable in the explanation of risk.
- The variables that explain the risk for US stocks differ a lot from the variables that explain the risk of European and Asian stocks
- For Asian equities, the current ratio indicator is more significant than the Asset Turnover indicator.
- Business growth is a statistically significant variable only in China and India.
- Shareholder profitability is relevant information only in some models, in Europe and Japan, and in Japan specifically in the Passenger Transportation Services sector.
- Neither the level of corporate indebtedness nor the leverage ratio are relevant information.
- CF_4 plays a certain role in Europe and Asia comparing to other cash flows measures.
- The Passenger Transportation on Services sector is the sector that shows the best models from the statistical point of view.

The results allow us to conclude that in each sector and in each zone the determinants of the risk is different but the main variables that explain the risk in any scenario are the Sentiment of the Investor, the variation of the Exchange Rate, the variation of the Gross Domestic Product, the Business Size, the Asset Turnover indicator, the CF_4/TA indicator and the Current ratio for Asian companies. Therefore, such information allows us to quantify the risk at a given time according to the market, macroeconomic variables, and the characteristics of

the company, accounting indicators, if the beta is not available, The results allow us to establish three hypotheses to be tested: the variable sentiment is a statistically significant variable, the statistical validity of the model improves with the sample size and the explanatory variables of the risk are different for each zone and for each sector.

LITERATURE REVIEW

It is evident that the interest of the scientific community to the risk and its management is growing. The researchers are focused on the cost of capital and its correlation to systematic risk and consequently, to the cost of capital in the calculation of the value created for financial management of the company. Better knowledge of the antecedents of this area implies greater efficiency in management and, therefore, a better calculation of the stock market value. To develop the research we find the works of Carvalho (2018), Jylhä (2018), Xing and Yan (2018), Van Binsbergen (2016), Savor and Wilson (2016), Jurek and Stafford (2015), Engle, Jondeau and Rockinger (2015), Baele, De Bruyckere, De Jonghe and Vander (2015), Wand, Li and Huang (2012), Bolton, Chenn and Wand (2011). Carvalho (2018) shows that fewer financing constraints in R&D-intensive firms determine a high volatility of the shares of these companies. In the presence of imperfect markets, high volatilities can be a reflection of fewer financing frictions and this will affect the value of the company and its welfare. Therefore, results have implications in the calculation of value and risk management policies. Jylhä (2018) studies one of the main anomalies detected in the capital market which is the different profitability between stocks with high or low beta is significantly smaller than the one estimated by CAPM. They study the effect of leverage constraints on the relation between CAPM betas and expected returns and the results show clear evidence that more stringent leverage restrictions involve a flatter, lower slope and a higher intercept market. Xing and Yan (2018), study whether the quality of the accounting information influences the systematic risk. They use the beta CAPM and the beta 3 factors model, as measure of systematic risk, and the results show that the quality of the accounting information influences the risk, an improvement in the quality of the accounting information reduces the risk and it is observed that the model explanatory with better statistical significance is achieved when the dependent variable is the beta CAPM. Van Binsbergen (2016) investigates the valuation of the assets in a general equilibrium model considering the agents' forms over individual varieties of goods. He create a model that generates a relationship between the expected return on a firm's stock and the price it charges for its products. Companies with the habit of

stock charge high prices, get low returns and low betas. Companies with a stable demand for their products have less risk and less beta. Savor and Wilson (2016) studied the relationship between systematic risk and the announcement of profits, which is one of the oldest anomalies in the capital market. The study provided an explanation of the anomaly based on risk. The results suggest that fundamental news causes a higher risk value than other market factors. Jurek and Stafford (2015) analyze the performance of hedge funds and show that the high profitability is consistent with an equilibrium in which a small subset of investors specialize in bearing downside market risks. Engle, Jondeau and Rockinger (2015) investigate the systematic risk of the European financial institutions. Bolton, Chen and Wang (2011) propose a dynamic model of investment, financing and risk management for companies with financial constraints and show that the management of liquidity and hedging derivatives are complementary tools to manage risk. Baele, De Bruyckere, De Jonghe and Vander (2015) analyze the systematic risk of the banking sector shares and the results reveal that only the market, real estate, and high-minus-low Fama factors are explanatory factors of the profitability of banking stocks from the US. And finally, Wang, Li, and Huang (2012) study the usefulness of the model (BBGB) bad beta good beta and find that the explanatory capacity of the model is between 20 and 30%, which is lower than the data reported by Campbell and Vuolteenaho (2004).

Therefore, risk antecedents remain in a key focus of relevant literature that is why there is a parallel line of research that seeks to improve the study of the relationship between risk and the profitability by introducing behavioral finance in the study on decision process. Subrahmanyam (2007) showed that behavioral finance is a growing area and DeBondt, Forbes, Hamalainen and Gulnur (2010) confirmed that this line of research can contribute to the financial industry and that the decision making process should be better analyzed.

Daniel, Hirshleifer and Subrahmanyam (1998) elaborate a theory that incorporates the evidence that the market underreacts to information, in order to explain some anomalies observed in the market and that it can’t be justified with the usual models that suppose a rational behavior of the investor, supposing the valuation of the assets to be rational and reflects all the available information. They show, among other results, that a positive return autocorrelations can be a result of continuing overreaction. Therefore, short-run positive autocorrelations can be consistent with long-run negative correlation.

Hirshleifer (2001) developed a research to defend the hypothesis that profitability increases with risk growth and that assets are undervalued. Risk and mispricing effect are not necessarily separate topics but they are different concepts. The asset valuation based on psychology allows us to capture the reality better. Subsequently, Lee, Jiang and Indro (2002) examine the relationship between market beta, extraordinary returns and investor sentiment for three different market indices and showed in their research that sentiment is an explanatory and statistically significant variable of excess of profitability and conditional volatility. A positive change in sentiment, higher optimism, generates a downward revision of volatility and an excess of profitability in the three indices and in each of the analyzed sub-periods.

Baker and Wurgler (2006) studied how investor sentiment affects the profitability of stocks. They measured the sentiment from the variation of 6 underlying proxies and estimated the systematic risk introducing the sentiment as an explanatory variable of the risk, thus obtaining a conditional beta. The results reveal that young stocks, small companies or those that do not pay dividends, with high volatility and high growth tend to provide a lower profitability, when the sentiment is optimistic

Following the work of Baker and Wurgler (2006) we find the research of Ho and Hung (2009) using a different measure of investor sentiment than in the previous study showing investor sentiment as information allowing to capture the impact of the size effect , B / M, liquidity and momentum in the relationship between profitability and risk. Yu and Yuan (2011) analyzes whether investor sentiment influences the relationship between the mean and the variance and investigates if the investor sentiment attenuates the relationship between the conditional mean and variance returns. Using the same measure of investor sentiment as Baker and Wurgler (2006), the results reveal that in periods of low sentiment there is a positive, statistically significant and economically important relationship, but in periods of high sentiment there is no relationship. The results agree with the fact that in periods of optimism the performance of investors who are driven by optimism alter the prices of the shares. Investors who are guided by the sentimet exert a greater influence in periods of high sentiment than in periods of low sentiment. Stambaugh, Yu and Yuan (2012) investigate the role of investor sentiment in a broad set of anomalies, 11 in total, observed in cross-sectional stock returns.They use the index built by Baker and Wurgler (2006) as a measure of investor sentiment and finds that anomalies are more evident when investor sentiment is high,and that

there is better profitability of long-short strategies following high sentiment and that sentiment has no effect on the benefits from the long legs of the strategies.

Chung, Hung and Yeh (2012) investigates investor sentiment as the asymmetric predictive power of stocks profitability in periods of expansion and recession. They used the monthly orthogonalized sentiment index of Baker and Wurgler (2006) as a measure of the sentiment and characteristics of companies such as size, book-to-market ratio, dividend yield, earnings-to-price ratio, age, return volatility, R&D expense-to-assets ratio, fixed assets, sales and external finance-to-assets results. The research showed that only a situation of economic expansion allow investor sentiment to show a significant profitability predictive power. In the situation of economic expansion, an increase of the sentiment index is associated with a portfolio profitability increase in the following month by 1.96%. It is applicable for portfolios formed by old stocks and short young stocks, after considering other determinants of profitability.

Uygur and Tas (2014) carried out an international study to analyze the role of investor sentiment in stock profitability. The stock indices of each analyzed economy, US, Japan, Hong Kong, UK, France, Germany and Turkey, are regressed with macroeconomic variables and investor sentiment. The results indicate that the investor sentiment has an asymmetric impact on the conditional volatility of market indices profitability because investor sentiment increases the volatility in periods of high sentiment periods. In all markets the relationship between mean and variance is weak in the high sentiment periods. An increase in investor sentiment in high sentiment period increases volatility while negatively affecting profitability.

In the same line we can find the work of Fong and Toh (2014) that studies the influence of investor sentiment in the MAX effect which is an anomaly detected by Bali et al. (2011) showing that stocks with high maximum daily returns over the past month perform poorly relative comparing to stocks with low maximum daily returns over the past month and therefore, it does not allow confirming the efficient market hypothesis that past prices do not contain relevant information to predict future prices. The results of the study show that the MAX effect exists and is higher during high investor sentiment period.

Arif and Lee (2014) also study the role of investor sentiment but in aggregate investment and future equity returns, since theoretically in periods with high growth expectations and easy access to financing, over-investment can occur. They establish a concrete measure of the

annual aggregate investment based on the value-weighted cross-sectional average of annual firm-level investment assuming that the firm-level investment changes in net operating assets of the firm adjusted by investments in (R&D). It uses three measures of investor sentiment, the first is the average value of the Consumer Confidence Index, the second is the aggregate net capital info from investor and the third is the Beaker and Weber index (2006). The results indicate that periods of high corporate investment are followed by low returns on stocks and specifically on growing stocks, which aggregate investment is positively correlated with investor sentiment, although not all sentiment measures show the same significance. Some new bottom-up measure of aggregate investment have better explaining power than sentiment of market-wide mispricing.

More recent researches on topic are works of Coulton, Dinh and Jackson (2016), Cahu, Deesomsak and Koutmos (2016), Wu, Hao and Lu (2017), Piccoli, Da costa, Da silva and Cruz (2018), Johnman, Vanstone and Gepp (2018), Bethke, Gehde-Trapp and Kempf (2018), Lin, Chou and Wang (2018) and Chiu, Harris, Stoja and Chin (2018). Investor sentiment is a variable to study in all mentioned papers. Coulton, Dinh and Jackson (2016) analyze how investor sentiment affects price formation.

The work of Cahu, Deesomsak and Koutmos (2016) ask if investor sentiment really matters. They study to what extent sentiment influences the investor behavior using data from the US stock market. The results tell us that there are investors who act according to their feelings, who are more willing to use the information coming from the sentiment indicators and who are more sentiment affected in bearish periods. The research of Wu, Hao and Lu (2017) focuses on shares listed on the American market but originally from China, France, Germany, Hong Kong, Japan and the United Kingdom. They studied the influence of investor sentiment on the undervaluation of the American Depository Receipt (ADR) and showed that sentiment in the US market has a positive relationship with the deviation in the price between ADR and market, but with a very small economic importance.

Bethke, Gehde-Trapp and Kempf (2017) developed a theoretical and empirical work that examines the influence of investor sentiment to the correlation of US corporate bonds. The data shows that bond correlation vary heavily over time and consider that the explanation is based on the behavior of the investor. As a measure of investor sentiment, they use the daily volatility of the Chicago Board Options Exchange index and believe that investor sentiment has two effects on investor behavior: investors with pessimistic thinking avoid risky assets

and react worse to negative information. Therefore, with negative feelings, investors are less likely to invest in bonds with high credit risk and then bonds have less liquidity than comparing to positive investor feeling. Taking into account that credit risk and liquidity are two important factors of bond risk, the correlation between these two risk factors is high when sentiment is low and when the sentiment is high the correlation is low. Therefore, the influence of investor sentiment on the correlation of the two risk factors is higher for high-quality than for low-quality rating.

Habid and Hasan (2017) studied the relationship between the life cycle of the company with risk and the influence of investor sentiment on that relationship. Using the OLS regression and US market data they showed that the influence of the investor sentiment is different depends on life cycle of the company. Thus, they showed that companies in the initial or final state of life show more risk during periods of high investor sentiment.

Johnman, Vanstone and Gepp (2018) showed that investor sentiment does not influence excess returns but it does affect the volatility of the FTSE100 stock index, so that positive thinking reduces volatility. Piccoli, Da Costa, Da Silva and Cruz (2018) showed that investor sentiment, measured by the Consumer Confidence Index, influences the relationship between risk and profitability in the Brazilian stock market. According to the theory, the relationship between profitability and risk must be positive but the data indicate that, in pessimistic periods of sentiment the relationship is positive and in periods of optimistic sentiment the relationship is negative, and always statistically significant, except for shares of small companies.

Lin, Chou and Wang (2018) showed that investor sentiment in US market, measured by the index constructed by Baker and Wurgler (2006), has a positive impact on price volatility and the bid-ask spread but that the impact is higher in the future market than the spot market.

And finally we found the work of Chiu, Harris, Stoja and Chin (2018) who studied the relationship between the volatility of stocks and bonds with the investor sentiment and the real economy, using data from the US market. Sentiment is measured by the US Crash Confidence Index provided by Robert Shiller and decomposes volatility into two factors, persistent long run and transitory short run. The research reveals a more consistent relationship between real economy and persistent component of volatility and between transitory components and changes in investor sentiment. The literature shows a recent interest to know more about risk and the interest to improve its explanation through the

incorporation of investor sentiment into the relationship between profitability and risk. There is sufficient evidence that the investor sentiment is an important variable to study as an explanatory factor of risk.

There is also a large body of literature that justifies interest in the tourism sector as a sector of study, with the purpose of providing more accurate results of the sector. In this area we found the works of O'Neill and McGinley (2016), Kizildag (2015) and Reynolds, Rahman and Balinbin (2013) proving a scientific interest to the sector and the diversity of topics. Thus, O'Neill and McGinley (2016) analyze the factors that influence the sale price, Kizildag (2015) studies the indebtedness of hospitality industry and Reynolds, Rahman and Balinbing (2013) identify macroeconomic information that influence sales and the econometric models for estimation. In parallel to the previous studies, there are scientific papers that offer a review of the research carried out in the tourism sector, using different approaches, they provide relevant conclusions to justify subsequent approaches. In this field we found the works of Weiler, Moyle and McLennan (2012), Park and Jang (2014), Oviedo (2016), Fong, Law, Tang and Yap (2016), Omerzel (2016), Manoharan and Singal (2017) , McKercher (2018), Farrigton, Antony and O'Gorman (2018), Kim, Bai, Kim and Chon (2018). The first work, is research by Weiler et al (2012) which analyzed the tourism sector in the US, Canada, Australia and New Zealand, between 1951 and 2010 and showed that the business discipline ranks ninth in the number of themes and that the Hotel and Restaurant administration discipline occupied the thirteenth place. In contrast, the Psychology discipline ranks first. It concludes that multidisciplinary research existed. Park and Jang (2014) concluded that an interdisciplinary investigation is necessary between hospitality finance and accounting with other disciplines. Oviedo (2016) justified his work on the need to have an interdisciplinary research in the tourism sector research. He established the difference between multidisciplinary and interdisciplinary research and considered the lack of the last in the tourism sector. Fong, Law, Tang and Yap (2016) focused their study on experimental design in hospitality and tourism research and concluded that in order to advance in the results of research, it is necessary to go beyond the most used methods, to go to more sophisticated methods. The data reveal that the most used study technique is ANOVA and that of the 161 articles studied, only three focused on the discipline Management and administration. Omerzel (2016) performed a literarature review focused on research on innovation in hospitality and tourism. It helps to understand innovation and points out that researchers should go further applying quantitative methods to verify the theoretical proposal. Manoharan

and Singal (2017) investigated a specific topic: diversity and the management, they indicated in the conclusions of their work that small samples limit the generalization of the results, that it is necessary to study subsectors of the hospitality industry and to expand the geographical area of study. McKercher (2018) developed a critical review of research stating out that more articles do not mean better knowledge and understanding because there is a lot of pressure to publish. He pushed authors not to replicate, and invited to develop a critical thinking. Farrington et al. (2018) elaborated a literature review of methods and practices of continuous improvement in the hotel and tourism sector. A practical implication of the research is that a change in the concept and in the application of the term business management is necessary. The management of relations with customers and suppliers is the aspect that can benefit the most from continuous improvement in the hospitality sector, through the contemplation of the human aspects involved such as emotions, mental health and prejudices. He suggested future research in this direction for Hospitality and Tourism Management field of knowledge. Kim, Bai, Kim and Chon (2018) studied precisely the published articles and literature reviews, the data reveal that there are 29 articles that are review of the literature in Economics and Finance, representing 17% of the articles, and that they are the most cited.

The previous works showed the variety of approaches in the tourism sector studies and consequently the scientific interest to this sector. Although McKercher (2018) suggests us to be more critical, the interest is to know more and make knowledge deeper. The literature reviews indicate the need for good samples to generalize the results (Manoharan and Singal, 2017). Fong et al (2016) and Omerzel (2016) emphisize on an improvement of the techniques and Park and Jang (2014) and Oviedo (2016) on interdisciplinary approach, while McKercher (2018) put the emphasize on the necessity to verify and ensure that the results are credible and representative

So we can conclude that there is scientific interest in improving knowledge of risk management, incorporating investor sentiment in the study of risk and there is scientific interest in the tourism sector which is a growing sector with a great impact on the wealth of domestic economies. In addition, there is a group of literature that justifies the necessity of a better knowledge of risk in the tourism sector. In this perimeter of literature we can find the papers of Kim, Ryan and Ceschini (2007), Barber, Ghiselli and Kim (2008), Lee and Upneja (2008), Schulte, Dechant and Schaefers (2011), Lee and Jang (2012), Kim, Kim and Gu (2012), Lee and Hooy (2012), Kim and Jang (2012), Chen (2013), Boz, Menéndez-Plans and

Orgaz-Guerrero (2014), Kim and Kim (2014), Aissa and Goaied (2016), Park and Kim (2016), Park, Song and Lee (2017), Park, Song and Lee (2017), Mar-Miller, Menéndez-Plans and Orgaz-Guerrero (2017) and Angel, Menéndez-Plans and Orgaz -Warrior (2018).

Kim, Ryan and Ceschini (2007) and Barber, Ghiselli and Kim (2008) investigated restaurant industry and the information which explain systematic risk through the CAPM beta. Lee and Upneja (2008) compared two traditional methods to estimate the cost of capital - CAPM and three factor model, with a new cost-of-equity method model, for the lodging industry. Schulte, Dechant and Schaefers (2011) studied the factors that explain the systematic risk of real state equities in Europe. Lee and Jang (2012) estimated the beta in the real estate of hospitality firms based on a two-factor model. Kim, Kim and Gu (2012) and Lee and Hooy (2012) investigated the determinants of systematic risk in the hotels and airlines industry of North America, Europe and Asia. They used the CAPM to estimate the beta and the ICAPM 5 factors model. Kim and Jang (2012) investigated the relationship between profitability and risk in real estate investment trust (REIT), Chen (2013) investigated the determinants of systematic risk in the hotels industry of China and quantified the risk through the CAPM beta. Boz, Menéndez-Plans and Orgaz-Guerrero (2014) investigated the determinants of the systematic risk of the European Accommodation and Food Services Industry, estimating the beta through the CAPM. Kim and Kim (2014) studied the influence of corporate social responsibility on the systematic risk of restaurant sphere, estimated from the Carhart fourt-factor model. Park and Kim (2014) studied the determinants of the systematic risk of the American restaurant industry, quantifying the risk through the CAPM beta. Aissa and Goaied (2016) investigated the determinants of the profitability of Tunisian hotels industry using the panel data technique. Park, Song and Lee (2017) investigated how investment in human resources affects non-systematic risk and Lee and Park (2017) analyzed the influence of corporate social responsibility on the systematic risk of restaurants in the United States and measured the risk through Carhart four factor model. They used the panel data technique for empirical research. Mar-Molinero, Menéndez-Plans and Orgaz-Guerrero (2017) investigated the relationship between systematic risk and a set of information, about a sample of european hospitality industry companies, and the influence of the economic and financial crisis. The beta is estimated through the CAPM and then the correlation between beta and the factors obtained from the factor analysis is studied. Paper of Angel, Menéndez-Plans and Orgaz-Guerrero (2018) analyzed a sample of American companies, applying the panel data

technique, in order to find the information that explains the systematic risk and compare the results with the study conducted with European companies.

Thus the literature review allows us to confirm a scientific interest to business risk management, and scientific interest to incorporate investor sentiment as explanatory factor of risk, a scientific interest for having precise knowledge of the tourism sector and finally, a scientific interest to continue studying the determinants of risk in the tourism sector. The study of systematic risk taking into account the industrial sector is justified by the study of Engle, Jondeau and Rockinger (2015), who analyzed the systematic risk of the European financial firms, and by the research of Foster, Kasznik and Sidhu (2012), that show that the country and the sector explain the market value of the shares and also the research of Damodaran (January 2018) who published the betas of every sector of the American economy on his web page.

The works of Lee and Hooy (2012) and Uygur and Tas (2014) justify an international study, the works of Kizildag (2015), Boz, Menéndez-Plans and Orgaz-Guerrero (2014), Angel, Menéndez-Plans and Orgaz - Guerrero (2018) justify applying the panel data technique, the studies by Lee, O'Neill and McGinley (2016) and Manoharan and Singal (2017) justify the improvement made in the database as a differentiating element, with respect to previous studies. And the works of Arif and Lee (2014) and Habib and Hasan (2017) justify incorporating the behavior or investor sentiment into the study.

According to the presented literary review, we could establish the hypotheses to be analyzed with empirical research:

H1. The sentiment variable is the other significant explanatory variable of the systematic risk in the tourism sector stock shares in addition to the results received from the model obtained in the first chapter. Boz et al. (2014),. Piccoli, Da Costa, Da Silva, Cruz (2018), Johnman, Vanstone and Gepp (2018), Habib and Hasan (2017), Arif and Lee (2014) and Stambaugh, Yu and Yuan (2012).

H2. The size of the database allows us to obtain a statistical model with greater explanatory power of the variables that influence the systematic risk in comparison to the model obtained in the first chapter. Boz et al. (2014), O'Neill and McGinley (2016) and Manoharan and Singal (2017).

H3. The variables that explain the systematic risk of shares vary for each economy and for each tourism sector under consideration, following the justification that the market risk is not the same for all economies, as evidenced by the work of Manoharan and Singal (2017) and Foster, Kasznik and Sidhu (2012).

DATA AND METHOD

The analyzed sample consists of 673 companies in the tourism sector from 6 different economies, more precisely: the United States, Europe, China, Hong Kong, India and Japan, obtained from the database https://eikon.thomsonreuters.com/index.html . The choice of geographical areas has been determined by the initial number of companies, therefore, some areas had to be eliminated due to the lack of representativeness. 563 companies are from the Hotels and Entertainment Services (HES) sector and the rest (110) of Passenger Transportation Services (PTS) and more specifically 193 companies are Restaurants & Bars (R&B), 146 are Leisure & Recreation (L&R), 155 Hotels, Motels & Cruise Lines (HM&CL), 69 Casinos & Gaming (C&G), 40 Airlines (AL) and 70 Passenger Transportation, Ground & Sea (PTG&S). All the companies from the sample are listed on stock market and having accounting information for at least for the last three years of the period under consideration, 2008-2017. The dependent variable is the systematic risk of the share, that is, the beta, obtained from the following regression model:

$$R_{it} = \propto_i + \beta_{iy} R_{M,t} + \mu_{it}$$

In which:

i = identifies the number of companies in the sample (1-673)

t = represents the number of data used to estimate the beta over 250 days

y = represents the number of fiscal years (2008-2017)

R_{it} = is the return on stock i in year y

B_{iy} = identifies the beta of stock i in year y

R_{Mt} = identifies the profitability of the market portfolio in period t, and

μ_{it} = is the random regression residual, assuming hope = 0 and constant variance.

The beta was estimated annually for each of the 673 companies based on the daily profitability of the shares and the daily profitability of the market portfolio. Market portfolios

for beta estimation have been the STOXX EUROPE 50, for Europe, DOW JONES INDUSTRIALS for the United States to follow the previous approach mentioned in the first and second chapter and to receive comparable results. There are 2 ways of measurement, including simple and excess return, but we decided to use the approach, taking into account the article of Boz et al. (2015). We pretend an excess return to be a scope of future research area. SHANGHAI SE A SHARE was chosen for China, HANG SENG for Hong Kong, CNX NIFTY 50 for India and NIKKEI 225 for Japan. Both the daily quotations of shares and the daily quotations of stock market indices (market portfolios) have been obtained from the Datastream database, as in the study by Chiu, Harris, Stoja and Chin (2018).

There are 24 explanatory variables which were used in the study and obtained from the database of Datastream: Current ratio (CR): ((Current Assets-Total / Current Liabilities-Total (WC08106)), Quick ratio (QR): (WC08101), Growth (GR):(Current Year's Total Assets /Last Year's Total Assets - 1) * 100 (WC08621)), Operating Profit Margin (OPM): (WC08316), Size 1 (SZ_1): Ln(Total Assets (TA)) (WC02999), Size 2 (SZ_2): Ln(Employees (EM)) (WC01001), Size 3 (SZ_3): Ln(Net Sales (NS)) (WC01001)), Earnings Before Interest and Taxes (EBIT): (WC18191), Net Income Available to Common (IAT):(WC01751), Leverage 1 (LV_1): (Total debt (TD)/Common Equity (CE))(WC08231), Leverage 2 (LV_2): (Long Term debt (LTD)/ Total Capital (TC)) (WC03251/WC03998), Leverage 3 (LV_3): (Long Term Debt (LTD)/Common Equity (CE)) (WC08226), Leverage 4 (LV_4): (Total Debt (TD)/Total Capital (TC)) (WC08221), Financial Leverage (FL): (EBIT/Net Income Available to Common) (WC18191/WC01751), Leverage ratio (LR): (Fixed Assets (FA)/Common Equity (CE)) (WC08266), Asset Turnover (AT): (WC08401), Efficiency 1 (EF_1): (Net Sales (NS) / Gross Fixed Assets (GFA)) (WC08431), Coverage Ratio (CGR): (EBIT/Total interest expense(WC08291)), Price to Book Value (PBV), Cash Flow 1 (CF_1): Net Cash Flow Operating Activities (WC04860), Cash Flow 2 (CF_2): Net Cash Flow Operating Activities + Net Cas Flow Investing (WC04860 + WC04870), Cash Flow 3 (CF_3): CF_2 – Depretacion, Depletion and Amortization (WC01151), Cash Flow 4 (CF_4): Funds From Operations (WC04201), Cash Flow 5 (CF_5): Net Cash Flow Financing (WC04890).

To measure the sentiment we have used two indexes: one is the Conference Board Consumer Conficende Index (CCI) obtained from the web www.conference-board.org/data/bcicountry.cfm?cid=15 and the other one is a Compund Sentiment Index

(COSI)) based on CCI (Consumer Confidence Index), BCI (Business Confidence Index), CLI (Composite Leading Indicator) and VIX (Volatility Index) obtained from http://www.oecd.org and http://www.cboe.com / vix, respectively. From each of the indices we obtain two measures of sentiment, one is the definition of positive or negative sentiment of the investor, optimistic or pessimistic, High Sentiment and Low Sentiment, and the other is the variation of the index, if the value of the index increases or decreases. index from one period to another, so we identify each period of the sample as a year of Growth of sentiment or Fall of sentiment. So we have 2 independent variables for each index. For CCI we have: HLSCCI (High and Low sentiment) and GFSCCI (Grow and Fall sentiment) and for COSI we have: HLCOSI (High and Low sentiment) and GFCOSI (Grow and Fall sentiment). The first sentiment index is available for all the economies analyzed and the second for all but Hong Kong and India. The first sentiment index were used in the works of Ho and Hung (2009) and Antoniou, Doukas and Subrahmanyam (2012) and Cahu, Deesomsak and Koutmos (2016) and the second index is the result of the work done in the chapter two of the doctoral thesis. The investor sentiment variable is a dummy variable that takes value 1 when the sentiment is optimistic or there is index growth and 0 when the sentiment is pessimistic or there is a decrease in the index. To assign an optimistic or pessimistic feeling to a period, we use the basic methodology of Nielsen, if> 100 then high sentiment and low sentiment if <100.

We choose Consumer Price Index (CPI), Gross Domestric Product (GDP), Exchange Rate (EX) and Unemployed Rate (UN), as the macroeconomic explanatory variables used in the study. All the data were obtained from the Datastream database for each of the economies under investigation.

We use four denominators, used in the previous works, to transform the available information from absolute form into the relative one according to Boz et al. (2015) and Angel et al. (2018), The variables are: Common Equity (CE) (WC03501), Net sales (NS) (WC01001), Financial Expenses (FE) and Total Assets (TA) (WC02999).

The initial database consisted of 2131 companies belonging to the indicated economic sectors. However, 874 companies were rejected because they belonged to geographical areas with a small number of companies in order to obtain significant results, 97 have been eliminated due to the non-availability of the market price of the shares and 487 due to the lack of sufficient accounting data from Datastream. Thus, the initial sample is configured by 673 companies (see Annex I) and we started to debug the database, using the JMP statistical

approach from SAS program, in two phases. In the first phase, the database were debugged with dependent variable, the beta and the systematic risk. So we have removed from the sample those companies that showed few days of contribution per year according to the database https://eikon.thomsonreuters.com/index.html. We should take into consideration the difference in the approaches to calculate daily price information in Datastrem and in Thomson Reuters. The first database, if it does not have the share price, replaces it with the latest available data and the second leaves it empty, indicating the actual days of contribution, which has allowed us to reject those companies with the lack of information on the daily prices. Once these companies were eliminated, we have calculated the beta of the shares, based on the model [1], using DataStream data and Thomson Reuters data, and the obtained betas show a ratio = 0,8645.

The second debug of the database has been done with the independent variables, also using the JMP, and with following criteria:

a) All companies in sample must have the information of at least the last three years of the period analyzed, 2008-2017. The period of scope was chosen to eliminate the effect of irrationality during the euphoria which led to financial bubble exploaded with the beginning of the crisis at the end of 2008. The companies made a sample of complete fiscal years data.

b) We have verified that all the denominators have positive information, neither zero nor negative, in order to guarantee that the information provided by the indicator is not altered. This verification has led us to eliminate the Financial Leverage (FL) ratio, since the zero and negative values of the IAT alter its meaning, and some companies in the sample, which have a value of the Common Equity indicator (CE) negative in the last three years of the study period.

c) We have quantified and analyzed the lost values of each variable and the maximum value of lost was 109. This revision has forced us to eliminate some independent variables due to excess of lost. We deleted Efficient 1 ratio (EF_1), Coverage Ratio (CGR), size 2 (SZ_2) and all indicators calculated with Financial Expenses (FE) as the denominator, in total 7 indicators. The missing values of the variables that remain in the study have been replaced by the mean of the previous and subsequent, if the lost value is inside the series, and by the previous or later, if it is at the end or at the beginning of the series respectively.

Consequently, we have been left with 38 independent variables, 34 from the company and 4 macroeconomic variables. With these variables we have proceeded as follows:

a) We have corrected the extreme values by means of a quantile analysis. We have identified the extreme values and we have considered that the values of the variable located above or below the 0.5 quantile are replaced by the value of that quantile. Therefore, a maximum of 1% of the values were replaced.

b) We have carried out a factor analysis in order to identify which information from the list of variables is homogeneous, (see annex II). We have carried out a factor analysis with the 34 indicators coming from the company and a factor analysis of the remaining 8 indicators: 4 macroeconomic indicators and 4 sentiment measures. The first analysis provided us 14 factors and the second analysis presented 3 factors with useful information, which we will discuss later, to configure the analysis of panel data.

c) We analyzed the information that make each factor and we choose indicators which show less lost values and present less incoherent values through all the years scope. The detected inconsistent values are removed and replaced by the previous or subsequent value.

In the following table 1, you can see all indicators chosen as a representative of every factor presented in Annex II:

Table 1

CF_4/TA (WC04201/ WC02999)	Datastream
LR (WC08226)	Datastream
CF_1/CE (WC04860 / WC03501)	Angel. et al (2018), Boz et al.(2015), Menéndez-Plans et at. (2012)
CF_1/NS (WC04860 / WC01001)	Angel. et al (2018), Boz et al.(2015), Menéndez-Plans et at. (2012)
IAT/NS (WC01751/ WC04860)	Angel et al. (2018), Habid et al. (2017)
IAT/CE (WC01751 / WC03501) ROE	Angel et al. (2018)
CF_2/TA ((WC04860 + WC04870) / WC02999)	Angel. et al (2018), Boz et al.(2015), Menéndez-Plans et at. (2012)
CR (WC08106)	Angel et al. (2018), Park, Song and Lee (2017), Boz et al (2015),
SZ_1 (Ln(WC02999)	Angel et al. (2018), Habid et al.(2017), Park, Song and Lee (2017), Park and Kim (2016)
LV_1 (WC08221)	Angel et al.(2018), Park, Song and Lee (2017)
CF_2/NS ((WC04860 + WC04870) / WC01001)	Angel. et al (2018), Boz et al.(2015), Menéndez-Plans et at. (2012)
GR (WC08261)	Angel et al.(2018)
AT (WC08401)	Angel et al. (2018), Mar-Molinero et al. (2017), Hua et al (2016), Park and Kim (2016)
PBV	Habid et al.(2017)

The factor analysis with macroeconomic variables and the sentiment variables (annex II) showed that: a) the CPI, the GDP and the HLSCCI index provide the same information, b) the unemployment rate (UN) and the measure of sentiment HLCOIS provide the same information c) that the three measures of sentiment, GFSCCI, GFCOSI and HLCOSI explain the same and d) that the exchange rate, EX, provides different information. Consequently, we chose explanatory variables: the GDP (Angel et al. (2018), Boz et al. (2015)), the EX (Boz et al. (2015), Lee and Jang (2012), Dolde et al. 2011)) and the measures of the investor sentiment GFSCCI and GFCOSI because despite of being in the same group of factors, they do not show correlation and to check the model designed in chapter two of the thesis analyzing influence and relationship of information on the risk. Once the independent variables were identified, we performed a research using the panel data technique (Angel et al. (2018), Park, Song and Lee (2017), Aissa and Goaied (2016), Kizildag (2015)) since it allows to study the behavior of the variables over the period of time. We apply the following model:

$$\beta_{it} = \alpha_0 + \sum_{f=1}^{F} \alpha_f \left(F_{ift} \right) + \sum_{m}^{M} \alpha_m \left(M_{mt} \right) + \sum_{s}^{S} \alpha_s \left(S_{st} \right) + \mu_i + \varepsilon_{it}$$

Which:

i = year (2008-2017)
t = 673 firms,
β_{it} = is the systematic risk of each firm(i) and year (t)
α = is the correlation coefficient of each indicator
α_0 = intercept
F = is the 14 company indicators
M = is the 3 macroeconomic indicators
S = is the 2 independent variables to measure investor sentiment

We applied the model to the total sample, to each of the 6 economic sub-sectors, to each of the 7 geographical areas, USA, Europe, Asia, Japan, China, Hong Kong and India and to the intersection between geographic area and tourism economic sector (see annex IV). We studied 25 different samples. The study was carried out by STATA program that showed us through the xttest0 test that is better to perform a panel data analysis than a least squares regression. Through the “hausman test” we confirmed the fixed effects, the “xtserial test” confirmed the existence of autocorrelation and the “xttest”3 test confirmed the presence of

heterocedasticity that were corrected using the instruction "xtpcse with het and c (AR_1) in the analysis. For all models, the F test is significant (see annex V). The instruction used to study the total sample is: xtpcse betas EX, GDP, GFSCCI, CF_4/TA, CF1/NS, CF_2/TA, CF_1/CE, CF_2/NS, IAT/CE, IAT/NS, SZ_1, CR, GR, LV_1, AT, LR, PBV, i, ident, het c (ar_1) adding a dummy variable for each company, incorporating temporal effects into fixed effects model.

RESULTS

We present the results of the research below. At first, we show descriptive statistics of the sample and then the results of the study analyzing relationship between risk and information in each of the subsectors, geographic areas and interconnection between both.

Descriptive statistics

In the table 2 we provide the descriptive statistics of the 14 independent variables and the dependent variable for the whole sample. The descriptive statistics in the table 2 show us that the companies in the study have an average beta of less than 1, with an average return of the shareholder (ROE) (IAT/CE) equal to 1.82 and an average level of corporate indebtedness equal 33.96, although the dispersion in the debt values is high.

Table 2. Descriptive statistics

	N	Mean	Deviation	Median	Mín.	Cuantiles 0,5	Cuantiles 99,5	Máx.
β	5936	0,53	0,48	0.45	-2,02	-0,59	2,13	3,72
CF_1/CE	5936	22,11	43,82	16,42	-150,94	-150,46	363,77	368,38
CF_1/NS	5936	7,91	47,68	10,78	-457,67	-452,27	159,78	163,78
CF_2/NS	5936	15,57	55,70	6,99	-290,11	-289,85	476,51	481,13
CF_2/TA	5936	6,67	9,79	5,12	-36,68	-36,51	49,98	50,12
CF_4/TA	5936	7,58	8,08	7,23	-29,84	-29,81	35,00	35,16
IAT/CE	5936	1,82	39,73	6,22	-351,08	-349,84	116,02	116,53
IAT/NS	5936	-0,37	57,43	3,71	-559,53	-557,61	225,25	230,70
SZ_1	5936	14,76	2,67	14,91	7,89	7,89	21,58	21,58
CR	5936	1,81	2,89	1,07	0,10	0,10	27,33	27,47
GR	5936	11,43	43,87	2,96	-48,42	-48,41	420,49	422,96
LV_1	5936	33,96	26,23	32,84	0,00	0,00	98,28	98,36
AT	5936	0,86	0,73	0,63	0,01	0,01	4,41	4,41
LR	5936	150,39	234,38	100,71	-0,11	-0,04	2302,84	2304,48
PTBV	5936	2,63	4,50	1,49	-1,27	-1,25	44,49	44,93

CF_1/CE (Net Cash Flow Operating Activities / Common Equity), CF_1/NS (Cash Flow Operating Activities / Net Sales), CF_2/NS (Net Cash Flow Investing / Net Sales), CF_2/TA(Net Cash Flow Investing / Total Assets), IAT/CE (Net Income / Common Equity) (ROE), IAT/NS (Net Income (Net Sales), SZ_1 (Ln (Total Assets), CR (Current Assets / Current Liabilities), AT (Net Sales / Total Assets), LV_1 (Total Debt / Common Equity), GR (Current year's Total Assets / Last year's Total Assets), PTBV (Price / BVE)

We have companies with positive growth and efficiency ratios with a positive average value except for the IAT/NS indicator which shows a negative average value. They are efficient companies with a market price of shares above their book value. Therefore, on average, the companies in the sample create value for their shareholders, if we consider that the market price of the stock is efficient and therefore close to the market value. Half of the companies in the sample have a shareholder return greater than 6.22, a size greater than 14.91, and a CF_1/CE ratio, net money generated by the actions of the holding with respect to the investment of the shareholder, greater than 16.42.

The data from the descriptive statistics of the macroeconomic information and the sentiment variable from table 3 reveals that an analyzed period of 2008-2017, could be characterized by GDP growth and a positive change in the exchange rate. It also shows that 64% of the years in the sample reflect a growth in the investor sentiment index, if this is measured through the CCI and 52% of the years if the investor's optimism and pessimism if it is measured by the Compound Sentiment Index.

Table 3. Descriptive statistics

	N	Mean	Deviation	Mín.	Máx.
GDP	5936	2,28	3,08	-5,42	10,63
EX	5936	0,86	8,05	-16,50	22,30
GFSCCI	5936	0,64	0,48	0	1
GFCOSI	4686	0,52	0,50	0	1

GDP (Gross domestic product), EX (exchange rate), GFSCCI (Grow Fall sentiment index based on CCI), GFCOSI(Grow Fall sentiment index based on compound sentiment index)

Results of the analysis of the relationship between risk, information and investor sentiment.

The analysis of the sample has been carried out in three parts. The first part analyzes the entire sample and each of the economic subsectors of the tourism industry. In the second part, each of the seven geographic areas that make up the study were analyzed and in the third and last part, the interaction between geographic area and economic sector is analyzed, specifically, the interaction between the seven geographical areas and the two main sectors,

which are Hotels & Entertainment Services and Passenger Transportation Services. The purpose is to guarantee a representative sample.

Results of the analysis of the total sample and each of subsectors in the tourism industry

The results of the study of the total sample show that there are six statistically significant independent variables that explain the systematic risk. Four of them are indicators that contain information about the company, one is a macroeconomic variable and another is the index of investor sentiment. Three of the six are: the GDP, SZ_1 and CR are positively related to systematic risk and three have negative relation: GFSCCI, shareholder profitability (IAT/CE) and the AT efficiency ratio.

In Table 4 we show the best model obtained from the analysis of the total sample and the six economic subsectors. We show only the significant variables of the seventeen included in the study.

Table 4. Total sample models

Independent variables	Total dataset	C&G	HM&CL	L&R	R&B	AR	PTG&S
EX			-0,005 (-4,47)				0,0046 (4,93)
GDP	0,0066 (3,5)			0,0238 (4,84)			0,0066 (1,86)
GFSCCI	-0,0633 (-7,47)	-0,088 (-2,92)		-0,0863 (-4,39)	-0,0907 (-5,73)		-0,0753 -4,11
CF_1/CE				-0,0007 (-2,05)	0,0013 (2,48)		
CF_1/NS			0,0005 (2,24)		-0,001 (-2,61)		
CF_2/NS				0,0004 (1,85)			
CF_2/TA		0,0029 (1,83)					
IAT/CE	-0,0003 (-2,07)						
IAT/NS			-0,0006 (-2,61)		0,0008 (1,74)	-0,0018 (-1,75)	
SZ_1	0,0520 (4,19)	0,0954 (3,06)			0,0733 (2,28)	0,1095 (2,45)	0,0977 (2,45)
CR	0,0393 (1,65)	0,0099 (1,93)					
AT	-0,0692 (-3,4)	-0,0690 (-1,79)		-0,1003 (-2,61)		-0,121 (-2,45)	
LEV_1					-0,0019 (-2,19)		
GR							-0,0008 (-2,04)
PBV		0,0186 (2,69)			-0,0087 (-1,83)		
N	5936	622	1420	1281	1634	339	640
R^2	0,6652	0,6606	0,647	0,648	0,609	0,7372	0,7928

EX (variation of the exchange rate), GDP (variation in gross domestic product), GFSCCI (variation of the sentiment index based on CCI), CF_1/CE (Net Cash Flow Operating Activities / Common Equity), CF_1/NS (Cash Flow Operating Activities / Net Sales), CF_2/NS (Net Cash Flow Investing / Net Sales), CF_2 (Net Cash Flow Investing / Total Assets), IAT/CE (Net Income / Common Equity) (ROE), IAT/NS (Net Income (Net Sales), SZ_1 (Ln (Total Assets), CR (Current Assets / Current Liabilities), AT (Net Sales / Total Assets), LEV_1 (Total Debt / Common Equity), GR (Current year's Total Assets / Last year's Total Assets), PBV (Price / BVE), C&G (Casino & Gaming), HM&CLS (Hotels, Motels & Cruise Line), L&R (Leisure & Recreation), R&B (Restaurants & Bars), AR (Airlines), PTG&S (Passenger Transportation, Ground & Sea)

From the total dataset of the sample we can conclude:

a) The systematic risk in the tourism industry increases with the growth of the GDP, business size and investment in working capital identified from the CR indicator. Thus, the larger size of the business, the higher GDP growth and the greater investment needed, the greater the risk shown by the shares and, therefore, the higher cost of capital will be demanded by the shareholders.

b) The systematic risk is reduced with investor sentiment, with shareholder profitability (ROE) (IAT/CE) and business efficiency (AT). Optimistic investor sentiment, increase in shareholder profitability and greater business efficiency reduce the systematic risk of stocks, confirming the 1st hypothesis.

The results of every subsector that make up the tourism industry are:

a) Although these sectors are included in the tourism industry, the variables that explain risk are not always the same.

b) The best model, with the highest R^2, is obtained in the PTG&S sector, 0.7628. In this case, five variables are statistically significant. Two macroeconomic, (EX,GDP), the investor sentiment (GFSCCI) and two business, the size of the company (SZ_1) and the growth of investment (GR).

c) The model with the most statistically significant variables is the model that explains the beta of the R&B sector's actions. Seven variables explain the risk and the one with the greatest explanatory power is the investor sentiment that shows a negative sign of the relationship, confirming 1st hyphothesis. In this sector there is a positive relationship of the risk with the business size and the efficiency ratio CF_1/CE and IAT/NS and there is a negative relation of the risk of the shares with the GFSCCI, the ratio CF_1/NS, the level of indebtedness, LV_1 and the PBV ratio. So the data tells us that if the investor's sentiment is optimistic, if the CF_1/NS indicator increases and if the greater the difference between the market price of the share and the book value of the share, the risk of the stock is reduced.

d) It is also observed that the risk is reduced with a higher level of indebtedness, a result that contradicts the theory because, theoretically, it is established that the higher the level of corporate debt, the greater risk the shareholder assumes. However, this result makes sense if the corporate debt is observed as a mechanism to control the activity of the management. The debt involves a fixed expense for the company and a control by size of the bondholders of the business management that allows to reduce the costs of agency and asymmetric information.

e) Airlines is the sector that shows the least statistically significant variables. There are only three accounting indicators explain beta of stocks in this sector. It is observed that the beta of the shares increases with the size of the company and is reduced with the business efficiency measured through two indicators IAT/NS and AT.

f) The risk of the shares of the companies in the Airlines and Hotels, Motels & Cruise lines sector do not show any relationship with the investor sentiment when the rest of the companies show a relationship between risk and sentiment, always negative and highly significant.

g) The risk of the companies cataloged in L&R is explained through the GFSCCI, CF_1/CE and AT with a negative sign and through the GDP and the CF_2/NS ratio with a positive sign. CF_1 quantifies net cahs flow operating activities, including funds from other activities and extraordinary items and CF_2 measures net cash flow investing. Therefore, CF_1/CE, is money generated by the operation for each euro invested by the shareholder and it is logical that the sign of the relationship is negative and CF_2/NS if it is positive means an outflow of money and if it is negative it means an inflow of money or disinvestment. Therefore, the greater the investment, the greater the net cash flow investing, the greater the risk of the shareholder of the company located in L&R.

h) Business size always shows a positive relationship with systematic risk.

i) The efficiency indicator AT always shows a negative relationship with systematic risk.

j) GDP always shows a positive relationship with systematic risk.

k) The growth of the investment, GR, only explains the risk of the stock in the PTGS sector.

Seven models tell us that investor sentiment (GFSCCI), business size (SZ_1), efficiency ratio (AT) and GDP always show the same sign of the relationship and appear in most models. The systematic risk increases with a positive evolution of the GDP and with a larger size of the company and is reduced with an optimistic sentiment of the investor and a greater business efficiency, confirming 1st hyphothesis.

Results of the study in the tourism sector by geographical areas.

In table 5 we show the result of the study ин geographical areas: USA, Europe (EUR), Asia (AS), Japan (JP), China (CH), Hong Kong (HK) and India (IN). We have also analyzed the effect of using the GFCOSI sentiment index in the model instead of the GFSCCI index, because despite being in the same factor there are two different ways of measuring sentiment that do not show correlation. In table V we show the eleven models of seven different samples. Neither Asia, nor Hong Kong, nor India have the GFCOSI sentiment index and therefore do not have a model.

The study of the data in the table shows that the change in the investor sentiment index modifies the model in all cases. The model with the highest R2 is obtained with European data and the model with less explanatory variables is obtained with the data of American companies. The model found for US companies differs from the model found for European companies and for the other areas.

The analysis of the models tells us:

a) That the risk of the American companies stocks is explained by the EX, GDP and AT, when the investor sentiment has been measured through GFSCCI. Modifying the sentiment measure involves a change of variables. It implies that the investor sentiment becomes an explanatory variable of the risk, together with the GDP and the efficiency ratio AT and implies that the EX ceases to be an explanatory variable. However, comparing with the other models, it is observed that GDP shows a negative relationship, when it is usually positive, and the sentiment index shows a positive relationship when it is usually negative. If we focus on the first model, we observe that the exchange rate explains the risk with a positive relationship sign, that is, an increase in the exchange rate implies a greater beta. Taking into account that the US exchange rate is expressed $ / €, amount of $ necessary to acquire a €, we see that an increase in the exchange rate means a depreciation of the dollar with respect to the € which is interpreted, through the data, as a greater risk for the American tourism sector. However, if the economy has good prospects and business efficiency improves the risk of the stock is reduced.

b) The systematic risk of the European shares is related to the EX, GFSCCI, CF_1/CE, ROE (IAT/CE), SZ_1 and AT according to the first model, so that an increase of the EX, of the efficiency, $CF_{1/CE}$, AT and the shareholder's return implies a risk reduction and, on the other hand, a larger business size implies a greater risk. If we change the index that measures the investor sentiment, it is observed that the EX remains as an explanatory variable as well as the business size and the efficiency ratio AT. We observe, therefore, that if the exchange rate is increased, expressed € / $, the risk of the shareholder is reduced. An increase in the exchange rate that means a depreciation of the € against the $ translates into a lower risk of the shares together with a higher efficiency and an optimistic sentiment of the investor and increases with the business size, that is to say, the greater investment necessary the systematic risk assumes the shareholder.

c) The beta of the companies that make up Asia is related to the EX, the GDP, the GFSCCI, the business size and the investment in working capital (CR).

In this sample we see that an increase in the EX, amount of foreign currency necessary to buy a $, and an optimistic thinking of the investor reduce the risk while greater investment (SZ_1) and greater investment in working capital (CR) reflect risk increase.

d) The data of Japanese companies tell us that the relationship between risk and explanatory variables is modified with the sentiment index, although in both cases five variables explain the risk of actions, of which four are maintained in the two models , the GDP, the CF_4/TA ratio, the IAT/CE and SZ_1 ratio. Thus, the risk increases with the GDP, with the ratio CF_4/TA and the size (SZ_1) and it is reduced with the profitability of the shareholder. In the first model, the fifth variable is the level of indebtedness, which shows a negative relationship, and in the second model the fifth variable is the index of investor sentiment that shows a negative relationship. The sign of the relationship between risk and level of indebtedness is contrary to the expected sign theoretically but if we observe the debt as an instrument of control of the decisions of the management team, to minimize the costs of agency and asymmetric information, it is understandable that it is interpreted that greater corporate debt means more control, less costs and therefore, less risk.

e) The resulting model of Chinese companies is the model that reflects the most explanatory variables of risk. The data show that the model changes with the change in the investor sentiment index, although 5 explanatory variables are in both models. Thus we see that the sentiment index explains the risk in the two models, along with the GDP, the SZ_1, the GR and the LR. The results indicate that systematic risk increases with GDP and SZ_1 and is reduced with GFSCCI, business growth (GR) and leverage ratio (LR), that is, the proportion of fixed assets over shareholder financing. In the first model, the risk also increases with the investment in working capital and with the AT indicator. And in the second model it increases with the level of indebtedness although the variable is statistically insignificant.

f) Regarding the Hong Kong data, we observe that the model has the smallest R^2 and the risk is determined by the EX, the GDP, the GFSCCI and the CR ratio. If the investor's sentiment is optimistic and the exchange rate increases, devaluation of the country's currency reduces the risk of the shares and if the GDP grows and investment in the investment fund is high, the shareholder's risk increases.

g) The Indian models show us that the companies' data reflect that the systematic risk increases with the GDP and with the ratios CF1/CE, CF4/TA, IAT/NS, and reduces with the type of change, the CR and the GR. If the exchange rate increases, Rupee / $, there is a depreciation of the local currency and consequently a reduction of the risk for the shares of tourism companies in India.

In summary we can conclude that:

a) The models are modified if we change the way of measuring the investor sentiment and that there are important differences between the results of US companies and the rest of the areas.

b) GDP is an explanatory variable of risk in all areas except Europe.

c) The exchange rate explains the risk with a negative sign, except for the USA. The higher the exchange rate, the less risk a consequence of a depreciation of the national currency against the dollar, which is interpreted as a positive situation for business profitability expectations. The positive sign that is observed for the sample of American companies justifies that a depreciation of $ against the € translates into an increase in the risk of American stocks.

d) The size has a positive sign if it is a statistically significant variable. The greater the investment, the greater the systematic risk.

e) The ROE explains the risk only in 3 of the 11 models.

f) The explanation of risk is always a combination of macroeconomic variables and variables derived from business management.

g) Sentiment indices always show a negative relationship with the shareholder's risk.

h) Comparing with the results of the study of the tourism sub-sectors we observed that most of the explanatory variables are similar to the geographical zones. Thus, in the study of geographical areas, the indicators CF_1/NS, CF_2/NS and CF_2/TA become less relevant and the indicator CF_4/TA becomes more important, which is the cash flow of the company that belongs to the shareholders.

Table 5. Results of the data with georgaphical segmentation.

Independent variables	USA		EUR		AS	JP		CH		HK	IN
EX	0,0044 (2,59)		-0,0019 (-2,44)	-0,00272 (-3,63)	-0,0019 (-3,63)				0,0257 (5,19)	-0,1707 (-1,98)	-0,021 (-8,25)
GDP	-0,0838 (-7,13)	-0,0843 (-8,74)			0,0159 (6,87)	0,011 (4,41)	0,0342 (12,24)	0,0647 (4,95)	0,0822 (6,35)	0,0625 (6,36)	0,1286 (3,7)
GFSCCI			-0,0871 (-5,48)		-0,0352 (-3,28)			-0,0927 (-3,68)		-0,2528 (-6,68)	
GFCOSI		0,0683 (2,66)		-0,0306 (-2,15)			-0,2096 (-14,91)		-0,1790 (-6,76)		
CF_1/CE			-0,0004 (-1,75)								0,0012 (2,15)
CF_4/TA						0,0062 (2,55)	0,0066 (2,82)				0,0061 (1,93)
IAT/CE			-0,0005 (-1,81)			-0,0008 (-2,23)	-0,0008 (-2,31)				
IAT/NS											0,0013 (2,61)
SZ_1			0,0881 (4,35)	0,0643 (3,23)	0,0571 (3,71)	0,1428 (3,79)	0,1233 (3,34)	0,0805 (2,47)	0,0685 (2,15)		
CR					0,0061 (2,01)			0,0205 (1,93)		0,0098 (2,23)	-0,0109 (-1,98)
GR								-0,0005 (-2,01)	-0,0006 (-2,54)		-0,0007 (-1,7)
LV_1						-0,0018 (-2,01)			0,002 (1,69)		
AT	-0,1502 (-2,01)	-0,1392 (-1,88)	-0,0617 (-2,7)	-0,0644 (-2,74)				0,1743 (1,79)			
LR								-0,0003 (-2,11)	-0,0002 (-1,91)		
N	825	825	1650	1650	3461	1677	1677	534	534	764	486
R^2	0,6481	0,6547	0,7094	0,6989	0,5699	0,5168	0,5623	0,5218	0,5508	0,4261	0,667

EX (exchange rate), GDP , GFSCCI (sentiment variation based on CCI), GFCOSI (sentiment variation based on compound índex), CF_1/CE (Net Cash Flow Operating Activities/Common Equity), CF_4/TA (Cash Flow of Company / Total assets), IAT/CE (Net Income /Common Equity)(ROE), IAT/NS (Net Income(Net Sales), SZ_1 (Ln (Total Assets), CR (Current Assets/Current Liabilities), GR (Current year's Total Assets/Last ear's Total Assets), LEV_1 (Total Debt/ Common Equity), AT (Net Sales /Total Assets), LR (Fixed Assets/Common Equity), USA (United States of America), EUR (Europe), AS (Asia), JP (Japan), CH (China), HK (Hong Kong), IN (India).

Results of the analysis of the interaction between geographic areas and economic sectors of the tourism industry.

In table 6 and table 7 we show the results of analyzing the interaction between the geographical area and the tourism sector, according to what is indicated in annex IV. We have also studied if changing the feeling variable modifies the explanatory model of systematic risk.

Table 6 (USA, Europe and Asia)

Independent variables	USA and HES		EUR and HES		EUR and PTS		AS and HES	AS and PTS
EX				-0,0022 (-2,68)	-0,0049 (-2,56)	-0,0057 (-3,04)	-0,0034 (-5,81)	0,0043 (4,33)
GDP	-0,0769 (-6,01)	-0,0856 (-8,22)	0,0086 (2,03)				0,0191 (6,95)	0,0113 (3,3)
GFCOIS		0,0602 (2,16)				-0,071 (-2,08)		
GFSCCI			-0,0884 (-5,15)		-0,0782 (-1,95)		-0,0349 (-2,81)	-0,0579 (-3,15)
CF_4/TA					0,0089 (1,82)			
SZ_1			0,0783 (3,39)	0,0564 (2,46)	0,1796 (3,56)	0,1428 (3,01)	0,0472 (2,88)	0,0995 (2,83)
CR							0,0064 (2,01)	
AT	-0,1455 (-1,89)	-0,1365 (-1,79)			-0,093 (-2,15)	-0,0996 (-2,2)	-0,0562 (-1,66)	
LV_1								
GR								-0,0007 (-1,84)
N	711	711	1385	1385	265	265	2861	2861
R^2	0,6246	0,6297	0,6742	0,6642	0,7964	0,7746	0,5422	0,7310

EX (exchange rate), GDP , GFSCCI (sentiment variation based on CCI), GFCOSI (sentiment variation based on compound índex), CF_1/CE (Net Cash Flow Operating Activities/Common Equity), CF_4/TA (Cash Flow of Company / Total assets), IAT/CE (Net Income /Common Equity)(ROE), IAT/NS (Net Income(Net Sales), SZ_1 (Ln (Total Assets), CR (Current Assets/Current Liabilities), GR (Current year's Total Assets/Last year's Total Assets), LEV_1 (Total Debt/ Common Equity), AT (Net Sales /Total Assets), LR (Fixed Assets/Common Equity), USA (United States of America), EUR (Europe), AS (Asia), HES (Hotels and Entertainment Services), PTS (Passenger Transportation Services)

.Table 7. (Japan, China, Hong Kong and India)

Independent variables	JP and HES		JP and PTS		CH and HES		CH and PTS		HK and HES	IN and PTS
EX	-0,0019 (-3,19)	-0,001 (-1,87)	0,0042 (4,98)	0,0045 (5,88)		0,0266 (4,5)		0,0271 (3,53)	-0,1671 (-1,78)	-0,0208 (-8,01)
GDP	0,0149 (5,05)	0,0379 (11,56)		0,0236 (6,11)	0,0783 (4,92)	0,0921 (5,87)	0,0562 (2,66)	0,078 (3,72)	0,0659 (6,21)	0,1281 (3,62)
GFCOIS		-0,2115 (-13,02)		-0,1514 (-7,9)		-0,1927 (-5,97)		-0,1659 (-3,88)		
GFSCCI			-0,07 (-3,96)		-0,1242 (-4,05)				-0,2681 (-6,59)	
CF4/TA	0,0051 (2,05)	0,0058 (2,42)	0,0265 (3,89)	0,0254 (4,18)			-0,0248 (-2,48)	-0,0238 (-2,61)		0,0056 (1,71)
CF2/TA			-0,0135 (-2,48)	-0,0094 (-1,88)						
CF1/CE			-0,0044 (-3,1)	-0,0042 (-3,21)						0,0016 (2,66)
CF2/NS			0,0056 (2,16)							
IAT/CE			-0,0039 (-3,23)	-0,0039 (-3,62)			0,0065 (1,84)	0,0056 (1,78)		
IAT/NS										0,0015 (2,86)
SZ1	0,1400 (3,75)	0,12 (3,29)	0,176 (1,68)	0,1684 (1,79)						
CR					0,0286 (2,42)	0,0228 (1,85)			0,0097 (2,19)	-0,0139 (-2,08)
LR			-0,0004 (-1,82)							
GR						-0,0006 (-1,9)	-0,0006 (-1,66)	-0,0008 (-2,3)		
AT		-0,0764 (-1,68)								
PBV	-0,005 (-1,68)	-0,0051 (-1,73)					-0,0436 (-2,7)	-0,0406 (-2,67)	0,0129 (2,24)	
N	1351	1351	326	326	350	350	184	184	704	456
R2	0,5119	0,5541	0,7570	0,7776	0,5688	0,5949	0,4869	0,5109	0,4104	0,6731

EX (exchange rate), GDP , GFSCCI (sentiment variation based on CCI), GFCOSI (sentiment variation based on compound índex), CF_1/CE (Net Cash Flow Operating Activities/Common Equity), CF_4/TA (Cash Flow of Company / Total assets), IAT/CE (Net Income /Common Equity)(ROE), IAT/NS (Net Income(Net Sales), SZ_1 (Ln (Total Assets), CR (Current Assets/Current Liabilities), GR (Current year's Total Assets/Last year's Total Assets), LEV_1 (Total Debt/ Common Equity), AT (Net Sales /Total Assets), LR (Fixed Assets/Common Equity), JP (Japan), CH (China), HK (Hong Kong), IN (India), HES (Hotels and Entertainment Services), PTS (Passenger Transportation Services)

In this study we have obtained eleven models of the intersection between the sector and the geographical area but they turned into eighteen due to the change of the investor sentiment index from GFSCCI to GFCOSI in order to study the impact. The data shows that the change in the investor sentiment index alters to a greater or lesser extent all the models and that the information that explains the beta of the shares is different for each sector according to the geographical area, although the variables that explain the risk is always a combination of macroeconomic information, investor sentiment and information from the company.

The model with the lowest R2 is the model resulting from the sample of HES companies in Hong Kong, the model with the most explanatory variables of risk is the one that explains the risk of the PTS companies in Japan. The sector with fewer statistically significant variables is US HES that shows only two independent variables if the investor sentiment index is GFSCCI, confirming the 3rd hypothesis of the geographical difference in the results.

The GDP variable is a statistically significant in Europe only and for PTS it does not play any role. It always has a positive relationship with less systematic risk for American companies, in which an increase in GDP means a decrease in beta.

The second variable that is more explanatory is the EX. However, the sign of the relationship is not the same. Thus, in China, JP in PT & S and Asia and PT&S the relationship is positive while in the other models the relationship is negative. An increase in the exchange rate means a reduction in the value of beta. So, according to the exchange rates used, we see that if the exchange rate for Europe, € / $ (€ needed to buy $) increases, it reduces the risk of the stocks of both sectors. In Asia and Japan, the relationship varies for each sector, thus showing a negative relationship with HES and a positive relationship with PTS. Thus, a depreciation of the national currency against the $ reduces the risk of the shares of the HES sector but, on the other hand, the same depreciation increases the risk of the shares of the companies located in the PTS sector.

The sample of companies in the PTS sector does not show a statistically significant relationship with the investor sentiment index. In the USA, the relationship between risk and sentiment has a positive sign, in other cases an optimistic investor sentiment is observed in the market as a risk reduction. Both measures of investor sentiment are explanatory variables in seven models.

Regarding to the information coming from the company, we observed that business size is the variable that most often explains the risk of stocks and always with a positive sign of the relationship. It explain the risk of both the HES sector and the PTS, except for the USA and HES companies and the companies of China, Hong Kong and India.

Regarding efficiency indicators, we observed that the CF4/TA ratio is an explanatory variable of risk with a positive sign for European companies, Japanese companies in both sectors and Indies in the PT & S sector. A higher ratio companies show a higher beta, except for Chinese PTS companies, whose relationship is negative. Given that the ratio informs us of the generated money available to shareholders investors for every € invested, the results tell us is that the higher the ratio, the more money from the shareholder available to finance new investments, and the risk is greater.

The efficiency ratios CF/TA, CF_1/CE, CF_2/NS and IAT/CE (ROE) are explanatory variables of the risk only for the Japanese, Chinese and Indian companies that make up the PTS sector. In the case of Japanese companies we can conclude that the profitability of the shareholder, IAT/CE indicate that the higher the profitability, the less risk, but for Chinese companies the opposite is true, the higher the profitability, the greater systematic risk. The positive sign of the relationship makes sense if the higher profitability is due to a high leverage effect, that is, to a high level of indebtedness.

The AT ratio is an explanatory variable always with a negative sign. It is an explanatory variable of the risk in the USA and JP stocks of the HE &S sector and of the European PT & S shares.

The growth of the investment is not an explanatory variable neither for USA nor for Europe, like the PBV ratio that is only an explanatory variable in some Asian areas and does not always show the same sign in the relation. Thus, for Hong Kong, the higher the PBV ratio, the greater the beta stock, which could be justified by a greater mistrust in the market price of the stock.

To generalize the results of this study we can conclude that investor sentiment, macroeconomic variables and information coming from the company always take part in a model that explains risk for the each zone and sector. There is a difference between US companies and European companies and there is a difference between Europe and Asia. It is observed that the PTS sector always offers an upper R^2 with respect to the other sector,

although all the models have a statistically high explanatory power, confirming the 2nd hyphothesis. The information of the company that explains the risk varies by companies and sectors but the business size is a relevant variable in the analysis as well as the AT ratio. The IAT/CE information and the debt ratio, is important in the financial analysis of a company, but it has a relevant role for Japanese and American companies only, and always for the PTS sample. However, the CF_4/TA ratio is an explanatory variable in nine models. This ratio shows us the money generated by the activity per unit invested and shows a sign of the relationship with the positive risk, except for Chinese companies in the PTS sector. Data tells us that the greater the amount of money per unit invested, the greater the beta, possibly due to a relationship between greater investment by the shareholder and greater risk for the shareholder.

CONCLUSIONS

We have provided our research on the relationship between the systematic risk of the shares, the risk assumed by the rational shareholder, and all the information using the panel data technique, because it allows us to consider the time variable in the analysis. Our sample consists of 673 tourism companies, 34 independent variables with company information, four independent variables with information on the economy and the market, four measures of investor sentiment and 5,936 estimated betas,

The main objective of the study was to know which variables explain the systematic risk and consequently provide useful information for business management, since the risk is inherent to it and determines the cost of capital or minimum profitability required by the investor. Using one of the main results of the CAPM, we can conclude that beta allows us to quantify the cost of equity capital objectively and scientifically, and consequently, allows us to quantify the rate that is used in the process of calculating the market value of the shares. Therefore, not having the beta leaves us without the most usefull tool to calculate the cost of capital and leaves us without an objective and scientific way of proceeding with respect to a fundamental variable in the financial decisions of the company and in the process of assessment. Not having the beta generates a scenario of subjectivity and improvisation.

Business management can not ignore the risk because there are no investment projects without risk and there is no business financing procedures without risk. Therefore, if we would like to develop an efficient business management, it is impossible to ignore how to measure risk, how to manage risk and what to do to anticipate its evolution. Efficient

management must always work with profit and risk expectations, since an increase in risk translates into an increase in the cost of capital, while maintaining profit expectations. We must act on the expected income and cost of capital to maximize market value of shares. If the risk is reduced, and the parameters of the economy that determine the market risk premium are maintained, the cost of capital is reduced and for the same income expectations the market value of the shares increases. Therefore, achieving the business objective of maximizing the value of the stock involves managing the risk and its evolution in a correct way.

So if a company is not a part of the capital market and does not have the beta as risk measurement, the company will stay in a scenario of lost objectivity and the cost of capital is determined by other unscientific ways. However, if we know which information explains beta, we can build a model that allows us to estimate a beta without disposing of the market prices of stock. From the statistically significant variables we can build a model which will make the beta corresponding to some shares, then we estimate the evolution of risk and consequently the cost of capital. The management team of the company would be able to act accordingly to minimize the negative effects on the shareholder if an increase in the risk of stock is foreseen and to anticipate the acquisition of financing or choosing other investment projects. A correct anticipation of some changes in variables will be always translated into greater efficiency in business management.

From a large database and considering the sample as a whole, we can conclude that:

1. The systematic risk of the tourism companies is explained through the GDP, GFSCCI, IAT/CE, SZ_1, CR and AT.
2. The risk increases with a positive evolution of the GDP, with the business size and with the investment in working capital.
3. The risk is reduced with the optimistic sentiment of the investor, with the profitability of the shareholder and with the business efficiency.
4. To quantify the beta of some actions of the tourism sector we can use the following model:

$$\beta it = 0{,}0066(GDPt) + -0{,}0633(GFSCCIt) - 0{,}0003(IAT/CEit) + 0{,}0520(SZ_1it) + 0{,}0393(CRit) - 0{,}0692\ (ATit)$$

that will provide us with an estimated beta of the tourism company's stock and at a specific moment of time, if the conditions of the sector are similar to analyzed period

From the research of the subsectors, we can conclude that:

- ✓ Shares with the most explanatory variables are the stocks of the Restaurants and Bars sector, followed by Casinos & Gaming and Passenger, Transportation, Ground & Sea, they have the model with the best R^2
- ✓ Investor sentiment and business size are an explanatory variable in four of the six subsectors.
- ✓ The efficiency ratio AT is an explanatory variable in 3 of the six subsectors
- ✓ The EX is only an explanatory variable in the PTG&S sector

Therefore, we see that the explanatory variables of risk in each of the subsectors are not always the same and are not always could be found for the total sample. The subsector whose model is more similar to the global model is C&G, they share four explanatory variables: investor sentiment, business size, investment in working capital and the AT efficiency ratio. The other models differ quite a bit by showing only two common explanatory variables or none like the HM&CL sector.However, we can generalize that the investor sentiment explains the risk, along with the business size and the AT ratio.

From a large database, and analyzes of geographical areas, we can conclude that:

- ✓ There are important differences between three major geographic areas: USA, Europe and Asia. Thus for the American companies EX, GDP and AT, could be used as a statistical measure of risk, for Europe the explanatory variables are six and for Asia five. The only common explanatory variable for the three areas is the EX, although the sign is the opposite in the USA with respect to the other two areas due to the calculation of the variable, as we have explained previously.
- ✓ Only one variable from the company explains the risk of the American AT shares while four variables of the risk are found within European shares.
- ✓ Investor sentiment is an explanatory variable in Europe and Asia but not in America, and in both cases with a negative sign.

If we expand the research by breaking down Asia into the 4 countries that compose it, we see that the GDP, the GFSCCI, the SZ_1 are explanatory variables in all cases and that the CR is

an indicator with explanatory capacity only in this geographical area. However, the AT ratio loses explanatory power in this zone.

The independent variables that have the most explanatory capacity are GDP, EX and SZ_1.

From a large database, and research on the interactions between geographical areas and economic sectors, we can conclude that:

- ✓ Investor sentiment, GFCOIS or GFSCCI, explain the risk except IN & PTS
- ✓ The EX and GDP explain the systematic risk, although the sign of the relationship changes. The GDP only shows a negative sign in the American stocks and the EX mostly shows a negative relationship, although for AS & PTS, JP & PTS and CH & HES the relationship is positive.
- ✓ The SZ1 is a relevant explanatory variable, it is significant in ten models. The other variables that contain company information and that explain the risk are the CF_4/TA indicator, which appears in six models, and the CR ratio and the AT indicator. Neither the level of indebtedness, nor the profitability of the shareholder (ROE), nor the business growth, nor the PBV ratio are significant variables in more than one model. It is observed that the ROE only explains the risk of the JP & PTS shares.

The results allow us to confirm the three established hypotheses, the investor sentiment is an explanatory variable and with a high statistical significance in all models except Hotels, Motels & Cruise Lines, Airlines and India and Passenger Transportation Services, confirming hypothesis 1, adding the recent knowledge to the findings that firms size (measured by assets) is the only accounting factor that influences stock risk, with three macroeconomic factors of GDP, exchange rate variation (between the euro and the U.S. dollar), and the profitability of the Dow Jones industrial average (Boz et.al., 2014). Our findings give the additional proof to the results of Yu and Yuan (2011), stating the importance of sentiment variable for mean-variance trade-off and they are in line with results of Wu et al., (2017) stating the effect of sentiment on mispricing. Our models show a high explanatory power, the lower R2 is equal to 0.41 and corresponds to the sample Hong Kong and Hotels & Entertainment Services confirming hypothesis 2, corresponding to the finding of O'Neill and McGinley (2016), who analysed the influence of economic conditions on the relationship between average daily rate (and net operating income) and market value. In addition our research react on the request of Manoharan and Singal (2017) who indicated the need for theory development, empirical research, and expansion of hospitality-diversity research, in terms of geographical regions,

we found that explanatory variables of the risk change for each sector and for each geographical area, although there is common information, confirming hypothesis 3 confirming evidences from the work of Foster, Kasznik and Sidhu (2012) who found that while company-specific factors are predominant in explaining cross-sectional differences, country and industry factors have incremental explanatory power over them.

IMPLICATION FOR MANAGEMENT

The topic investigated is our research is strictly relevant for business management, since it affects all decisions in the financial area and there is no risk-free management, the results obtained here have a great implication in business management by showing us which information explain the systematic risk. The cost of equity capital is an essential data to make financial decisions and to achieve the main business objective, to maximize the market value and the value created for the shareholder. Therefore, it is very important to be able to determine the value of the cost of capital scientifically. Large companies, which are part of the capital market, quantify the cost of equity capital from the security market line that uses, among other parameters, the beta of the shares as a measure of risk. Thus, knowing the antecedents of beta allows manager to anticipate the evolution of risk and the evolution of the cost of capital. Anticipation always implies a more efficient management and, consequently, a greater creation of value for the shareholder. On the other hand, there are companies that do not have a beta because they are not quoted in the capital market, and knowing the information which influence risk could allow managers of an SME to know what information to observe and analyze to quantify risk. So far, the results of this research have a direct implication in the economic and financial management for any company in the tourism sector.

LIMITATIONS

The main limitation of the presented work is in the estimation of the beta of the systematic risk. It is necessary to check if a different estimations of beta confirms or modifies the results.

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ANNEX

Annex I . General dataset

Table 1. General information of the data set

Áreas geográficas analizadas	Hotels & Entertainment Services				Total	Passenger Transportation Services		Total
	Casinos & Gaming	Hotels, Motels & Cruise Lines	Leisure & Recreation	Restaurants & Bars		Airlines	Passenger Transportation Services	
EUROPE	25	52	44	33		16	14	184
USA	16	12	19	40	87	11	2	100
ASIA	28	91	83	120	322	13	54	389
JAPAN	12	11	30	95	148	3	31	182
CHINA	1	11	27	4	43	6	17	66
HONG KONG	14	32	14	19	79	1	5	85
INDIA	1	37	12	2	52	3	1	56

Annex II . Result factor analysis macroeconomic variables and sentiment.

Table 1. Result of the factorial analysis of the macroeconomic variables and sentiment.

	Factor 1	Factor 2	Factor 3
GFSCCI	**0,828002**	-0,149076	-0,143407
GFCOSI	**0,727111**	-0,10646	0,055327
HLCOSI	**0,606204**	-0,153652	0,515546
HLSCCI	-0,151541	**0,858489**	-0,043697
CPI	-0,245007	**0,813597**	0,23638
GDP	0,388844	**0,808771**	-0,06372
EX	-0,017487	0,107188	**0,920014**
UN	**-0,682662**	-0,201528	-0,076784

GFSCCI (Grow or Fall sentiment based on consumer confidence index), GFCOSI (Grow or Fall compound sentiment Index), HLCOSI (high and low Compound Sentiment Index), HLSCCII (High and low Sentiment Index based on consumer confidence index), CPI (variation of the Consumer Price Index), GDP (variation of the Gross Domestic Product), EX (variation of the exchange rate), UN (variation of the unemployment rate)

Table 2. Result of the factor analysis of the variables that contain company information.

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14
CF_4/TA	**0,8844**	0,0005	0,0866	0,0865	-0,0383	0,0401	0,0084	-0,0133	0,0450	-0,0368	0,0081	-0,0341	0,0671	0,0023
CF_1/TA	**0,8817**	-0,0656	0,1085	0,1545	-0,0841	-0,0657	0,0243	-0,0412	0,0550	-0,0409	0,0714	-0,0457	0,1348	-0,1071
EBIT/TA	**0,7498**	0,0664	0,0164	-0,1209	**0,3200**	**0,3209**	-0,1014	0,0089	0,0263	-0,0313	-0,0501	0,0488	-0,1184	0,1637
IAT/TA	**0,7249**	0,0663	0,0106	-0,1363	**0,3699**	**0,3315**	-0,1085	0,0201	0,0342	-0,0510	-0,0464	0,0593	-0,1318	0,1639
CF_3/TA	**0,7020**	-0,0839	0,1113	0,0840	-0,0559	-0,0798	**0,6310**	-0,0312	0,0405	-0,0292	0,0968	-0,0267	0,0511	-0,0861
LR	0,0099	**0,9684**	0,0035	0,0191	-0,0178	-0,1062	0,0381	-0,0097	0,0187	0,0237	0,0067	-0,0162	0,0173	-0,0134
LV_4	0,0215	**0,9430**	0,0852	-0,0029	0,0098	-0,2830	-0,0074	-0,0038	0,0087	0,0591	0,0009	0,0088	-0,0158	0,0346
CF_1/CE	0,1528	-0,2995	**0,9054**	0,0095	0,0093	-0,1288	-0,1065	-0,0069	0,0177	0,0828	0,0118	0,0114	0,0110	-0,0039
CF_4/CE	0,1606	**0,4010**	**0,8459**	0,0045	0,0050	-0,1294	-0,0787	-0,0062	0,0166	0,0850	-0,0037	0,0040	-0,0014	0,0519
CF_2/CE	-0,0308	-0,0161	**0,8087**	0,0249	-0,0278	0,1903	**0,3936**	-0,0179	0,0191	0,0294	0,0136	-0,0471	0,0630	0,0141
CF_3/CE	0,0787	**-0,6916**	**0,6614**	0,0164	-0,0080	0,1761	0,1362	-0,0060	0,0216	0,0208	0,0149	-0,0112	0,0214	-0,0122
LV_3	0,0107	0,2877	**0,4897**	-0,0443	0,0636	**-0,4092**	-0,1261	0,0057	-0,0187	0,2427	-0,0097	0,0627	-0,1058	0,1113
CF_1/NS	0,0685	0,0042	0,0124	**0,9372**	0,1863	0,0126	-0,0164	-0,0005	0,0141	0,0144	0,0735	0,0206	-0,0153	0,0077
CF_4/NS	0,0376	0,0078	0,0041	**0,8954**	0,2229	0,0122	0,0043	0,0280	0,0210	0,0124	-0,2466	-0,0105	-0,0168	0,0441
EBIT/NS	0,0526	-0,0080	0,0027	0,2678	**0,9061**	0,0103	0,0155	-0,0033	0,0170	-0,0007	-0,1751	-0,0089	0,0199	-0,0398
IAT/NS	0,0463	-0,0108	-0,0002	0,1332	**0,9020**	0,0051	0,0162	0,0050	0,0027	-0,0073	-0,1104	0,0165	0,0164	-0,0372
OPM	0,0725	0,0040	0,0084	**0,3934**	**0,7400**	0,0215	-0,0019	-0,0122	0,0707	0,0120	**0,3394**	-0,1227	0,0270	-0,0147
EBIT/CE	0,1823	-0,2153	0,0877	0,0077	0,0353	**0,8726**	-0,0440	0,0005	0,0004	0,0314	0,0097	0,0139	-0,0249	-0,0613
IAT/CE	0,1475	**-0,4245**	-0,1088	0,0105	0,0262	**0,8448**	-0,0070	0,0027	0,0097	-0,0199	0,0095	0,0038	-0,0089	-0,0717
CF_2/TA	0,2670	-0,0673	0,0969	0,0019	-0,0163	-0,0787	**0,8966**	-0,0345	0,0011	0,0136	0,0811	-0,0114	0,0101	-0,0435
CF_5/TA	-0,3356	0,0151	0,0110	-0,1239	0,0761	0,0558	**0,7713**	0,0482	-0,0351	0,0305	-0,0142	0,1291	-0,0858	0,0980
CF_5/CE	-0,1931	**0,3701**	-0,2292	0,0126	-0,0428	**0,5434**	**0,5518**	0,0035	-0,0116	-0,0527	-0,0083	-0,0170	0,0588	0,0023
QR	-0,0189	-0,0048	-0,0091	-0,0038	-0,0040	0,0012	-0,0020	**0,9952**	-0,0482	-0,0550	0,0044	0,0031	-0,0115	-0,0055

CR	-0,0244	-0,0056	-0,0106	-0,0123	-0,0013	0,0015	-0,0003	**0,9946**	-0,0475	-0,0608	-0,0025	0,0013	-0,0166	-0,0057
SZ_1	0,0281	0,0101	0,0100	-0,0106	0,0116	0,0116	-0,0060	-0,0215	**0,9732**	0,1331	-0,0121	-0,0026	-0,1061	-0,0172
SZ_3	0,1077	0,0062	0,0263	0,0551	0,0484	-0,0013	-0,0105	-0,0786	**0,9651**	0,1174	0,0185	-0,0255	0,0862	-0,0111
LV_2	-0,0430	0,0115	0,0907	0,0149	-0,0006	-0,0212	0,0058	-0,0359	0,0889	**0,9614**	0,0065	-0,0048	-0,0160	-0,0085
LV_1	-0,0806	0,0575	0,1058	0,0148	-0,0082	-0,0064	0,0169	-0,0847	0,1629	**0,9378**	-0,0023	-0,0078	-0,0075	0,0076
CF_3/NS	0,0476	0,0007	0,0141	-0,1131	-0,0100	0,0076	0,0489	-0,0054	0,0078	0,0051	**0,9750**	-0,0085	-0,0077	-0,0204
CF_2/NS	0,0071	-0,0007	0,0045	**-0,6137**	-0,1675	0,0016	0,0502	-0,0026	-0,0076	-0,0019	**0,7548**	-0,0188	-0,0054	-0,0032
CF_5/NS	-0,0314	0,0049	-0,0073	**-0,6484**	-0,2860	0,0189	0,0891	0,0903	-0,0155	-0,0068	**0,4011**	0,2713	-0,0188	0,0698
GR	-0,0248	-0,0044	-0,0048	-0,0767	-0,0445	0,0027	0,0627	0,0000	-0,0237	-0,0097	-0,0073	**0,9723**	0,0091	-0,0159
AT	0,0676	-0,0004	0,0234	-0,0212	0,0396	-0,0042	-0,0261	-0,0253	-0,0198	-0,0235	-0,0112	0,0087	**0,9685**	0,0291
PBV	0,0338	0,0235	0,0617	0,0181	-0,0685	-0,1063	0,0173	-0,0117	-0,0256	0,0013	-0,0133	-0,0144	0,0301	**0,9544**

Current ratio(CR): ((Current Assets-Total / Current Liabilities-Total (WC08106)), Quick ratio (QR): (WC08101), Growth (GR):(Current Year's Total Assets /Last Year's Total Assets - 1) * 100 (WC08621)), Operating Profit Margin (OPM): (WC08316), Size 1 (SZ_1): Ln(Total Assets (TA)) (WC02999), Size 2 (SZ_2): Ln(Employees (EM)) (WC01001), Size 3 (SZ_3): Ln(Net Sales (NS)) (WC01001)), Earnings Before Interest and Taxes (EBIT): (WC18191), Net Income Available to Common (IAT):(WC01751), Leverage 1 (LV_1): (Total debt (TD)/Common Equity (CE))(WC08231), Leverage 2 (LV_2): (Long Term debt (LTD)/ Total Capital (TC)) (WC03251/WC03998), Leverage 3 (LV_3): (Long Term Debt (LTD)/Common Equity (CE)) (WC08226), Leverage 4 (LV_4): (Total Debt (TD)/Total Capital (TC)) (WC08221), Financial Leverage (FL): (EBIT/Net Income Available to Common) (WC18191/WC01751), Leverage ratio (LR): (Fixed Assets (FA)/Common Equity (CE)) (WC08266), Asset Turnover (AT): (WC08401), Efficiency 1 (EF_1): (Net Sales (NS) / Gross Fixed Assets (GFA)) (WC08431), Coverage Ratio (CGR): (EBIT/Total interest expense(WC08291)), Price to Book Value (PBV), Cash Flow 1 (CF_1): Net Cash Flow Operating Activities (WC04860), Cash Flow 2 (CF_2): Net Cash Flow Operating Activities + Net Cash Flow Investing (WC04860 + WC04870), Cash Flow 3 (CF_3): CF_2 – Depreciation, Depletion and Amortization (WC01151), Cash Flow 4 (CF_4): Funds From Operations (WC04201), Cash Flow 5 (CF_5): Net Cash Flow Financing (WC04890).

Annex III

Table 1. Correlation coefficients between macroeconomic variables and sentiment variables.

	EX	CPI	GDP	UN	GFCOSI	HLCOSI	GFSCCI	HLSCCI
EX	1	0,245	0,079	0,006	0,120	0,257	-0,077	0,055
CPI	0,245	1	0,478	-0,007	-0,193	-0,155	-0,326	0,602
GDP	0,079	0,478	1	-0,299	0,238	0,028	0,184	0,538
UN	0,006	-0,007	-0,299	1	-0,244	-0,464	-0,347	-0,035
GFCOSI	0,120	-0,193	0,238	-0,244	1	0,265	0,554	-0,251
HLCOSI	0,257	-0,155	0,028	-0,464	0,265	1	0,394	-0,158
GFSCCI	-0,077	-0,326	0,184	-0,347	0,554	0,394	1	-0,191
HLSCCI	0,055	0,602	0,538	-0,035	-0,251	-0,158	-0,191	1

GFSCCI (Grow or Fall sentiment based on consumer confidence index), GFCOSI (Grow or Fall compound sentiment Index), HLCOSI (high and low Compound Sentiment Index), HLSCCII (High and low Sentiment Index based on consumer confidence index), CPI (variation of the Consumer Price Index), GDP (variation of the Gross Domestic Product), EX (variation of the exchange rate), UN (variation of the unemployment rate)

Annex III

Table 2. Correlation coefficients between the dependent variable and independent variables

EX (exchange rate), GDP , GFSCCI (sentiment variation based on CCI), GFCOSI (sentiment variation based on compound índex), CF_1/CE

	β	CF_1/CE	CF_1/NS	CF_2/NS	CF_2/TA	CF_4/TA	IAT/CE	IAT/NS	SZ_1	CR	GR	LV_1	AT	LR	PBV
β	1	0,14	0,02	0,05	0,09	0,07	0,03	-0,01	0,24	-0,05	0,04	0,16	-0,11	0,10	0,09
CF_1/CE	0,14	1	0,26	-0,02	0,13	0,41	0,27	0,11	0,10	-0,13	-0,05	0,29	0,17	0,53	0,22
CF_1/NS	0,02	0,26	1	-0,07	0,09	0,32	0,18	0,50	0,07	-0,13	-0,13	0,01	0,02	0,05	-0,03
CF_2/NS	0,05	-0,02	-0,07	1	0,54	-0,05	-0,01	-0,19	-0,01	0,05	0,23	0,00	-0,17	-0,03	-0,01
CF_2/TA	0,09	0,13	0,09	0,54	1	0,24	0,05	-0,01	-0,02	-0,07	0,25	0,00	0,07	-0,01	0,06
CF_4/TA	0,07	0,41	0,32	-0,05	0,24	1	0,46	0,29	0,05	-0,08	0,00	-0,13	0,29	-0,03	0,11
IAT/CE	0,03	0,27	0,18	-0,01	0,05	0,46	1	0,36	0,11	0,02	0,09	-0,11	0,01	-0,18	-0,08
IAT/NS	-0,01	0,11	0,50	-0,19	-0,01	0,29	0,36	1	0,09	-0,07	-0,01	-0,03	0,06	0,00	-0,03
SZ_1	0,24	0,10	0,07	-0,01	-0,02	0,05	0,11	0,09	1	-0,13	-0,03	0,32	-0,09	0,17	-0,10
CR	-0,05	-0,13	-0,13	0,05	-0,07	-0,08	0,02	-0,07	-0,13	1	0,09	-0,33	-0,16	-0,18	-0,04
GR	0,04	-0,05	-0,13	0,23	0,25	0,00	0,09	-0,01	-0,03	0,09	1	-0,03	-0,08	-0,09	0,07
LV_1	0,16	0,29	0,01	0,00	0,00	-0,13	-0,11	-0,03	0,32	-0,33	-0,03	1	-0,09	0,54	0,09
AT	-0,11	0,17	0,02	-0,17	0,07	0,29	0,01	0,06	-0,09	-0,16	-0,08	-0,09	1	-0,07	0,11
LR	0,10	0,53	0,05	-0,03	-0,01	-0,03	-0,18	0,00	0,17	-0,18	-0,09	0,54	-0,07	1	0,24
PBV	0,09	0,22	-0,03	-0,01	0,06	0,11	-0,08	-0,03	-0,10	-0,04	0,07	0,09	0,11	0,24	1

CF_1/CE (Net Cash Flow Operating Activities/Common Equity), CF_4/TA (Cash Flow of Company / Total assets), IAT/CE (Net Income /Common Equity)(ROE), IAT/NS (Net Income(Net Sales), SZ_1 (Ln (Total Assets), CR (Current Assets/Current Liabilities), GR (Current year's Total Assets/Last year's Total Assets), LV_1 (Total Debt/ Common Equity), AT (Net Sales /Total Assets), LR (Fixed Assets/Common Equity), PBV (price to book value)

Annex IV.

Table 1. Interaction between geographic area and economic sector analyzed.

EUROPE	Hotels and Entertainment Services (154) and Passenger Transportation Services (30)
USA	Hotels and Entertainment Services (87)
ASIA	Hotels and Entertainment Services (322) and Passenger Transportation Services (67)
JAPAN	Hotels and Entertainment Services (148) and Passenger Transportation Services (34)
CHINA	Hotels and Entertainment Services (43) and Passenger Transportation Services (23)
HONG KONG	Hotels and Entertainment Services (79)
INDIA	Hotels and Entertainment Services (52)

Annex V

Table I. Test F for every model.

Sample	**F test that all u i=0**
Total Sample	Prob > F = 0,0000
Casinos & Gaming	Prob > F = 0,0000
Hotels, Motels & Cruise Lines	Prob > F = 0,0000
Leisure & Recreation	Prob > F = 0,0000
Restaurants & Bars	Prob > F = 0,0000
Airlines	Prob > F = 0,0000
Passenger Transportation, Ground & Sea	Prob > F = 0,0000
USA whit GFSCCI	Prob > F = 0,0000
USA with GFCOSI	Prob > F = 0,0000
Europe with GFSCCI	Prob > F = 0,0000
Europe with GFCOSI	Prob > F = 0,0000
Asia with GFSCCI	Prob > F = 0,0000
Japan with GFCCI	Prob > F = 0,0000
Japan with GFCOSI	Prob > F = 0,0000
China with GFSCCI	Prob > F = 0,0000
China with GFCOSI	Prob > F = 0,0000
India with GFCCI	Prob > F = 0,0000
Hong Kong with GFCCI	Prob > F = 0,0000
USA and Hotels & Entertainment Services with GFSCCI	Prob > F = 0,0000
USA and Hotels & Entertainment Services with GFCOSI	Prob > F = 0,0000
Europe and Hotels & Entertainment Services with GFSCCI	Prob > F = 0,0000
Europe and Hotels & Entertainment Services with GFCOSI	Prob > F = 0,0000
Europe and Passenger Transportation Services with GFSCCI	Prob > F = 0,0000
Europe and Passenger Transportation Services with GFCOSI	Prob > F = 0,0000
Asia and Hotels & Entertainment Services with GFSCCI	Prob > F = 0,0000
Asia and Passenger Transportation Services with GFSCCI	Prob > F = 0,0000
Japan and Hotels & Entertainment Services with GFSCCI	Prob > F = 0,0000
Japan and Hotels & Entertainment Services with GFCOSI	Prob > F = 0,0000

Japan and Passenger Transportation Services with GFSCCI	Prob > F = 0,0000
Japan and Passenger Transportation Services with GFCOSI	Prob > F = 0,0000
China and Hotels & Entertainment Services with GFSCCI	Prob > F = 0,0000
China and Hotels & Entertainment Services with GFCOSI	Prob > F = 0,0000
China and Passenger Transportation Services with GFSCCI	Prob > F = 0,0000
China and Passenger Transportation Services with GFCOSI	Prob > F = 0,0000
Hong Kong and Hotels & Entertainment Services with GFSCCI	Prob > F = 0,0000
India and Hotels & Entertainment Services with GFSCCI	Prob > F = 0,0000

[1] The exchange rates of the different economies, except the USA, have been expressed in foreign currency, Yuan, Yen, Rupee, Hong Kong $, Euro, necessary to buy an American $. The US exchange rate is the amount of US dollars needed to buy € 1

[1] If the negative CE value was found at the beginning of the series, the initial years affected were eliminated and if the negative value was interspersed in the series, it was replaced using the same criteria as with the missing values.

[1] The seven indicators that could not be used in the study are CF_1/FE, CF_2/FE, CF_3/FE, CF_4/FE, CF_5/FE, EBIT/FE, IAT/FE

CONCLUDING REMARKS

Cost of capital continue to be a core investment value concept for private and institutional traders and other actors of the international stock market.It helps to design the optimal capital structure, evaluate investment options and take capital budgeting decisions. Antecedents of the cost of capital could be grouped into different ways, but the systematic risk remain in all the most of models and calculations.

Systematic risk or undiversifible risk is the volatility that affects all the economic cluster and industries, it infuences on all markets and difficult to predict. Beta (β) is a measure of one stock volatility comparing to the market. It measures the risk performance of a particular stock or sector has to the whole market. So we can conclude that trying to define the variables, which influence on systematic risk coefficient (β), we will understand the antecedents of risk level and cost of capital.

Most of the CAPM models focus on the internal and external data set of information which influence on beta, but we should always remember that we are all humans, with our own not rational actions, fears and emotions. Taking into consideration the newly developed field of knowledge of behavioral finance we must always try to avoid a purely rational concept of market, trying to merge behavioral and non behavioral approaches.

In our research we started from the database of US companies in tourism industry and further developed into more countries and undustry clusters. In the first paper we established 3 hyphothesis and found that systematic risk is explained by businesses' size and growth, along with three indicators of business efficiency and consumer price indices. In the second paper we incorporated behavioral sentiment variables into beta model analyzing cluster peculiarities of sentiment dependent companies. We found that the level of regression between systematic risk coefficient (β) and sentiment is dependent on high-low period of sentiment, it is stronger during high and low sentiment period and weak during neutral. We also found that high-low period of sentiment affects differently on companies from different clusters and sentiment affected companies are companies belonging to the cluster with low level of financial stability. Third paper allowed us to increase the dataset from 79 to 673 companies and to improve the number of countries and variables to be tested. We confirmed that the size of the database allows us to obtain a statistical model with greater explanatory power and the results show that the investor sentiment together with a combination of accounting and macroeconomic information are risk explanatory variables, except for USA, Japan and India

and for the subsectors of Hotels, Motels & Cruise Lines and Airlines. The investor sentiment shows a negative sign of relation to risk and other explanatory variables vary for each sector and area.

Thus, the systematic risk of the tourism sector in general shows a positive relationship with the business size (SZ_1), the investment in working capital (CR) and the growth of gross domestic product and a negative relationship with the investor sentiment, return ratio of equity and the Asset Turnover efficiency ratio. However, the Hotels, Motels and Cruise Lines sector shows a negative relationship with the exchange rate, the IAT/NS ratio and positive with the CF_1/NS ratio and the US companies show a different relationship to European and Asian companies.

Our findings are very useful for tourism enterprises management in different countries, it provides information which explain the equity risk to facilitate efficient business management and help to objectively quantify the risk without even having beta.

Our research add the light to the shaded field of behavioral finance in crosssection to systematic risk, we ask the other researchers to go deeper into analysis adding other sectors of economy and more sofisticated models of risk measurement as the part of the business management efficiency improvement by using models of four or five factors. In addition we ask to add S&P500 as a measurememnt of daily returns in comparison to DJ index, to validate excess return rather than simple returns. Another robustness check could be to compare original S index of Barker and Wurgler to the results from the PCA analysis and to the weighted moving average index. We are sure that such research direction will help practioners to stabilize business approaches and establish new culture of cost capital control and management.